Implements Text Chat on Android Device using Bluetooth

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Abstract—*Nowadays android becomes the latest technology in the Smartphone's. Android is a powerful application API and it provides the open sourcing. Thus I design a chatting application based on android Bluetooth which establishes connection that can be secure, insecure and discoverable between smart phones and then messages are exchanged between them and provides communication on low power. Wireless communication can be done by the help of Bluetooth technology in mobile communication. Bluetooth is a short range specification of radio frequency. It can be one to one and one too many. Bluetooth replace the needs of cable. By the help of Bluetooth we operate keyboard, mouse without direct link of CPU. Printer, headphone, mouse, keyboard or any digital devices are part of Bluetooth Technology. In Bluetooth two way communications has occurred without support of network for Short-range. Bluetooth is a mainstream Smartphone platform for mobile communication that is integrated in Android. Bluetooth has low energy.*

Keywords: *Android, Bluetooth, Messages, Wireless Communication, Classroom etc.*

1. INTRODUCTION

In recent years, by development of mobile communication especially release of Android phone has injected new poignancy to mobile space. Android is a mobile operating system for smart phone. It is based on Linux. It's completely open and integrated platform for smart phones. It consists middleware, user interface and operating system. It's a wireless communication standard for short range. The advantage of Bluetooth is it's availability in low price, can be easily control and can maintain non-visual distance limitations. Bluetooth is an important part or we can say feature of smart phones. It's integrated in android platform it's like android mobile network communication. Android provides various APIs for developers and Bluetooth is one of them. Purpose of this chat room which is based on Bluetooth of android is connecting smart phones in a PAN, and then communicates without any cost. This paper carries a text messages chat system with the help of Bluetooth based on android platform and it also provide the feature of storing the message. Android phones are divided in to client and server and then the text messages chat between friends and also with those persons with that you are not familiar.

There is no need of GSM or Wi-Fi connection required. In addition to the class room can be used to gather to or more than two persons at a time.

2. BACKGROUND AND RELATED WORK

Bluetooth is a low cost, low power, short-distance technology to replace the needs of cable. It's an open specification governed by Bluetooth SIG (Special Interest Group).In beginning there were only five companies who started or lead the Bluetooth SIG to which in late 1999, four new companies were added. The total of nine companies now runs Bluetooth SIG. Nowadays Bluetooth has been very common in all mobile devices. It allows user to exchange data even without any network connectivity.

Nikita Mahajan, Garima Verma, Gayatri Erale, Sneha Bonde, Divya Arya [1] proposed Chatting through Bluetooth. In this paper they implement the chatting using Bluetooth through android. Where there are basic send, receive, clear and close options with the text window.

Rahul Verma, Ruchit Gupta, Manas Gupta, Rahul Singh [4] proposed a chatting application using Android Bluetooth. In this they build the messaging through Bluetooth apart from just transfer of files.

2.1 Comparative Analysis

Nikita Mahajan, Garima Verma, Gayatri Erale, Sneha Bonde, Divya Arya and Rahul Verma, Ruchit Gupta, Manas Gupta, Rahul Singh tried well in there paper. In my paper I tried to take the chat to a level up by not only just sending and receiving messages but also saving them. This feature can be seen in hot chat applications and I tried to do this through Bluetooth without any internet connectivity.

3. BLUETOOTH PROTOCOL AND LAYERED ARCHITECTURE

Bluetooth is a wireless standard for transferring data over short distances. It's low cost transmission for the various devices and electronic products. It has kernel, driver, protocol

layers user library, adaptation layer. Bluetooth can be used to transmit data. L2C AP, SDP, RFCOMM are layer that include number of agreements that provides upper transmission. RFCOMM is a cable replacement protocol that provides great transport capabilities for various high level services. Bluetooth Technology use RFCOMM because of its wide support and available API on most operating system .Those application that used a
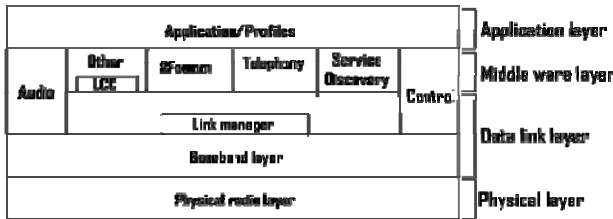
Fig. 1 Bluetooth protocol and layer architecture serial port to communicate quickly port to use RFCOMM.

4. PROCESS OF TEXT MESSAGES THROUGH BLUETOOTH

1. It first checks Bluetooth of the devices is in ON/OFF mode.
2. If Bluetooth of devices is in OFF mode then it makes the request to enable the Bluetooth.
3. Scanning of the devices is performed in a particular range.
1. Display list of all the devices in the particular range.
2. Select the device with which you want to chat using text messages
3. If the device connects then set up the chat session.

