# Web Solution using More Secure Apache HTTP Server with the Concept of Full Virtualization

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## ABSTRACT

Virtualization is the concepts by which we can easily run the multiple virtual machines on a single physical machine by sharing the resources .By using the concept of virtualization the "unsigned" memory which is waste also utilize [1].If we are not having the different machines so we can easily adopt the concept of virtualization by which we create the virtual machine. In the Linux kernel managing a RAM optimally is a long –solved problem [2]. In this paper we are implementing the concept of virtualization and the lamp server for which it is easy to run the n number of guest on virtual machine ,with the help of the Apache web server we can secure our web site by intrusion attacks and also apply the authentication on that .Once we have DNS correctly setup and our server has access to the internet we'll need to configure the apache to accept surfers wanting to access our website .These configuration maintains any existing resolution to an Internet Service Provider (ISP).And in this paper the main approach is for the college student who are in a dorm room with the limited Ethernet jacks and router they can easily solve their problem with this approach .

**Keywords:** virtualization, server, virtual machine, web

## 1. INTRODUCTION

Linux virtualization can be used for isolating specific apps , programming code or even an operating system itself. The most powerful Linux virtualization solution includes Xen, KVM, QEMU, Virtual Box and VMware. The Red Hat Enterprise 6 and Red Hat enterprise Linux version 5.4 or later include the kernel –based virtual machine (KVM),takes the advantage of the latest hardware virtualization capabilities and is tightly integrated with the Linux kernel. Virtualization concept is basically used for the cloud computing which help to reduce the cost of infrastructure and improve the utilization and flexibility of allocating computer resources [3].for this implementation we have to make some server which are playing important role in virtualization for communicating one base machine to virtual machine like Yum Server ,DNA Server, Apache server and LAMP server and we need to do Bridging for the implementing the full virtualization . In fig 1.1 we see how the concept of virtualization we have taken for providing the communication between the host machine and the virtual machine or what the virtualization actually works on the machine how they share the resourced of the single machine for the multiple virtual machine.
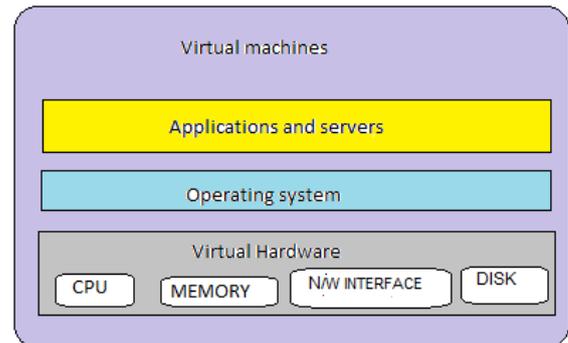


**Fig 1. [basic structure of virtualization]**

## 1.1 Yum server

Yum server is also called as the yellow dog Adapter which is basically used for installing the packages in Red Hat Enterprises Linux 6.Yum server is used for the improving the RPMs and installing the packages and else it is an automatic updater and package installation for RPM system [Fig 1.2(a)] we see that when we make the repository then the yum client and server get communicate with their IP address where server kept the all RPM files in the /var/ftp/pub and by the YUM Client we will install the software and packages from Yum Server [4].
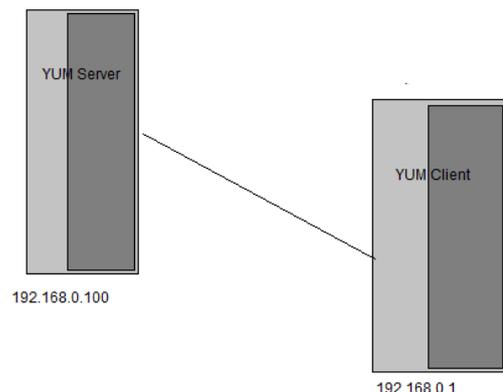


**Fig1.1(a) [communication between the yum server and client.]**

## 1.2 DNS Server

Domain name server is used for communicate with the server by using the IP addresses .In this paper we are taken the static IP address , the reason for taken the static IP is when we connect our network with the real network or LAN it will not fluctuate. There is an drawback of the DNS server for which here we also make the secured proxy server also called as Apache server due to which if the DNS server is located in the LAN then or combine with the default gateway then there are some cryptographic attack will be take place[5] .There are 13 root authoritative DNS server that all DNS servers query first. The package of DNS server is bind,bind-utils ,daemons name is 'named' and the configuration file /etc/named.conf/var/named/* .We are using the server.example.com to IP address such as 192.167.0.100 and the key configuration files to support such services include /etc/nssswitch.conf, /etc/resolv.conf, and etc/hosts,etc/named.conf,var/named/.DNS resolution maps a fully qualified domain name such as server.example.com that is also known as forword lookup.

