Remote Desktop Access through Android Mobiles and Android Mobiles Access through Web Browser

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Abstract: In this paper, we will present the process to access the computers and handle them with the help of android mobile phones. As well as access the Android Mobile by using a Web Browser. This process is implemented by using a Socket and to access the android mobile "NANOHTTPD" is used. So to work on this, we must install server on our computer and also Android devices must also run the server and must connected with Wi-Fi/Hotspot network. In this the user can access & perform operation through the range of Wi-Fi platforms such as windows. There is event-handling function used in this so as to support clicking and using keyboard. Whereas to access android mobiles through your Web-browser the LAN connection is needed to be set up.

Keywords: Android, Java, Wi-Fi, Mobile Terminal.

I.   INTRODUCTION

Initially mobile phones were developed only for voice communication but now-a-days the scenario has changed, voice communication is just one aspect of a mobile phone. There are other aspects which are major focus of interest. Two such major factors are web browser and GPS services. Both of these functionalities are already implemented but are only in the hands of manufacturers not in the hands of users because of proprietary issues, the system does not allow the user to access the mobile hardware directly. But now, after the release of android based open source mobile phone a user can access the hardware directly. He can design customized native applications to develop Web and GPS enabled services and can program the other hardware components like camera etc. This paper describes an Android application designed to control the Remote Desktops. Technological developments have enabled the creation of mobile devices with the technical features which were previously conceived only in PC architecture. With this application, here comes the need to integrate these devices so that interaction between the PC and mobile can be monitored and a better interaction can be accomplished.

One of the most widely used mobile OS these days called "**ANDROID**". **Android** is not just a collection of software but it comprises of operating system as well as middleware and key applications. Android Inc. was founded in Palo Alto of California, U.S. by Andy Rubin, Rich miner, Nick sears and Chris White in 2003. Later Android Inc. was acquired by Google in 2005. After original release there have been number of updates in the original version of Android are android 1.1, 1.5(Bluetooth), 1.6(Google), 2.0/1(file exchange support) (2009), 2.2(Wi-Fi support), 2.3(touch screen) (2010), 3.0(video chat) (2011), 4.0 latest. Android 4.1, Jelly bean the world's most popular platform gets ever better.

II.   FEATURES & SPECIFICATIONS

Android is a powerful Operating System supporting a large number of applications in Smart Phones. Some of   the current features and specifications of android are:

1. Application framework - it enables reuse and replacement of components
2. For connectivity GSM/EDGE,IDEN, CDMA,EV DO, UMTS, Bluetooth, Wi-Fi, LTE, NFC and WIMAX.
3. Dalvik virtual machine which is optimized for mobile device.

4. Integrated browser which is based on the open source web kit engine.
5. Optimized graphics to support custom 2D, 3D graphics library.
6. SQLite.
7. Media support.
8. Messaging using SMS and MMS.
9. 3G, Wi-Fi, camera, GPS, compass etc. are some more applications.

Application:

This application developed is divided into two parts, the first part includes handling desktop using application in Android and the second part is manipulating mobile phones through android browsers as well as any web browser.

PART A

While handling of remote desktop a LAN connection has to be established, that is all participating devices like android phone and pc are supposed to be in same network. This can be done by using a Wi-Fi hotspot connection or any method available like using routers or Bluetooth depending on speed of connection the performance of application is decided.

Once connection is established server has to be started on the pc or laptop and client application will be started on android device.

By using Socket primitives like Socket, Bind, Listen, Accept, Connect, Send, Receive, Close, Communication among the client and server takes place.
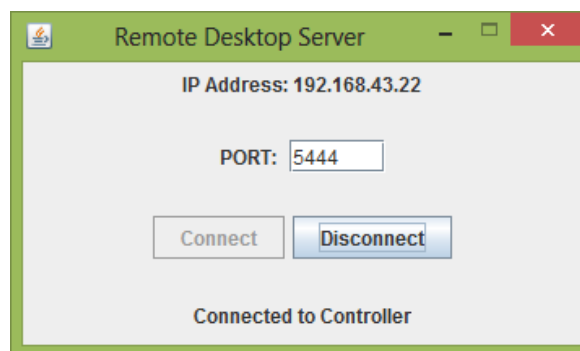

Fig 1: - Server with port number and IP Address (implemented on pc).

