A Review on Design of Local Network HUB

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Abstract - **In this paper, we are highlighting the overview of the local network hub and the system containing RPI based hub which is capable of performing functions within some specified limits of time, accuracy and cost. A RPI based hub is a Linux based system which will be designed using free software for raspberry pi that provides sharing of digital content using language Python and ARM processor. The RPI hub creates a local Wi-Fi network , which is independent from the Internet, with the anonymous file sharing and chatting capabilities. Also this paper briefly describes the components which will be used in the system.**

Keywords - Raspberry pi, Linux, python, ARM Processor, local network hub.

1. INTRODUCTION

Officially launched in February 2012, the Raspberry Pi personal computer took the world by storm, selling out the 10,000 available units immediately. It is an inexpensive credit card–sized exposed circuit board, a fully programmable PC running the free open source Linux Operating system. The Raspberry Pi can connect to the Internet, can be plugged into a TV, and costs around $35. It works as if relatively low price.The devices measures about 2 by 3 inches and weighs 45 grams. When we plug in a keyboard and connect it to a TV monitor it functions like a desktop computer. It runs Linux as operating system and provides all the standard desktop applications that come with our linux distribution of choice. Raspberry pi has a broadcom BCM2835 system on a chip(SOC), which includes an ARM1176JZF-S 700 MHZ processor, videocore IV GPU. It does not include a built in hard disk, but it uses an SD Card for booting and persistent storage with Model B+ using a MicroSD. when users join the Wi-Fi HUB wireless network and open a web browser, they are auto matically redirected to the Wi-Fi HUB welcome page. users can anonymously chat, post images or comments on the bulletin board, watch or listen to streaming media, upload and download inside their web browse. It is designed to be private and secure. No logins are required and no user data is logged. The users remain anonymous-the system is perposely not connected to the internet in order to subvert tracking and preserve user privacy.

2. PREVIOUS WORK

Raspberry pi is a credit-card size single board computer developed in UK by Raspberry pi foundation. The original purpose of developing Raspberry pi was to provide a low cost educational tool for children to learn programming.In 2006, the founders of Raspberry Pi had noticed that most young IT professionals had only done a little web design, in contrast to the boom in the skills seen in the 1990s. At the same time, computers had become too expensive for experimental programming. The small size and rock-bottom price of $25 to $35 quickly inspired a wide range of novel and experimental embedded system applications and projects, ranging from robotics and pet feeding to custom LED displays. After Raspberry Pi is released for a few hours, its 10,000 initial stocks are completely sold out. The invention of small size personal computers has raised a new revolution in the IT industry, which started a new competition.

3. HARDWARE REQUIRED

The following parts are needed to construct the Raspberry Pi HUB:

Raspberry pi parts- 1. One Raspberry Pi model B 512MB RAM.

2. One 16 GB SDHC Class 4 Card.

3. One HK Mini USB WI-FI 150 Mbps wireless adapter 150M LAN 802.11n/g/b with or other supported WI-FI adapter for Raspberry Pi.

4. USB Flash Drive (Formatted FAT32 with a single portion) The Kingston 16 GB works well.

5. Ethernet Cable, Computer with Ethernet port, 5V/ USB Battery (optional).

4. SYSTEM ARCHITECTURE

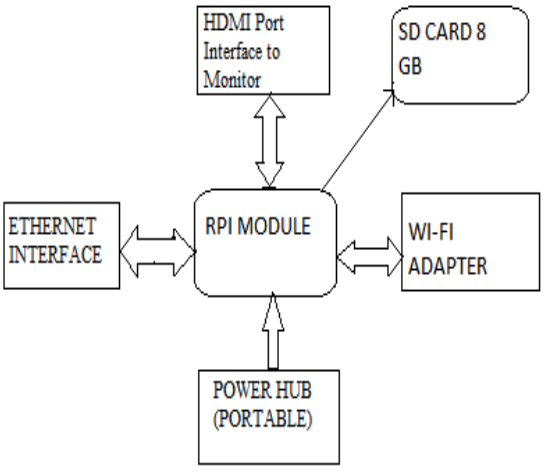

Fig.1 Block Diagram

The Raspberry pi consists of HDMI Port which is used to connect to the monitor of the computer and The HDMI port can also be connect to the T.V. for the display. The USB Port can be connect to the keyboard and Power Supply is provided through the Power Port. The Raspberry pi can be connect to the Internet via Ethernet Interface. The Wi-Fi adapter is used to create Wi-Fi Range for the communication and data Transmission in the Wi-Fi Range. The Raspberry pi runs linux as operating system and provides all the standard desktop applications that come with our linux distribution of choice. Raspberry Pi has a broadcom BCM2835 System on a chip(SOC), which includes an ARM1176JZF-S 700 MHZ Processor, video core IV GPU .It does not include a built in hard disk, but it uses an SD card for booting and persistent storage with Model B+ using a Micro SD.

