Mobile & PC Hybrid Communication Protocol

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Abstract—The mobile network is capable to transfer the data over internet and to provide the required features to most of the applications. Still, there is a scope of improvement in terms of the protocol it uses for the transmission of the packets from one device to another. According to today's technology we have many applications that help us to communicate with the mobile devices, but the controlling of the same is still a pain for the developers of the various mobile applications. In this project, we will focus on the development of the new protocol, which will not only be supported on the GSM network, but also will help developers to communicate with the Mobile Devices in a better way. Also the controlling of the mobile devices will become much easier by pursuing the results of this project. By pursue of this protocol, one can easily control PC to PC, PC to Mobile and Mobile to PC. We understand the risks of information leakage in creating this kind of protocol. Thus the new Protocol developed will be secure enough to handle the privacy of the packets shared across the channel. It will also require the authentication before being used in the applications for any communications. By the help of this we can validate the User before sharing the control of the device.

Keywords: Protocol, Remote Control, GSM Network, Internet, Packet

I.   INTRODUCTION

In modern world, mobiles are not only used as medium for distant communication but also it is now a days became a very important contributor to daily life of people. Mobile phones have grown a lot in terms of technology and features. Now people can perform a lot of difficult tasks by the use of their mobiles in a very easy manner. On the other hand the personal computers (PCs) has also developed a lot new functionality in them. Not only the PCs are now used to perform the individual tasks but also they are used to communicate with the mobile phones. Along with the usability, both Mobiles and PCs have also acquired a lot of new methods for troubleshooting and diagnostics. Not only in the terms of automatic but also in terms of manual troubleshooting. The days of going to customer service center are substituted by the new ways of remote controlling the device and troubleshooting the same over the internet. The remote controlling of one device to another is not only used for diagnostics but also it used to control the device to perform innumerable tasks from a remote location.

Protocols helps the technology to communicate in an effec-tive manner. Even in the case of remote controlling a device, protocols play a very major and important role. In today's world there are certain application and protocols, in which there is a communication between mobile to mobile, pc to pc, and mobile to pc. All these applications uses the existing architecture of the protocols to achieve their tasks and to provide user a limited functionality. The maximum number of applications provides the remote control from a PC to another PC.

These applications do not provide the functionality of remote controlling the mobile device from a personal computer in an easy and efficient manner. Also the applications work in communicating with the device only when both the devices are connected and the application is launched on both the devices. If in case anyone of the device is out of communication network, then we got no option to communicate with the same or to pass on the desired commands to the same so that it can process the same when up. This paper focuses on the use of customized protocol with a combination of WCF service in order to control the mobile device from the PC. Not only this, the software architecture which will be discussed in this paper will be efficient enough to provide PC to PC, Mobile to PC and Mobile to Mobile remote controlling. In case of one device out of communication network or switch off state, the Software Architecture will be capable enough to hold the set of commands at database level via WCF service and then to pass on the same to the device when found in network of communication.

II.   RELATED WORK

As the Data sharing brings new challenges to networking,hybrid protocol must offer appropriate techniques for coping with them.The basic architecture of protocol includes a host and target which will be communicating directly through each other.All the commands is maintained by WCF service. Some studies use File transfer Protocol which is free,reliable and effective way for sharing files[1].Until now the file sharing between the devices used to be in the specific ranges like Wi-Fi, Bluetooth, internet, Wi-Max, Ethernet cable, infrared, LAN, MAN, WAN, RS232 serial communication wire (point to point communication). Which is though

really very much helpful but the file sharing gets limited till some range, beyond that limit the file sharing connection gets disconnected, this can be the utmost drawback of today's technology. And other thing is if one of the devices is switched of then there is no use of that application which could share our data.If other functionalities are to be provided FTP needs to be modified by adding new extensions.We will design new mechanism and add new header fields to support extra features. Similarly a study in [2] described a File sharing for ubiquitous mobile devices using peer-to-peer model.The concept enables flexible and seamless communications for mobile devices.each and every computer on the network acts like server and client both because of that the load and the overhead on the network gets distributed across all over the devices on the network. The architecture is semi centralized or hybrid which is having a central database server acting as an interface between different mobile phones. The communication medium for this model is MMS and SMS.However,there is a need for an additional Protocol in case of security and exchange contents.Another study in[3] described the novel Application platform to enable communication between computer device and mobile network through a protocol.As a modified version we can add a new feature to it that, it can also perform remote control.

The offline feature of the architecture will be based on the user selection of the pairing of the devices the detail about which will be saved in a database on the server of the WCF Service. The details of the commands and authentication will also be saved on the same database in different tables. The basic overview of the solution architecture is shown in Figure

III. PROBLEM DESCRIPTION

The paper is going to deal with the basic problems of the remote controlling functionality. The major problems faced sometimes is the efficiency and the speed of the remote controlling. Also this feature of controlling the remote device creates the delay in screen rendering based on the internet speed and network traffic congestion of the existing protocol.

Let S be the software architecture proposed as a solution to the problem. Then the value of S can be determined by the following mathematical equation:

$$S = P, DM, W, DC, C, O$$

Where, P is the protocol which helps the software archi-tecture in effective and fast communication, DM is the list of master devices controlling the another device, thus $DM = dM0, dM1, dM3\ DMn$, W is the WCF web service used to provide an independent platform for communication between set of different Operating Systems

O as $O = o0,o1,o2\ ..\ On$, DC is the list of Controlled devices which are controlled by another device, thus $DC = dC0, dC1, dC3\ DCn$ C is the set of commands or documents to be shared across the devices, thus $C = c0, c1, c2\ .\ Cn$.