Once connection is fully established the server indicates the "PORT NUMBER And IP ADDRESS" which are to be inserted into client application which helps unique connection among pc and android device. Once connect option is selected on android application the application will enter into manipulation phase for desktop.
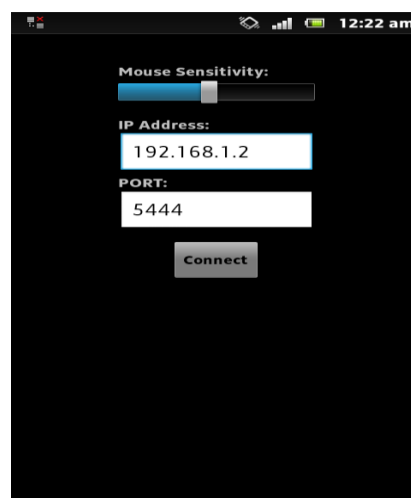

Fig 2: - Client with port number and IP Address (implemented on android device).

This allows us to handle typing mouse pointer manipulation using touch screen as well. The connection can be terminated by using disconnect option provided on server side. Only problem may occur in this is conflict of Port numbers and/or IP Address used during connection.

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Fig 3: - Client with Keyboard   And Mouse clicking functionality.

STEPS FOR "PART A" IMPLEMENTATION

Step 1: Get devices into same network that is PC and Android.

Step 2: Start Server and get Port number and IP address to insert in client.

Step 3: Match both client side and server side addresses and click on connect.

Step 4: Manipulate the device as needed.

PART B

Other half of this is handling of android phone using similar LAN connection. Once devices are in same network the server is started on android device which indicates connection address in form of a web address. This address includes IP address and Port number. E.g.: - http://192.168.2.3:7070.

This address is entered into web browser's address bar which will make connection to server. As in this server provides functionality for live camera and handling music player and its volume controls as well as retrieve previously send text messages as well.
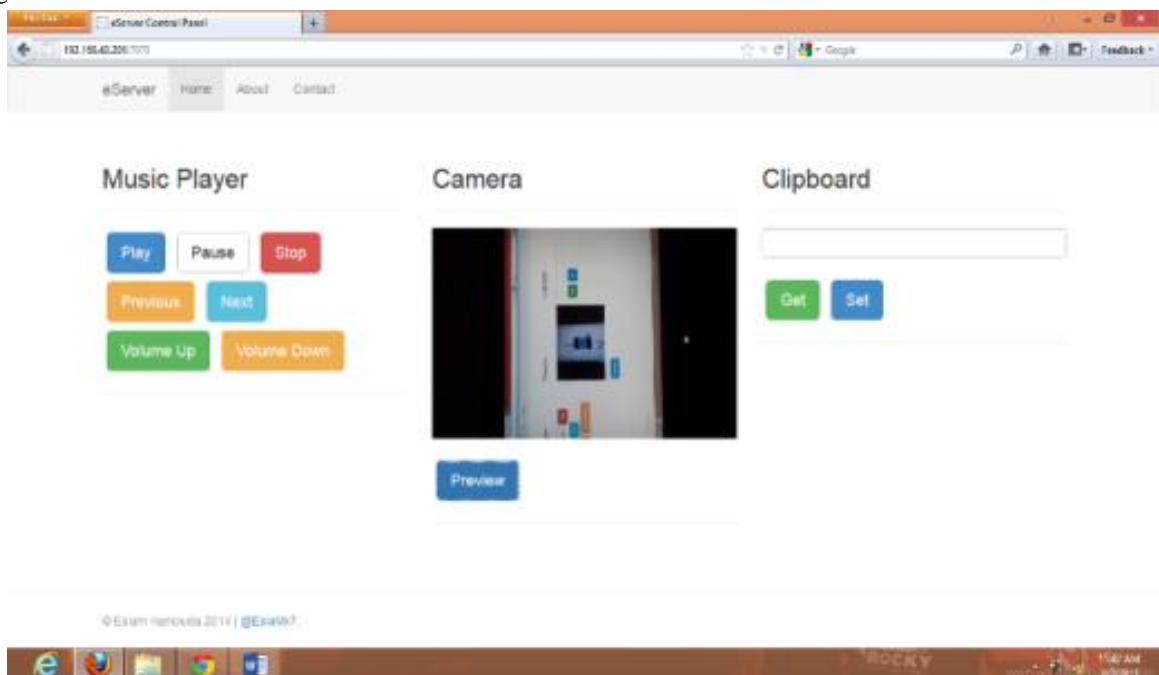