## 1.3 Apache Server

Apache is the most popular Linux-based Web server application in use .The package of Apache web server is httpd ,Daemons –httpd and the configuration file for the apache server is: /etc/httpd/*,/var/www/*. When the DNS server have correctly setup and the server has access the internet after that we have to configure the Apache to accept the client to access the web site . For securing the web site for the Intrusion attacks and denial of service attack here the authentication facility is available  only the authenticated client which  can access the web site . sometime DNS is not aware for the status of the Apache whether the service of Apache is available or not [6]. For making the Apache Http server for more secure need to generate the key for the web site which is run on the Apache server and easily access by the virtual machine that is https://server.example.com , for generating the key by the command "genkey" and install some packages crypto-util* mod_ssl* -y for setup HTTPs Certificate for local network purpose. For the saving the data we need to initialize the Phpmyadminstepup bin which we can create the database into the localhost for which we need to install the packages through the yum server named as php* mysql* -y and  need to some change in the httpd.conf  for change the directory Index by which we can access the  web site through their domain name .

## 1.4 Bridging

Bridging plays the major role for the full virtualization, by the bridging we configure the two files: eth0 and br0, eth0 is for the Ethernet and the br0 is for the bridging by which virtualization concept arise for n number of virtual machine In the OSI layer bridging acts between the upper two layers ,below the network layer. By this we can easily provide the redundant networking capability to the computers and share the data between the one computer to the another computer so here we are implementing the bridging for the sharing the data between the host and the client in this we are using the Rhel6 as a host and the Rhel6 as a client in the virtualized manner or more virtual NICs[7].In this approach we need to create a network bridge so need to create a file /etc/sysconfig/network-scripts/ .  for sharing the resources the appropriate approach is virtualization [8].

## 2. IMPLEMENTATION

### 2.1 For Yum server

i. Mount the ISO

ii. install the vsftpd and createrepo package.

iii. configuring YUM Repository Server .

### 2.2 For Yum Client

i. Remove the file from /etc/yum.repos.d/:rm-rf/etc/yum.repos.d/*

ii. Create Repo file at /etc/yum.repos.d/rhel.repo

iii. Clear the cache

iv. check server is working or not by the command : yum info php*

### 2.3 For the DNS server

i. Configure the named.conffile .

ii. configureforware and reverse zone files.

ii. restart the named service and apply the chkconfig by the command : service named restart and chkconfig on .

### 2.3 .1  Steps for network configuration

1. select the device configuration  Fig 2.3.1 (a).
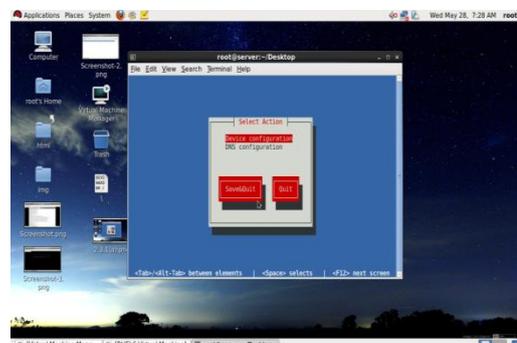


**Fig 2.3.1(a) [Device configuration for the Static IP]**

2. Select eth0 the LAN card

3. Provide static ip for the sever ,gateway and DNS to be 192.168.0.100 and netmast to be 255.255.255.0  Fig 2.3.1(b)

**Fig 2.3.1(b)[ Default gateway and the DNS for the HTTP]**

4 Now configure the DNS provide the hostname and the DNS

5 Restart the services and making the settings permanent

## 2.4 Virtualization using concept of Bridging

i. Install packages for virtualization

Yum install kvm* qemu* virt* libvirt* -y

ii. Starting the service and make them permanent .

iii. Copy the file in verbose mode from /etc/sysconfig/network-scripts/ifcfg-eth0 to /etc/sysconfig/network-scripts/ifcfg-br0.

