

“LINUX  
ADMINISTRATION”  
PRACTICAL  
MANUAL

T.Y.B.Sc. (I.T) - SEMESTER V

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# Linux Administration Practical Manual

## INDEX

Practical No	Practical Name	Page No.
1.	Installation of Red HAT Linux operating system.  a. Partitioning drives  b. Configuring boot loader (GRUB/LILO)  c. Network configuration  d. Setting time zones  e. Creating password and user accounts  f. Shutting down	
2.	Software selection and installation	
3.	Basic Commands	
4.	Do the following changes in Grub file  a. Write the path where the grub file is located.  b. Change the timeout and title of the system.	
5.	Setting up Samba Server	
6.	Configuring dhcp server and client	

## Linux Administration Practical Manual

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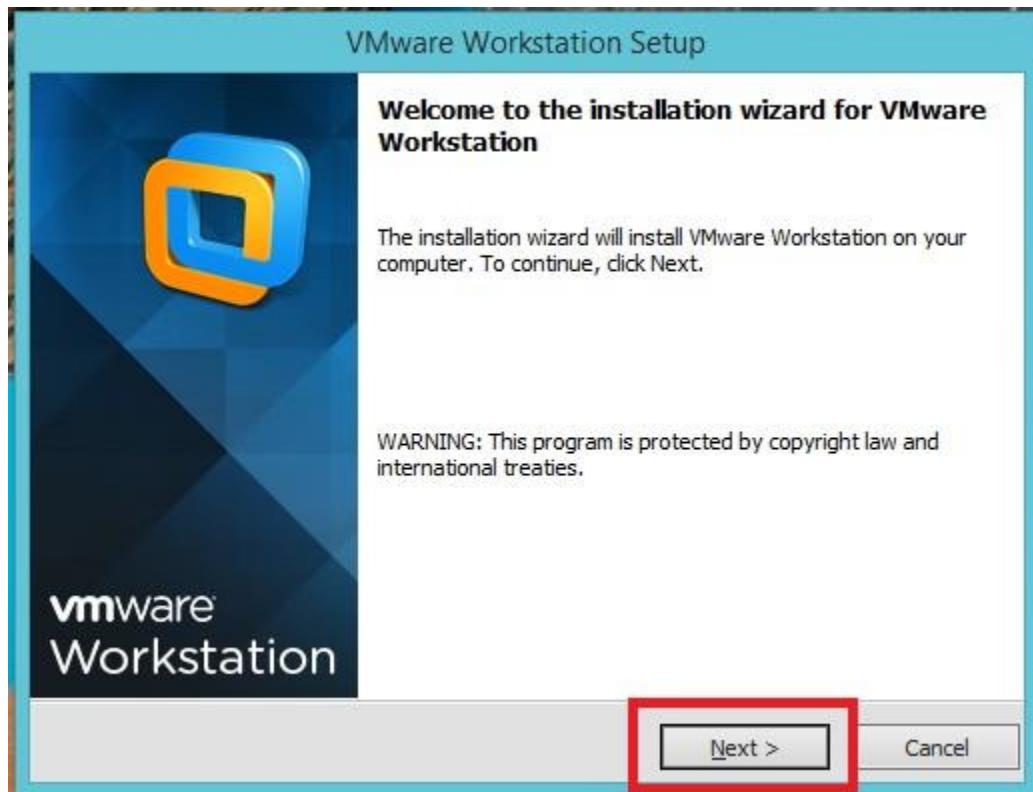
7.	Configure a DNS Server with a domain name of your choice.	
8.	Configure a Linux server and transfer files to a windows client .  (Setting up NFS File Server)	
9.	Connecting to the internet  a. Setting up linux as a proxy server  b. Configuring mozilla or firefox to use as a proxy.	
10.	Configuring Mail Server.	
11.	Configure FTP on Linux Server. Transfer files to demonstrate the working of the same.	
12.	Using gcc compiler (Programming using C).	
13.	Using gcc ++ compiler (Programming using C++).	
14.	Configuring Apache Web Server.	

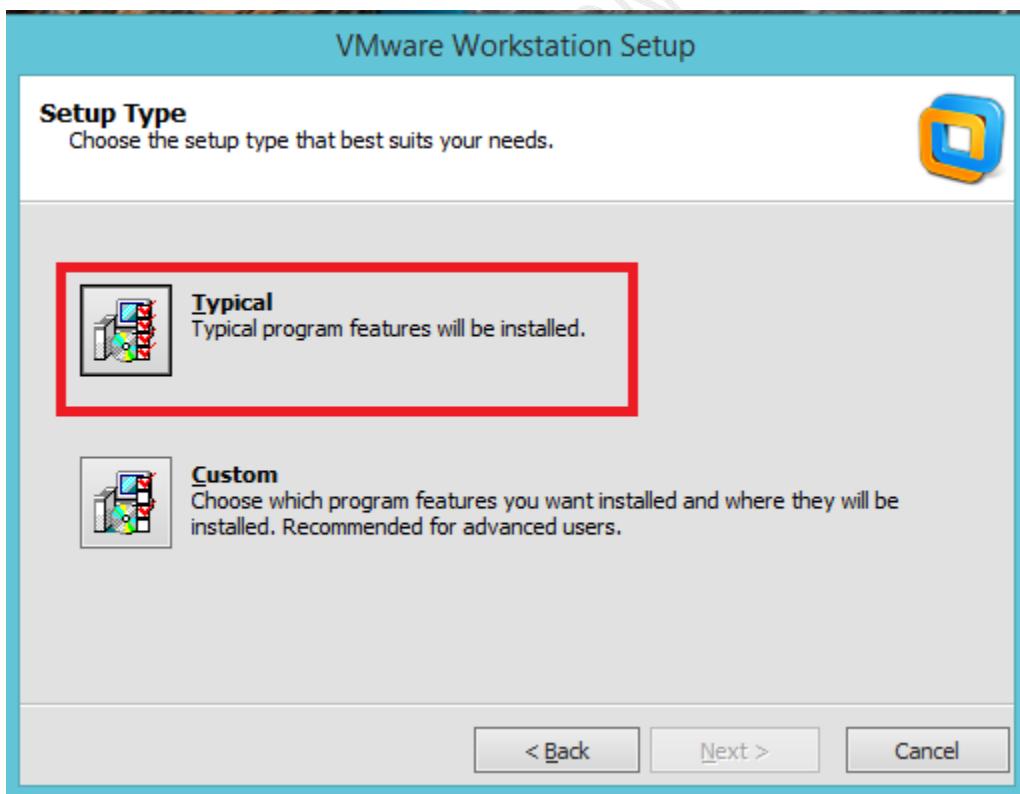
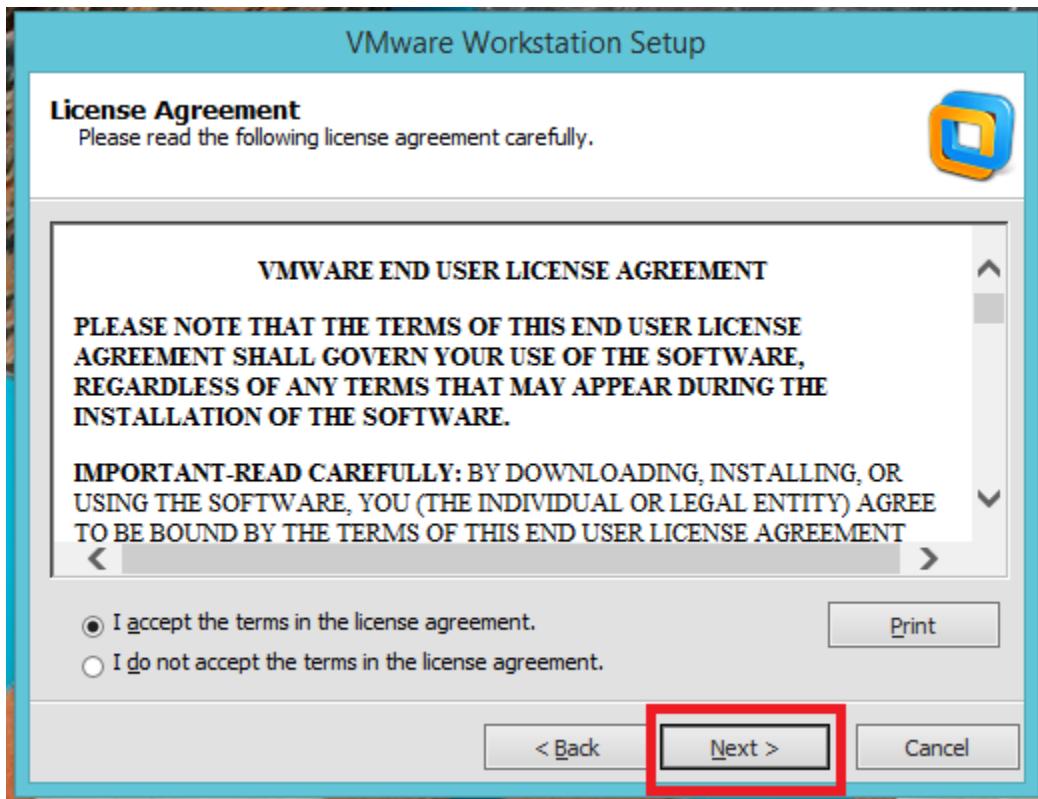
## Linux Administration Practical Manual

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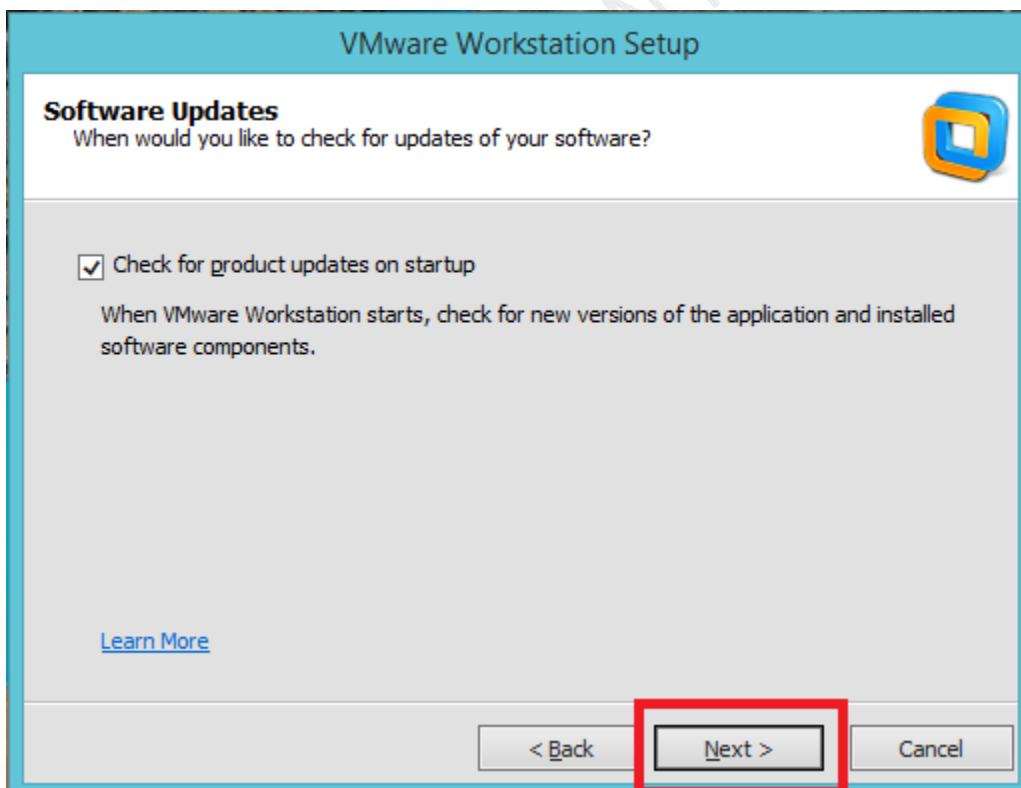
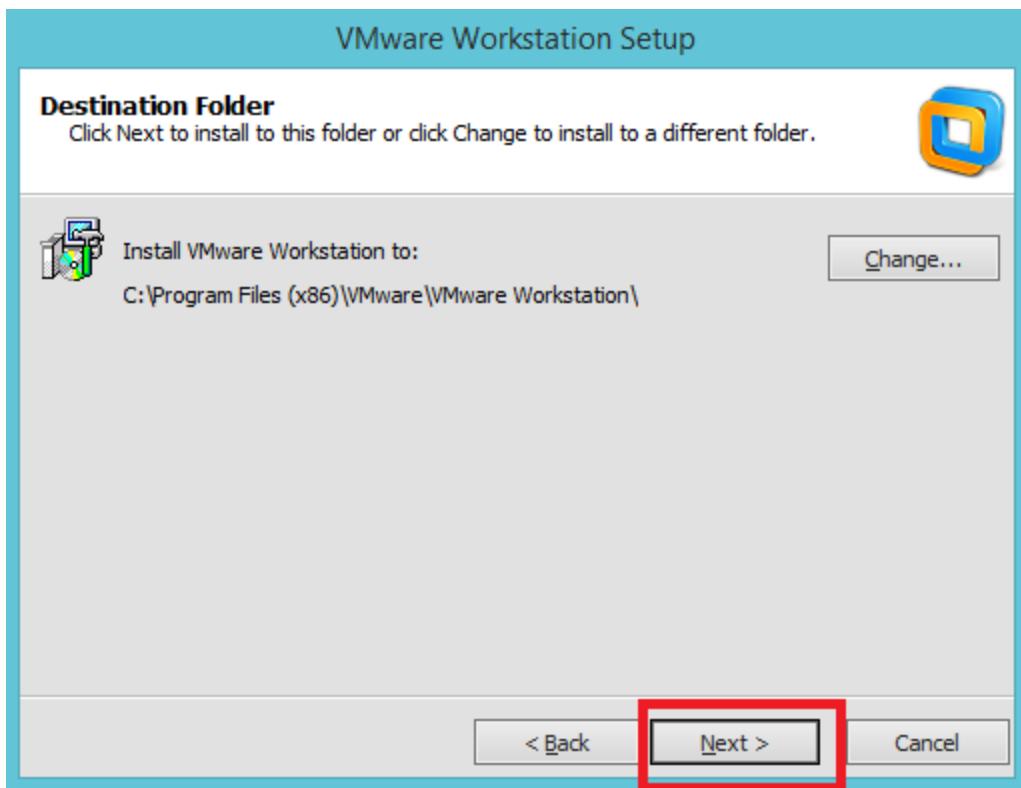
15.	<p>Linux system administration</p> <ul style="list-style-type: none"><li>a. Becoming super user</li><li>b. Temporarily changing user identity with su command</li><li>c. Using graphical administrative tools</li><li>d. Administrative commands</li><li>e. Administrative configuration files</li></ul>	
16.	Using javac compiler	

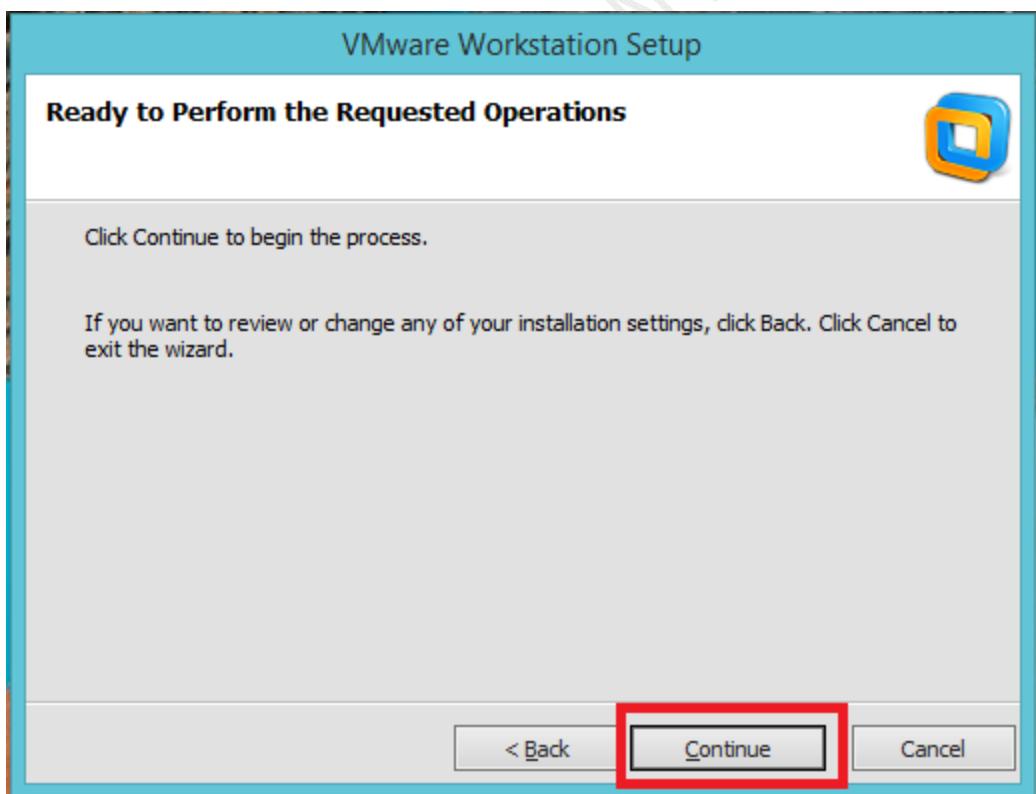
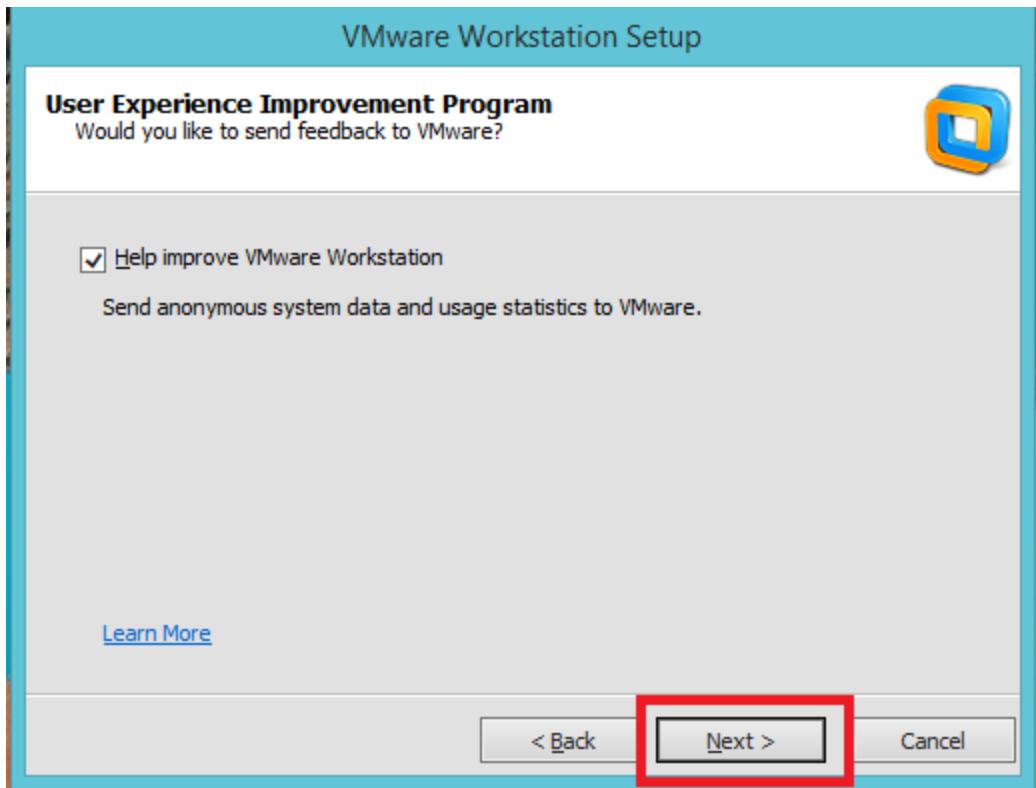
## **Practical no 1: Installation of Red HAT Linux operating system.**

