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Portable Raspberry Pi Server

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Abstract: **- Sharing and accessing data has become one of the most important part of our lives. Knowingly or unknowingly we keep multiple copies of same files on our various personal devices, which is redundant and takes up a lot of unnecessary space. In this paper we tried to showcase the use of Raspberry Pi which is a Single Board Computer, to make a device which streams personal data through wireless link to all our personal devices. Size and power consumption of Raspberry Pi makes it highly portable and can be used as a data server anywhere the user wants. Also in domestic environment is can act as both data server as well as internet router at the same time.**

Keywords**: Raspberry Pi, Personal Storage device (PSD), Portable Server, Data Sharing.**

I. INTRODUCTION

The Raspberry Pi is a series of single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the edification of rudimentary computer science in schools. The Broadcom BCM2835 SoC used in the first generation Raspberry Pi is remotely identically tantamount to the chip utilized in first modern generation smartphones predicated on ARMv6 architecture. The Raspberry Pi 3 utilizes a Broadcom BCM2837 SoC with a 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor, with 512 KB shared L2 cache. The Raspberry Pi 3 are equipped with 2.4 GHz Wi-Fi 802.11n (150 Mbit/s) and Bluetooth 4.1 (24 Mbit/s) based on Broadcom BCM43438 FullMAC chip and have 1GB of RAM [1]. A media server, in this case refers either to a dedicated computer appliance or a small personal computer or for the home, dedicated for storing various digital media (meaning digital videos/movies, audio/music, and picture files). To simply put, a media server is a device that stores and shares media. In a domestic environment, a media server acts as a cluster of information: videos, audios, photos, etc. These different types of media are stored on the media server's hard drive [2].

II. MOTIVATION

Data sharing is one of the things which is done by technology today. The problem is however that the data to be shared has to be copied over multiple devices and accessed individually. The reason behind developing this project is so users can share data live across a number of devices simultaneously and don't have to worry about saving it on their devices, thus reducing the hassle of duplicating data and saving space for more important files on individual devices. This will act as private home server as well as entertainment system. Also portability will be an additional factor due to the size of raspberry pi and its power consumption.

III. LITERATURE REVIEW

As per our survey there exists an online service called as Plex. Plex is a software suite and client-server media player system. The Plex Media Server runs on Windows, MacOS, Linux, FreeBSD, which organizes audio and visual (photos and videos) content from personal media libraries and streams it to their player. The players can either be the Plex Apps available for mobile devices, smart TVs, and streaming boxes, or the web UI of the Plex Media Server called Plex Web App, or the old Plex player called Plex Home Theater. As it is an online service it requires internet to access to your personal files and it is also paid service which makes it relatively expensive. Whereas Raspberry Pi is comparatively cheap and can be used off the grid. The proposed system can also be modified into web server, GitHub server, backup server.

IV. PROPOSED SYSTEM

The idea is to develop a device which is portable and capable enough to act as a media server and a hotspot at the same time. The system will have an application (Android/Windows) for the owner (admin) of the device which will act as an authorization portal for guest users of the proposed device. The admin will be able to give rights to the guest users either to access the data or access and modify the data, this feature will give the complete control over its device. To connect to the hotspot, the guest user will have to enter random key which will be provided by the admin via the admin application. Once entering the key, the user will be able to use the service of the device. The admin

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can change the rights of the connected user or make the user disconnect at any time he/she wants.
The device will be sharing all of the data which resides in the PSD which is connected to the device. The PSD can be any USB storage device, External HDD/SDD etc. The admin will be able to stream, download and upload data to its PSD via the proposed device. The main Ethernet can be connected to the proposed device and this will give streamless access to personal data as well as internet at the same time to all of its connected users, thereby making it the complete routing solution for domestic purpose.

V. REQUIREMENTS

Hardware

1. Raspberry pi
2. User's PSD
3. Power source

Software

1. Diet Pi

DietPi is an extremely lightweight Debian Jessie OS. With images starting at 400MB, that's 3x lighter than 'Raspbian Lite'. DietPi is highly optimized for minimal CPU and RAM resource usage, ensuring that the raspberry pi always runs at its maximum potential.

1. Languages: HTML, CSS, JavaScript, PHP, Java.
2. Technologies: Plug and Play, DLNA.

The Digital Living Network Alliance is a non-profit trade organization, and it was started by Sony in 2003. The DLNA defines standards that enable devices to share photos, video, music with each other. DLNA can be thought as a kind of home cloud because with DLNA, we can access any type of data we want anywhere, stored on any device on the same network. Universal Plug and Play (UPnP) is a set of networking protocols that permits networked devices to seamlessly discover each other's presence on the network and establish network services for data sharing and entertainment. UPnP is developed primarily for domestic networks.

