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Fast Air Connect

Data transfer between android device and computer

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Abstract—the theme of this project is to have wireless transmission of data across laptop and Android smart phone at a speed much higher than Bluetooth®. The project is based on establishing dynamic Wi-Fi connection on one device and tethering of data on the other. This project can be used at commercial as well as social level. It is one of the software which can be used on daily basis.

Keywords-android; Wi-Fi; java; data transfer; sharing;

I. INTRODUCTION

Fast Air Connect is an application which uses Wi-Fi technology to transfer data between mobile phones and PCs or Laptops. The speed of transfer provided by this application is at much higher speed than Bluetooth. The user interface of Fast Air Connect is very user friendly and can be handled very efficiently.

1.1. Description

'*Fast Air Connect*' is software that enables users to transfer data between mobile phones and PCs or Laptops. The Fast Air Connect works on simple fundamentals of wi-fi, that is, a local area wireless technology (WLAN). Here the tethering technique is used to send out the data to another device which can catch the incoming data through its wi-fi capability. The protocol used for transferring data is MS-TCC[1]. The software mainly will consist of two applications one for Windows OS and other for Android OS. The interface of desktop application is developed using java applet and for android application interface is build using xml and connectivity is done using java for both application. The user can establish connection between mobile phone based on Android OS and Laptop, PC or Desktop based on Windows OS and can share data. The application will allow you to exchange elements like photos, songs, videos from the phone to the computer and vice versa in the fastest and most feasible way.

1.2. Problem Formulation

There are many existing technologies which enables user to transfer data between mobile phone and PCs. The major disadvantage of those existing technology is the user interface of some of the application. Some applications also use data connectivity every time for pairing the devices or say to connect the devices. Using every time data connectivity for this purpose makes it uneasy as it increases the cost of access.

1.3. Proposed Solution

Fast Air Connect is the application that will enable you to connect the mobile phones with Laptop and PC. The user interface will be user friendly and can be handle efficiently. It will use MS-TCC protocol for transmission of data.

1.4. Scope of the project

Presently the application is used to transfer the data between the devices connected to each other when they are connected via Fast Air Connect. The application can be further extended for the devices connected through router. This application is especially for Windows OS and Android OS further it can be extended for different types of OS.

II. REQUIREMENTS

The requirements of the project are divided into two broad categories, namely, the functional and the nonfunctional requirements. These requirements have been given below. These requirements specify what the project is expected to achieve.

2.1. Functional Requirements

Functional requirements specify the objective goals of the project. This means, it defines what features the project is supposed to have.

2.1.1. Data Transfer. The basic requirement of this project is that it should be able to transfer data among the connected devices via wi-fi. The data should not be altered in air. Also, the data should reach completely. Thus, the ACID property while transmission should not be violated.

2.1.2. Wi-fi and Tethering. The device should have wi-fi hardware. That is, it must be able to connect to WLAN (Wireless Local Area Network). Tethering algorithm should be present in at least one of the two connecting devices in order to share data.

2.1.3. Android OS. As our project mainly focuses on android devices, for smart phones, it must have android operating system to install the application.

2.2. Non-Functional Requirements

Non-functional requirements[2] are complimentary to the functional requirements. They do not add extra features, but help in enhancing the quality of the product. The main motto of our project is to give the best speed for transmission of data among two devices. Thus, the most prime non functional requirement is the data transfer speed. This speed mainly depends on the underlying wi-fi hardware of the device. The following table gives the details of various wi-fi protocols released till 2012.