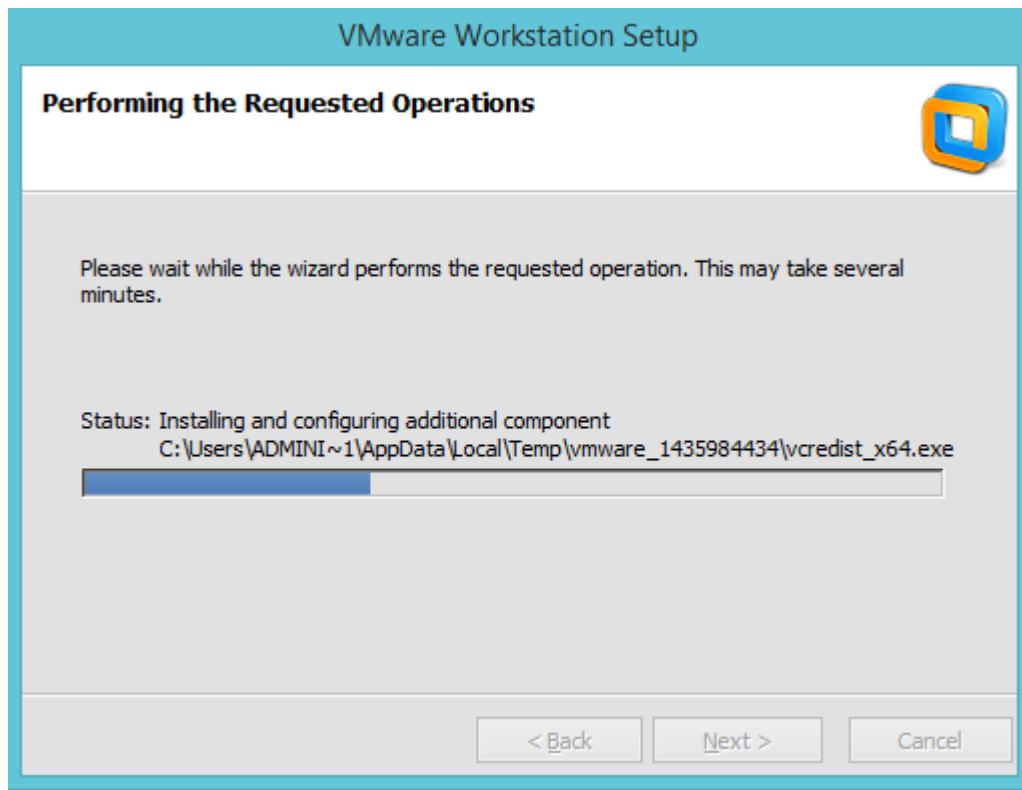




# Linux Administration Practical Manual

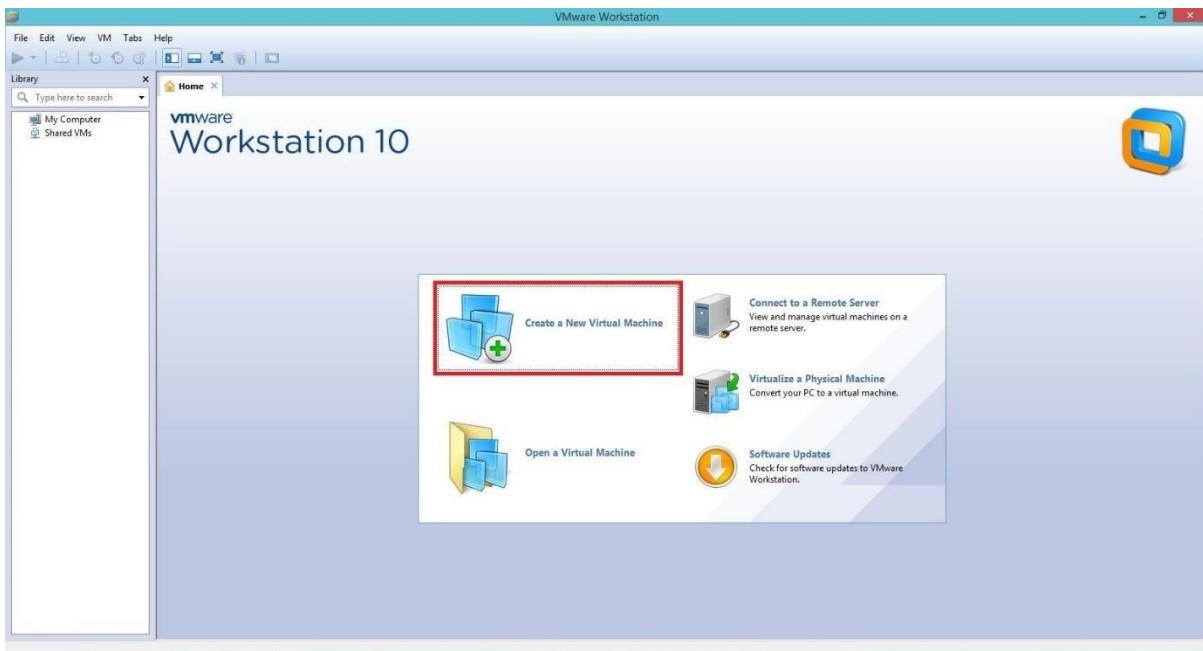




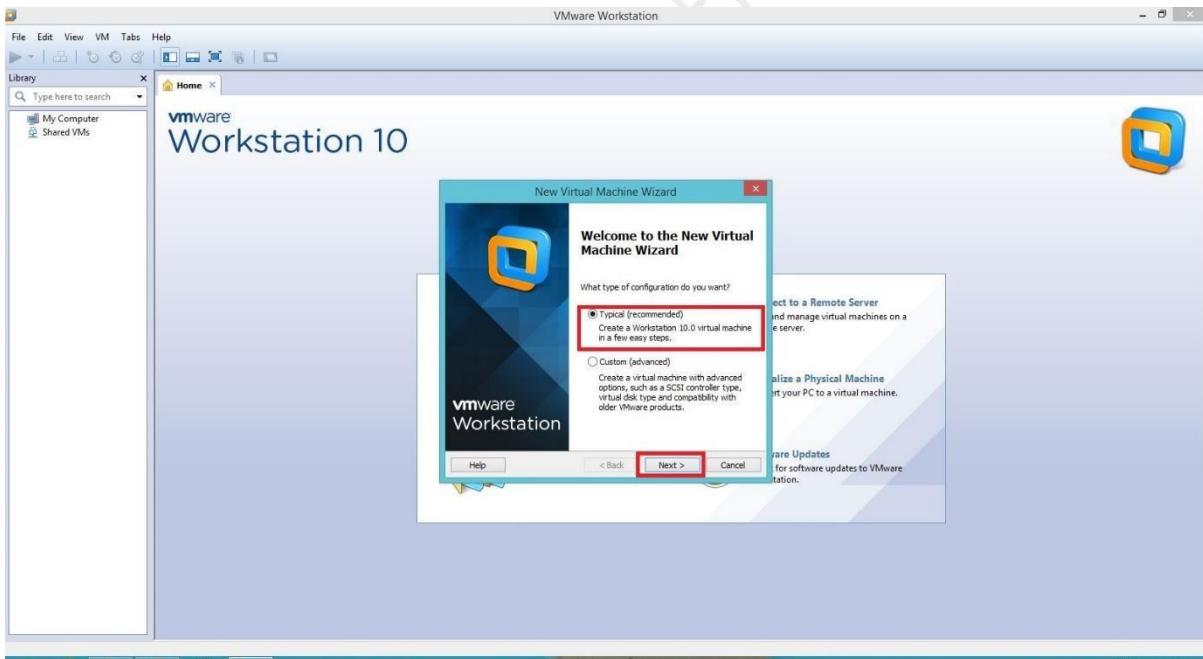


1. Double click on VM VirtualBox icon and Oracle VM VirtualBox Manager will open.
2. Click on New button in the toolbar to create a new virtual machine

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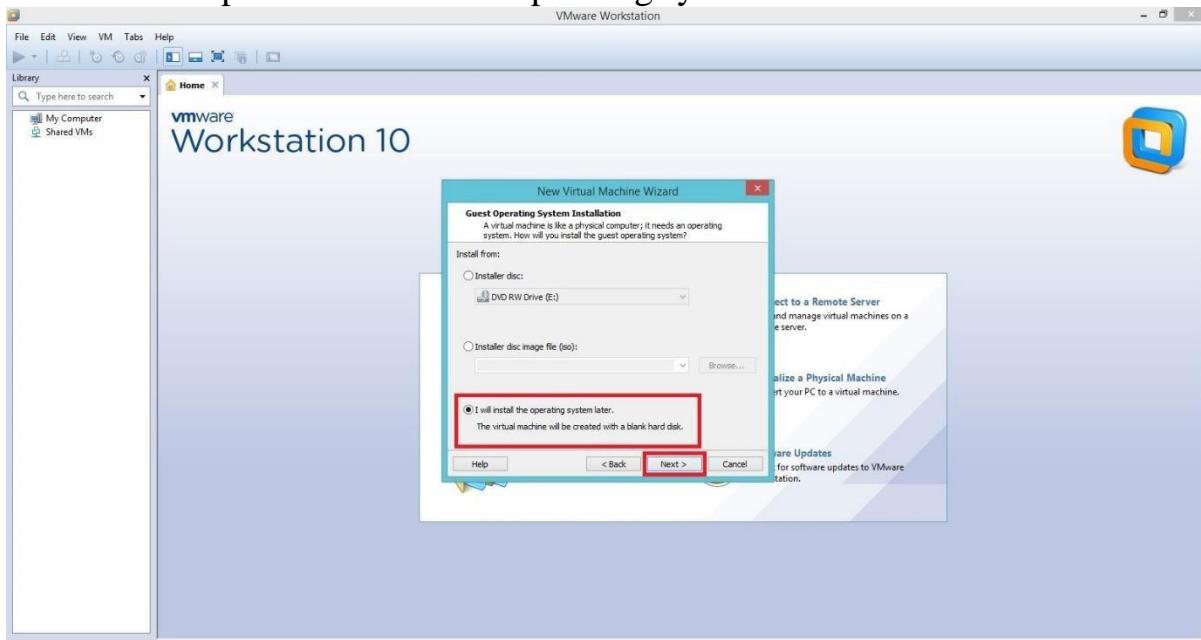


3. Create Virtual Machine Dialog box will open

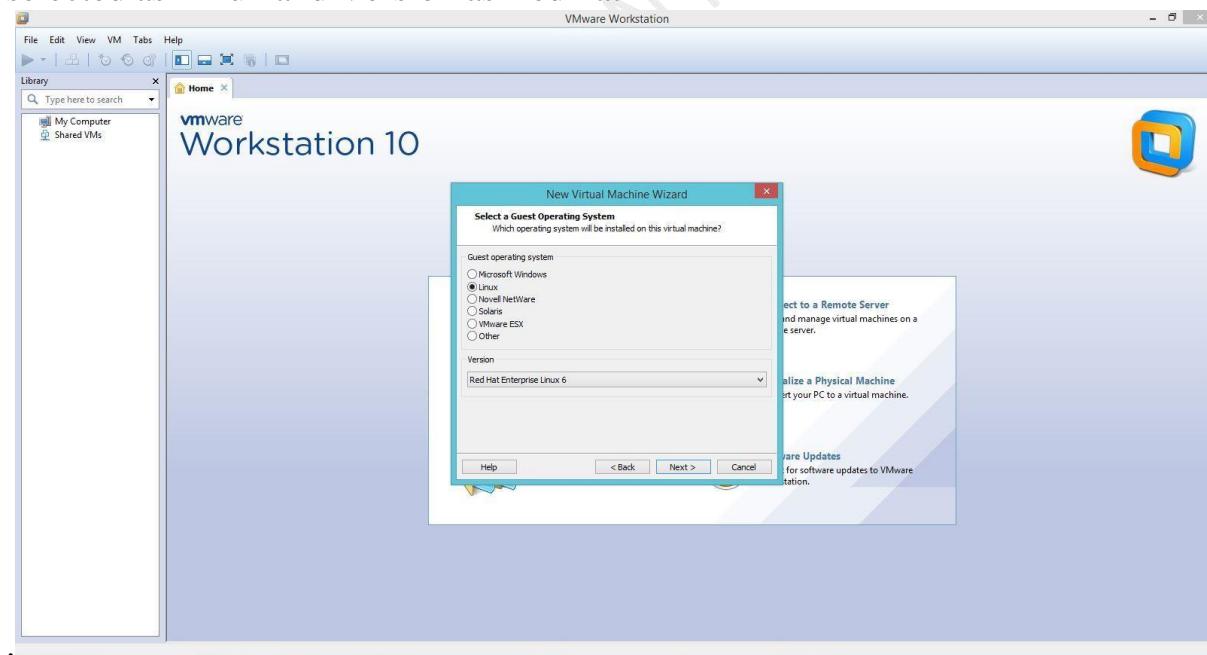


# Linux Administration Practical Manual

4. Select option “I will install operating system later”.



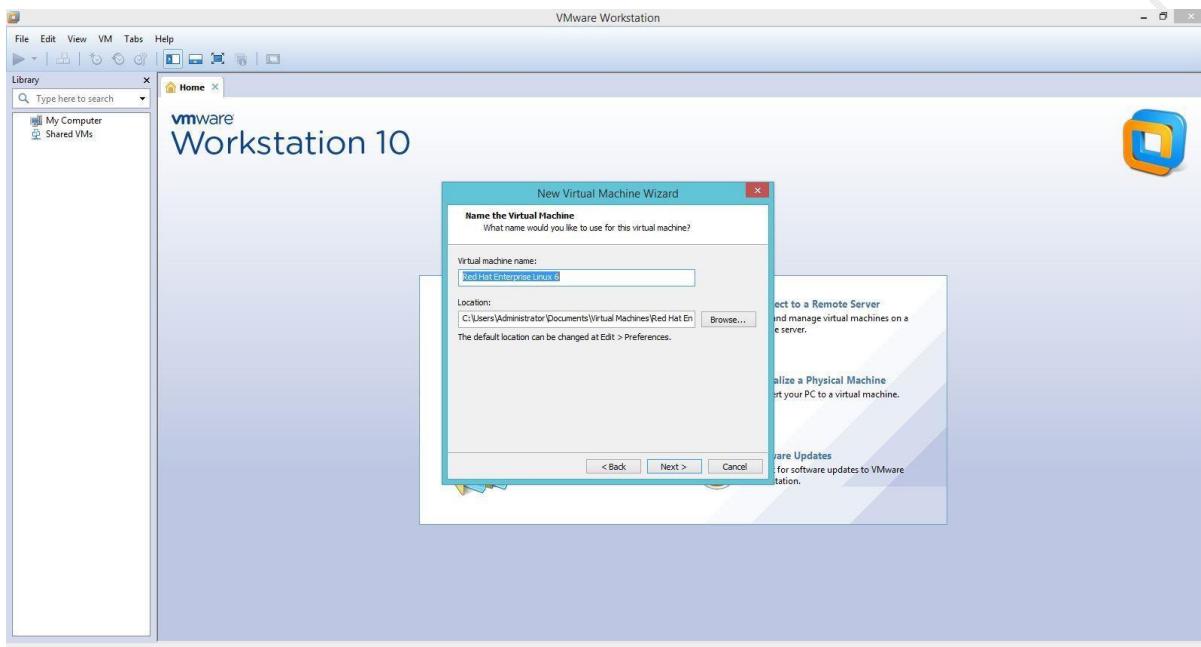
5. Select the operating system as RedHat the Type will automatically get selected as Linux and Version as Red hat



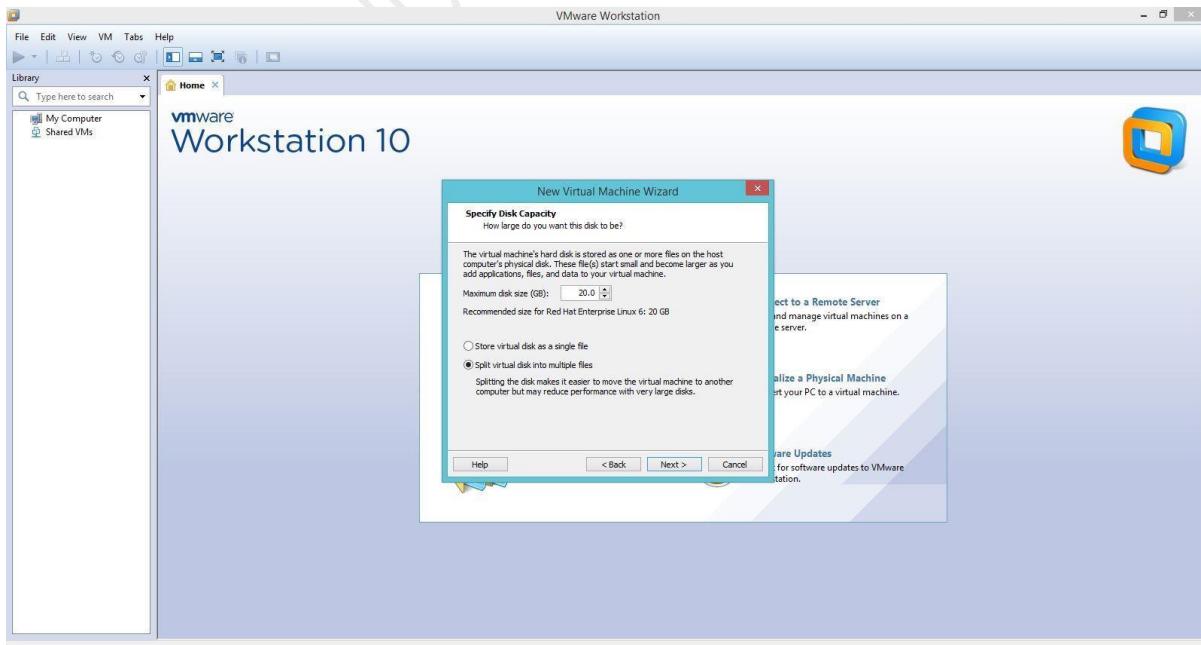
(Virtual Box support no of operating system which you can select from, Type drop down menu)

# Linux Administration Practical Manual

6. Now write the virtual machine name as you want or set it by default “Red Hat Enterprise Linux 6”.

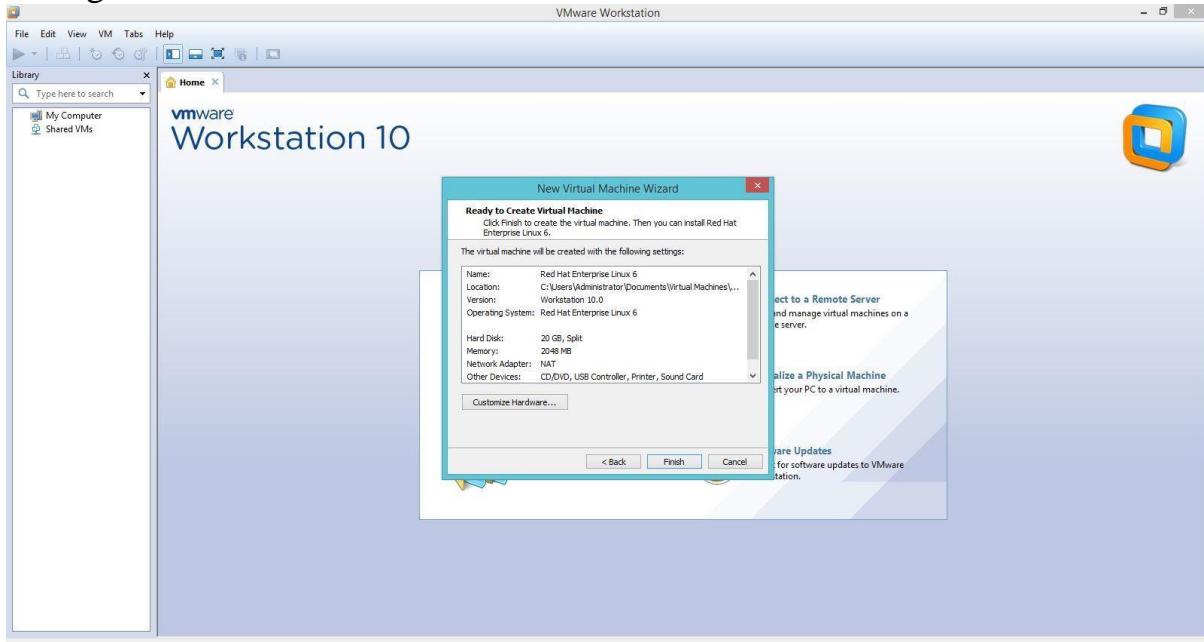


7. Now Select the Hard disk space as 20GB and select Store virtual machine as single machine.



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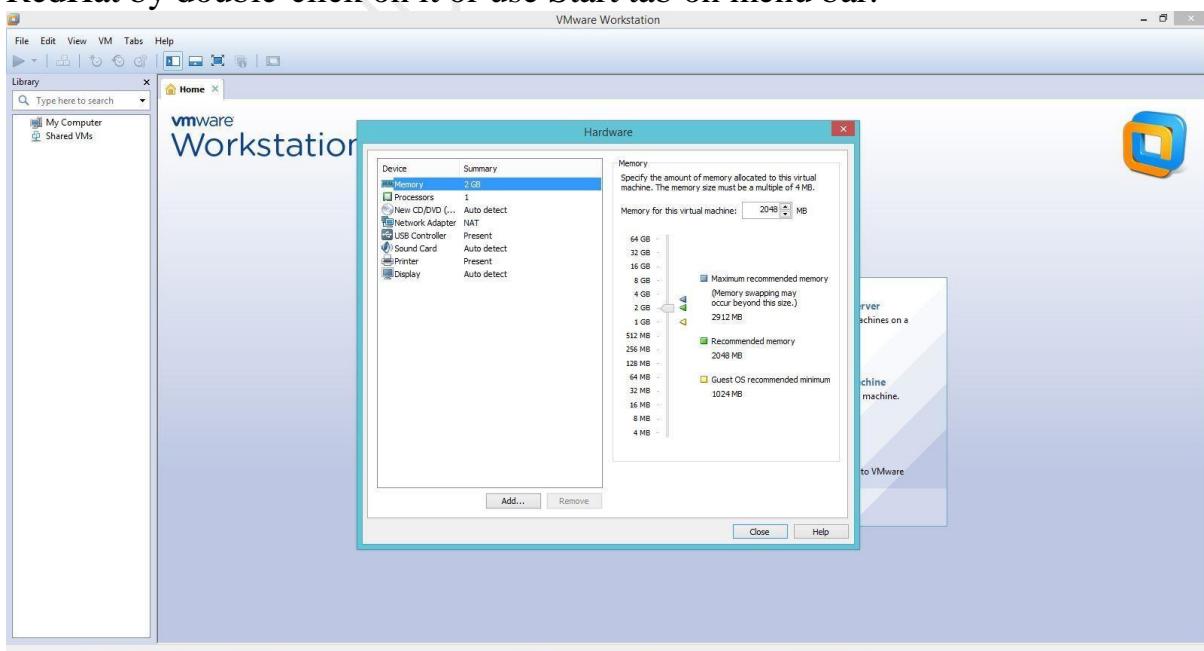
8. Now you get the option that virtual machine is created with the following settings



