

## PERSONAL CLOUD USING RASPBERRY-PI

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**Abstract** - Cloud Computing is one of the emerging technology of recent era which lets us access our data over the internet. Our aspect of this paper is that it gives the user freedom for using space and saving with strong control over system. One of the purpose of developing the system is to use Raspberry Pi as a Server and a open source software (Own cloud) and use it as a personal cloud storage. This paper will show steps on how to build a personal cloud storage by using credit card size Raspberry Pi(minicomputer), which will help the user to enable cloud storage mode to their external hard drive. However, Other cloud storage services like Dropbox, Google drive, and iCloud gives limited amount of storage. This research will help the users to use (1TB) or above size external hard drive to be use and have access anywhere from any device over internet. Also the second part of this paper focuses on to replace the laptops to raspberry pi that lecturers can use in the class to play PowerPoint slides, and Videos. Also, the cloud storage provides services to the individuals and business to software and hardware that are managed by the third party at remote location like Dropbox.

**Key Words:** cloud, Raspberry-Pi, open-source, dropbox

### 1. INTRODUCTION

A cloud is massive collection of storage of various amounts of data gathered together at some Servers, which helps client to connect or access the data from the Server. As the data keeps on increasing there is a massive need of storage server which can hold tracks of client, their profiles, their data such as photos, document file, videos, etc. Moreover, there is risk, if our server crashes there might be loss of someone or even if the data gets theft. Sometimes the user forced to see the advertisements of products and deals on the screen while browsing which user have search for on third-party applications or sites, this means somewhere in system the user data is been shared and level of privacy and level of privacy is not maintained. Since this shows that, there is need of storage server of own as well as privacy maintenance and security. When you are out of storage on your PC the cloud storage is one of the Solution to store data over internet, which you can access anywhere from any device. Cloud storage is becoming popular from last few years, which allows us to store and share your pictures, videos,

text documents and other data over internet. Instead of keeping data on our own computer hard drive or update applications, we use services over the internet. The most common example of the cloud computing are the Dropbox, Google drive, and iCloud, these storage services allow the users to store data over the internet with specific amount of storage depending on the user's requirements. Cloud computing comprises of three layers a) Infrastructure as a service (IaaS) b) Platform as a service (PaaS) c) Software as a service (SaaS). Depending on the requirements, the customer can choose one or more services provided. Raspberry Pi is the credit card size minicomputer, it runs a Linux operating system called Raspbian, the hardware on this device 512 ram, two USB ports, Hdmi port, Ethernet port, SD card slot, audio output and so on. Raspbian is a free operating system based on Debian optimized for the raspberry pi hardware. It involves

- Linux
- Command Line Interface
- Graphical User Interface
- Installing Drivers and Software
- Programming

For most people, beginning to experiment on a \$1000 laptop, putting precious data at risk is a daunting prospect. The user should think twice before putting all their digital photos, music collection and online banking at risk. The focus of this project is to create a personal cloud storage by using Raspberry Pi connected to external hard disk.

### 2. PROBLEM DEFINITION

The aim of this research paper is to develop a cloud computing project, where the users can use their external hard drive's connected to Raspberry Pi through internet, they can have access to any where from any device. According, (Jon Brodtkin, 2008) even though security, privacy and trust issues exist since the evolution of internet, the reason why they are widely spoken these days is because of the Cloud Computing scenario. Any client/small organization/enterprise that process data in the cloud is subjected to an inherent level of risk because outsourced service by pass the

“physical, logical and personal controls” of the users.

**2.1 Sub-Problem I:**

1. To develop a cloud computing project where users can have large amount of storage with the help of Raspberry Pi.
2. Most of the user have external hard drive 1 TB (Terabyte) or more but the users cannot carry the external hard drives all the time, whereby this project will benefit the users connect to personal cloud storage over internet.

**2.2 Sub-Problem II:**

1. Most of the cloud computing services are providing limited storage to the users, at the same time the risk of your data to store at third party is a big issue. Example is the recent incident of exposed nude pictures of the celebrities from iCloud.
2. Laptops that the lecturers are using for slides provided by Limkokwing University are limited in quantity and most of them are not working (requires maintenance). The laptop cost is above \$300 and need maintenance. There is no notification to alert user if someone is trying to access and modify on raspberry pi that act as the server for personal cloud storage. Most of user using same email and password for online media that will let intruder try to access your cloud storage and thief data.

