Media Centre and Personal Cloud on Raspberry Pi 2

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ABSTRACT

Nowadays cloud storage is all the rage in world. Almost everyone who use a smartphone uses a cloud storage service. This project introduces a system focused on cost reduction and providing quality services in the field of technology. Raspberry Pi is a powerful yet small credit card sized computer that can carry out tasks that requires decent amount of processing power. This project uses a web interface hosted on the Raspberry Pi which in turn enables user to move his/her data back and forth from his/her handheld device. This project also proposes a system which would enable user to consume data on the Raspberry Pi by connecting the same to a screen. By means of a media server, user will be able to consume the data that he /she previously stored on the Raspberry Pi on a considerably large screen without downloading the media to their personal device. This project will result in drastic cost reduction that is incurred by an individual for using cloud services. The complete system will be based on wireless communication and can be controlled by the user remotely.

Keywords- Raspberry Pi, Cloud Storage, Smartphone, Media server.

INTRODUCTION

We came across a problem scenario which is faced by almost every individual who has an acquaintance with the technology and proposed a solution to the same problem by using Raspberry Pi. Further, every step off proposal is mentioned in detail including the installation of the operating system on the board including the services required to be installed on the Pi.

With the advent of 21st century new technologies, methodologies and concepts were being introduced to the world. As the years rolled by new technologies and ideas made their way into the modern world. The concept of cloud storage was brought into existence by Joseph Carl Robnett Licklider in the 1960. Today, cloud storage services are widely used by individuals across the globe and the technology surrounding it is vastly developing. However, access to these services comes with a significant cost.

Thus, there arises the need to address this problem and reduce the overall cost that an individual incurs whilst having access to the services. The proposed project addresses the problem by providing the same services to the user while maintaining the quality of the service. Now, consider a situation where a person has to pay a hefty amount to the cloud storage services monthly or annually

in order to maintain his/her data. To access this cloud storage service the user also requires to have to subscribe to an internet plan which allows user to use abundant amount of data. All this procedure results in the elevation of the total cost required to access the service.

The proposed system makes use of the Raspberry Pi as a web server which provides cost-effective solution to the problem stated above. The Raspberry Pi will host a web interface which would be accessed by the user. This web interface will enable user to move his files from his personal device to the storage on the Pi, user will be able to backup all his/her files wirelessly without the use of internet, here the Pi will act as a cloud storage centre. User will also be able to acquire the same data if he/she so desires by just connecting his/hers personal device to the Pi wirelessly. A Media server on the Pi will enable the user to consume his/her stored media on the Raspberry Pi itself simply by just connecting a secondary screen to it, be it a monitor or a television.

LITERATURE REVIEW

P. Bhaskar Rao and S.K. Uma proposed a project for home control and monitoring system using a microprocessor and microcontroller, with IP connectivity for accessing appliances and controlling devices remotely using Smart phone application. It does not require a dedicated server PC and offers communication protocol to monitor and control the home environment with switching functionality [1].

Jiwa Abdullah introduced a mobile controlled car security system that offers higher level of car security features. This is able to notify the car owner immediately when intrusion is detected. Any of the car feature can be controlled remotely via a mobile phone from anywhere at any time. It is based on GSM positioning system and has the potential to assist in stolen car recovery [2].

Sanjana Prasad and others proposed a Smart surveillance monitoring system using Raspberry pi and PIR sensor for mobile devices.The key feature of this system is that the home security system captures information and transmits it to a Smart phone using web application. When motion is detected, the cameras automatically starts recording and the Raspberry pi informs the owner through web application [3].

Dhaval Chheda and others proposed a system which aims to substitute laptops with Raspberry pi will. It will help achieving quality of service and consume small amount of power. The proposed system will be controlled remotely by mobile phone [4]

External Interface Requirements

The project requires the following external requirements.

1. Connection to the Wi-Fi network.

   The raspberry Pi system must be added to the Wi-Fi network. For this the proper network must be selected from the available access point menu of the Raspberry pi. As the interface is graphical it is same as selecting the access point in any other media devices. After selecting the Wi-Fi network the system must be provided with password to gain access to the network.

2. Web Browser must be present in user's device.

   The only way to access the system is through a web browser. First it must be made sure that device is in same network as Raspberry pi system. Then

the user can navigate to the IP address of the raspberry Pi system with the help of browser. This will lead user to a webpage which is specifically designed to provide Upload and Download functions.

Functional Requirements

As the system broadly provide three function which are uploading and downloading files to the server, viewing those file remotely on any monitor or projectors and as a portable PC. The system can be used by the user when one file is to be shared with all the members connected to the same network.

Use case description

The following are the cases when the system can be used.

1. When the user needs to share a single file with all the members connected to the Wi-Fi network.

2. When the user needs to download a file available at the server.

3. When the user wants to open that file on a monitor or projector.

4. When a user wants to use it as a portable PC.

Basic steps

1. First the raspberry Pi system must be connected to the available Wi-Fi network. To do this proper network must be selected from the raspberry pi and password for the network must be provided.