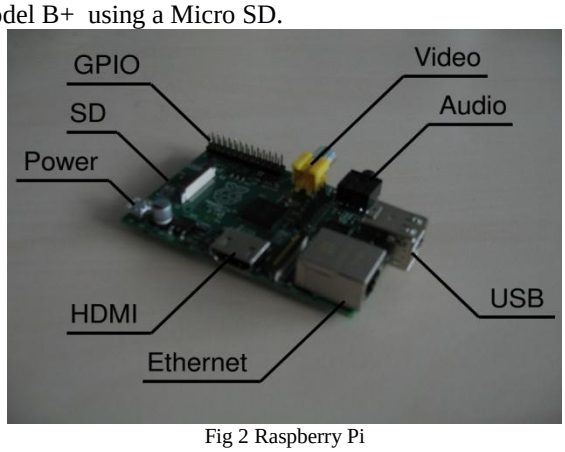

Fig 2 Raspberry Pi

A. Linux

Linux is a Unix-like computer operating system assembled under the model of free and open source software development and distribution. The defining component of Linux is the Linux kernel, an operating system kernel first released 5 October 1991 by Linus Torvalds. Linux system uses a monolithic kernel where the entire operating system is working in kernel space and is alone in supervisor mode.

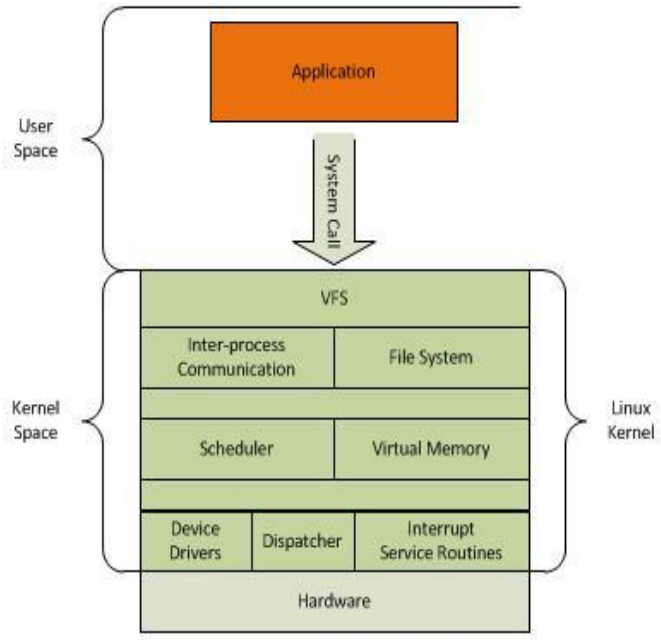

Fig.3 Structure of Monolithic kernel

The Raspberry pi is not suited to running Windows due to its hardware, but there are plenty of linux distributions which fit nicely. In addition to this, most distributions of linux are free, however Windows can cost many times the price of the Raspberry Pi itself. We have selected the Raspbian linux distribution as an operating system of our device. Raspbian is based on debian Wheezy (Debian 7.0) with faster floating point support. It provides over 35,000 available deb software packages, pre-compiled software bundled for easy installation on a Raspberry Pi computer. Specifically tuned for optimal performance on the Raspberry Pi ARM11 hardware. The Raspbian Linux distribution basically contains the LXDE desktop environment, the Openbox window manager, the Midori browser, software development tools and example source code for multimedia functions.

B. PYTHON

The official programming language of the Raspberry Pi is Python. Python is a flexible programming language that runs on almost any platform. Thus, a program can be created on a Windows PC or Mac and run on the Raspberry Pi and vice versa. Python is an elegant, reliable ,powerful, and very popular programming language. Making Python the official programminglanguage of the popular Raspberry Pi was genius.

C. Arm Processor

An ARM Processor is any of several RISC(Reduced Instruction set computer) microprocessors developed by Advanced RISC Machines ltd. The ARM Architecture was originally conceived by Acorn Computers in 1980s. since then it has evolve in to family of Microprocessors used in consumer electronic devices such as multimedia players, Mobile phones, pocket calculators and PDAs.

D. Local Network Hub

Raspberry Pi is used to create a local network HUB for the communication such as data transfer, chatting, offline download. Once, the hub is created communication can be done in the Wi-Fi Range, Independent of Internet. In Modern time software companies are prefer more secure data sharing. This is the secure method of communication. The Raspberry Pi is purposely not connected to the internet to provide the Antipiracy. This Local network hub can be very useful in industry for data sharing. Creating a HUB using Raspberry pi is easy, low cost, and also consumes less space as compared to the PCs.

CONCLUSION:

In this article we have tried to present the embedded based wireless access point with WI FI HUB support for to develop a technology that can help organization who suffers the loss in market due to HUB STORAGE. Through this article we provide the basis and foundation for developing this kind of devices , showing the different steps to implement an embedded based wireless access point with cloud support. The most important aspects to be taken into account in order to have good results: the selection the of the hardware to serve the powerful HUB application. It is always necessary to test the HUB application as per hardware. The results so far are very encouraging, in some cases the response timings are very fast .In future we are to be able to have more complex applications.

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