iv. Make changes in the br0.

v. Make changes in the eth0.

vi. Now ,go to application-> System Tools->virtual machine manager and install the iso image of Rhel6.
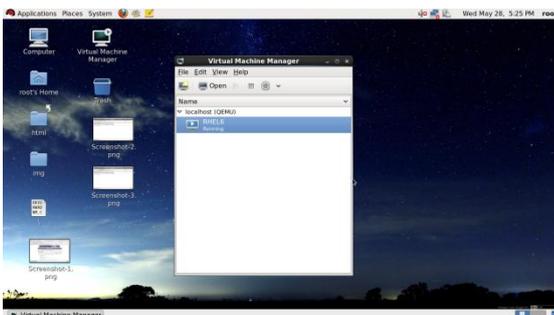


**Fig 2.4(a) [Show the virtual machine manager with RHEL6 as the virtual machine]**
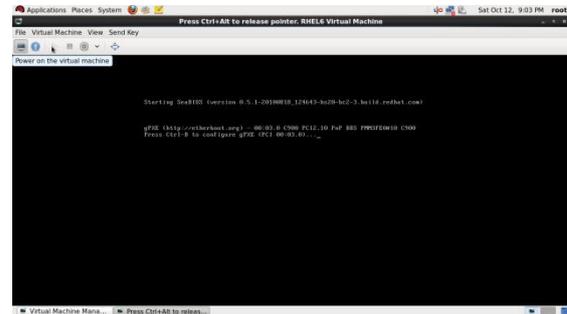


**Fig 2.4(b) [starting the Rhel6 machine as virtual machine]**

## 2.5 Apache HTTP Server

i. Set the Static IP.

ii. make a file in /var/www/html/index.php

iii.Flush the iptables :iptables – F

iv. Disable selinux Fig 2.5.(a)
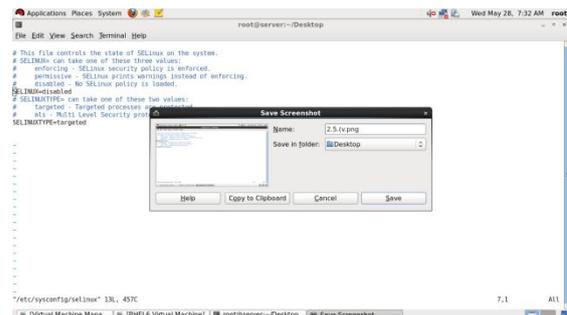


**Fig 2.3 (a)[ Disable the Selinux]**

v. save the service of iptables

vi. make change to the httpd.conf.file: Fig 2.5(b).

**Fig 2.5(b)[httpd configuration file]**

vii. setup /etc/hosts/file.

viii. Restart the web browser.

*2.5.1 Steps for Apache Directory web authentication for security*

i. Make changes to Httpd.conf file.

ii. changes in .htaccess file .

iii Add user and set password .

htpasswd –c /var/www/html/.htpasswdpratibha
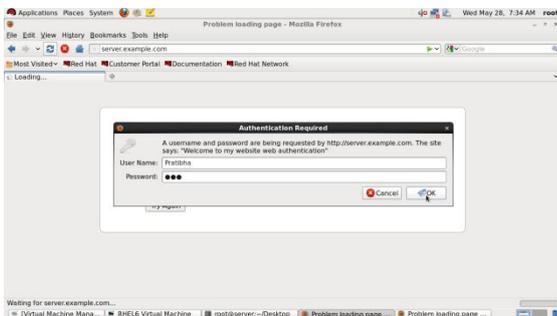


**Fig 2.5.1 (a) [User authentication for the web site only authenticated client access the site ]**

iv. Go to the http://server.example.com Fig 2.5.1(d)



**Fig 2.5.1(b) [web site with the domain name Server.example.com]**

*2.5.2 Steps for Php setup using mysql;*

i. Create shortcut of /var/www/html on Desktop

ii. Apply yum clean all

iii. Install the packages through yum , package name as php* mysql* .

iv. Configure the https.conf

v. Apply the sevice and make them permanent by using the command – service httpd restart and chkconfighttpd on

vi Extract the phpMyAdmin setup.

vii. Chk status for mysql service:

servicemysqld restart

servicemysqld stop

viii. Run the command

mysqld_safe-skip-grant-tables&

mysql-u root

ix. Set the Root password and Flush the Privileges .