5. DESIGN OF COMMUNICATION THROUGH ANDROID BLUETOOTH

Bluetooth API is provided by Android platform for communication between two devices that are paired. Communication through Bluetooth is based on unique MAC. Devices must be paired before communication for security purpose. The connected device will be shared with RFCOMM channel. RFCOMM channel is used to transmit data and known as the Serial Port Profile. Communication process includes Query Bluetooth, finding devices and connecting Bluetooth. In query Bluetooth we use Bluetooth adapter for getting Bluetooth activity and its methods. Bluetooth adapter is also used to discover other Bluetooth devices. It creates BluetoothServerSocket and it's like TCP sever socket. It is used to create a listening server socket. Android API supports RFCOMM which is connection oriented and provides streaming transport over Bluetooth. Second is finding devices: means scan all the nearer devices to pair and connect with a device. Third is Connectivity. In which device is connect through Bluetooth by secure, insecure and discoverable mode. Firstly request a connection, accept a connection and then text message transmission between devices is take place.
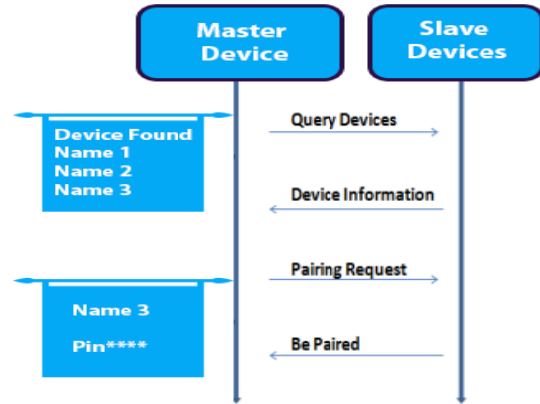

Fig. 2: Bluetooth pairing process

6. MECHANISM FOR MESSAGE PASSING THROUGH ANDROID BLUETOOTH (PROPOSED WORK)

Bluetooth chat through android includes various classes and methods. BluetoothChat is the main class that is used for displaying the chat. BluetoothAdapter perform basic tasks like initiate device, query device to get the BluetoothDevice in a short range for pairing by getBondedDevices() method, Connection point is called BluetoothSocket. It allows android devices to chat using Android Bluetooth. BluetoothServerSocket is created by BluetoothAdapter and it's like TCP sever socket which is used for transmission among two android devices. Broadcasting of messages is done by application or system itself by Broadcast Receiver. Messages are sometime referred to as events. Papers [1] and [4] do the chatting through android but the chat is not saved in their paper so I proposed a chat mechanism using Android Bluetooth in which message saving is performed. I proposed some custom classes like MessageData and Share Preferences for storing the application data. MessageData defines the type. SharePreference for storing data permanently, I used Editor for modification. Single instance is made for chat saving. I Implemented Gson library for message storage in json format in key value pair and allow custom representation for objects and it includes pre-existing objects. ArrayAdapter shows messages using BluetoothChat class and toString(). Messages are shown on the screen when you are connected and also when you are not connected with another Bluetooth device. I worked using API level 4.1, known as JELLY_BEANS and it is also compatible with lower versions.

Sample Code for Message Saving

mConversationArrayAdapter = **new**

ArrayAdapter<String>(**this**, R.layout.*message*);

mConversationView=(ListView)findViewById(R.id.*in*);

mConversationView.setAdapter(mConversationArrayAdapter);

MessageData messageData = gson.fromJson(set.getList(), MessageData.**class**);

if(messageData!=**null**)

{

 for(**int** i=0;i<messageData.getList().size();i++)

 {

 String infomessage=messageData.getList().get(i);

         mConversationArrayAdapter.add(infomessage);

         }

}

When message is writing
String writeMsg = **new** String(writeBuf);
String writeMsgSharepref="Me: " + writeMsg;
mConversationArrayAdapter.add("Me: " + writeMsg);
MessageData iqData = gson.fromJson(set.getList() ,MessageData.**class**);

if(iqData==**null**)
{
 iqData=**new** MessageData();
}
String infoMsg= writeMsgSharepref;
iqData.getList().add(infoMsg);
Gson gsonMsg = **new** GsonBuilder().create();//creating GSON object
String convert = gsonMsg.toJson(iqData, MessageData.**class**);
set.setList(convert);

7. ADVANTAGE OF BLUETOOTH TEXT CHAT

1. Short range wireless communication standard.
2. Less power consumption.
3. No license is required.
4. Internet connection is not required (No GSM/Wi-Fi).
5. Creative approach for entering in to mobile word.

8. LIMITATION OF TEXT MESSAGES

1. Due to short range of communication it's not used for communication for large ranges between devices.
2. Unfamiliar or unknown are also communicate with others using Bluetooth devices.

9. CONCLUSION

This paper proposed a user-friendly interactive Application for android device and requires no prior knowledge of software. It allows android smart phones and tablet users to send and receive messages through Bluetooth with in a class room at free of cost and also provide message saving. No internet is required. So there is no cost cutting and it increases the communication between devices. It's an innovative approach for chatting using Bluetooth.

10. FUTURE SCOPE

In Future, I can do information transmission like audio and video and pictures transmission with saving. I can be done calling through Bluetooth from one android device to another android device. It still needs improvement in functionality of the application.

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