4. TCP/UDP

The Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) does the work on the Transport layer in the TCP/IP protocol suite. They perform the same role, providing an interface between applications and the data-moving capabilities of the Internet Protocol (IP), but they do it in very different ways. The two protocols thus provide option to higher-layer protocols, sanctioning each to cull the opportune one depending on its needs.

5. SQLite

This is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. The code for SQLite is in the public domain and is thus free for use for any purpose, commercial or private. SQLite is one of the most heavily deployed database in the world with a plethora of applications can count, including several high-profile projects. SQLite is an embedded SQL database engine. Unlike most other SQL databases, SQLite does not have a separate server process. SQLite reads and indites directly to mundane disk files. A consummate SQL database with multiple tables, indices, triggers, and views, is contained in a single disk file. The database file format is cross-platform - you can liberatingly copy a database between 32-bit and 64-bit systems or between large-end and small-end architectures. These features make SQLite a well-known cull as an Application File Format.

VI. ARCHITECTURE

This is a preliminary flowchart (fig 1) that shows the overall working of the device itself. This gives us a brief explanation of how the device boots up, the way of primary and secondary users connects to it (in this context the primary user is the owner and the secondary will be the guest user)

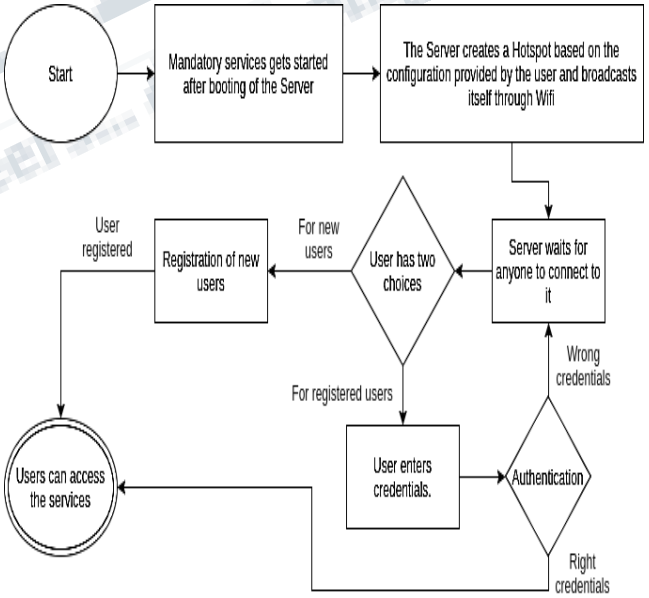

Figure 1

The overall architecture of the proposed system is given below (fig 2).

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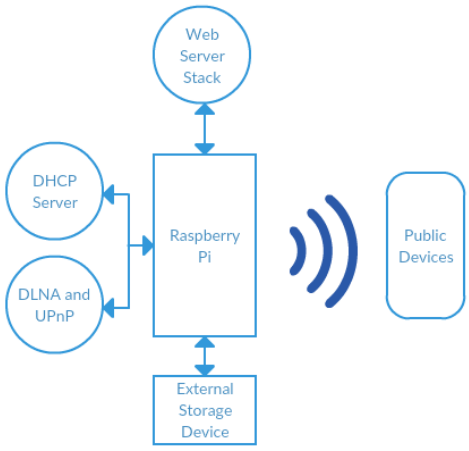

Figure 2

VII. CONCLUSION

The goal of the paper is to develop a Media Server system which can provide seamless file sharing between devices without the hassle of duplicating data. The system is fully portable due to which it consumes less energy while satisfying every user's needs. The basic system will be automatically configured to provide mandatory features to the users without the need for the users to configure it. Moreover, it can be extended to include features not provided with the system.

REFERENCES

1. Anand Nayyar and Vikram Puri "Raspberry Pi- A Small, Powerful, Cost Effective and Efficient Form Factor Computer: A Review" IJARCSSE, Volume 5, Issue 12, December 2015.

2. P.J.E. Velthuis "Small Data Center using Raspberry Pi 2 for Video Streaming" University of Twente, The Netherlands.

3. Jagdish A. Patel, Aringale Shubhangi, Shweta Joshi, Aarti Pawar, Namrata Bari "Raspberry PI Based Smart Home" IJESC, Volume 6 Issue No. 3, March 2016.

4. Gaurav Jadhav, Kunal Jadhav, Kavita Nadlamani "Environment Monitoring System using Raspberry-Pi" IRJET, Volume 03 Issue 04, April 2016.