Here the set of devices can be either PCs or Mobile phones.

IV. SOLUTION APPROACH

The host to client communication can be defined as PC to PC, PC to Mobile, Mobile to Mobile or Mobile to PC. The protocol installed on the devices takes care of communicating with the WCF service and remote controlling the same via software architecture. Whenever the request for the remote control of the remote device will be raised, the host will invoke the protocol library to communicate to the WCF service which in turn authenticates the user and then connects the same to the protocol receiver end of the client. If the client is offline but previously connected by the same host with same credentials, then our web service will allow the user to log and save a few commands for the remote device in order to get them executed on the device when it comes online. The offline command will allow user to execute the series of predefined steps, to run any application with the known path, to send any file from a known path to a predefined email address. Fig. 1. Basic Solution Approach.

V. PROTOCOL DATA PACKET STRUCTURE

The structure of the protocol is derived from various different protocols TCP, FTP and MSMQ. The TCP architecture helped the protocol to derive the structure for enhanced speed while communicating. The FTP architecture provided the details for transferring a file over the network with efficient solution. The protocol inherited the message sending capability of MSMQ, so that it can send the message even in the disconnected state to the WCF service. The top row of Figure 2 shows the bytes and the below rows shows the occupancy in those bytes as per the octants. As it is clear from Figure 2, the data packet used in the protocol is the combination of the TCP, FTP and MSMQ protocols. The flags which were not required as a combination are being removed from the data packet structure. Based on the data packet structure of the above mentioned protocols, the data packet is derived for the efficient and fast protocol. The data packet structure is shown in Figure 2.

VI. COMPLETE SOLUTION APPROACH

Fig. 3. A Complete Solution Approach.

VII. CONCLUSION

The complete architecture of the software approach of the protocol usage is described in Figure 3. The solution approach of using a separate protocol in order to remote control one device from another device will be an efficient as the network loss will be minimized (used the feature of TCP for the same in Protocol Data Packet structure). The solution approach will be lag free as the network traffic for the existing protocol will not hamper the flow this protocol. The protocol will be quick in term of transferring the files from one system to another (used the flags of FTP in the Data Packet structure of this Protocol).

VIII.   REFERENCES

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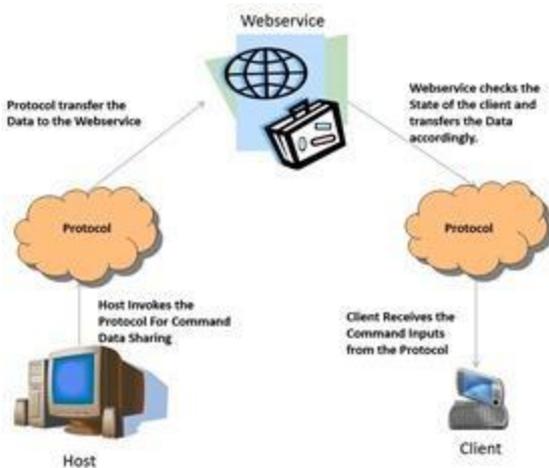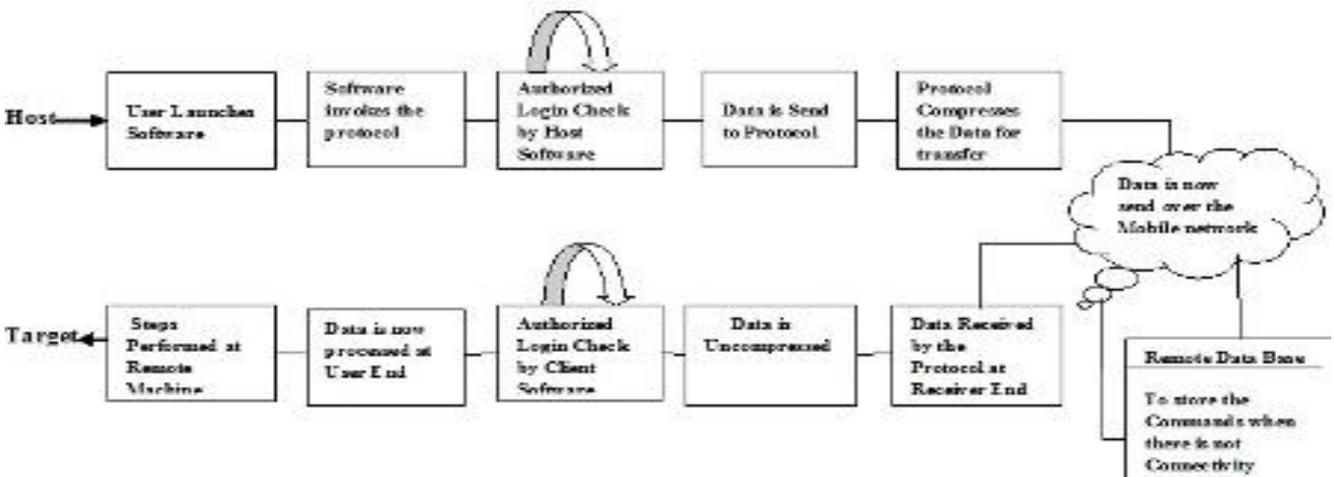
Fig. 1. Basic Solution Approach.

Fig. 2. Protocol Data Packet Structure.

Fig. 3. A Complete Solution Approach.