www.ijecs.in
International Journal Of Engineering And Computer Science ISSN:2319-7242
Volume 4 Issue 4 April 2015, Page No. 11391-11395

Development of WiFi-Bluetooth Communication Protocol

Prof. Manjitsing Valvi, Jay P. Chauhan, Dinsha S. Dinani
Department of IT
KJSCE, Vidyavihar
Mumbai, India
manjitsingvalvi@somaiya.edu
jay.chauhan@somaiya.edu
dinsha.d@somaiya.edu

Abstract
Being different standards, translating packages sent from Bluetooth to Wi-Fi and vice versa is difficult and also the connections should not be broken or interrupted. Finding a right way to send and receive data is the need and also efficiency and reliability of the data is also necessary. Each protocol has its own associated hardware and software specification. Hence for communication between 2 devices with 2 different protocols is difficult. The system allows us to develop a network through which two powerful protocols can communicate with each other, even though the standards of the protocol are different.

I. INTRODUCTION

The above proposed system is all about to develop such a network which will allow these two powerful communication protocols link with each other just by using our intermediate protocol convertor. We will demonstrate the capability of our system by showing chatting between these two protocols and even will demonstrate file transmission in full duplex mode.

II. LITERATURE REVIEW

A. Wi-Fi

In a WiFi network, computers with WiFi network cards connect wirelessly to a wireless router. Wi-Fi also allows communications directly from one computer to another without the involvement of an access point. This is called the ad-hoc mode of Wi-Fi transmission. Wi-Fi allows the deployment of local area networks (LANs) without wires for client devices, typically reducing the costs of network deployment and expansion. Spaces where cables cannot be run, such as outdoor areas and historical buildings, can host wireless LANs.

Figure 1: WiFi Representation

B. Bluetooth

Bluetooth is a standard for wireless communications based on a radio system designed for short-range cheap communications devices suitable to substitute for cables for printers, faxes joysticks, mice, keyboards, and so on. Bluetooth wireless technology is the global short-range wireless standard for personal connectivity of a broad range of electronic devices. The technology continues to develop, building on its inherent strengths – small-form factor radio, low power, low cost, built-in security, robustness, ease-of-use, and ad hoc networking abilities. Bluetooth devices communicate using radio waves in order to remove the need for a physical wired connection.

Figure 2: Bluetooth Representation

III. PROPOSED SYSTEM

The proposed system is aimed to develop a network, which will allow interoperability between a WiFi device and a Bluetooth device with a gateway PC in between.

The followings are the various steps that will describe the working of the above proposed system.
• The system will be consisting of the following three major units:

- The PC with WiFi Link
- The PC with Bluetooth Link
- The PC with WiFi and Bluetooth Link both

