Virtual Lab Control Using Android Phone

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Abstract- Android based lab control is a system which allows you to access desktop of remote computers act as "Server" through the android phone act as "Client" using Wi-Fi network. This system is based on VNC architecture where user is able to see and access the desktop of remote computer of any platform like Linux, Mac, and Windows etc .For that, a VNC server must be installed on a computer connected using Wi-Fi network. The image of the desktop is compressed before it is transmitted to the phone. So to work on this, we must use a VNC protocol to access the graphical user interface of remote computer. The user can perform the operations like capturing the screen, mouse clicking, zooming, panning, opening documents and file transfer etc.

Index Terms- Android, Desktop, VNC, Wi-Fi, Server.

I. INTRODUCTION

The growing popularity and introduction of smart phone has brought a big change in technical field of cellular phone. Now a day, smart phones are spread worldwide and provide much more facility than the cellular phone. These phones provide features which were previously provided by the computer system architecture [4].

The proposed system should be able to communicate with the remote system and it should have the control on the device from the mobile phone. The system can perform the operation from a android phone like a normal desktop system does. Whether you have some query while implementing the program and your teacher is not available or she is not present in the college, this system gives you correct solution to keep you connected. The system is graphical desktop sharing system which uses protocol to remotely control another computer. Here the proposed system is trying to implement access to remote computers from a android phone. This system makes use of virtual network computing. VNC is platform independent.VNC is a desktop sharing system which provides remote control via network.

II. RELATED WORK

In the scope of remote control there are several projects and initiatives designed to allow remote desktop control via android phone [5].

For instance, we have software called "Team Viewer" which is a computer software package for remote control, desktop sharing, online meeting, web conferencing and file transfer between Computers .Versions are available for the Microsoft windows, OSX, Linux, Android, WindowsRT, Windows phone operating system. While the main focus of this application is remote control of computers, collaboration and presentation features are included .Team viewer can be used without charge by non-commercial users and business premium. Other point to be considered is remote visualization mechanism that are useful for achieve remote display of other devices. The most popular system designed to perform a remote control of devices is Virtual Network Computing. This system was design to access the desktop in mobile devices.

This paper focuses on access of multiple computers using android phone. So whatever the existing system was there they were trying to access a single desktop. That means one to one relationship was there. Only one machine would be controlled by the android phone. But now this paper enlists the process how to access the multiple computers through networking or Wi-Fi. This paper presents a proposal that covers this area of interest. The proposed platform is providing openness [5].

The VNC system is compound by client and server where the client is remotely connected to the server and send request to server to retrieve the update of remote controlled devices. The server side tracks and encodes display updates and the client side decodes and renders the update received.

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III. EXISTING SYSTEM

The existing systems are potentially good system which allows us to remotely connect to the machine and access their respective desktops. But they have some limitations. They are listed below [1].

1. One of the application is based on central server, where client and server are connected to the central server. Here the application area is executed on central server. Because of this, the speed of operation is low and the whole system is depends on central server.

2. Another application is controlling desktop from a android phone. But the system uses RFB protocol which is slow protocol. Because of this working of this application is slow.

So because of this drawback we are concentrating on proposed architecture.

III.   PROPOSED SYSTEM

1. VNC ARCHITECTURE-

Proposed system based on VNC architecture i.e. Virtual Network computing. Virtual Network computing is a graphical desktop sharing system which provides remote control via network. It supports a controlling functionality by usage of a graphical screen update from a controlled device and capturing a mouse and keyboard [4]. The proposed system is based on HTTP protocol.

The Hypertext Transfer Protocol is an application protocol for distributed, collaborative information system. Using this protocol we can transmit all information between connected devices. VNC system required two type of application for proposed system i.e. One is sever side application and other is client side application. In this application client can send the request to the server after that server can accept request and send reply to the client.

This module deals with the authentication and connection between client and server. The IP address of the server and the password transmitted the first frame after the handshaking is done [4].