x. Restart the service and make them permanent .
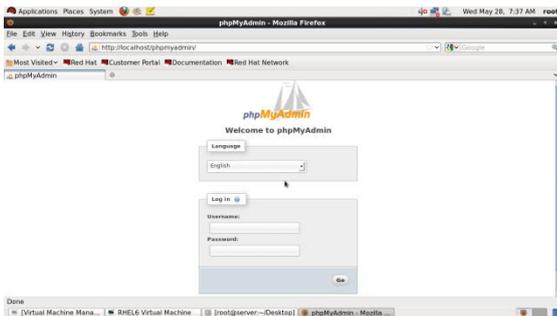
**Fig 2.5.2 (a) [Phpmyadmin setup for the SqlDatabase ]**
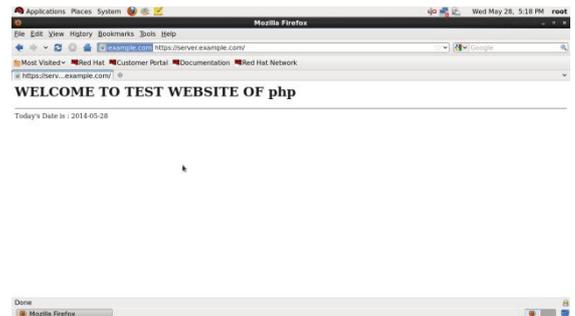


**Fig 2.5.3(b)[Certification will be provided to the website as Https for more secure site.]**
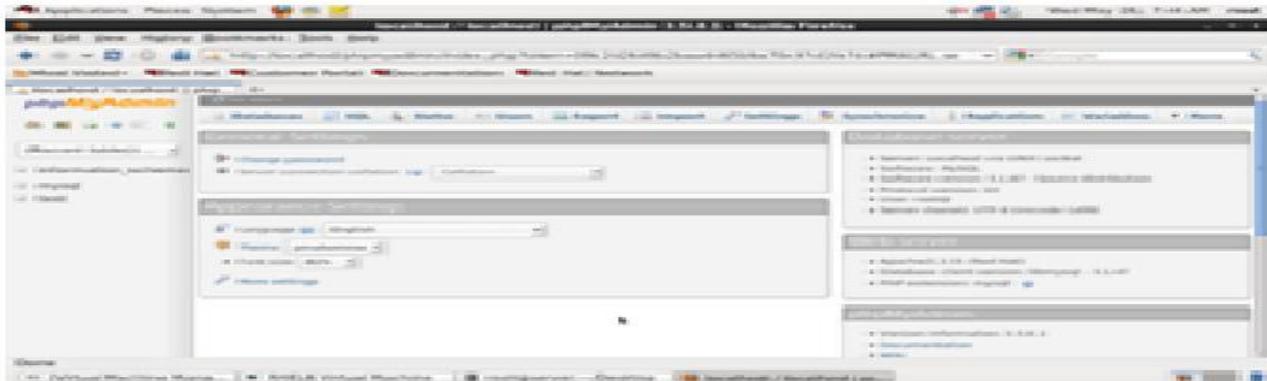


Fig 2.5.2(b) [After loging into the Phpmyadmin Setup.]

## 2.5.3 Steps for the certification for local network purpose



**Fig 2.5.3(a) [Changes into the ssl.conf. file]**

i. Install the packages name as crypto-utill* mod_ssl* -y

ii. Generating the key for the 100 days and create the certificate as per requirement

iii. Make changes to ssl.conf file Fig2.5.3(a).

iv. Restart the services and make them permanent.then login into web page as https://server.example.com Fig 2.5.3.(b)

**Fig 2.5.3(c) Certification which is created for secure page**



**Fig 2.5.3(d) [Full Certification details]**

## 3. CONCLUSION

Red Hat Enterprise Linux 6 is delivers advances in application performance ,scalability ,and security .HTTP (hypertext Transfer protocol ) server, or a web server is a network service that serves content to a client over the web .Full virtualization provides the complete abstraction between the hardware and the guest operating system .In this approach we see that the guest operating system is provided a complete virtual physical environment the virtual machine run as a client and we didn't need to be modify in order to run the virtualized environment .And the main scenario of making this approach is for college students in a dorm room with limited Ethernet jacks and no routers so by this approach it is easy to connect with the Ethernet.

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