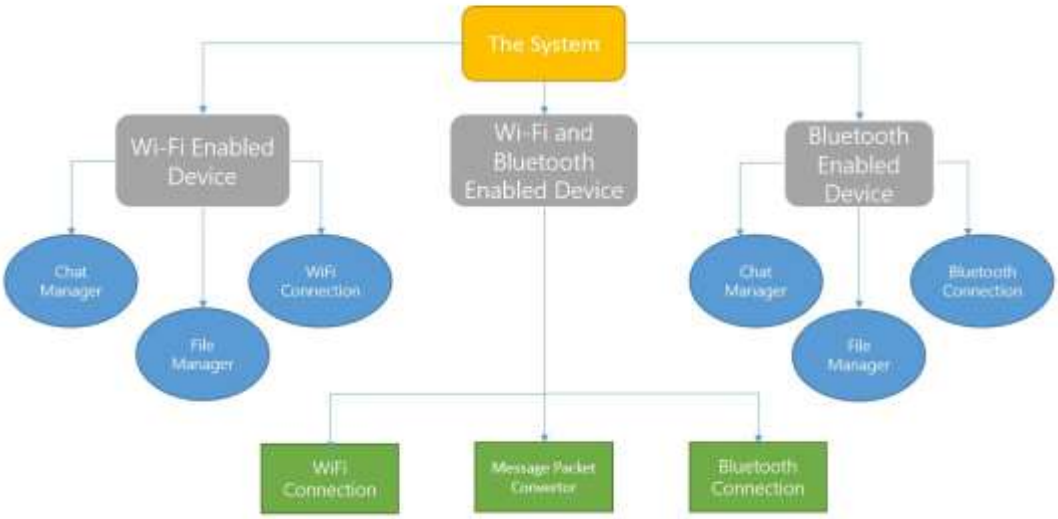

Figure 3: Overall layout of the proposed system

A. The PC with WiFi Link

We will write software for this PC that will follow the protocol designed by us for communication with the intermediate PC. The job of this software will be to send and receive the information in predefined packet format using the WiFi Link of the PC. The GUT will be consisting of a chat room and a file handling system. User can type any message or select any file to be transmitted to the remote Bluetooth Linked PC.

B. The PC with Bluetooth Link

We will write software for this PC that will follow the protocol designed by us for communication with the intermediate PC. The job of this software will be to send and receive the information in predefined packet format using the Bluetooth Link of the PC. The GUI will be consisting of a chat room and a file handling system. User can type any message or select any file to be transmitted to the remote WiFi Linked PC

C. The PC with WiFi & Bluetooth Link

This is the main PC that WiFi actually perform the intercommunication or inter conversion of WiFi packets and Bluetooth packets and vice versa. The software will accept packets incoming through the WiFi connection of PC and decompose it for its raw information and again pack it for transmission to the Bluetooth Link. The same process will be repeated again for the reverse direction communication.

D. Features

- Short Range Wireless System-The Mobile Device with Bluetooth Connectivity, with short range for communication, can easily connect with WiFi devices in the nearby communication range.
- Independent of protocol and device- Mobile Device and PC though having different networks, Bluetooth and WiFi respectively, can communicate independent of protocol standards.
- Dynamic Creation- The connectivity between the devices is created immediately and dynamically with no waste of time.
- Direct Virtual Communication between Wi-Fi and Bluetooth linked mobile- The devices connected to each other are independent of the type of network used for connecting with the other devices. An intermediate PC (main server) is responsible for connections between the devices.
- Room for message transmission and reception- The devices connected to each other can easily communicate and also separate room for devices communicating, is created.
- File transmission facility- Along with message transfer file transfer can also be done which is the most important feature covered.

IV. METHOD USED

The following will be development steps so as to achieve the working Prototype Model of the above proposed system.

- Initializing all the system variables.
- Initializing Bluetooth and WiFi connections.
- Present the Graphical Interface to the user.
- Provide options of Message Sending or File transfer.
- If Message Sending option is selected then user is prompted to provide message for sending then the packet is created of the associated message and sent to the Bluetooth-WiFi Driver.

- The Bluetooth-WiFi Driver will determine the message based on the packet.
- The message reception takes place and the packets are decoded and displayed in the display area of the GUI window.
- If the File Transfer option is selected the user has an option to select the file by providing the directory of the file.
- Further the file is sent as a packet to the Bluetooth-WiFi Driver.
- The packets are resolved based on the type of the packet.
- The file reception takes place and the packets are decoded and with simple name and directory provided by user the file is received and stored in the system.

V. RESULTS OF OUTCOMES ACHIEVED

The outcomes achieved are represented in the figure which shows the various graphical images of the system. Message sending/receiving as well as File transfer capability has been achieved during the development of the system. The system can transfer the files and messages without any delay of time. The most important is part of the working of the system is the proper establishment of communication between the two devices with the intermediate PC which can then transfer message/file over the two devices.

