Abstract—The current web hosting systems suffer major drawbacks of maintaining complex immovable domain servers. Purchasing new domain space and maintaining huge servers is very expensive. These huge domain servers also require continuous high voltage for its proper functioning. To overcome the existing issue, a recently discovered credit card sized device named ‘Raspberry Pi’ is used. The raspberry pi (raspi) is a low cost tablet can be used instead of high level configured hardware systems as a domain server for internet web hosting. In addition raspi can act as a cheap remote surveillance camera when configured with webcam device. Hence in the present work, raspi will be used as the domain server for live streaming the captured video through dynamic web pages.

Keyword—Raspberry pi, dynamic DNS, port forwarding, live streaming, LAMP server

I. INTRODUCTION

Raspi is a credit card sized single board computer [1]. It can run Linux and other lightweight operating systems using ARM11 Processors running at 700 MHz by 512 MB RAM [7]. Usually, complex and high configured computers will be used as domain servers for hosting websites. Raspi device is just a $35 computer (Fig 1.). Raspi can be configured as a domain server to host small Websites [2].

A. Webhosting using dynamic IP addresses

When home computers are connected to internet through a router, ISP assigns any dynamic IP address and it’s the external IP address of the router. The external IP assigned for routers are changed randomly by ISP at each time of connecting to internet. Generally, to host a website an IP is required and dynamic IP addresses are unsuitable for hosting websites. So static IP addresses were bought from ISP companies but it’s highly expensive. Website hosted on internet is assigned to a unique IP address. Accessing website using IP address numbers becomes complex for a normal user and it is highly insecure to directly provide the IP address of the websites for accessing it. To overcome these difficulties Domain Name Server (DNS) are used which refers to IP addresses of websites [10], example: www.domainname.com.

To resolve dynamic IP conflicts, free dynamic DNS service can be obtained from Dynamic DNS services such as noip.com, dnsdynamic.org and some other dynamic DNS services [12]. Dynamic DNS address must be configured in router settings to enable remote access of raspi domain server [11].

B. Port forwarding

After obtaining a dynamic DNS name for a developed website, the router needs to be configured. Usually the router acts as a firewall which blocks the incoming traffic when webpage is requested by remote users [8]. So port forwarding must be performed to forward the requests for accessing the desired service on raspi by configuring their port numbers. These port numbers are the sub hierarchies of IP addresses. By
default web servers have 8080 as their port number. The router must be configured properly to forward the incoming requests to the specific port number of raspi webcam server.

II. LITERATURE REVIEW

The early birth idea of raspi computer, the tiny device was formulated in 2006 by Eben Upton with some of his mates [5]. Later the idea was executed by using alpha board which were powered and booted up successfully on 12, Aug 2011. Then there were further improvements implemented to the hardware and named as Raspberry pi, which was launched as credit card sized single board computer developed in UK by the ‘Raspberry Pi Foundation’. The main goal of the idea is for promoting teaching basic computer science in schools. It is a low cost computer, bought for children in UK to perform small researches with its tiny applications. The device has the capability of running Linux operating systems which could be considered as one of its most important advantage.

Raspi device is considered as a playfield for innovative developers because of its compatibility and with its expandable configurations. Simple home automation projects are also carried out using raspi device by its GPIO port which could control other devices example: controlling coffee machine. It has a possibility of connecting a webcam to raspi device, which could act as small security cam on work places [6]. Simple word press websites can be loaded on raspi web server [3].

III.EXISTING SYSTEM

Most of the websites are hosted on internet using the storage space provided by webhosting companies. Web server machine is just a computer always connected to the Internet. When a web page is visited, data is downloaded from web server machine. Common webhosting is performed using few methods like Self-hosting, Shared-hosting, hosting through Virtual Private Server & Dedicated Servers. Self-hosting is hosting small own website from home computer by using home Internet connection. Shared-hosting service is hosting the website along with thousands of other websites that are already stored on a single domain server. If website data requires highest security, then hosting is done using Virtual Private Server & Dedicated Servers [10].