2. Using a web browser navigate to the IP address of the raspberry Pi system. The IP address given to raspberry pi system is different in different systems. Once the user navigate to that address a web page containing the functions for upload and download will be shown.

3. For uploading a file to server.
   a. The user needs to click on the upload box and select the file

that is to be uploaded to the server. After selecting the file click on 'submit' and the file will be uploaded.

   b. Once the file has been uploaded it will be shown in the download list with a tick symbol in front of it

4. For downloading a file from server
The files that are uploaded to server will be shown in a download list on the web page. The hyperlink to that file is shown in a list and is labelled as the name of the file. The user must click on the desired file name to download it and the usual download options will be presented.

5. For viewing those uploaded file
Open VNC viewer which is an android application to control desktop of raspberry pi navigate to the folder where file is uploaded and open the desired file

PROPOSED SYSTEM

The Designing of this project is done in five phases. The phases are as follows

- Information Gathering
- Understanding & collection of Resources
- Assembling the Hardware parts
- Configuration and Additional Features Building
- Testing and Turing

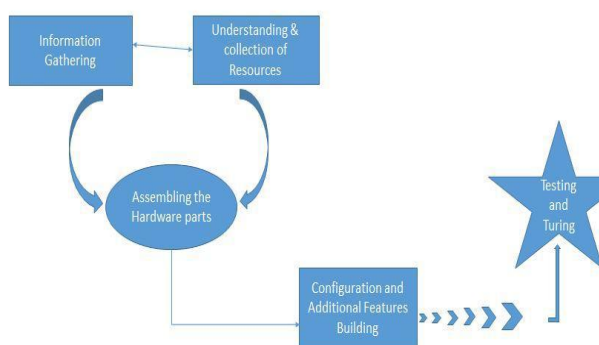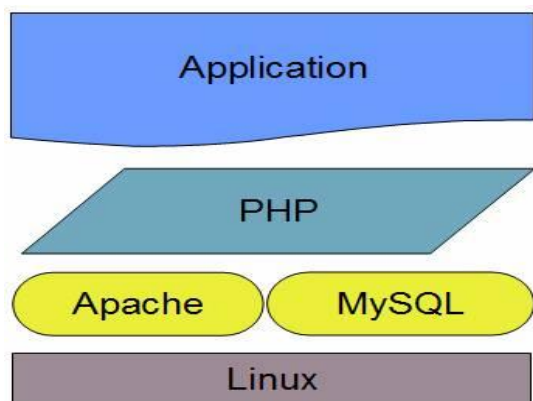The whole process flow can be represented as follows:

Fig:-Process Flow

SYSTEM FLOW CHART

HARDWARE & SOFTWARE REQUIREMENT

Hardware Requirement:
- Raspberry Pi 2 version B+
- SDHC SD Card, at least 8 GB
- A Wi-Fi adapter
- A USB Flash Drive
- Computer with USB card reader(for flashing the Operating system onto the SD card)
- Power supply(5V, 2A)
- A HDMI/VGA adapter (for conversion of HDMI output to VGA output)
- A Monitor
- Keyboard
- Mouse
  ## Software Requirement
- Win32 Disk Imager (For writing the OS to the SD card)
- Raspbian OS (Default OS for Raspberry Pi)
- Drivers for Wi-Fi adapter.
- Apache web server
- MySql – database management system

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RESEARCH METHODOLOGY

The objective of the proposed system is to create a web server on Raspberry Pi that will host the web interface that enables user to relocate his/her data onto the storage of the Pi. All the data on the Raspberry Pi will be stored in a database in tabular form. Different type of data will be stored in different sections so that it would be easy for

the user to retrieve the relevant data when required. Raspberry Pi will also be configured as a Media Server. If the user wants to consume the media without downloading it back on his/her personal device, Media Server will enable him/her to directly stream content onto their personal devices. If user so desires to view media on a large screen, it can simply be achieved by connecting any screen that supports a digital video signal. Streaming media on personal devices without downloading them on their devices will help users to avoid memory clutter that occurs on these devices. The whole project is based on wireless network to avoid all the hassle of managing the wires.

CONCLUSION

Thus, we have developed a device which is capable of hosting a web interface that enables user to backup or store his data on the Raspberry Pi's storage. This data can be retrieved by the user if he/she loses the same on their personal devices. The Raspberry Pi here will act as a cloud server for the user and also as a Media Server wherein the user can easily consume media without downloading it on their devices. This will save memory on user's device which can be utilized by some other important task. Thus, this project achieves its goal of providing a cost effective solution to the expenses that a user incurs by using cloud storage services without compromising on the quality of service. This

project in return also boasts extra functionalities like a Media Server service wherein users can stream media on their devices without paying extra

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