**3. PROBLEM SOLUTION**

Following are the problem solutions for the above problems encountered:

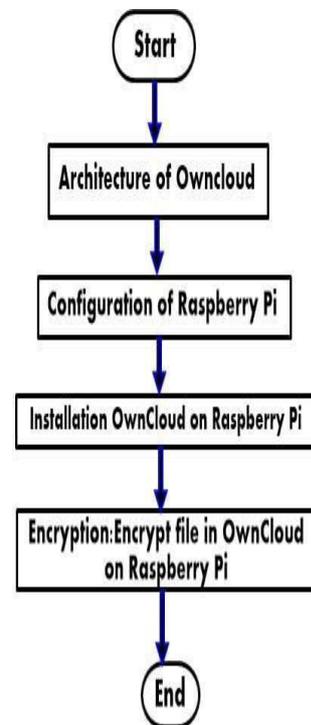
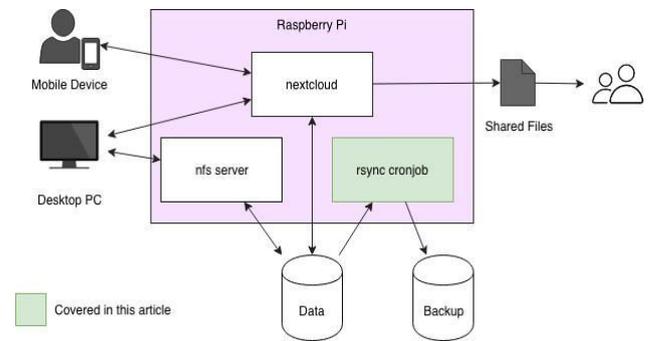
**Sub Problem 01:** To Create a Personal Cloud Computing for E-learning or personal use

**Sub Problem 02:** To Help University to reduce cost for buy laptops, use Raspberry Pi to plug and play chapters slides. Diffie Hellman Key Exchange and AES 256-bits keys Encryption Algorithm. Raspberry Pi will reduce the cost and effort for lecturers, also it is easy to carry. The new technology which will be affordable to everyone and also it will enable the user to use their external hard drives over internet possible.

**4. METHODOLOGY**

As shown to setup Raspberry pi to work as own cloud we need to follow multiple steps case of various poses in complex background is truly difficult. These

steps mainly includes creation of web page and making raspberry pi as server to store the data. So we need to install some servers like php server, nfs server to access the user data.



Steps for Software Implementation:

- Step 1: Setting up the Raspberry-Pi Own Cloud Server
- Step 2: Mounting & Setting Up the Drive
- Step 3: Basic Setup
- Step 4: Port Forwarding & External Access

When connecting to the own cloud server externally, we will need to make sure we use https otherwise we will get an invalid request in our browser. Setting up port forwarding is super easy to do and allows us to have access to your personal cloud on the go. Also, after we have done this, we can still connect via our local IP as well.

## 5. CONCLUSIONS

The personal cloud storage with Raspberry pi provided a lot benefits such as cloud services without any charges, also user can determine their storage space using their own hard disk and added security involving encryption. With this security features will ensure all data security. User can have used hard disk with large space hence user can store the large of data on it. Using the own cloud system, we can store data with the help of smartphone, laptop or any device which has internet connectivity. The system is implemented using Linux based operating system as we have used raspberry Pi with Raspbian OS. The OS is easy to use and easy to handle. T081-phe created webpage to access the data is made with the help of PHP and SQL servers. Raspberry Pi personal cloud storage, prescribed trust and privacy protection on its users, while maintaining security as its domain. Users, for the most part, accepted this script; however, some varying levels of trust were observed in users.

Open SSH is an application that allows us to securely access Linux systems remotely over the network. We can use Open SSH simply for secure file sharing. But it also allows us to log on to a system and control it over the network, even using the GUI, just as if we were sitting in front of it. The default installation of Linux on your Raspberry Pi should have "SSH daemon" running. This means that your Raspberry Pi is listening on port 22 for a remote computer asking to make a connection to it. In this case, this will probably mean your normal desktop or laptop computer. Thus, technology, objectivity and trust go hand in hand; they all appear simultaneously as a heterogeneous network is reduced, stabilized and made durable. Raspberry Pi cloud storage as a case study of cloud computing is not a completely stabilized technology, though it is well on its way. It is stable enough that users for the most part trust the technology and behave in accordance with its user scripts. However, there is still a concerted effort on the part of Raspberry Pi cloud storage to communicate its objectivity and trustworthiness and to further reduce its heterogeneity and the marginality of some users.

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