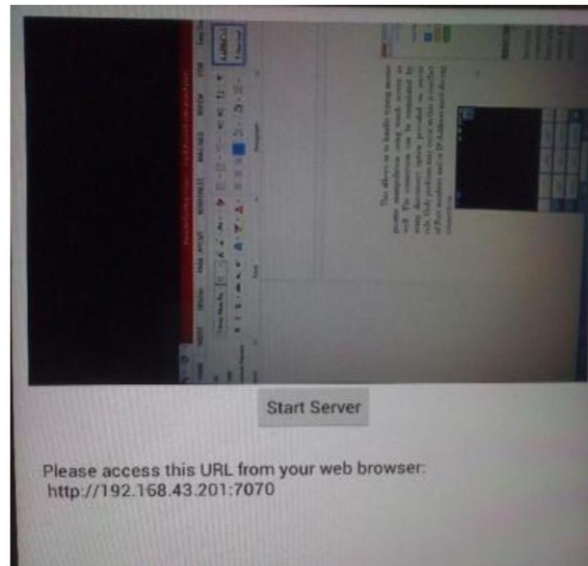**Fig 4:-Web browser with accessed address**

Fig 5:-Server on Android mobile device

For making connection any of device can be used that's is any device supporting web browser can be used to connect to server only requirement for this is the device needs to be in same LAN connection. This functionality is implemented using and protocol called as "NANOHTTPD". The NANOHTTPD protocol is a light weight protocol. It is used to easily embed HTTP server into JAVA. It is open source and also supports for cookies as well. It supports file upload with minimum memory overhead. It has blocking mode and is a multi-threaded application.

STEPS FOR "PART B" IMPLEMENTATION

Step 1: Get devices into same network that is PC and Android.

Step 2: Start Server and get Port number and IP address to insert in clients Web browser.

Step 3: Match both client side and server Addresses and click on go or press Enter key to visit address provided by server.

Step 4: Manipulate the device as needed.

III.   PROPOSED ARCHITECTURE

Android devices by just using a web browser, which can be even be of an android mobile as well. Remote Desktop Access supports handling of computer by using a keyboard, mouse that is just by touching mobile screen we can handle mouse of desktop even the keyboard provides typing functionality as well. Both parts of application that is while accessing a desktop, server needs to be onto PC and while handling Android phone, server needs to be on Android Device. Server must to interpret all events received from client and inject them into self-system.

The main part included is connection of a LAN network, this will connect both Computer and Android device as well. This is just done by entering IP address and Port Number which is generated by server of any side that may be server on Computer or even server which is present on Android device. For this reason Socket Primitives are implemented and also to access Android device "NANOHTTPD" protocol is used.

A controlling functionality by usage of a graphical screen update from a controlled device and capturing a mouse and/or a keyboard. This system is based on RFB (Remote Frame Buffer) protocol to transmit all information between connected devices. Transmission is done on one port using TCP/IP protocol. This system requires two type of application for a proper work - server application for a machine under control and client - for a supervisor (controlling) device. The cellular user can manipulate the desktop on the cellular phone. Here we have modules they are listed as below and the functionality and design of each module is described further.

*A. Desktop Handling and Android Device manipulation***:** In first part of this application we can access desktop and do handling of features like keyboard and mouse, and other part would allow the web browser on Android as well as Desktops to access Android device.

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B. Pointing and clicking: The user can move the pointer on the remote desktop display vertically and horizontally by using touch screen of Android mobile. Single click-Double click are also implemented and buttons for Right and Left click are also provided.

C. Inputting text:

Text is entered locally on the cellular phone using the built-in text input capability of the cellular phone. Which allows to do any type of typing of data as well.

D. Android device manipulation:

Android device is accessed its camera is used for live images and also its music player Text is entered locally on the cellular phone using the built-in text input capability of the cellular phone. Which allows to do any type of typing of data as well.

Table 1: Inputs/Outputs

Input	Output
User inputs Username, password, IP address and port number.	User is logged into the system.
User can select whether he wants to handle Android device or handle Remote Desktop.	Accordingly to the selection of access Corresponding application will be opened.
LAN Connection	Any part of handling requires devices to be in LAN connection that is Wi-Fi/Hotspot.
IP address and PORT number.	Depending on the part of application server generated IP address and port number is to be entered.

Limitations:

There are some limitations, however. The most important one is the specific range of Hotspot and Wi-Fi. Basically this means devices that are further away need to be brought into range, an alternative for this is to bring devices in same network.

Future scope:

Instead of just handling, a wide range of functionality can be provided and this can also be implemented by using internet as well.

IV.   CONCLUSION

This application will provide assistance to the system administrator in monitoring the tasks and also provide file transfer. Currently the scope of this system is within Wi-Fi area. Next step will be implementing this system over Internet. The LAN Connection will be used for implementation of the system. Due to wide use of android devices, this system will be developed for tablets and other handheld devices. This system will provide mobility for users for controlling their computer desktops over internet and also control Android devices as well. More facilities and features for accessing applications running on remote desktop from mobile handheld devices will be provided. Thus the extended scope of this system will prove to be helpful in providing mobility and accessing the remote desktop over the internet.

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