The server and client communicate using a protocol called as HTTP protocol. Basically this protocol is functions as request-response protocol in the client server computing model.

Fig.1. VNC architecture based mobile access computers

2 .VNC architecture based multiple desktop access

The proposed system is desktop sharing system which allows remote access to multiple computers via android phone. When the server and client starts, the client (Android phone) request for OTP by entering the IP address of server machine. The server sends the OTP via SMS to client. Entering that OTP, connection between client and server will be established. Once the connection is established, the client can request for various services like viewing screen shots, keyboard control, mouse

control, messaging etc.Server receives all the request from client and processes that request by generating response [1].
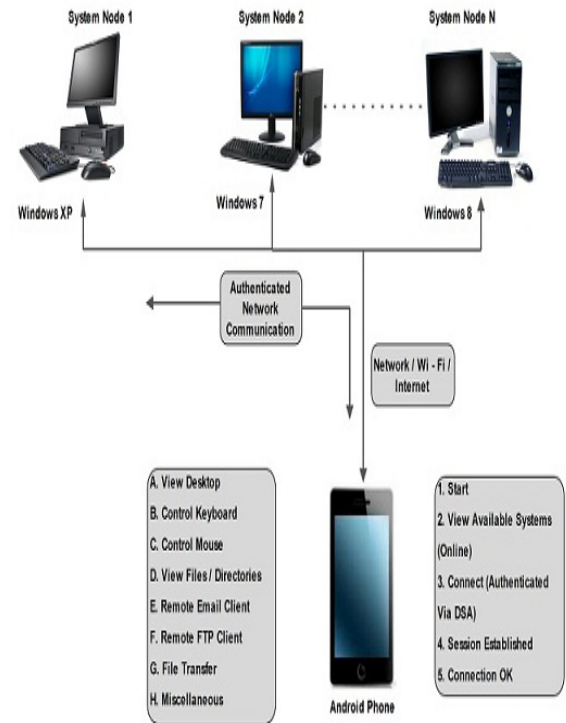

Fig 2 . Multiple desktop access using android phone

3.   *Design of proposed system*

Proposed systems have four main modules. Those modules are listed as below and the functionality and design of each module is described further [2]:

A. Desktop sharing-

In this module, Remote desktop screen will be accessed. This will be done with the help of VNC protocol.

B. Pointing and clicking-

User can click on the remote display screen .Also he can perform the mouse clicking events such as single click, double click etc.

C. File transfer –

User can move the file from one folder to another folder.

D. Email –

We can send the email from phone to another user.

E. Control Keyboard-

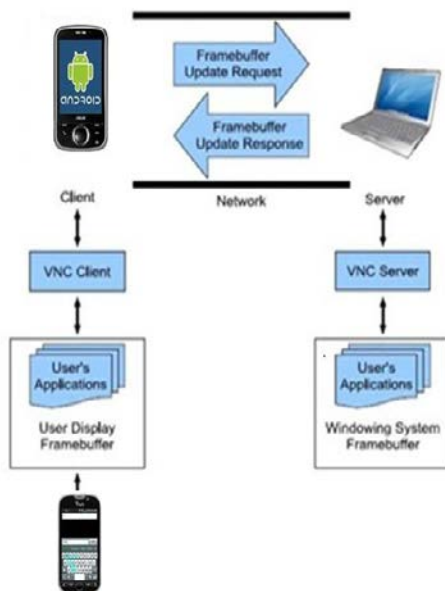We can use the shortcuts for file operations like cut, copy, paste etc.

4 .Algorithm to be used-

SHA1 (Secure Hash 1) Algorithm-

SHA1 algorithm is safe against the preimage attacks. SHA1 algorithm is a hashing algorithm which is used for converting the message to a unique representation of the message of fixed size i.e. multiple of 512 bits in length, without the loss of information about its exact original length in bits 1 [1].We have provided security for this application while authentication for the user is done.

