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HomeControl – Remote Access to Your Devices

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Abstract---Today's world has become a global village. Also the life of common man has become very demanding and he is constantly commuting from one place to another. In this situation, he may want to control his devices at home or any other place remotely, from anywhere in the world. This gives rise to the concept of our system; HomeControl is about giving the user freedom to access his devices remotely using android device such as Mobile phone or Tablets. The user just has to access a remote android application which stores his/her device preferences and he can edit from there. The remote application supports any android mobile device, so that the user can control his devices from anywhere, anytime.Another feature of this system is "Remote Surveillance" which helps user to monitor any unwanted activity on the user's premises, by giving live feed on the remote application. This adds a security dimension to the whole system making a complete package for the user who wants to keep things under watch remotely.

Keywords--- Device Switching, Live feed, Security, Remote Access, Android application, Internet based.

I. INTRODUCTION

Today, people from all strata of the society have appliances at home to do common household work as well as some specific tasks. Also, the commuting time in the day is increasing rapidly, due to large distances and traffic, delay etc. In this situation, the user needs a method to control his devices at home from wherever he is, thus leaving him/her worry free about what's happening at home. Also, people want to keep a check on the happenings in the vicinity to detect any unwanted activity, and if any is found the action can be taken from informing a neighbor to contacting the police.

The solution to the above situation is our system. It is a combination of software as well as hardware. The devices to be controlled are connected to the PC of the user at home (Hereafter referred as "Control PC"). More specifically, they are connected to the Universal Serial Bus (USB) Port of the Control PC. The software (a client application and android application) work in harmony to implement the desired function. It can also provide automated control to the devices by setting appropriate threshold values of sensors.Furthermore, a web camera is present at the user's premises and it is connected to the Control PC. The web camera constantly monitors user premises and sends feed of it in the form of chunks to the Android application.As this system is fully account based so multiple users i.e. more than one family members can manage and control their devices and get live feed of their home premises remotely.

II. LITERATURE SURVEY

[1] With the availability of products which integrate mobile devices and cloud networking rapidly increasing, many users can see how new technology can impact their everyday lives. In this paper we have developed a Home Automation system that employs the integration of multi-touch mobile devices, cloud networking, wireless communication, and power-line communication to provide the user with remote control of various lights and appliances within their home.

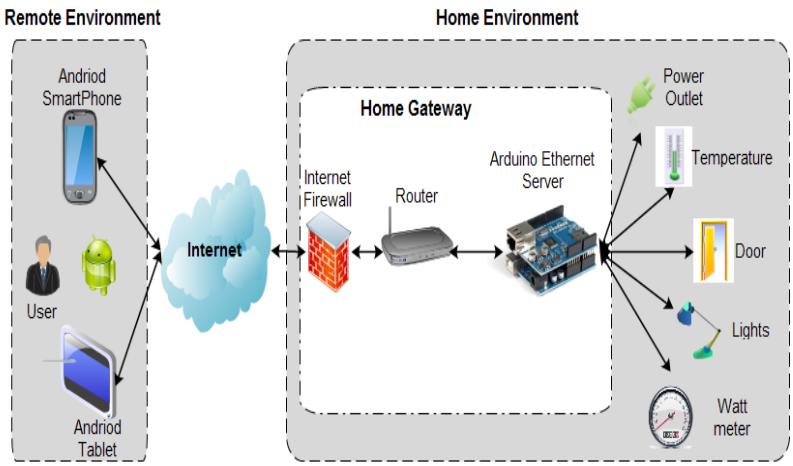

Fig. 1 Overview of Conceptual Architecture

This system uses a consolidation of a mobile phone application, handheld wireless remote, and PC based program to provide a means of user interface to the consumer. The home automation system differs from other systems by allowing the user to operate the system without the dependency of a mobile carrier or Internet connection via the in-home wireless remote. This paper illustrates the architectural view for the Home Automation system.