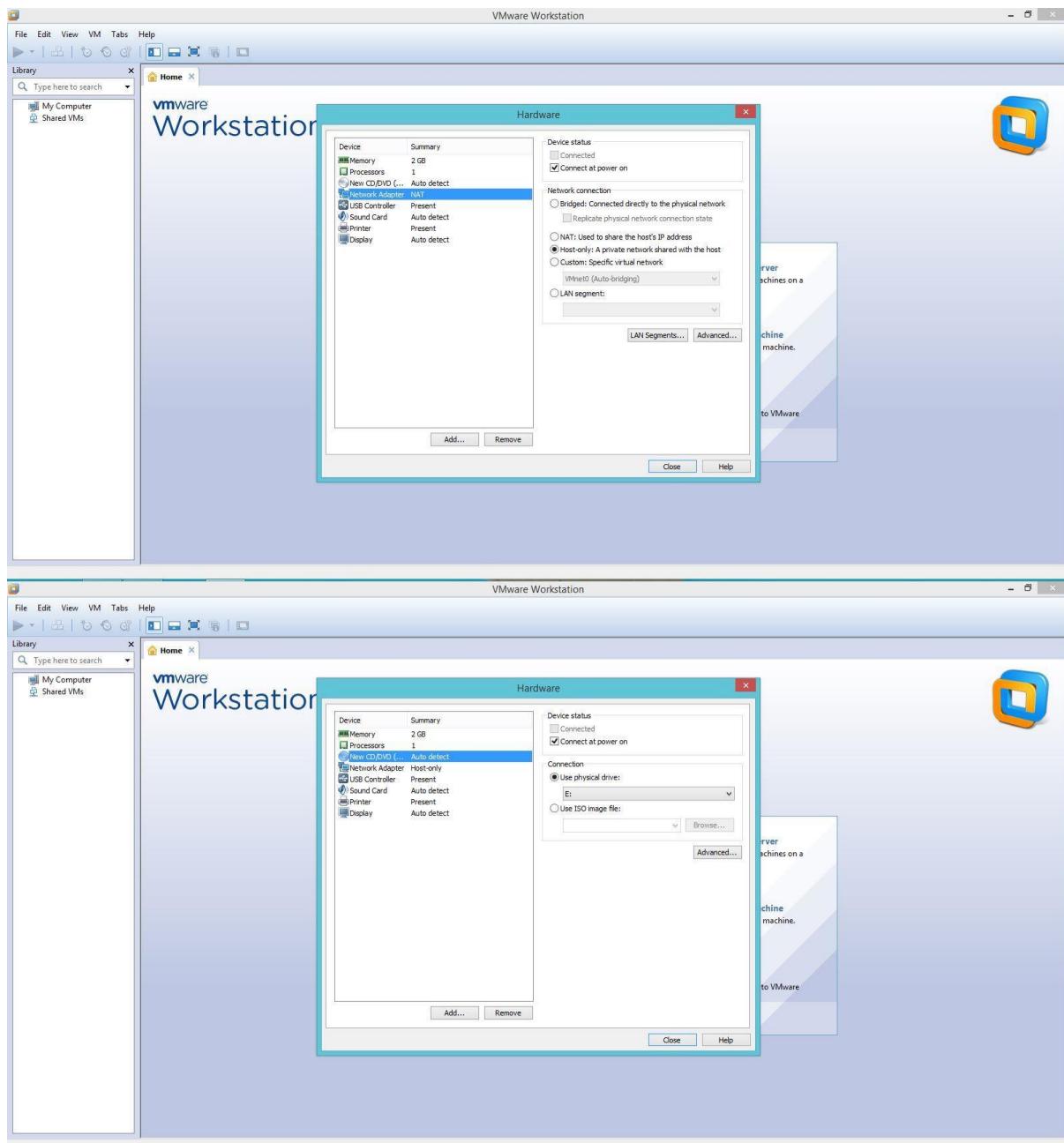
9. Click on “customize Hardware” Select the memory size that is RAM you want to allocate for RedHat virtual machine (1 GB) click Next button.

10. Now select create a virtual hard drive to the new machine click create button.

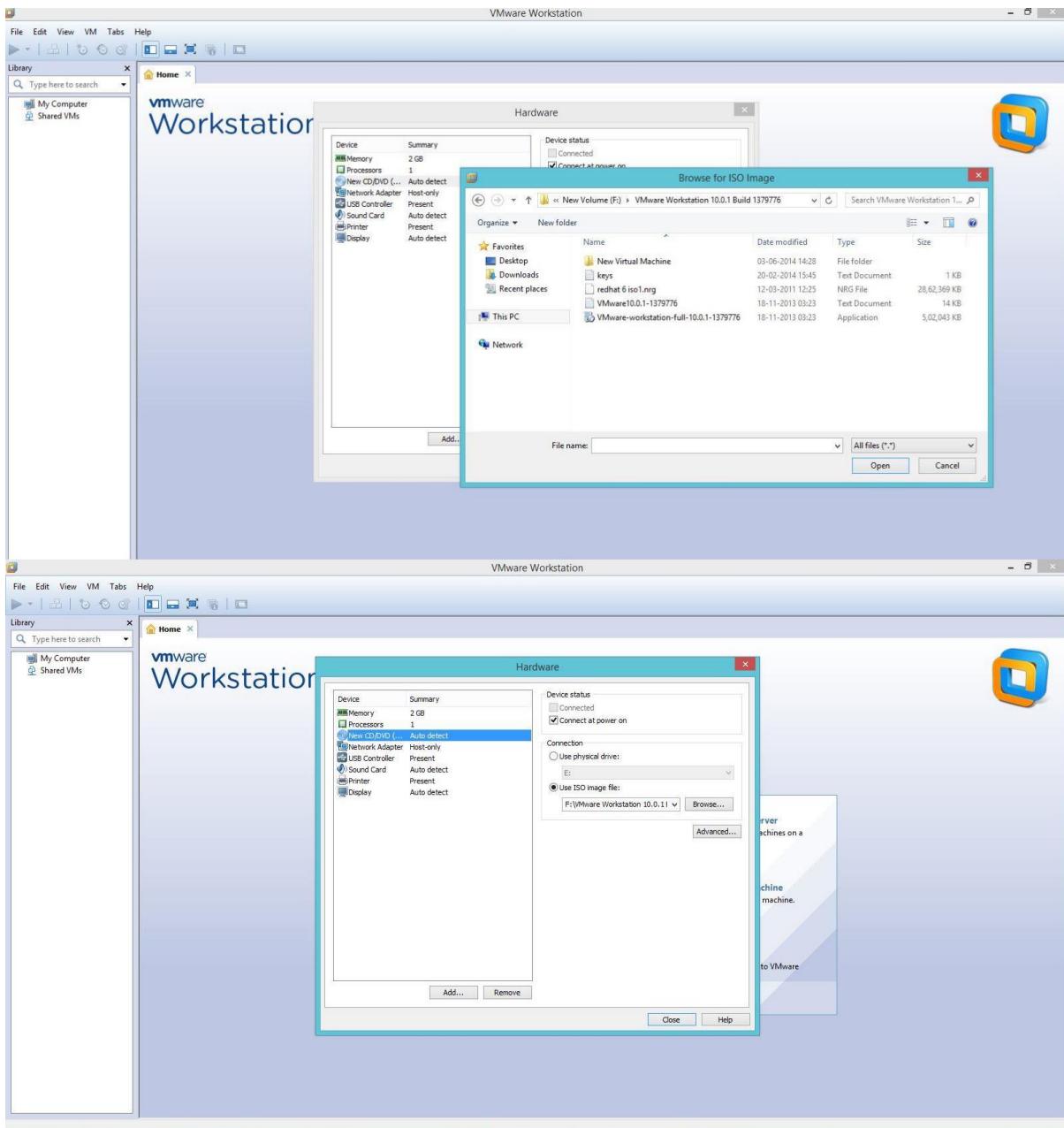
11. Your RedHat Virtual Box operating system drive is created. Now start the RedHat by double-click on it or use Start tab on menu bar.



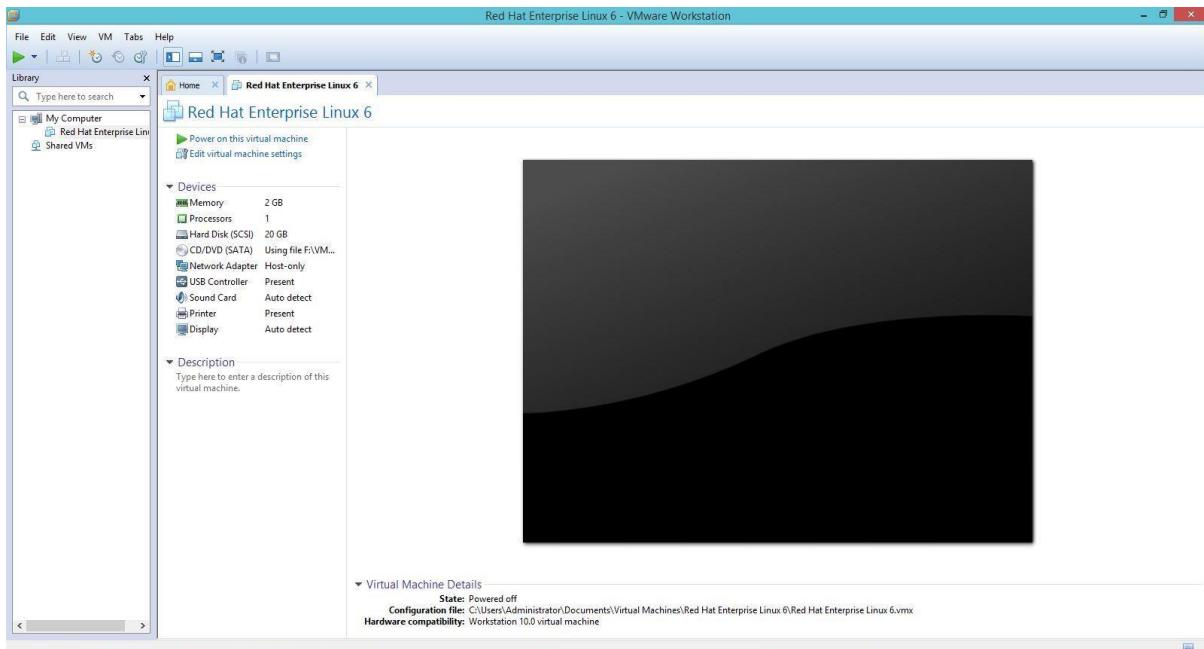
# Linux Administration Practical Manual



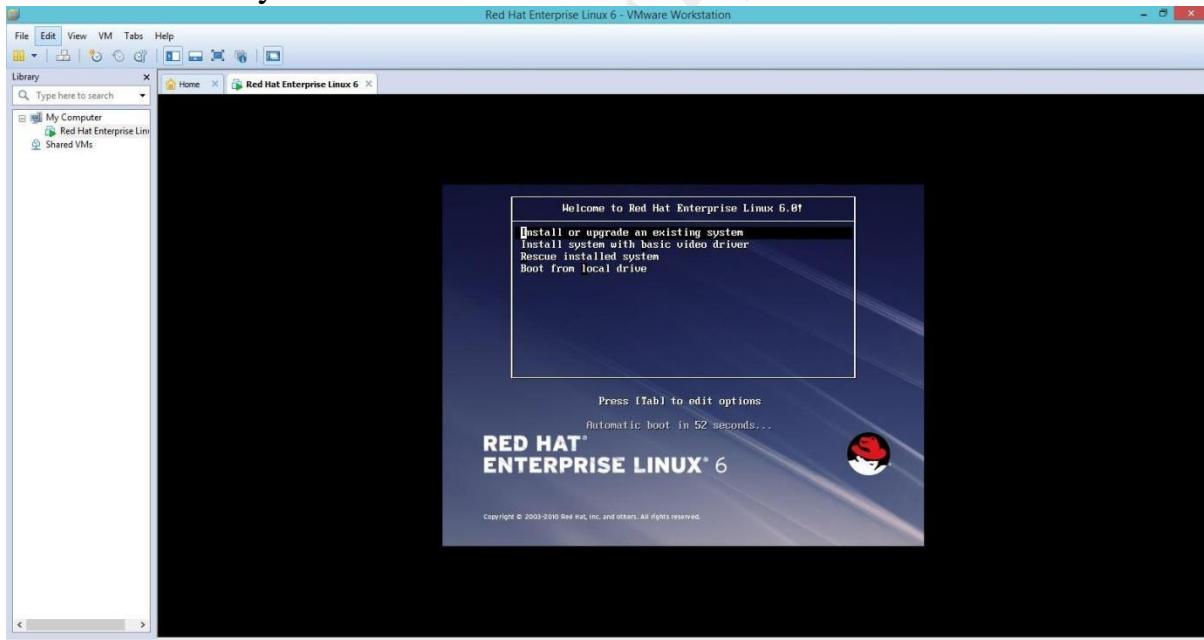
# Linux Administration Practical Manual



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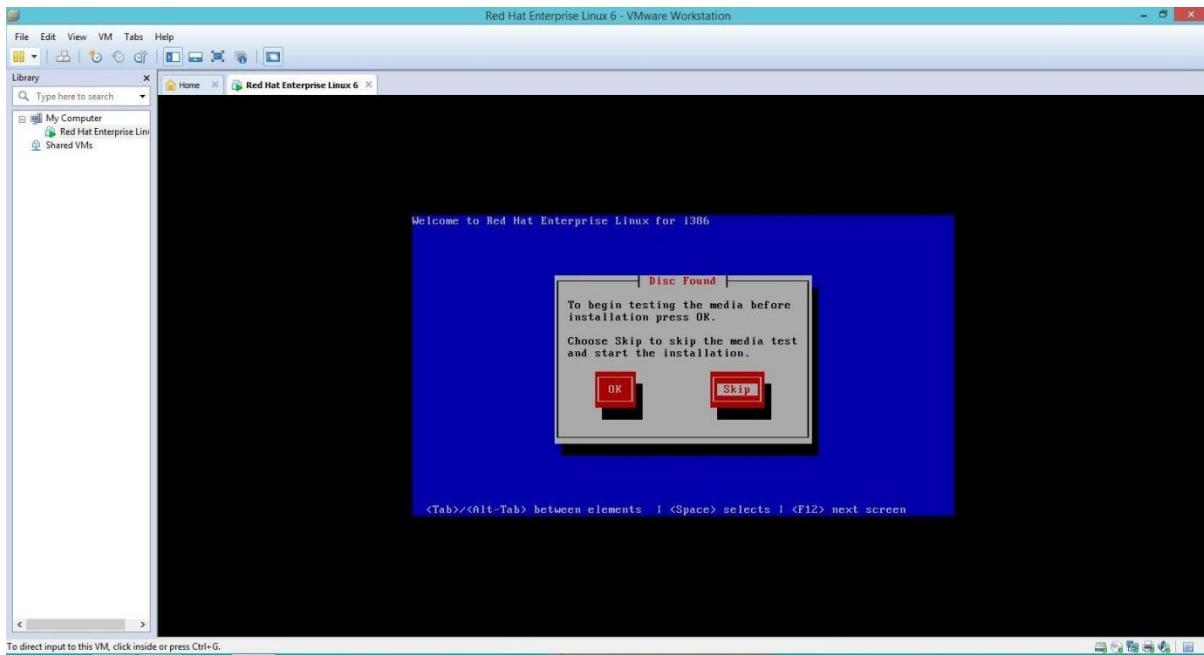


12. Red hat installation starts from here. select “Install or upgrade an existing system” option and press enter. It is a by default graphical installation option or it will automatically start in a while.

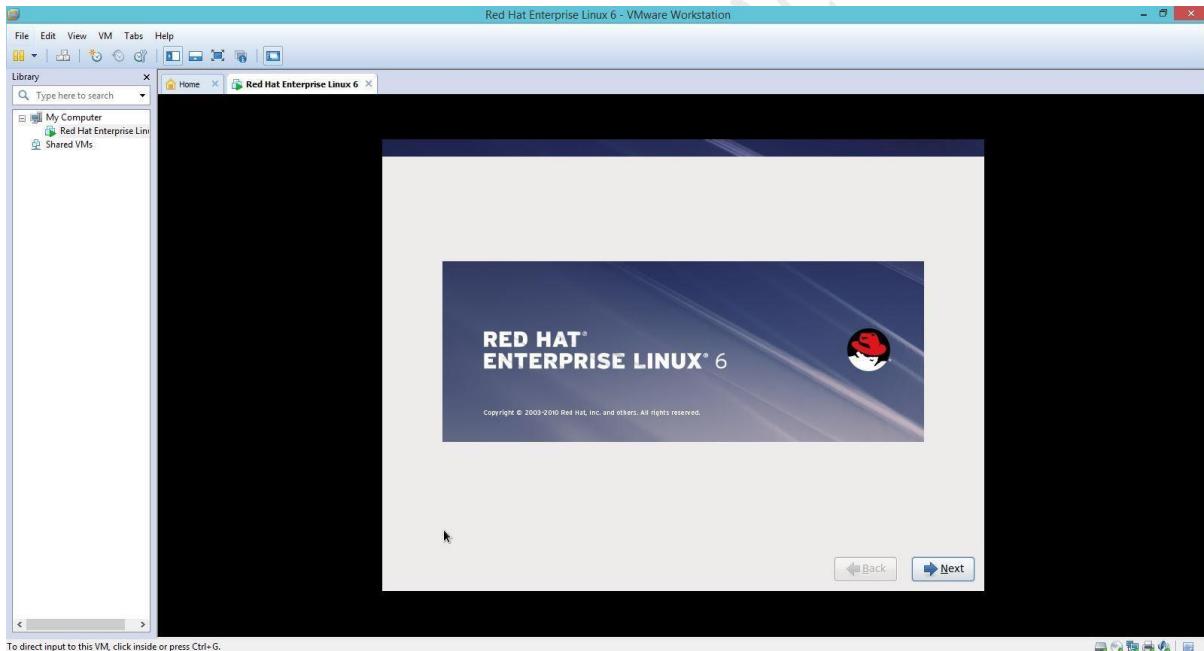


13. Here it will prompt for testing media before installation select “Skip” here

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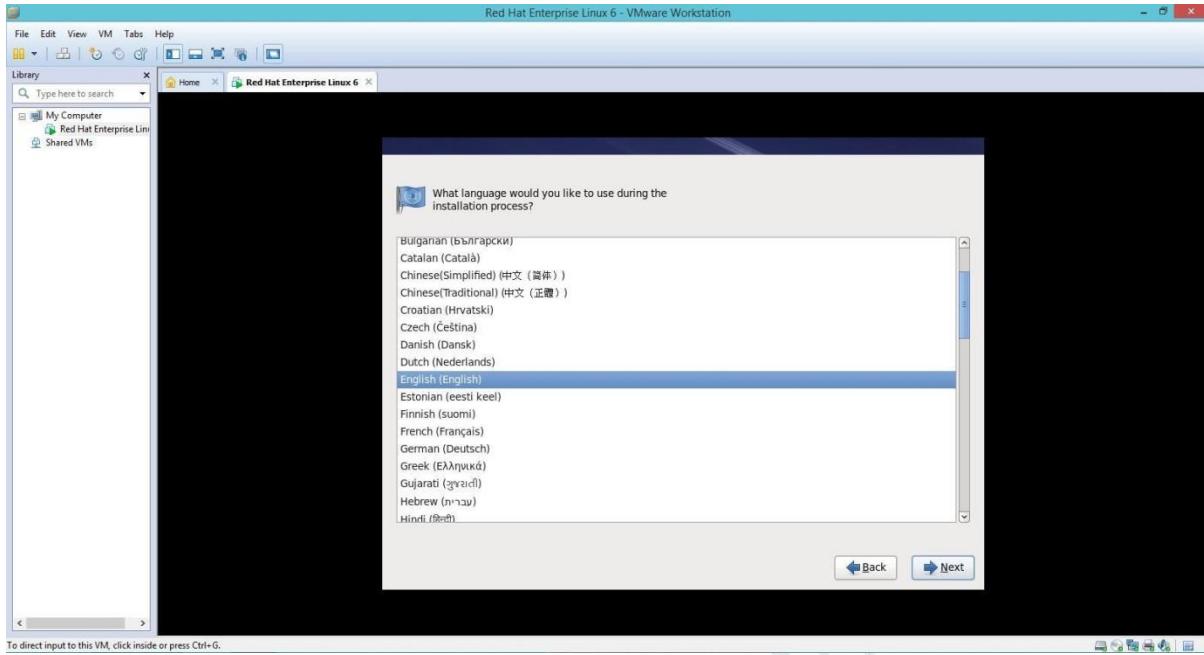
## 14. Select “Next”