When the user is logged in, the attacker does not need to find out the exact password. It is enough to find a string that result in the same hash. When the user enters the password in the password field. Some hash value is created and it is stored in the database. This hash value is compared with the password that user has entered. If it matches then we said that the user is authenticated user.

Algorithm Steps-

1. Padding-

Pad the message with a single one followed by zeroes until the final block has 448 bits.

2. Append the size of the original message as an unsigned 64 bit integer-

Initialize the 5 hash blocks (h0, h1, h2, h3, h4) to the specific constants defined in the SHA1 standard.

3. Hash (for each 512bit Block)-

A. Allocate an 80 word array for the message schedule
B. Set the first 16 words to be the 512bit block split into 16 words.
C. The rest of the words are generated using the following algorithm-

Word [i3] XOR word[i8] XOR word[i14] XOR word[i16] then rotated 1 bit to the left.

4. Loop 80 times doing the following. (Shown in fig)

5. Calculate SHAfunction() and the constant K (these are based on the current round number.

■ e=d
■ d=c
■ c=b (rotated left 30)
■ b=a
■ a = a (rotated left 5) + SHAfunction() + e + k + word[i]

6. Add a, b, c, d and e to the hash output-

Output the concatenation (h0, h1, h2, h3, h4) which is the message digest.

SHA1 Message Digest-

The messages digest of the string:

"This is test for theory of computation".

Message digest for the above string is-

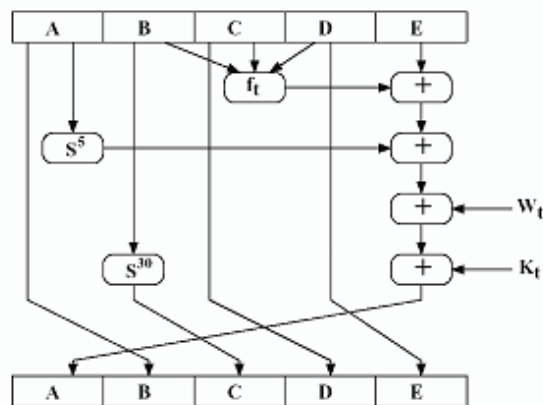4480afca4407400b035d9debeb88bfc402db514f.

Fig 3. SHA1 algorithm block diagram
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IV. APPLICATIONS

- Home appliances can be controlled using comphroid.
- Students in a distributed group can view the computer screen which is manipulated by the instructor.
- Remote Desktop System is very useful even in industries. Whenever there is new application or update, it is not required to be installed in all the - systems. Only the host computer can be updated & rest of the system & mobile devices can access it remotely.

V. EXPERIMENTAL RESULTS

Experimental result describe the process of desktop sharing in the form of input –output.
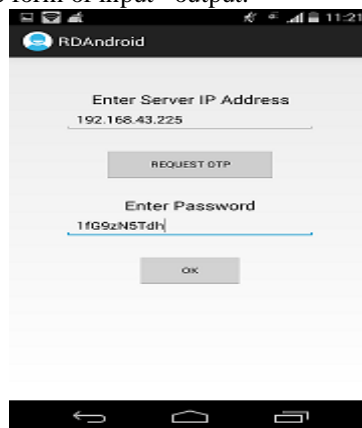

Fig.4. Login Page

Firstly user opens the application. He enters the IP address of the machine which he wants to access. After entering the IP address, user request for one time password (OTP) that will generate at the server side. User has ho entered this OTP. Then he accesses the desktop (shown in fig 5).

Fig.5. Actual view of desktop

VI. CONCLUSION

This application provides easy access to remote desktop via android phone and security using OTP.This will be implemented using Wi-Fi network. This application provides system administrator to control the files, monitoring the tasks. The VNC architecture is used to implement this system and HTTP protocol is used for exchange or transfer hypertext. Thus the extended scope of this system will prove to be helpful in controlling handheld devices.

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