V · T · E				802.11 network PHY standards							[hide]
802.11 protocol	**Release date**[5]	**Freq-uency**	**Band-width**	**Stream data rate**[6]	**Allowable MIMO streams**	**Modulation**	**Approximate range**[citation needed]			
							Indoor		**Outdoor**	
		(GHz)	(MHz)	(Mbit/s)			(m)	(ft)	(m)	(ft)
—	Jun 1997	2.4	22	1, 2	N/A	DSSS, FHSS	20	66	100	330
a	Sep 1999	5	20	6, 9, 12, 18, 24, 36, 48, 54	N/A	OFDM	35	115	120	390
		3.7[A]					—	—	5,000	16,000[A]
b	Sep 1999	2.4	22	1, 2, 5.5, 11	N/A	DSSS	35	115	140	460
g	Jun 2003	2.4	20	6, 9, 12, 18, 24, 36, 48, 54	N/A	OFDM, DSSS	38	125	140	460
n	Oct 2009	2.4/5	20	7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2 [B] (6.5, 13, 19.5, 26, 39, 52, 58.5, 65) [C]	4	OFDM	70	230	250	820[7]
			40	15, 30, 45, 60, 90, 120, 135, 150 [B] (13.5, 27, 40.5, 54, 81, 108, 121.5, 135) [C]			70	230	250	820[7]
ac	Dec 2013	5	20	7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2, 86.7, 96.3 [B] (6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78, 86.7) [C]	8		35	115[8]		
			40	15, 30, 45, 60, 90, 120, 135, 150, 180, 200 [B] (13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 180) [C]			35	115[8]		
			80	32.5, 65, 97.5, 130, 195, 260, 292.5, 325, 390, 433.3 [B] (29.2, 58.5, 87.8, 117, 175.5, 234, 263.2, 292.5, 351, 390) [C]			35	115[8]		
			160	65, 130, 195, 260, 390, 520, 585, 650, 780, 866.7 [B] (58.5, 117, 175.5, 234, 351, 468, 702, 780) [C]			35	115[8]		
ad	Dec 2012	60	2,160	Up to 6,912 (6.75 Gbit/s) [9]	N/A	OFDM, single carrier, low-power single carrier				
ah	Est. 2016[5]	0.9								

Table 2.1: IEEE 802.11 Protocol details

III.   IMPLEMENTATION

The project implementation includes accomplishment of 2 tasks. They are, creating an Android Application for Android smart phones and a Desktop Application for Laptop and desktops which supports wi-fi.

3.1.   Android Application

[3] As the project focuses on data transfer from mobile devices to the computer, the Android Application is to give an interface to this data transfer. Here, the wi-fi and tethering abilities of Android Device is used to transfer local files to another device instead of sharing its internet connectivity. Each screen an Android Application displays is known as an activity. There can be any number of activities in an application. The significant activities of our android application are described briefly below.

3.1.1.   Main Activity. The Main Activity of an application is the activity that starts first as soon as the application is launched. In our application, the main activity will have 3 options which can be used by the user, i.e., *Create Network*, *Join Network* and *Paired Devices.*
Create Network option is used to start the tethering network of the mobile phone. It has two options, either to be a hotspot or to connect to an hotspot through its wi-fi capability. The project also has the feature of pairing up with another device. This builds up a session between them unless one of it disconnects. The advantage of pairing is that it need not search for a network again and again if it is frequently used.

3.1.2.   Paired Device Activity. The application will maintain a limited list of devices that had been connected through this application previously for data transfer. This feature eliminates the effort of pairing the same device again and again. The details of the devices previously paired are stored in the local database of the application. The user is given the option to delete specific pairing and connect again. If the user deletes an entry from list of paired devices, the entry is deleted from the database. And thus, the pairing has to be done again before transferring data to the same device at later stage.

This concept works similar to the paired devices of Bluetooth. Another reason for pairing being lost is if the tethering configurations of paired device are changed.

3.1.3. Transfer Panel Activity. The user can reach this activity, by selecting a paired device that is currently active or pairing to a newly searched device. This activity is the core of entire project. Here, the user gets an interface to select the files he/she wish to transfer to another device.

3.2. Desktop Application

[4] Another half of this project is creating an interface for the computer, i.e., laptop or desktop. It will have a similar interface as the android application UI. There will be similar functionalities. The interface for desktop application has been shown in Fig 5.6 in chapter 5. This application will be implemented using Java.

IV.   CONCLUSIONS

4.1.   Conclusion

Through this project, we aim to create a product that can help users transfer the data between smart phones and computers with efficiency, speed and reliability. The project also gives a better interface allowing it to be more user-friendly. This will make the product more useful. The project does not involve any new innovation, but it offers modification to the existing technology.

4.2.   Future Scope

There exist many operating systems in smart phones like Android, iOS, Windows, Symbian, etc. Also, there exist different operating systems for computers like Windows, iOS, Linux, etc. Currently, our project only focuses on Android in smart phone operating systems and Windows in computer operating system. The future scope of this project will be extending it beyond the boundaries of the operating system. Thus, as a future plan, we intend to develop the software for other operating systems in smart phones and computer domains.

REFERENCES

[1]   http://msdn.microsoft.com/en-us/library/dn409925.aspx accessed on january 2015

[2]   http://en.wikipedia.org/wiki/IEEE_802.11 accessed on february 2015

[3]   Reto Meier , "Android 4 Professional Application Development" .

[4]   Herbert Schildt, "Java 2 : The Complete Reference ".