## 15. Language Selection :--

Using the mouse select a language to use for the installation. The language we select here will become the default language for the operation system once it is installed. Once you select the appropriate language click “Next” button

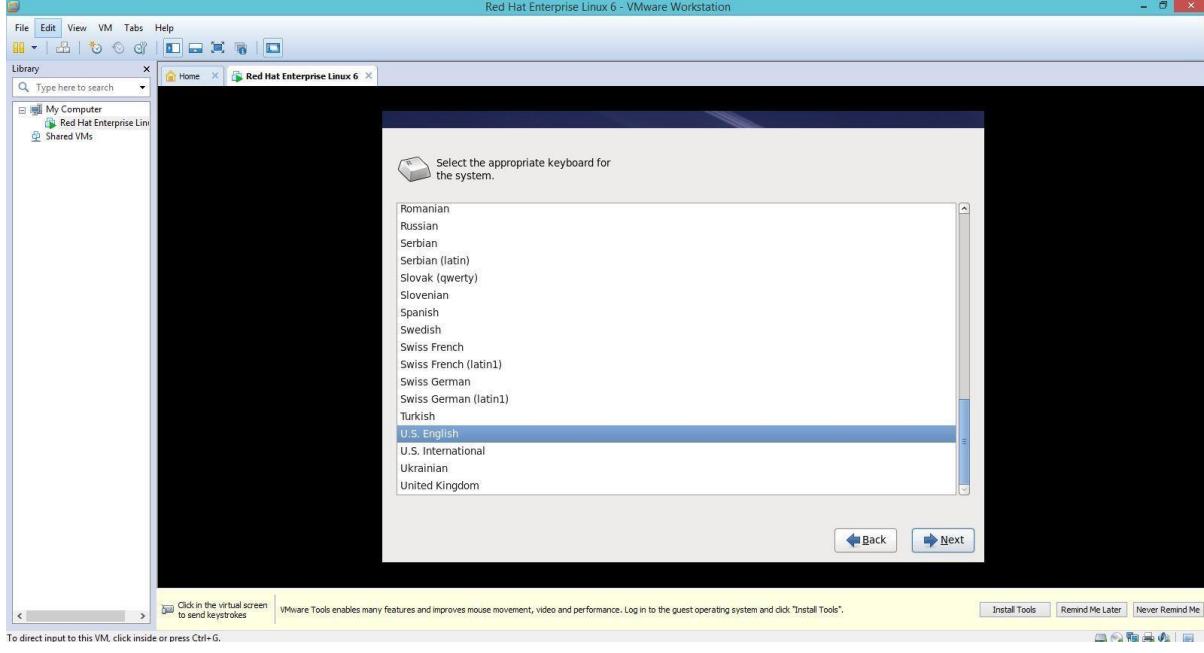
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To direct input to this VM, click inside or press Ctrl+G.

## 16. Keyboard configuration :-

Select the correct layout type(for example U.S. english) for the keyboard we should prefer for the installation and as the system default once the selection is made, click “Next” to continue.



To direct input to this VM, click inside or press Ctrl+G.

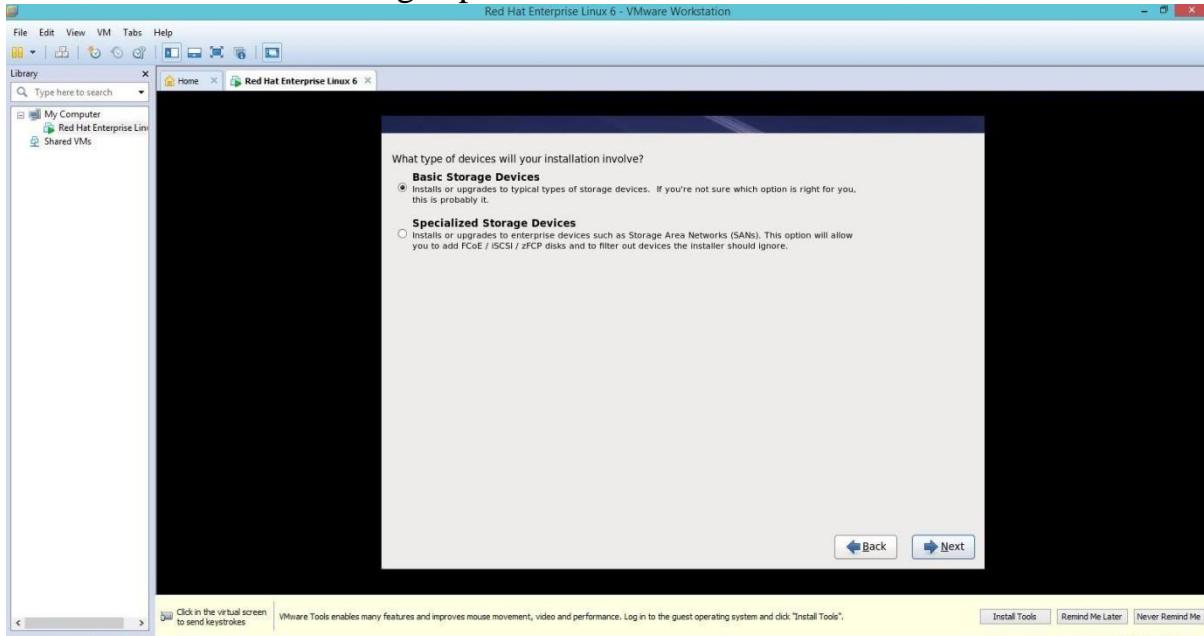
## 17. Enter the installation number:-

Enter the installation number. This no. will determine the package selection set that is available to the installer. If we choose to skip entering the installation number we will be presented with a basic selection of packages to install later on.

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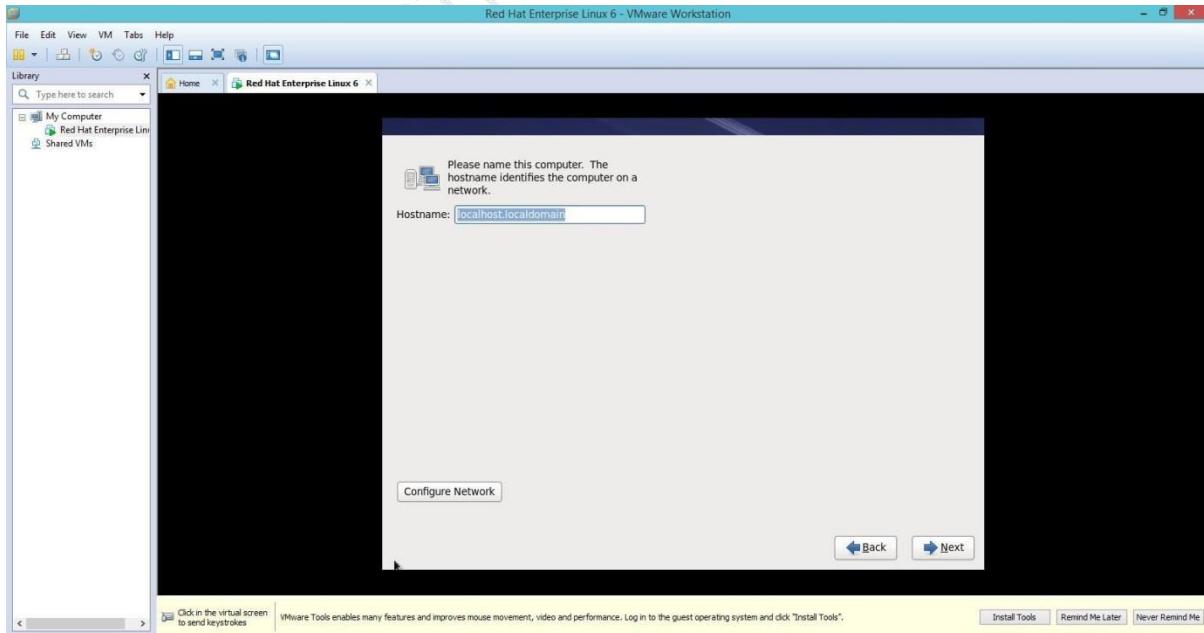
Click on “Skip entering installation number. Then Ok - . Skip-> Yes and then done.

## 19. Now select basic storage option

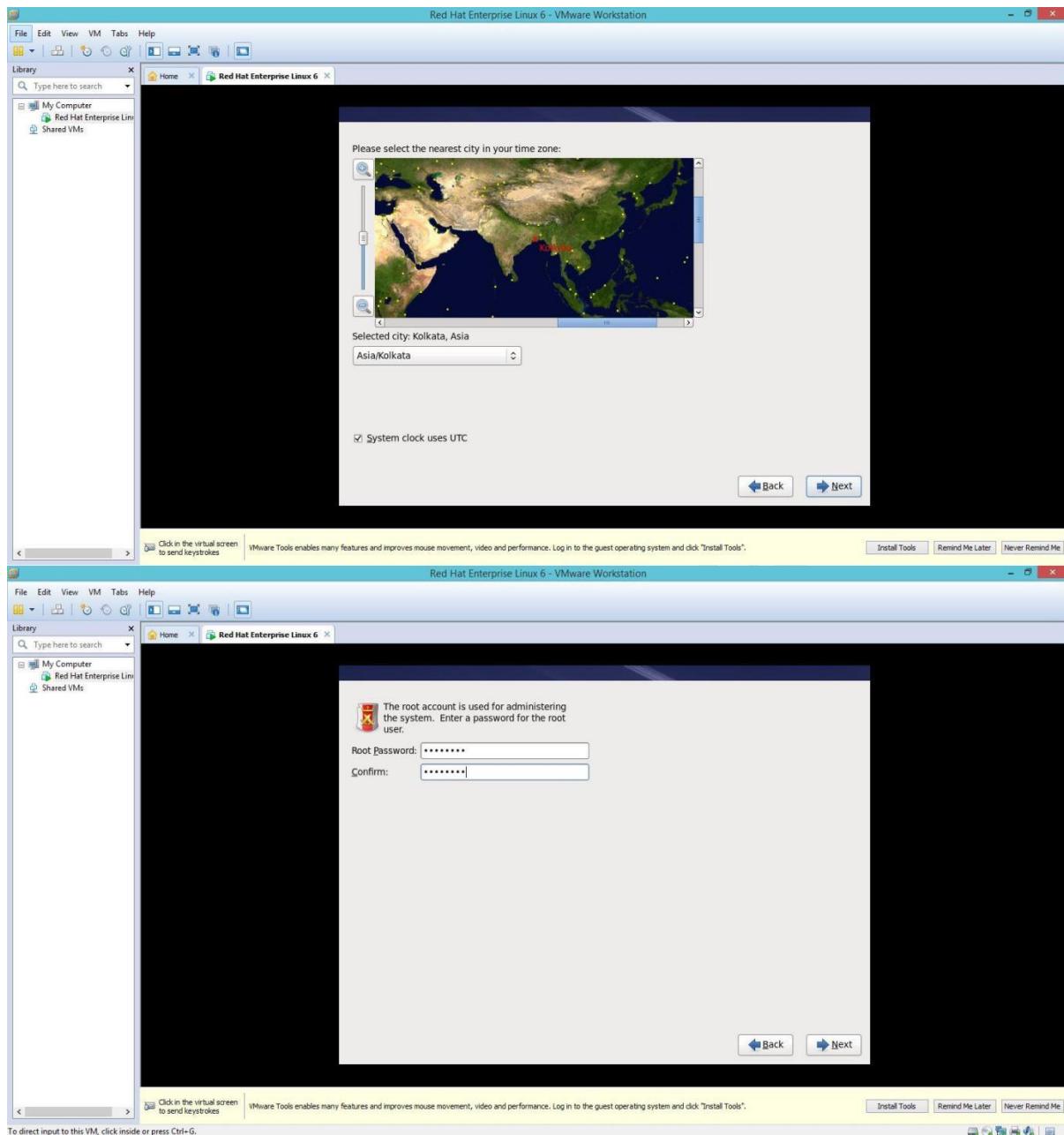


20. Now the system will find the hard disk space and need to re-initialize for creating directories. Select “re-initialize” all option.

21. Now here we assign our Hostname change the hostname as you desire or let it be as localhost.localdomain

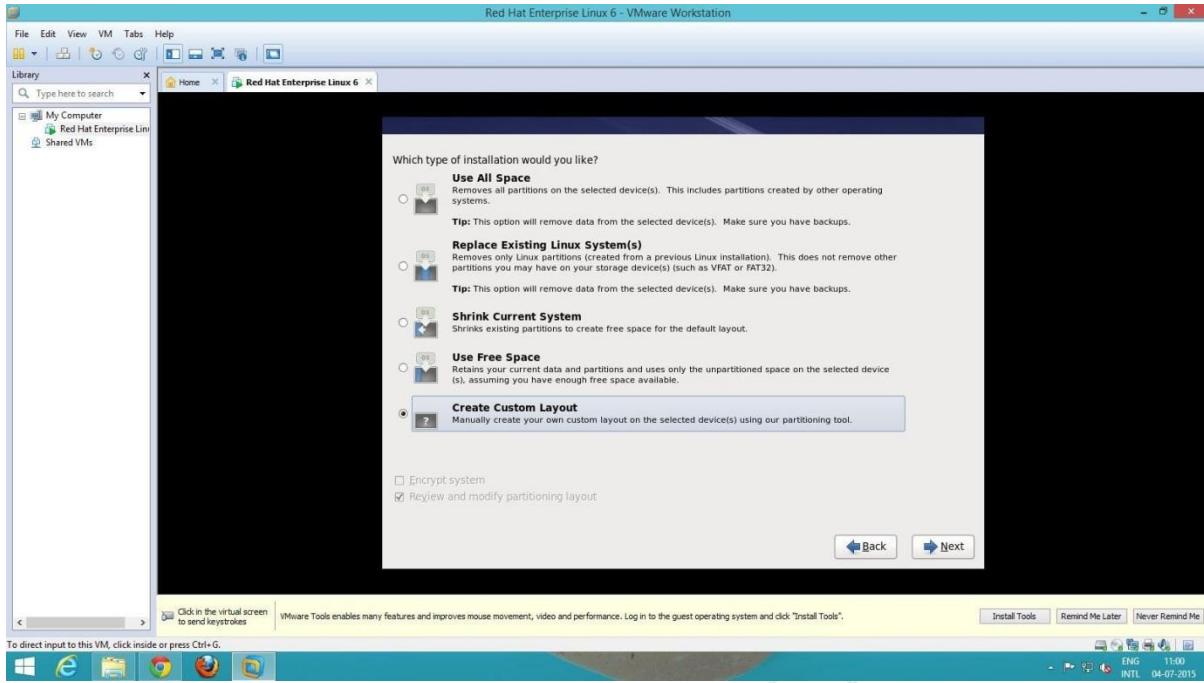


# Linux Administration Practical Manual



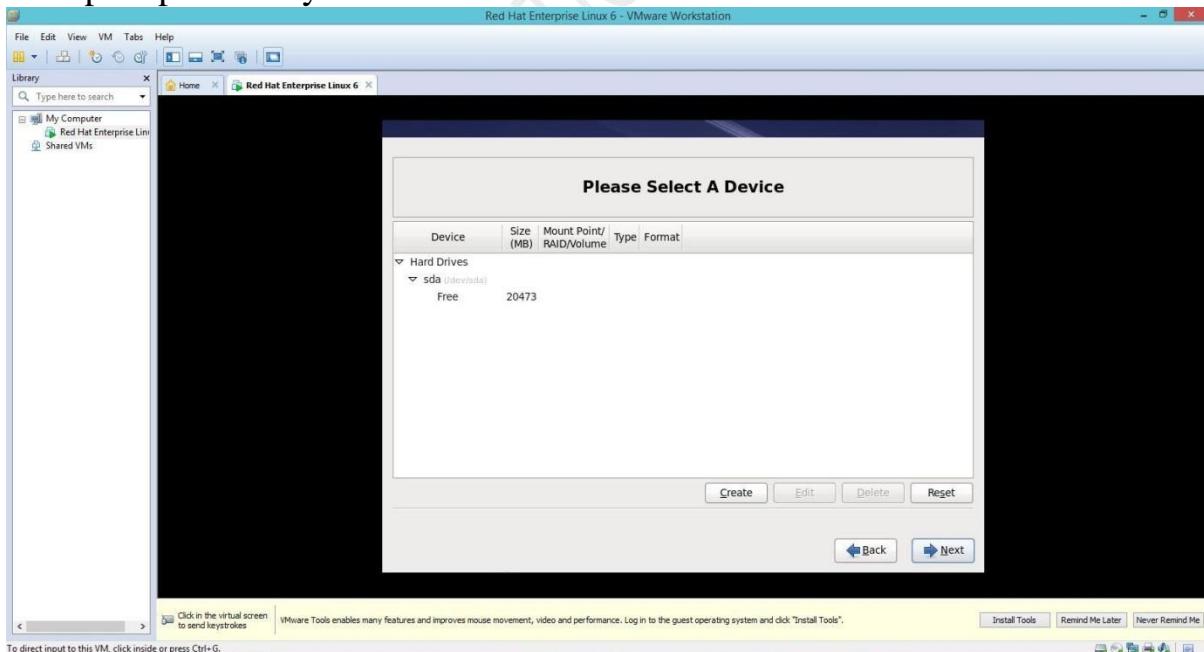
22.. Now select “Create Custom Layout” for manually creating Partitions

# Linux Administration Practical Manual



## 23. Disk Partitioning Setup :-

Partitioning allow to divide the hard drive into installed sections where each section behaves as its own hard drive partitioning is particularly useful if we run multiple operation system.