[2] The system uses Arduino Ethernet Server and router to provide a low cost and flexible home control and monitoring system using an embedded micro-web server, with IP connectivity for accessing and controlling devices and appliances remotely using Android based Smart phone app. The proposed system does not require a dedicated server PC with respect to similar systems and offers a novel communication protocol to monitor and control the home environment with more than just the switching functionality.

III. COMPARISON WITH EXISTING SYSTEM

The system proposed in [1] by Nicholas Dickey, Darrell Banks and Somsak Sukittanon, avoiding use of mobile carrier or internet connection as the system features only in-home wireless remote. So, it provides automation for the devices only if user is at home. Thus it comes under locally controlled system; termed as in-home controller. Even it does not include any special kind of user authentication which makes system vulnerable to unauthorized users. Furthermore, system uses in-home remote controller device to control home appliances which sums up additional cost to the system.

While our system uses internet as a medium for switching home appliances; implements web service to felicitate communication between remote android device and Control PC. As HomeControl is fully based on internet so gives user provision to access his home from anywhere in the world. HomeControl gives remote surveillance feature by providing live feed of home premises on user's remote android device. It also allows feature of "Automated Home" using sensors to control devices by setting threshold values as per user user's expectation.

IV. PROPOSED SYSTEM

As the Automated and Artificial Intelligence technologies are gradually increasing with a pace and life of common men has become more challenging; so he's constantly commuting from one place to another. So he might want to control his home along with keeping it under his watch from any remote location.In this situation HomeControl comes into the picture. HomeControl allows user to access their devices remotely through android device by keeping medium as internet.

In our proposed system, we are developing two applications and one hardware circuitry:

1. Client Application – Which runs on Control PC and sends signals to devices connected to the hardware.
2. Remote Android Application – Allows user change, monitor device status and obtain live feed of home premises.
3. Hardware Circuitry – Which is connected to the control PC through USB port and devices are connected to it through ULN driver and relay circuit with external 230V power supply.

Proposed system functionalities and working:

1. Allow user to control his devices remotely:

This system is a combination of software as well as hardware which will allow the user to switch ON/OFF his devices from a remote location on internet enabled android device. The user can control up to 8 devices in such fashion.

Device status is changed by identifying new 8-bit serial data string from USB port and ORing with previously obtained string.

The devices to be controlled can be full 230V AC appliances as the circuit used allows us to control large voltage and current from a small voltage circuit.

2. Enable user to keep a watch on his premises:

The system is equipped with Remote Surveillance feature by obtaining live feed of home premises. It uses a web camera connected to the Control PC. The web camera constantly captures images with nearly negligible amount of delay and sends it to remote android application in the form of chunks.

If anything suspicious found, the action can be taken by either informing neighbor or contacting nearest police station.

3. Adds new functionality of "Automated Home":

This system allows user to control home appliances with the help of automated sensors. It includes different type of sensors such as temperature, heat, infrared, potentiometer with certain predefined threshold values; if sensor crosses given threshold values, device status is affected respectively.

User can define threshold values of sensors by considering environmental conditions and many more suitable factors.

4. Allows account based multi-user system:

The system manages home appliances by same account name on different devices viz. Control PC and Remote Android Device. So if there are more than one family members who wants to control their appliances remotely can do it just by logging in with same username on different android devices.