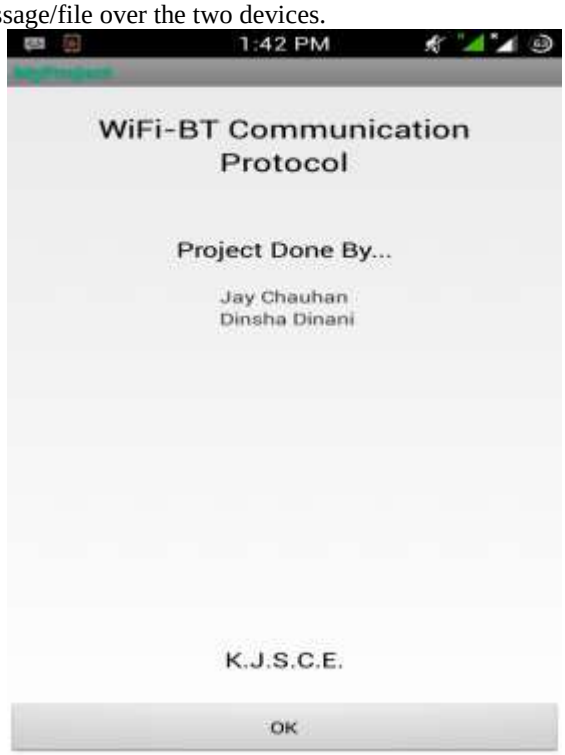

Figure 4:
Welcome Screen on Android Phone which represents that the app on Android phone has started and ready to use.

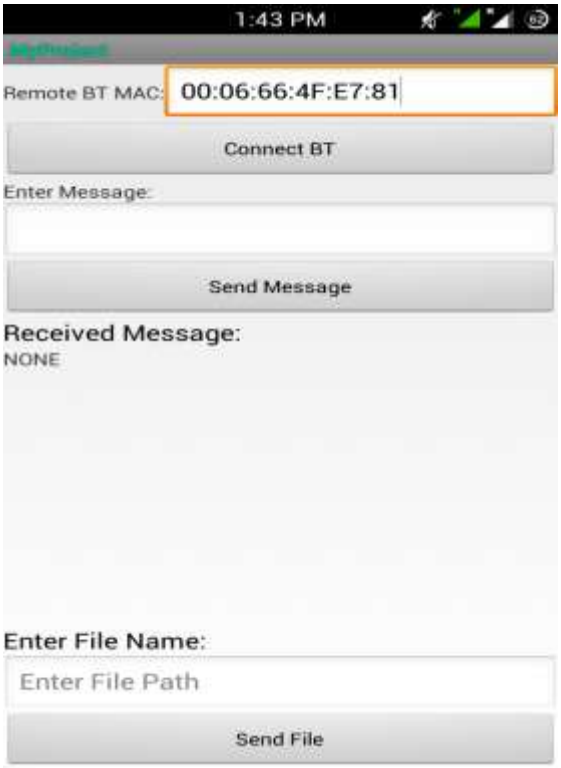

Figure 5:
Main Screen of the Android App where the user needs to provide the MAC address and tap on Connect BT to establish a connection

Figure 6:
User Interface for sending and receiving the Message/File with establishment of the connection.

Figure 6:
Intermediate PC to connect the PC and the Android Phone App for Communication

VI. FUTURE ENHANCEMENTS

There is always chance to improve the any system as research & development is an endless process. Our system is no exception to this phenomenon. The following improvements can be done.

- File size can be increased,
- All types of files can be integrated,
- Multimedia sharing can be incorporated.

VII. CONCLUSION

By the realization of the above proposed system one can learn many aspects of the software development strategies and various programming techniques for PC based applications.

REFERENCES

[1] Networking and Computing, 2013 Conference-Implementation of WiFi/Bluetooth-based Smart Narrow Field Communication.

[2] Mobile Computing and Ubiquitous Networking (ICMU), 2014 Seventh International Conference.

[3]www.itservices.stanford.edu/services/category/network-and-connectivity - Stanford Edu

[5]www.developer.android.com - Android development libraries, SDK and ADT tools