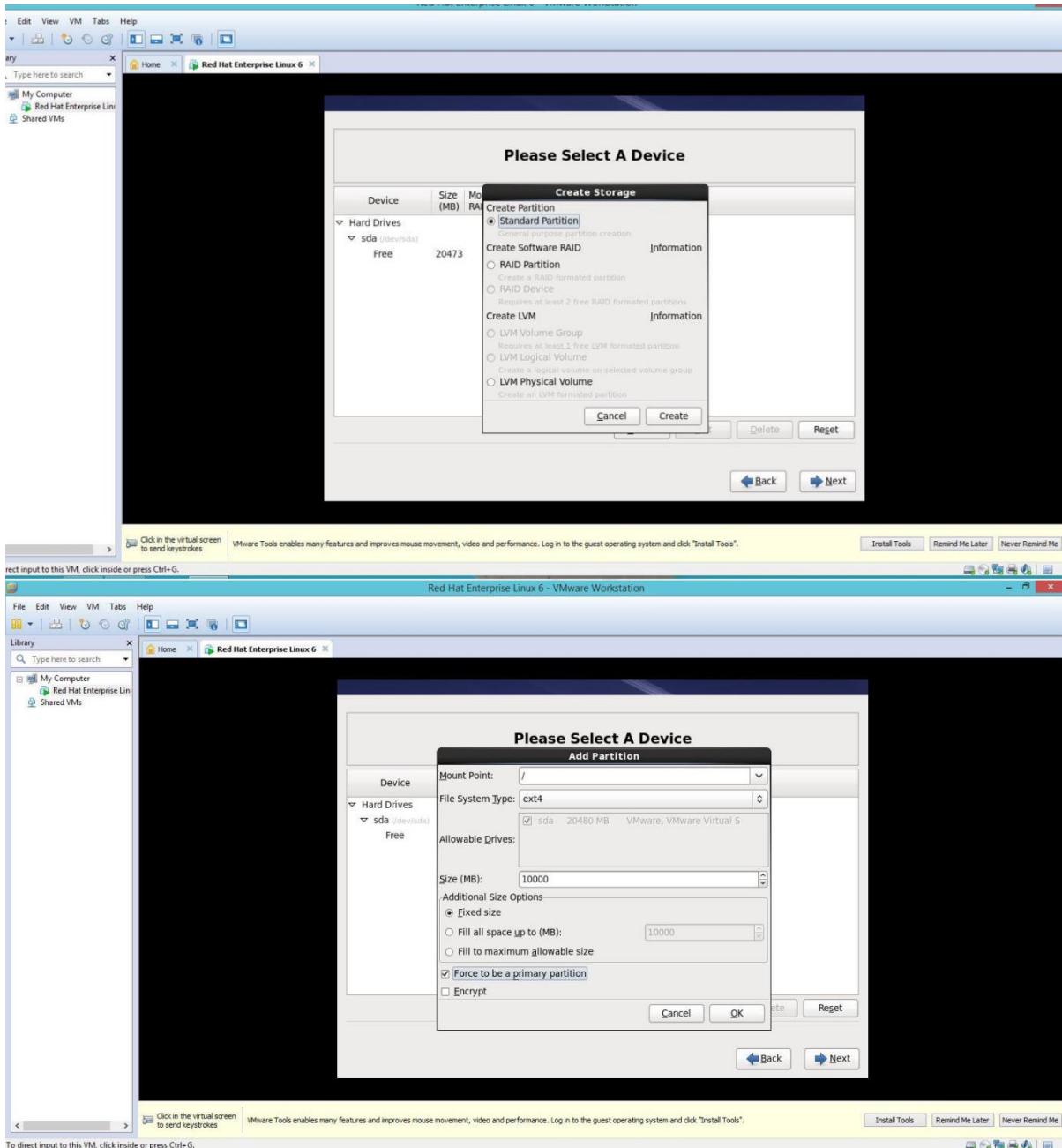


For Root :-

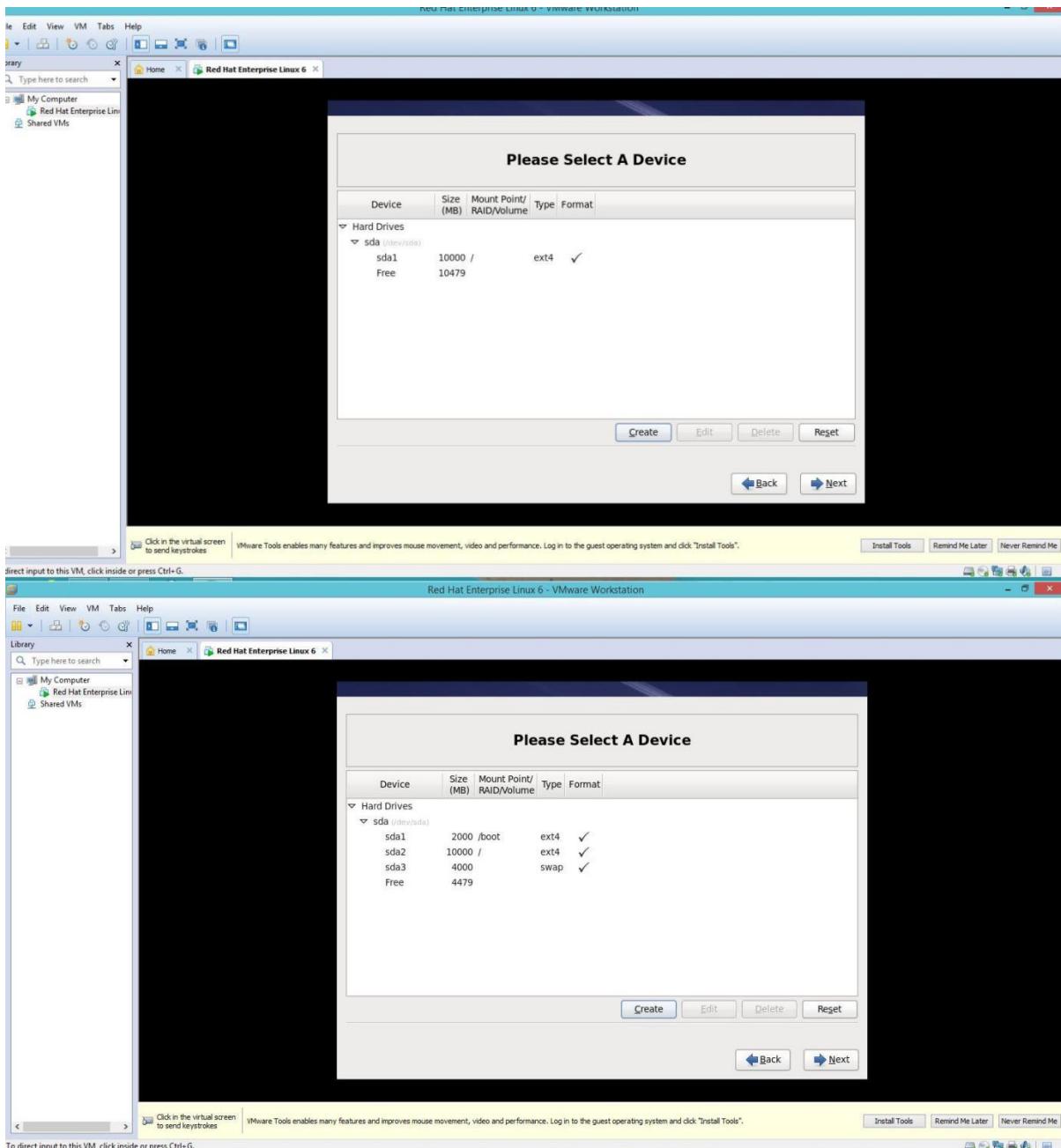
Select the option of create custom layout then create new partitions where mount

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point is /(root) of type ext4 click on “force to be primary partitions” and give size as 10000 MB and click Ok



# Linux Administration Practical Manual



For Swap :-

create new partitions where file system type is swap and size 4000 MB, click Ok

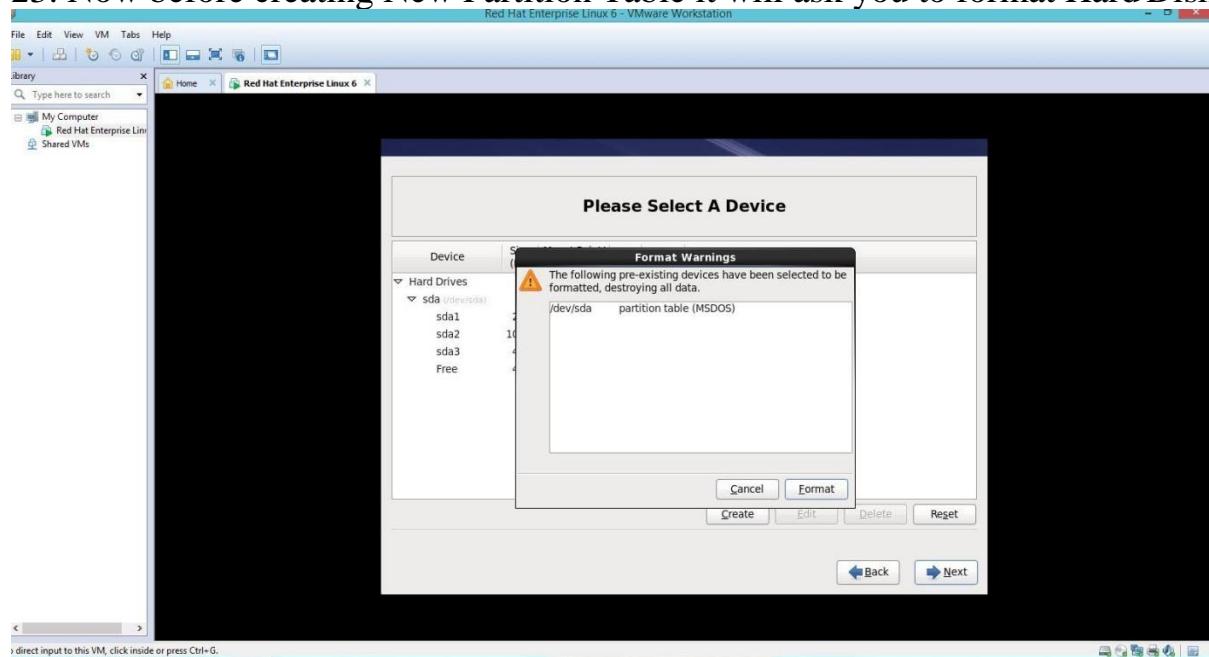
Now partitioning is complete. Click on “next”.

The following is tabular presentation of Disk Partition.

Sr. No	Mount Point	File system type	Size (MB)
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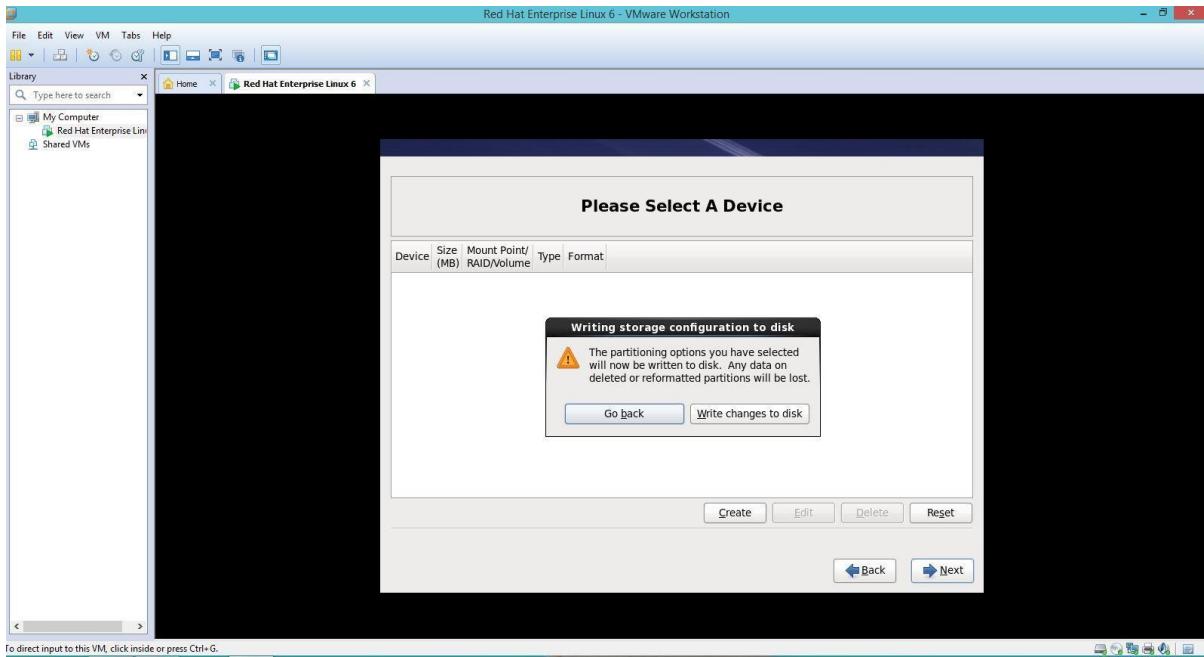
```
1      /(root)Ext3/Ext4  10000 MB
2      -      /swap        4000 MB
3      /boot  Ext3/Ext4   2000 MB
```

23. Now before creating New Partition Table it will ask you to format Hard Disk.

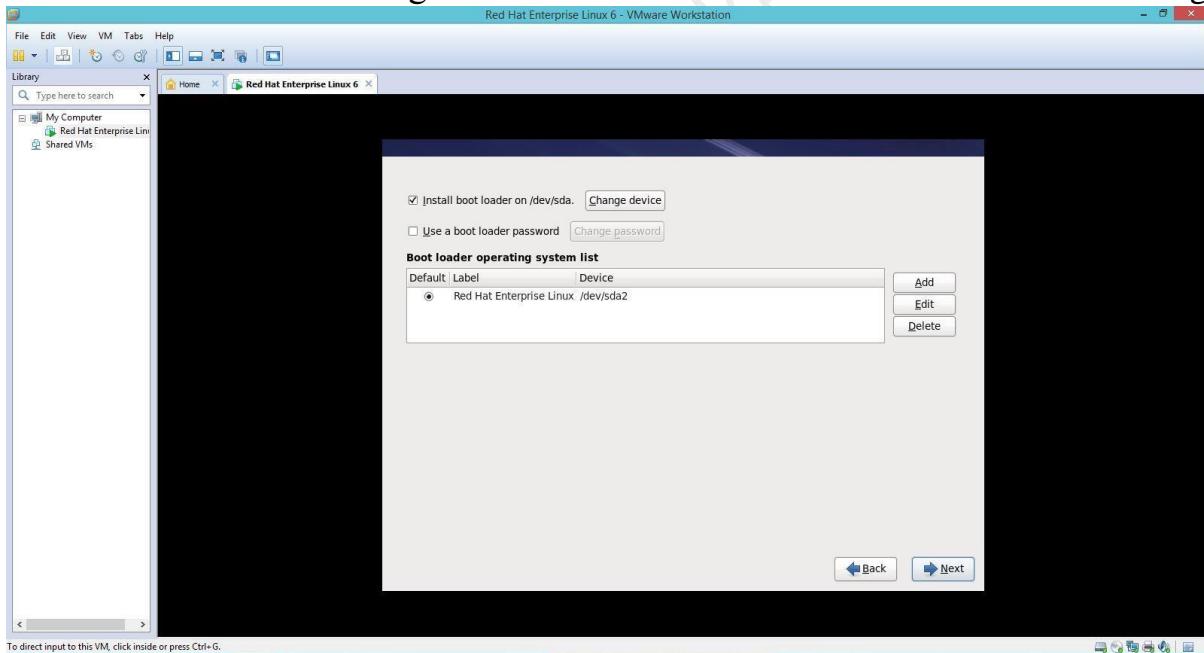


Now it will ask for format and write changes to disk, click on “Write changes to disk”

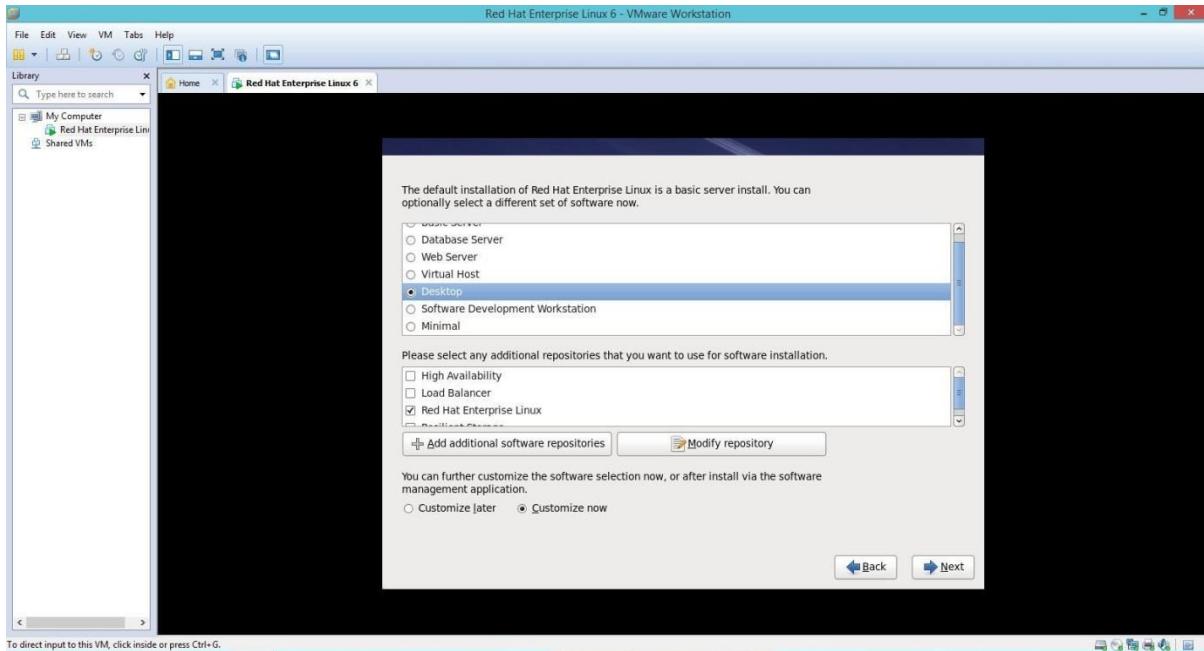
# Linux Administration Practical Manual



24. Now here we can configure our boot loader. Click “Next ” for default setting



25. Now it gives you prompt for installation of Software. Select customize now for installation of set of software and click on “Next”



## 26. Software selection:-

By default, the Red Hat Enterprise Linux installation process loads a selection of software that is suitable for a system deployed as a basic server. Note that this installation does not include a graphical environment. To include a selection of software suitable for other roles, click the radio button that corresponds to one of the following options:

**Basic Server**

This option provides a basic installation of Red Hat Enterprise Linux for use on a server.

**Database Server**

This option provides the MySQL and PostgreSQL databases.

**Web server**

This option provides the Apache web server.

**Enterprise Identity Server Base**

This option provides OpenLDAP and Enterprise Identity Management (IPA) to create an

identity and authentication server.

**Virtual Host**

This option provides the KVM and Virtual Machine Manager tools to create a host for virtual machines.

## Desktop

This option provides the OpenOffice.org productivity suite, graphical tools such as the GIMP, and multimedia applications.

## Software Development Workstation

This option provides the necessary tools to compile software on your Red Hat Enterprise Linux system.

This option provides only the packages essential to run Red Hat Enterprise Linux.

A minimal

installation provides the basis for a single-purpose server or desktop appliance and maximizes

performance and security on such an installation.

Click on Customize now and select following software.