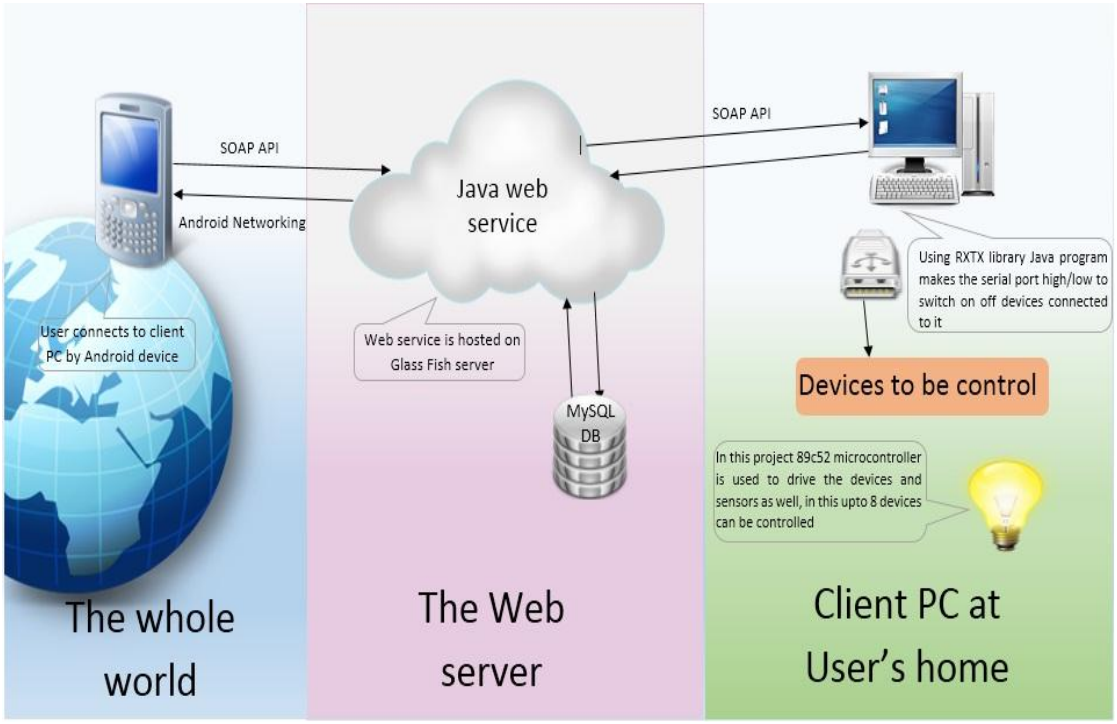

Fig. 2 Overall system architecture

V. CONCLUSION

Thus with the help of communication between android remote application and client server application HomeControl enables user to control his home appliances from any remote location. HomeControl also features remote surveillance by giving user live feed of their home premises. User can also automate his devices by using different sensors so that monitoring can be managed without intervention of user. HomeControl implements web service for the communication between remote android application and server application. For initiating the connectivity with web service, IP address of server hosting the service is provided as a reference to both remote android application and server application. Device controlling is a serial communication. Microcontroller is programmed to control the devices connected to the hardware with the help of sensors. Using this system as a framework HomeControl can be expanded to include various other options such as number of devices to control can be increased and provide high quality video surveillance with negligible amount of delay by increasing bandwidth.

REFERENCES

[1] Nicholas Dickey, Darrell Banks, and Somsak Sukittanon," Home Automation using Cloud Network and Mobile Devices" , 2012 IEEE
[2] Rajeev Piyare and Seong Ro Lee," Smart Home-Control and Monitoring System Using Smart Phone", ICCA 2013, ASTL Vol. 24, pp. 83 - 86, 2013
[3] Prof. M. B. Salunke, Darshan Sonar, NileshDengle , SachinKangude, DattatrayaGawade, " Home Automation Using Cloud Computing and Mobile Devices.",2013
[4] Prahlada Rao B. B, PayalSaluja, Neetu Sharma, Ankit Mittal, Shivay Veer Sharma," Cloud Computing for Internet of Things & Sensing Based Applications" , 2012 IEEE
[5] Jinsoo Han, Chang-Sic Choi, Wan-Ki Park, Ilwoo Lee," Green Home Energy Management System Through Comparison of Energy Usage Between the same kinds of Home Appliances" , 2011 IEEE
[6] Gerhart, James(31 March 1999). Home Automation And Writing. MacGraw-Hill professional. ISBN 0070246742
[7] Harper, Richard, Ed. (14 August 2003). Inside the Smart Home. Springer. ISBN 1852336889
[8] "Glassfish Info" http://glassfish.java.net/
[9] Communication of mobile and tablet devices" http://www.arkessa.com