A. Webhosting system suffers from listed difficulties

- Need professional hosting companies
- Complex and immovable
- Requires lots of hard disks and memory
- Need high optimization to deliver the website files to thousands of readers simultaneously
- Requires continuous high voltage
- Expensive

IV.PROPOSED SYSTEM

In proposed system raspi device is used for developing dynamic webpage which is capable of live streaming video captured by raspi webcam server (Fig. 2.) [6]. Software installed in raspi device are light weight components, which used for developing dynamic webpage and do not require large storage space in SD card for installation. To build small home server, Dynamic DNS service is used in resolving dynamic IP provided for home routers by ISP.

Port forwarding is set on home routers configuration setting. It directs the remote incoming traffic requests to the raspi domain server for accessing raspi’s website.

![Fig. 2. Architectural design of proposed system](image)

If raspi is used as domain server for hosting real time websites it results in some efficient advantages in performance when compared with normal domain servers.

- Cost efficient
- Less Power consumption
- Portable web cam domain server

V.IMPLEMENTATION

In order to host a website using raspi for live streaming the following hardware and software are required [4],

A. Hardware requirements:

- Raspberry pi
- SD memory card Minimum 8 GB (class 10 is preferable)
- Micro USB power cable or micro USB type mobile charger (5 V)
- Ethernet cable
- HDMI cable
- Webcam
- Powered USB hub
B. Software requirements:

- New Out Of Box Software (Raspbian Wheezy Operating System)
- SD Formatter Tool
- LAMP server
- Motion

‘New Out Of Box Software’ (NOOBS) is open source software that contains package of Linux type operating systems. It can be downloaded from raspberriy.org. To install the operating system, first SD card must be formatted using ‘SD Formatter’ tool available on the raspbi website. SD card is plugged in to a card reader that can be easily inserted to PC. Now, SD card is formatted using SD formatter which contains some specialized options, so full erase option should be chosen for complete clear format before installing the operating system. The downloaded NOOBS rar file is extracted and the extracted files are copied to the formatted SD card.

SD card must be inserted to raspbi device and it requires 5 A power supply to boot up the raspbi.

$ sudo apt-get install motion

V. EXPERIMENTAL RESULTS

Raspi is just a single board device which is booted up with the help of any SD memory card that contains the suitable operating systems for raspbi. On experimenting raspi device as a web server, a light weight software package ‘LAMP (Linux Apache Mysql PHP)’ was installed in raspi computer which was clearly elaborated in implementation [13]. Web pages are developed using PHP and loaded into the raspi web server folder. Raspi’s SD card acts as the domain space for webpage. It is be made available on internet by resolving router’s external dynamic IP address of raspi to point the DNS name of the website using dynamic DNS service. So even if the ISP changes the router’s IP address of raspi device dynamic DNS fixes the issue.

If a user had requested the raspi’s webpage by entering DNS name in his web browser, the request is forwarded to the raspi’s router. Raspi device is connected to internet by simple home routers which have default firewall setting that blocks incoming traffic for raspi web server. To fix this problem, port forwarding is done in router’s setting which informs the router to allow sending the users request to access the webpage from the remote raspi’s web server. As an advancement of the raspi’s webpage, live streaming is possible through webcam server of raspi device. 24x7 power and internet supply is required.

VI. PERFORMANCE EVALUATION

The speed of ARM11 processor on raspi could be equivalent to a 300MHz Pentium2 processor. Since it’s a low configured device it does suit heavy operating systems like windows and Mac. Raspi’s processor could be over clocked for enhanced performance of the device. Modest 800MHz option looked smart to select it turns raspi device to work as an efficient domain server (Fig. 4.).
portable domain server when compared with high configured domain server.

Fig. 5. Comparison chart of overall performance

VIII. CONCLUSION

Webhosting and living using raspberry pi helps in building a perfect small home server where web hosting can be done using raspi. This could be made as real time application by fixing the raspi webcam server in call taxies which could act as remote security camera.

A. Future enhancements
To have increased performance of the developed system, clusters of raspi devices can be racked.

REFERENCES

[2] www.linuxjournal.com/content/raspberry-pi-perfect-home-server