1> Base server -Desktop :-

    Desktop  
    KDE  
    X-windows

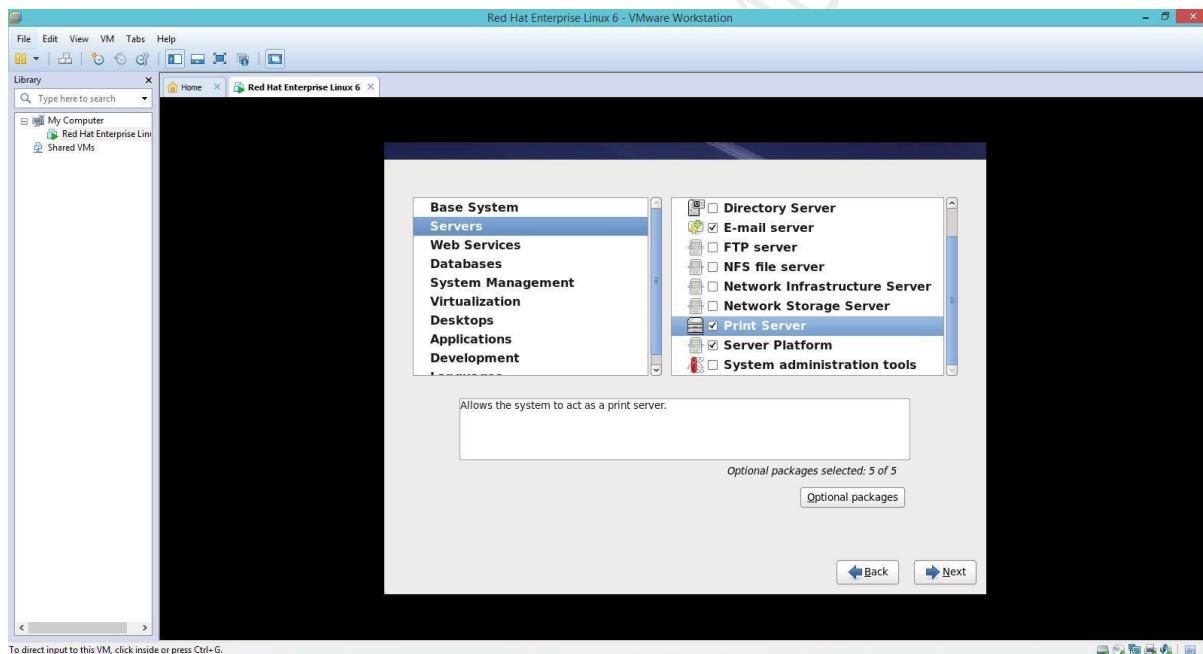
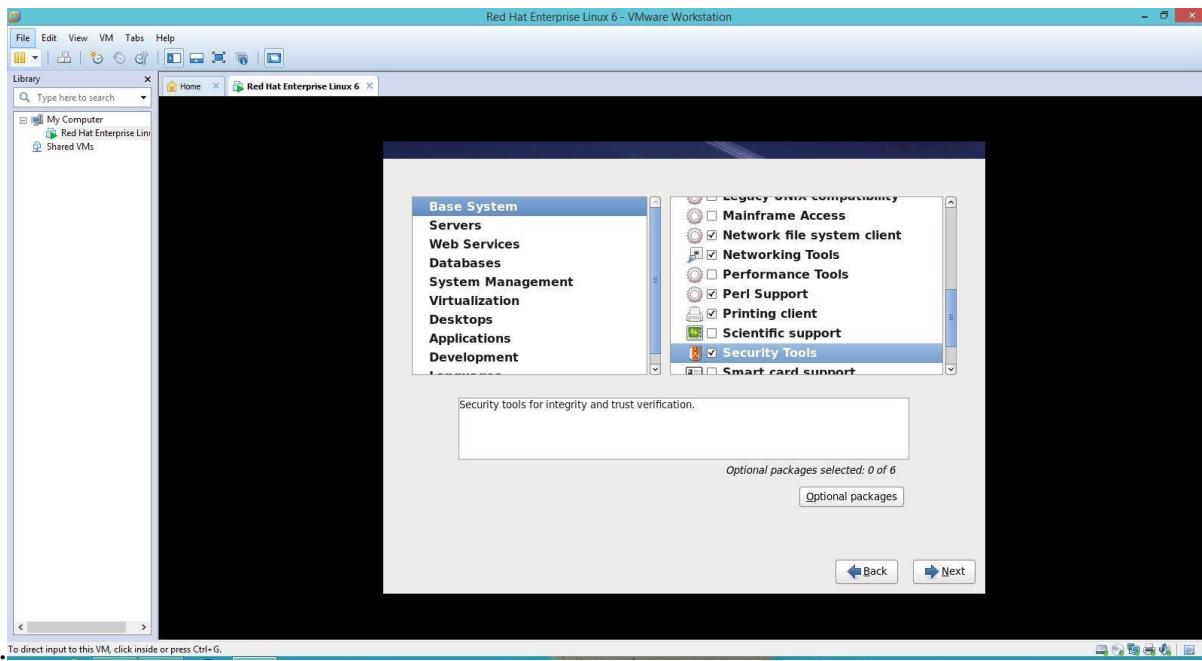
2> Server

3> Web server

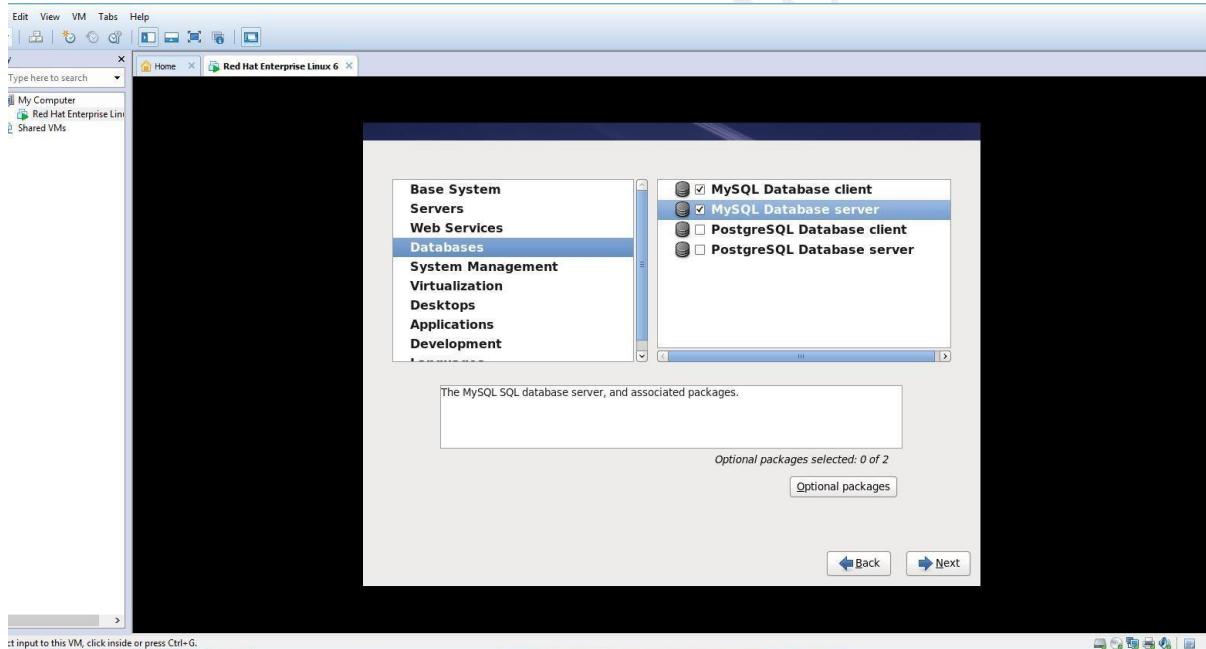
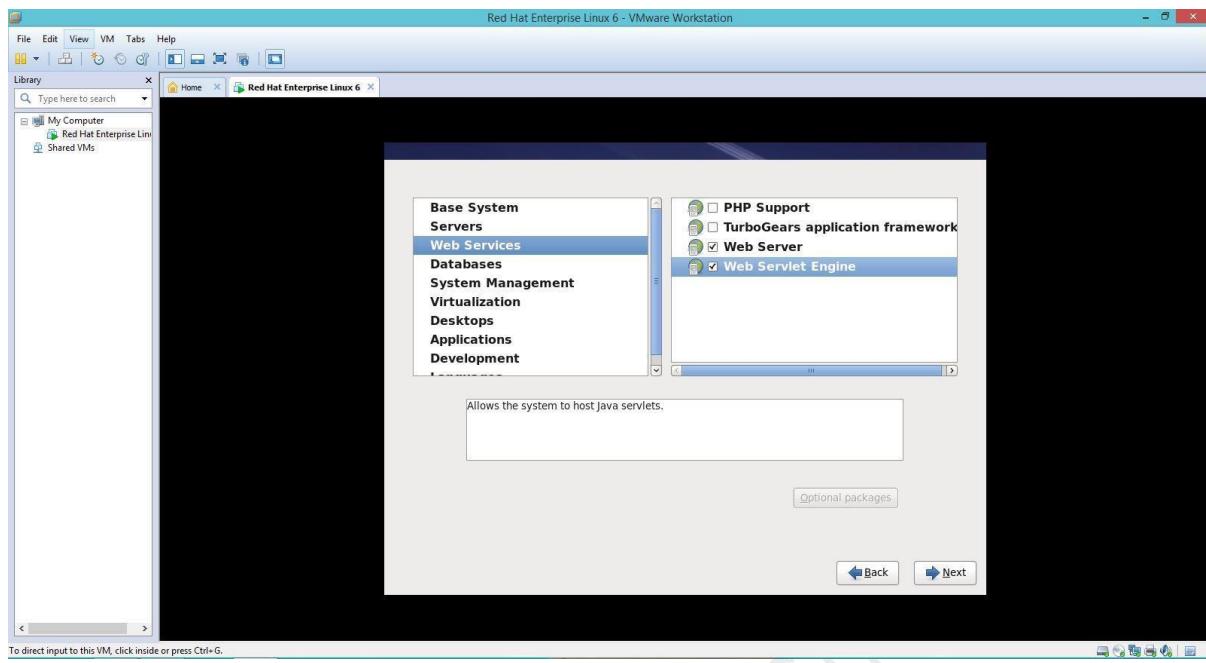
4> Database

5> System management

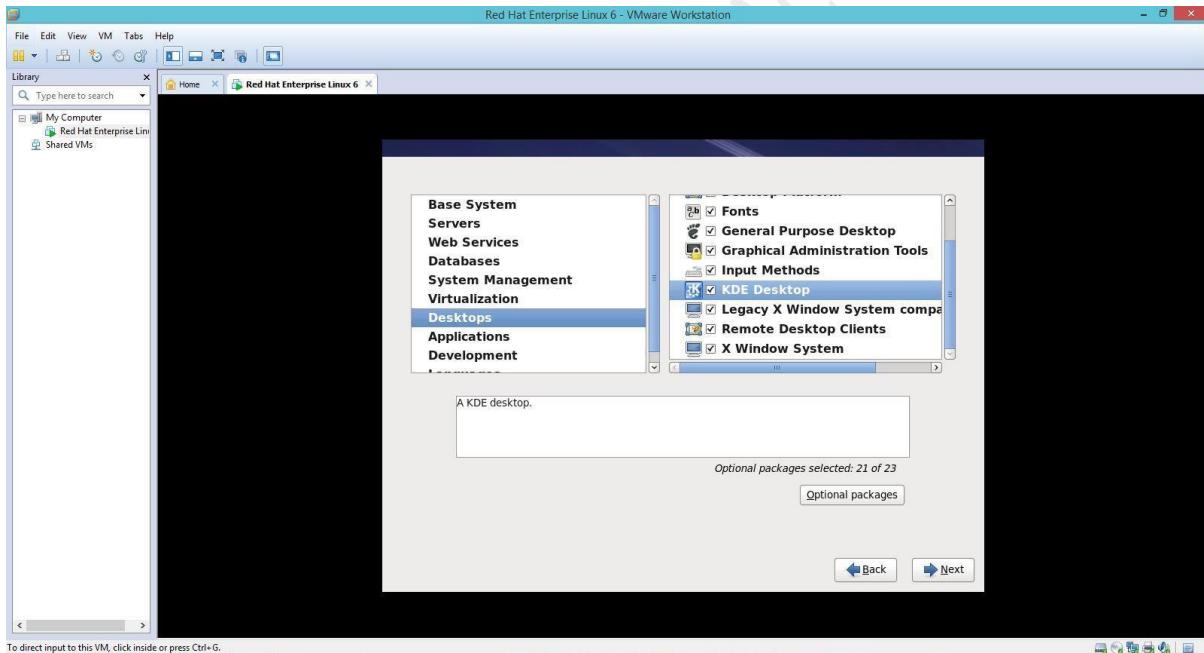
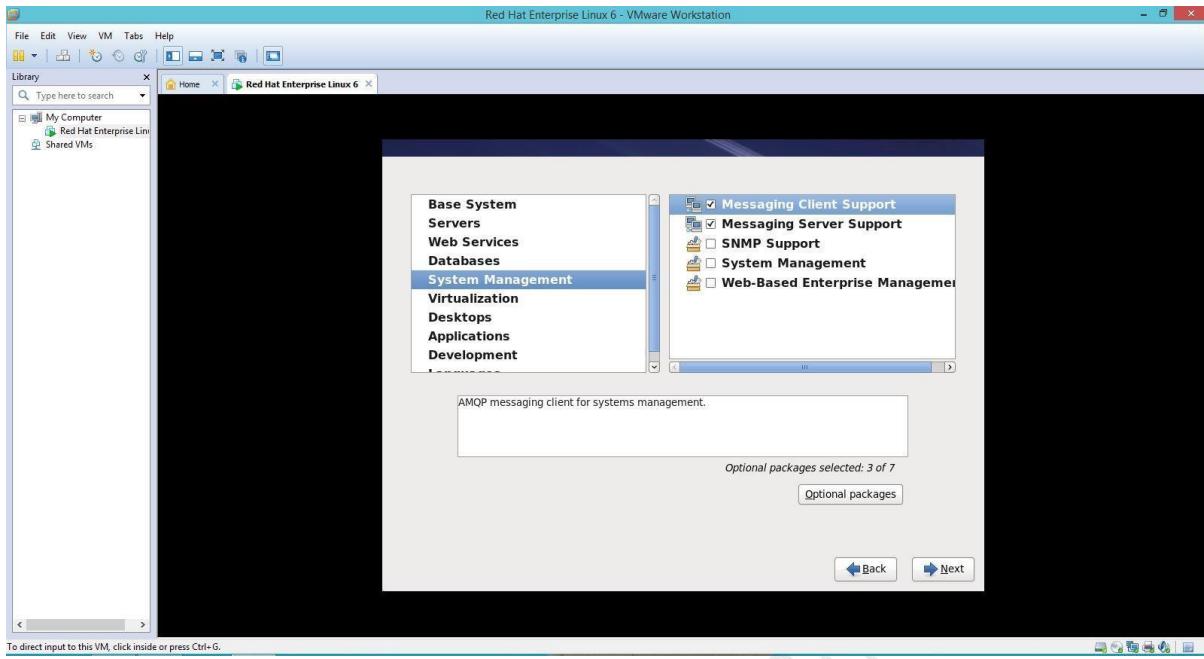
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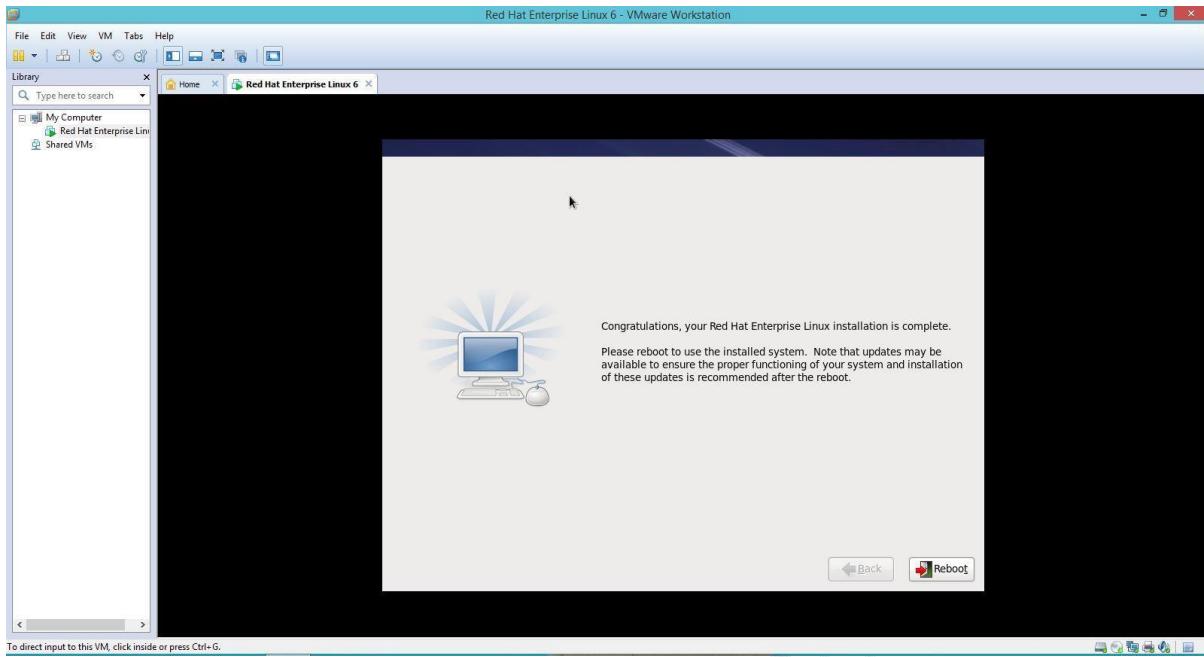


# Linux Administration Practical Manual

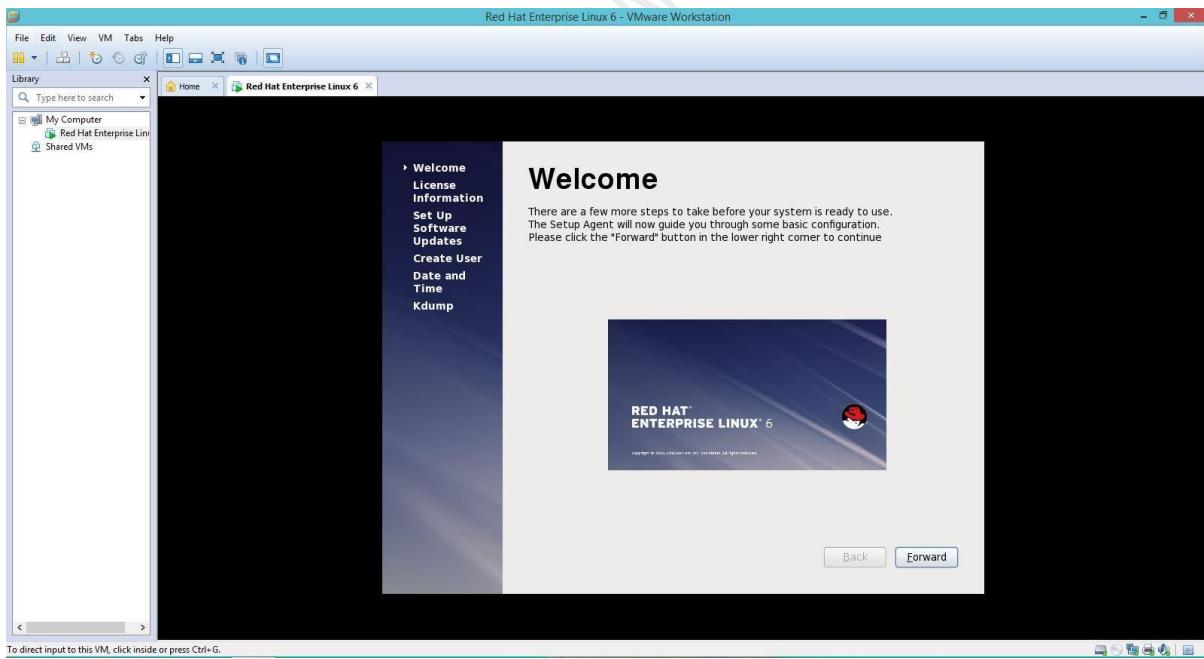


27. Now the next windows showing that it is “Transferring the install image to hard drive” it copy all files to hard drive so installation process get faster
28. Now the installation start from the hard disk files.
29. Installation of Red hat is completed and ask for the reboot. Click on “Reboot”.

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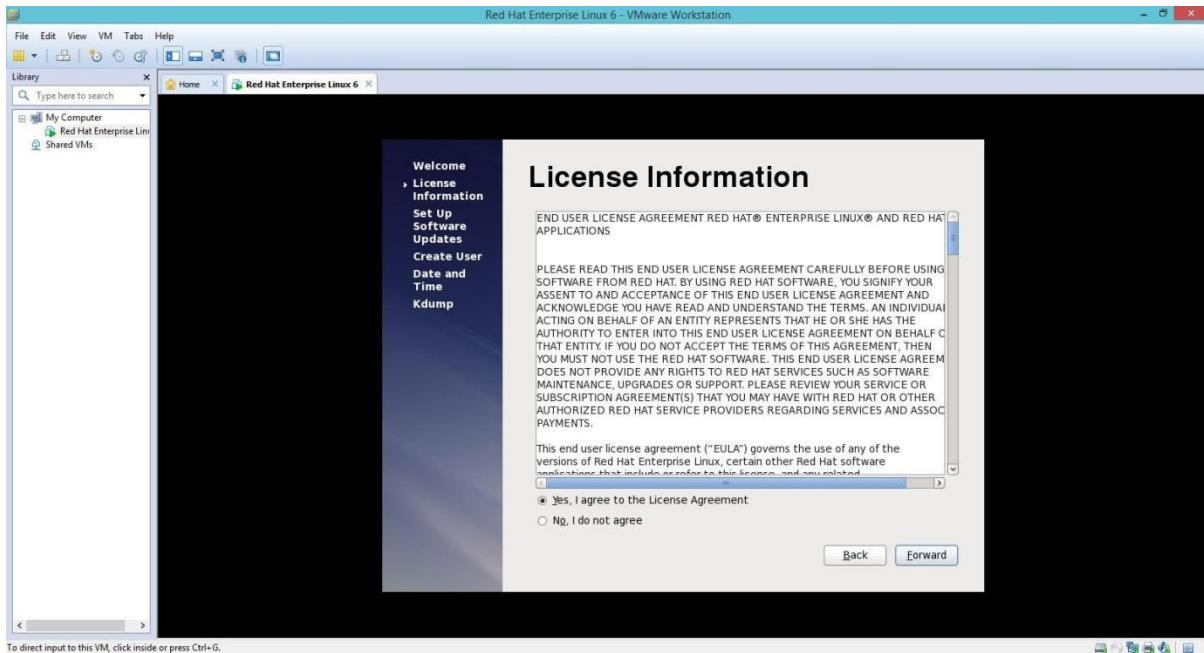


30. once the Red hat start it show the window saying few more steps are there for basic configuration. Click on “Forward”.

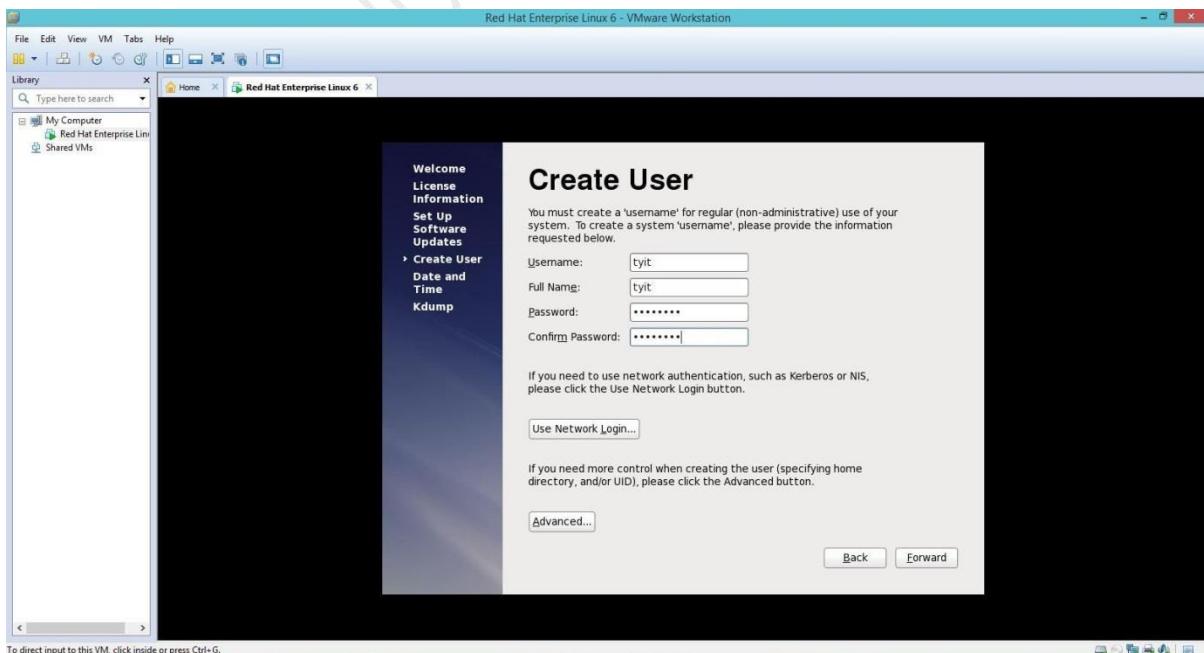


31. Here select “I agree to the license agreement” to proceed and click “Forward”.

# Linux Administration Practical Manual

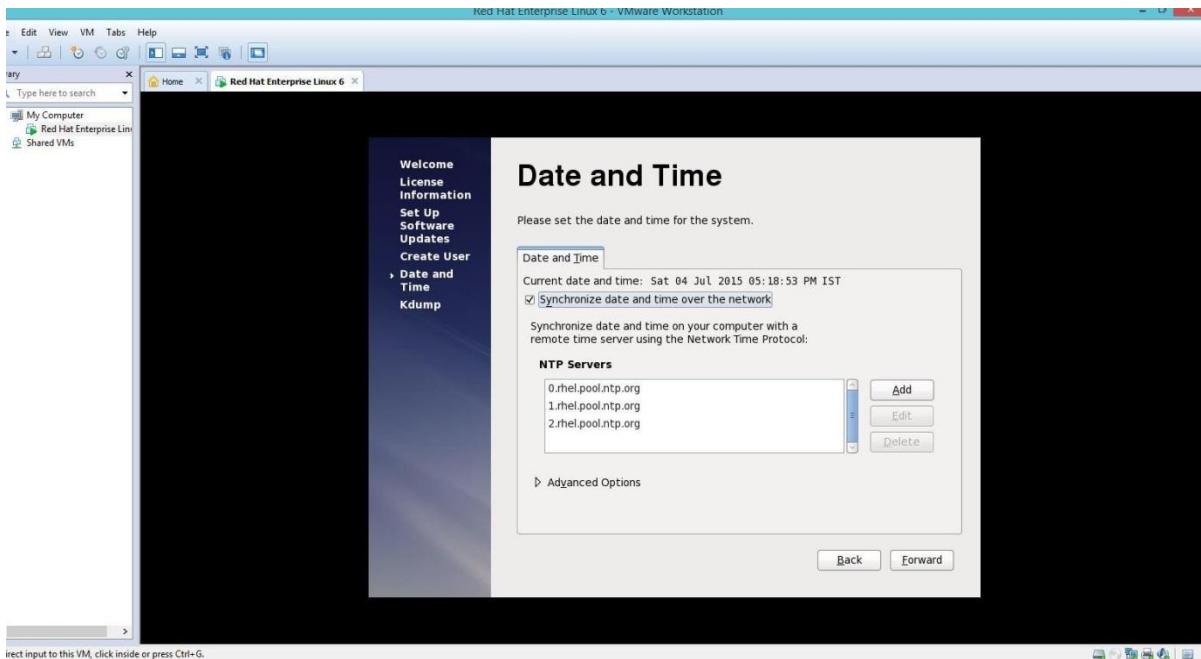


32. Now it asks for software update as we don't have the RHN No. Click "Forward" .
33. Click on "Forward" to finish update setup
35. Now we have to create Normal User for our system. Provide Username and password and click on "forward". The Root user is different from the user we created now. Root user has administrator rights and the user we created is normal user without administrative rights.



## 35.Date and Time Zone Configuration

Now select the System date for the window,



Set your time zone by selecting the city closest to your computer's physical location. Click on the map to zoom in to a particular geographical region of the world.

From here there are two ways for you to select your time zone:

Using your mouse, click on the interactive map to select a specific city (represented by a yellow dot).

A red X appears indicating your selection.

You can also scroll through the list at the bottom of the screen to select your time zone. Using your mouse, click on a location to highlight your selection.

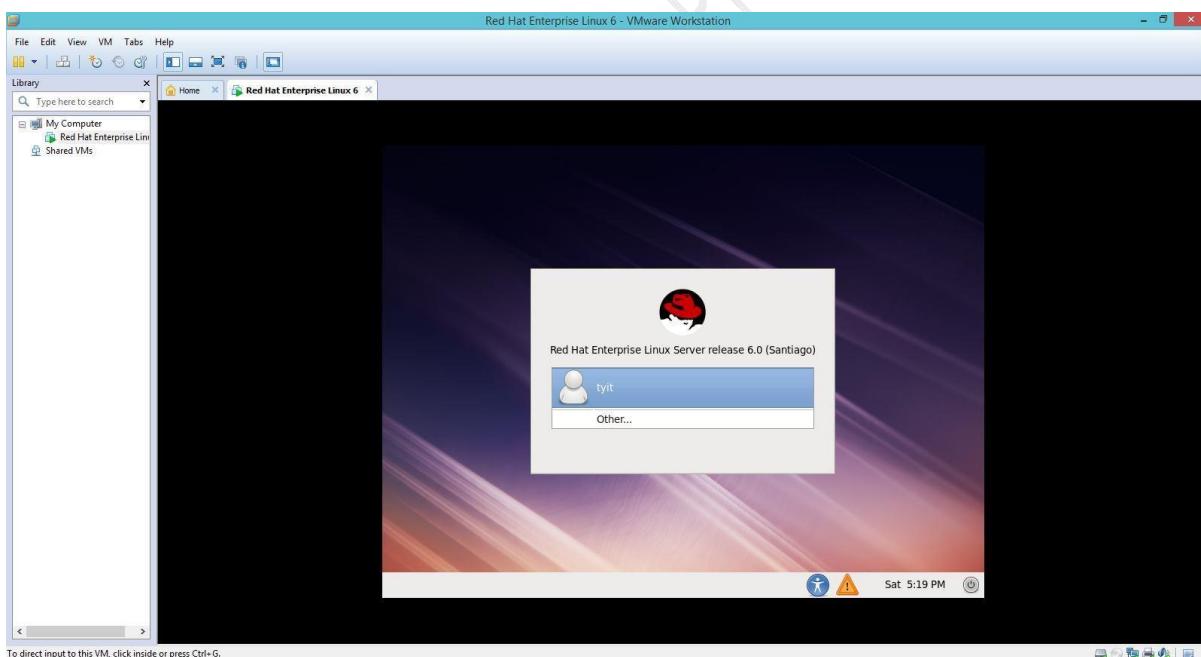
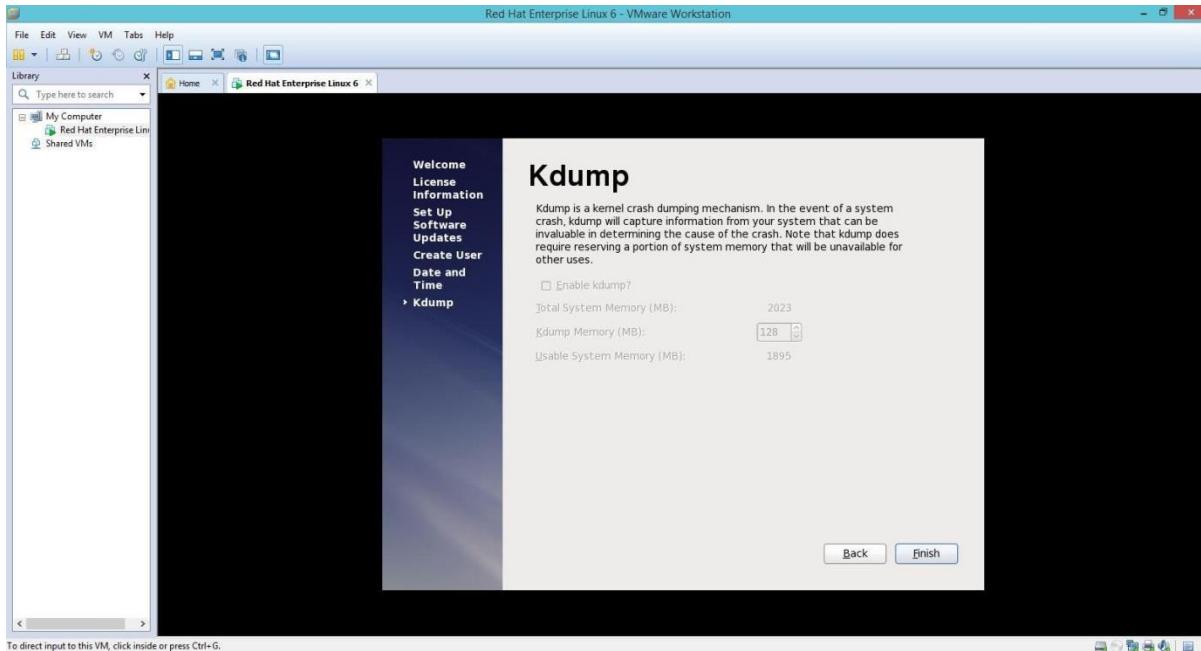
If Red Hat Enterprise Linux is the only operating system on your computer, select System clock uses UTC. The system clock is a piece of hardware on your computer system. Red Hat Enterprise Linux uses the time zone setting to determine the offset between the local time and UTC on the system clock. This behaviour is standard for systems that use UNIX, Linux, and similar operating systems.

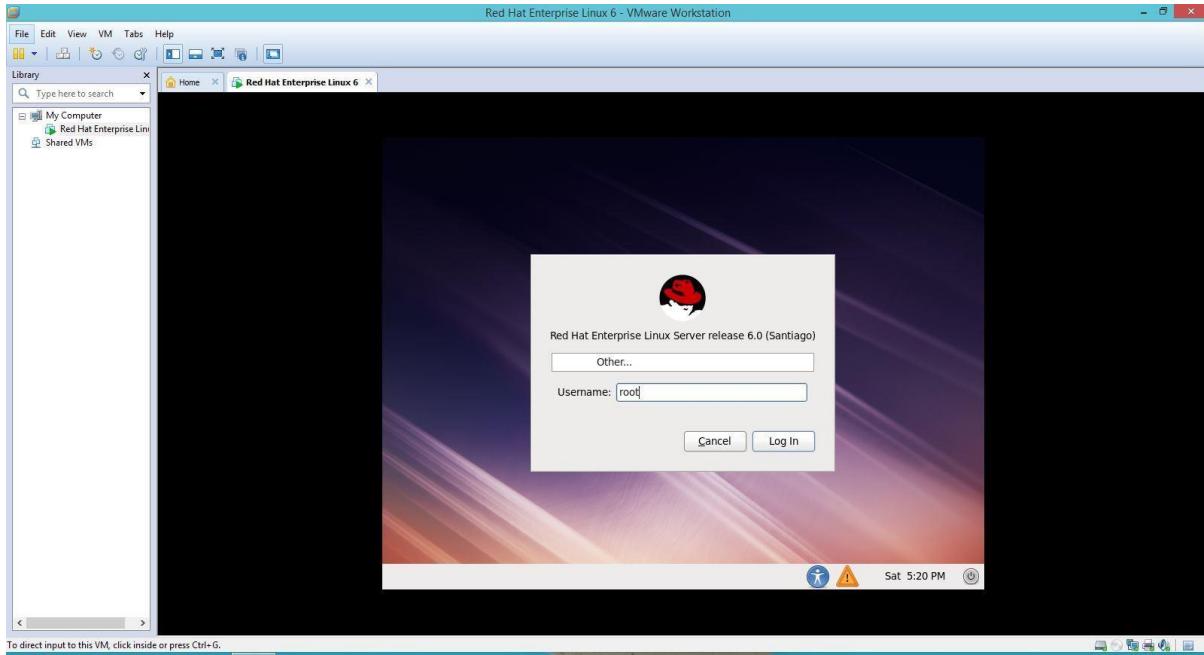
Click Forward to proceed

36. Now it will gives you Error “Insufficient memory to configure kdump”. Click on Ok.

# Linux Administration Practical Manual

## 37.. Kdump is used for backup and recovery purpose





39. Now your RedHat Virtual Machine is ready for use. Select the Redhat Virtual Option from VM-Ware Workstation.

### Shutting Down

To shut down Red Hat Enterprise Linux, the root user may issue the /sbin/shutdown command. The shutdown man page has a complete list of options, but the two most common uses are:

/sbin/shutdown -h now

and

/sbin/shutdown -r now

After shutting everything down, the -h option halts the machine, and the -r option reboots.

PAM console users can use the reboot and halt commands to shut down the system while in runlevels 1 through 5. For more information about PAM console users, refer to the Red Hat Enterprise Linux Deployment Guide.

If the computer does not power itself down, be careful not to turn off the computer until a message appears indicating that the system is halted.

Failure to wait for this message can mean that not all the hard drive partitions are unmounted, which can lead to file system corruption.

## **Practical no 2: Software Selection and Installation**

RPM (Red Hat Package Manager) is a default open source and most popular package management utility for Red Hat based systems like (RHEL, CentOS and Fedora).

The tool allows system administrators and users to install, update, uninstall, query, verify and manage system software packages in Unix/Linux operating systems.

The RPM formerly known as .rpm file, that includes compiled software programs and libraries needed by the packages.

This utility only works with packages that built on .rpm format.

### **Some Facts about RPM Package:**

1. RPM is free and released under GPL (General Public License).
2. RPM keeps the information of all the installed packages under /var/lib/rpm database.
3. RPM is the only way to install packages under Linux systems, if you've installed packages using source code, then rpm won't manage it.
4. RPM deals with .rpm files, which contains the actual information about the packages such as: what it is, from where it comes, dependencies info, version info etc.

(The *name* of the packaged software, The *version* of the packaged software, The package's *release* number).

### **There are 5 basic modes of RPM:**

1. Install : It is used to install any RPM package.
2. Remove : It is used to erase, remove or un-install any RPM package.
3. Upgrade : It is used to update the existing RPM package.
4. Verify : It is used to query about different RPM packages.
5. Query : It is used for the verification of any RPM package.

To install any package go to the Packages Folder:

```
# cd /media/RHEL_6.0\i386\Disc\1/Packages
```

Once you are in the Packages folder - Now you can run your rpm commands.

## (1) Package Installation:

- The basic syntax for installation with rpm (redhat package manager) is:

```
[root@tyit ~]#rpm -ivh package [name and version]
```

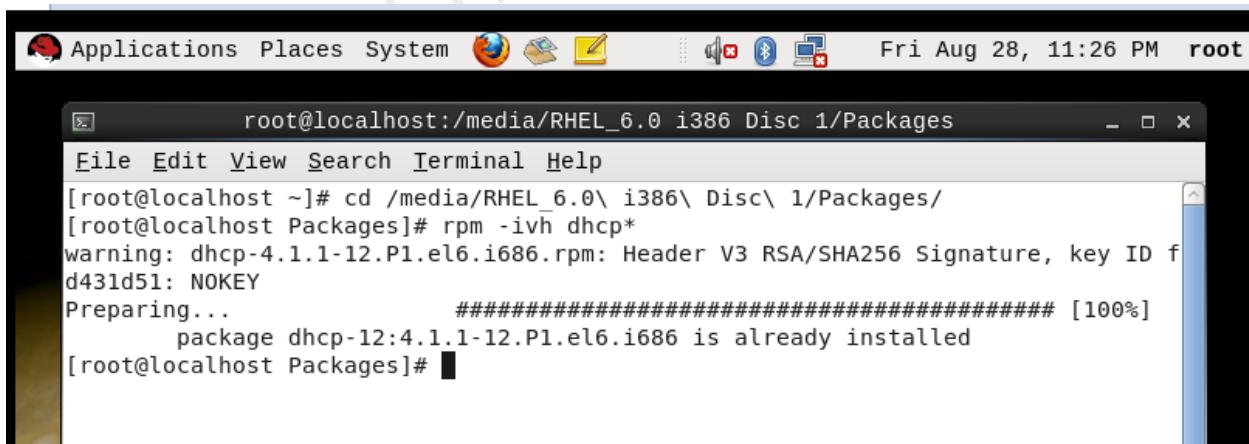
- **Following are rpm installation options:**

-i : To install the package

-v : verbose it is to enable verbose and shows useful messages  
during installation.

-h : It prints during installation up to 50 hash (#) to illustrate the progress.

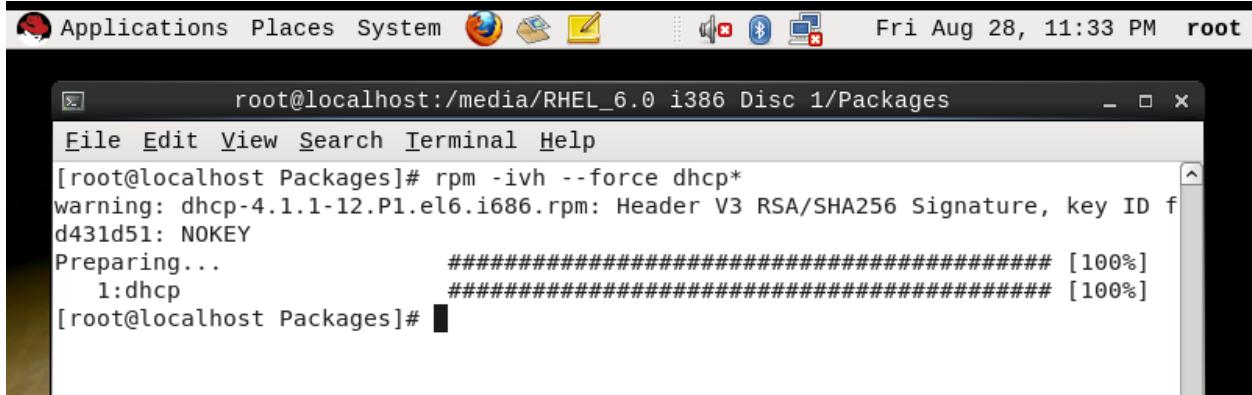
Example : rpm –ivh dhcp\*



The screenshot shows a terminal window titled "root@localhost:/media/RHEL\_6.0 i386 Disc 1/Packages". The window contains the following text:

```
[root@localhost ~]# cd /media/RHEL_6.0\ i386\ Disc\ 1/Packages/
[root@localhost Packages]# rpm -ivh dhcp*
warning: dhcp-4.1.1-12.P1.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID f
d431d51: NOKEY
Preparing... ################################ [100%]
      package dhcp-12:4.1.1-12.P1.el6.i686 is already installed
[root@localhost Packages]#
```

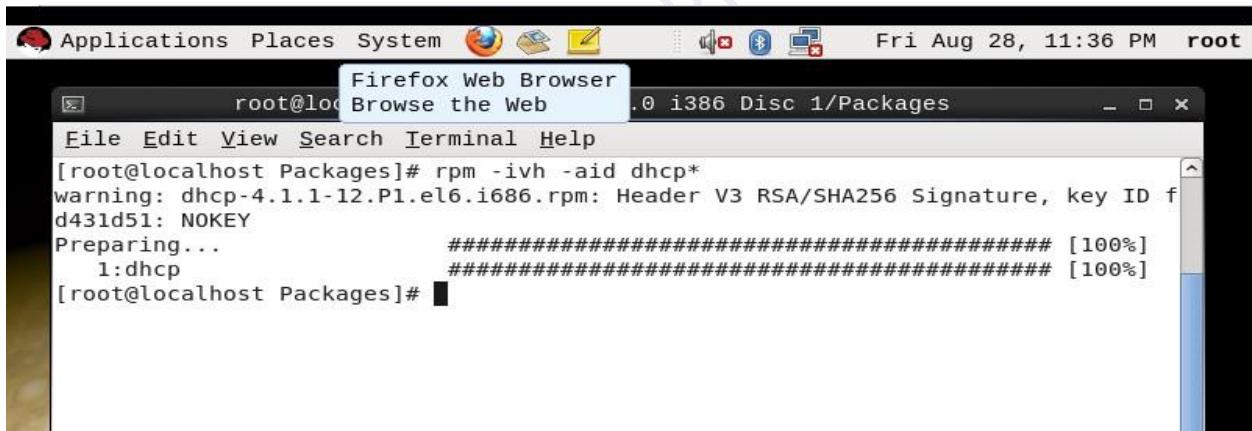
--force : installs package forcefully or replaces if already exists.



A screenshot of a Linux desktop environment showing a terminal window. The window title is "root@localhost:/media/RHEL\_6.0 i386 Disc 1/Packages". The terminal prompt is "[root@localhost Packages]#". The user runs the command "rpm -ivh --force dhcp\*". The output shows a warning about a RSA/SHA256 Signature and key ID, followed by the preparation and installation of the "dhcp" package at version 1:dhcp. The progress bar indicates 100% completion for both steps.

```
[root@localhost Packages]# rpm -ivh --force dhcp*
warning: dhcp-4.1.1-12.P1.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID f
d431d51: NOKEY
Preparing... ################################ [100%]
 1:dhcp ################################ [100%]
[root@localhost Packages]#
```

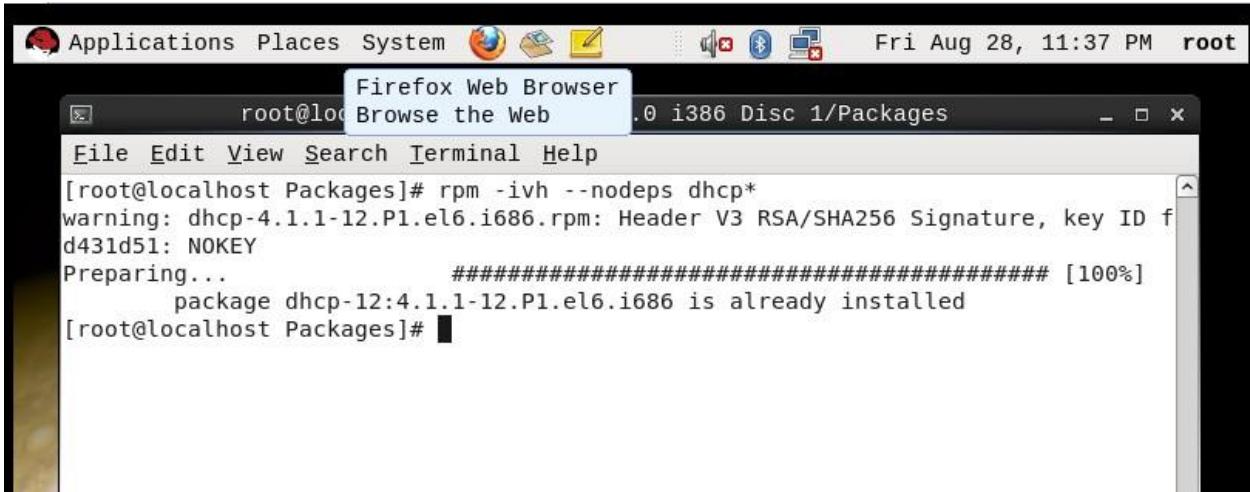
--aid : To install package along with dependencies



A screenshot of a Linux desktop environment showing a terminal window. The window title is "Firefox Web Browser" and the sub-title is "root@localhost:/media/RHEL\_6.0 i386 Disc 1/Packages". The terminal prompt is "[root@localhost Packages]#". The user runs the command "rpm -ivh -aid dhcp\*". The output is identical to the previous screenshot, showing the same warning, preparation, and installation steps for the "dhcp" package.

```
[root@localhost Packages]# rpm -ivh -aid dhcp*
warning: dhcp-4.1.1-12.P1.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID f
d431d51: NOKEY
Preparing... ################################ [100%]
 1:dhcp ################################ [100%]
[root@localhost Packages]#
```

--nodeps : it performs no dependency check.

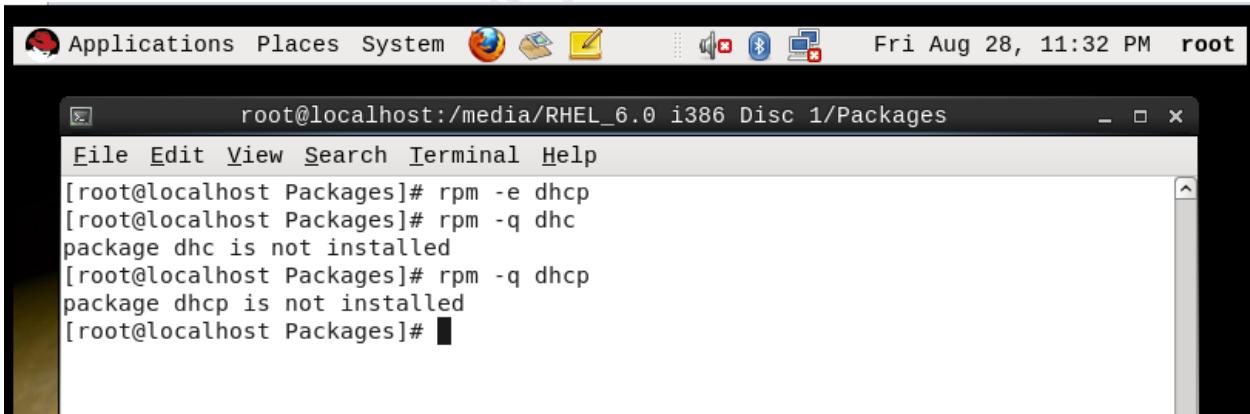


A screenshot of a Linux desktop environment showing a terminal window titled "Firefox Web Browser". The window title bar also displays "root@localhost Packages .0 i386 Disc 1/Packages". The terminal window contains the following text:

```
[root@localhost Packages]# rpm -ivh --nodeps dhcp*
warning: dhcp-4.1.1-12.P1.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID f
d431d51: NOKEY
Preparing... #####
      package dhcp-12:4.1.1-12.P1.el6.i686 is already installed
[root@localhost Packages]#
```

## 2) Remove Installation Packages:

1. -e : To uninstall the package from the system



A screenshot of a Linux desktop environment showing a terminal window titled "root@localhost:/media/RHEL\_6.0 i386 Disc 1/Packages". The terminal window contains the following text:

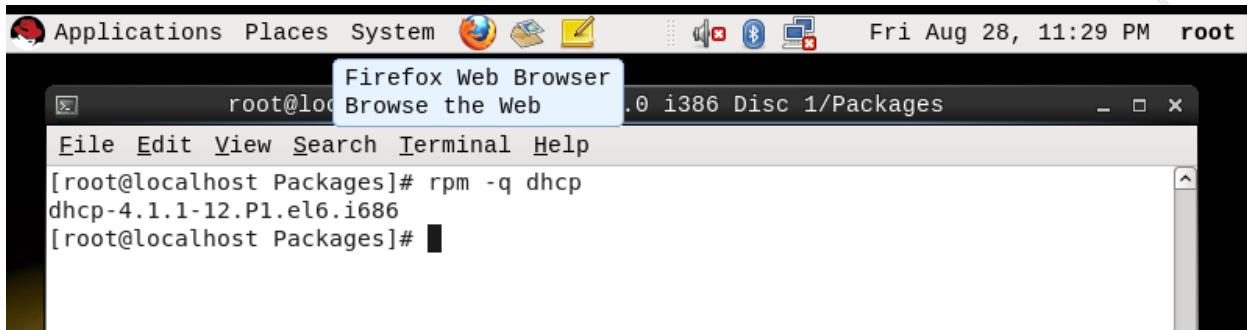
```
[root@localhost Packages]# rpm -e dhcp
[root@localhost Packages]# rpm -q dhc
package dhc is not installed
[root@localhost Packages]# rpm -q dhcp
package dhcp is not installed
[root@localhost Packages]#
```

### 3. Upgrade the Package:

-u : to upgrade the existing package.

### 4. Query the Installed Package:

-q: to query any installed packages



A screenshot of a Linux desktop environment. At the top, there is a menu bar with "Applications", "Places", "System", and icons for "Firefox Web Browser", "Nautilus File Manager", and "GNOME Terminal". The date and time "Fri Aug 28, 11:29 PM" and user "root" are displayed. Below the menu is a terminal window titled "Firefox Web Browser" with the sub-titles "root@localhost Packages" and ".0 i386 Disc 1/Packages". The terminal shows the command: [root@localhost Packages]# rpm -q dhcp and the output: dhcp-4.1.1-12.P1.el6.i686. The window has standard X11 window controls (minimize, maximize, close).

-qa : to query all installed packages



A screenshot of a Linux desktop environment. At the top, there is a menu bar with "Applications", "Places", "System", and icons for "Firefox Web Browser", "Nautilus File Manager", and "GNOME Terminal". The date and time "Fri Aug 28, 11:29 PM" and user "root" are displayed. Below the menu is a terminal window titled "Click to view your appointments and tasks" with the sub-titles "root@localhost:/media/RHEL\_6.0 i386 DISC 1/Packages". The terminal shows the command: [root@localhost Packages]# rpm -qa | grep dhcp and the output: dhcp-4.1.1-12.P1.el6.i686. The window has standard X11 window controls (minimize, maximize, close).

# Linux Administration Practical Manual

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-qi : to show general information about the package searched for.

The screenshot shows a terminal window titled "root@localhost:/media/RHEL\_6.0 i386 Disc 1/Packages". The window contains the following text:

```
root@localhost:/media/RHEL_6.0 i386 Disc 1/Packages
File Edit View Search Terminal Help
Version      : 4.1.1                               Vendor: Red Hat, Inc.
Release     : 12.P1.el6                         Build Date: Fri 03 Sep 2010 10:22:07
PM IST
Install Date: Sun 26 Jul 2015 05:26:56 PM IST    Build Host: x86-002.build.bos
.redhat.com
Group       : System Environment/Daemons      Source RPM: dhcp-4.1.1-12.P1.el6.src
.rpm
Size        : 2190718                           License: ISC
Signature   : RSA/8, Wed 08 Sep 2010 12:20:41 AM IST, Key ID 199e2f91fd431d51
Packager    : Red Hat, Inc. <http://bugzilla.redhat.com/bugzilla>
URL         : http://isc.org/products/DHCP/
Summary     : Dynamic host configuration protocol software
Description :
DHCP (Dynamic Host Configuration Protocol) is a protocol which allows
individual devices on an IP network to get their own network
configuration information (IP address, subnetmask, broadcast address,
etc.) from a DHCP server. The overall purpose of DHCP is to make it
easier to administer a large network. The dhcp package includes the
ISC DHCP service and relay agent.

To use DHCP on your network, install a DHCP service (or relay agent),
and on clients run a DHCP client daemon. The dhcp package provides
the ISC DHCP service and relay agent.
[root@localhost Packages]#
```

# Linux Administration Practical Manual

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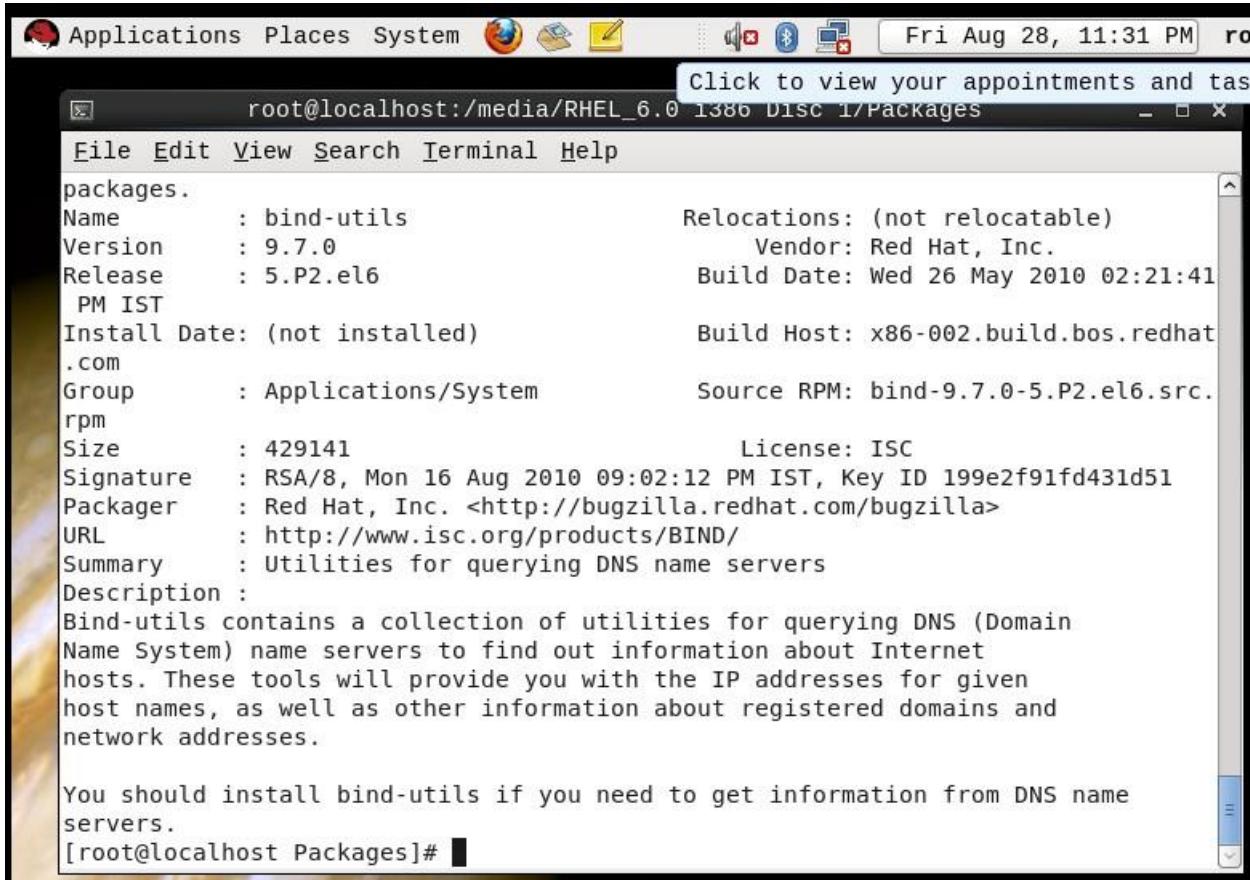
-ql : to show list of package files installed

The screenshot shows a terminal window titled "root@localhost:/media/RHEL\_6.0\_i386\_Disc\_1/Packages". The window displays a list of files installed by the DHCP package. The list includes various configuration files, documentation, and libraries. The terminal prompt at the bottom is "[root@localhost Packages]#".

```
/usr/share/doc/dhcp-4.1.1/References.txt
/usr/share/doc/dhcp-4.1.1/api+protocol
/usr/share/doc/dhcp-4.1.1/dhclient-tz-exithook.sh
/usr/share/doc/dhcp-4.1.1/dhcpd-conf-to-ldap
/usr/share/doc/dhcp-4.1.1/dhcpd.conf.sample
/usr/share/doc/dhcp-4.1.1/dhcpd6.conf.sample
/usr/share/doc/dhcp-4.1.1/draft-ietf-dhc-ldap-schema-01.txt
/usr/share/doc/dhcp-4.1.1/ms2isc
/usr/share/doc/dhcp-4.1.1/ms2isc/Registry.perlmodule
/usr/share/doc/dhcp-4.1.1/ms2isc/ms2isc.pl
/usr/share/doc/dhcp-4.1.1/ms2isc/readme.txt
/usr/share/doc/dhcp-4.1.1/sethostname.sh
/usr/share/doc/dhcp-4.1.1/solaris.init
/usr/share/man/man1/omshell.1.gz
/usr/share/man/man5/dhcp-eval.5.gz
/usr/share/man/man5/dhcp-options.5.gz
/usr/share/man/man5/dhcpd.conf.5.gz
/usr/share/man/man5/dhcpd.leases.5.gz
/usr/share/man/man8/dhcpd.8.gz
/usr/share/man/man8/dhcrelay.8.gz
/var/lib/dhcpd
/var/lib/dhcpd/dhcpd.leases
/var/lib/dhcpd/dhcpd6.leases
[root@localhost Packages]#
```

## Linux Administration Practical Manual

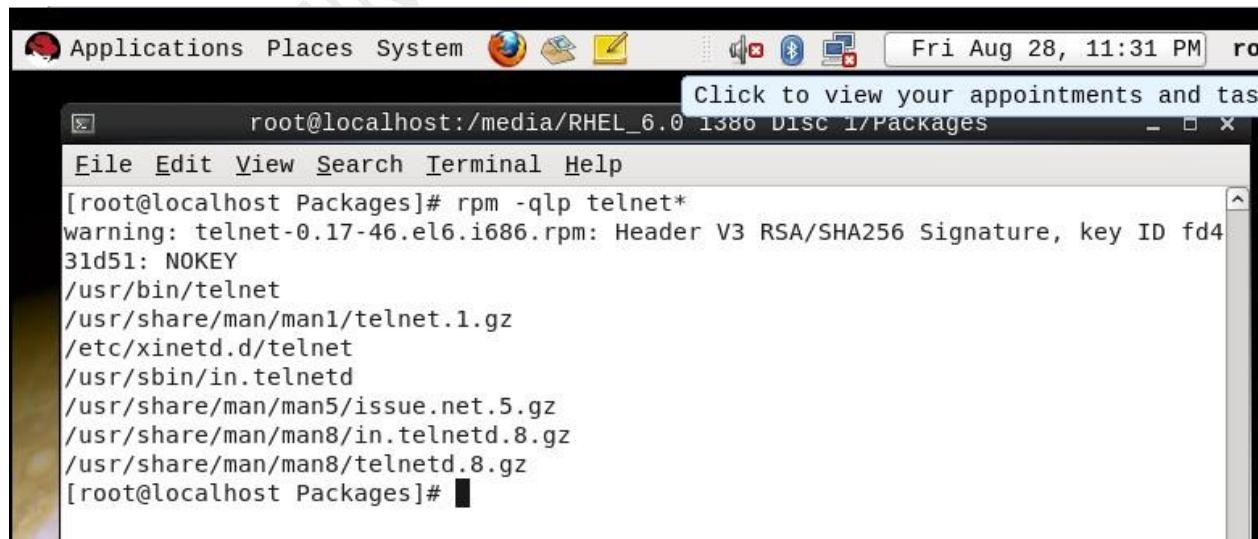
-qip : to show general information of uninstalled packages



```
Click to view your appointments and tasks
root@localhost:/media/RHEL_6.0_i386_Disc_1/Packages
File Edit View Search Terminal Help
packages.
Name        : bind-utils                         Relocations: (not relocatable)
Version     : 9.7.0                               Vendor: Red Hat, Inc.
Release     : 5.P2.el6                           Build Date: Wed 26 May 2010 02:21:41
PM IST
Install Date: (not installed)                  Build Host: x86-002.build.bos.redhat
.com
Group       : Applications/System               Source RPM: bind-9.7.0-5.P2.el6.src.rpm
Size        : 429141                             License: ISC
Signature   : RSA/8, Mon 16 Aug 2010 09:02:12 PM IST, Key ID 199e2f91fd431d51
Packager    : Red Hat, Inc. <http://bugzilla.redhat.com/bugzilla>
URL         : http://www.isc.org/products/BIND/
Summary     : Utilities for querying DNS name servers
Description :
Bind-utils contains a collection of utilities for querying DNS (Domain Name System) name servers to find out information about Internet hosts. These tools will provide you with the IP addresses for given host names, as well as other information about registered domains and network addresses.

You should install bind-utils if you need to get information from DNS name servers.
[root@localhost Packages]#
```

-qlp : to show list of package files of uninstalled package.

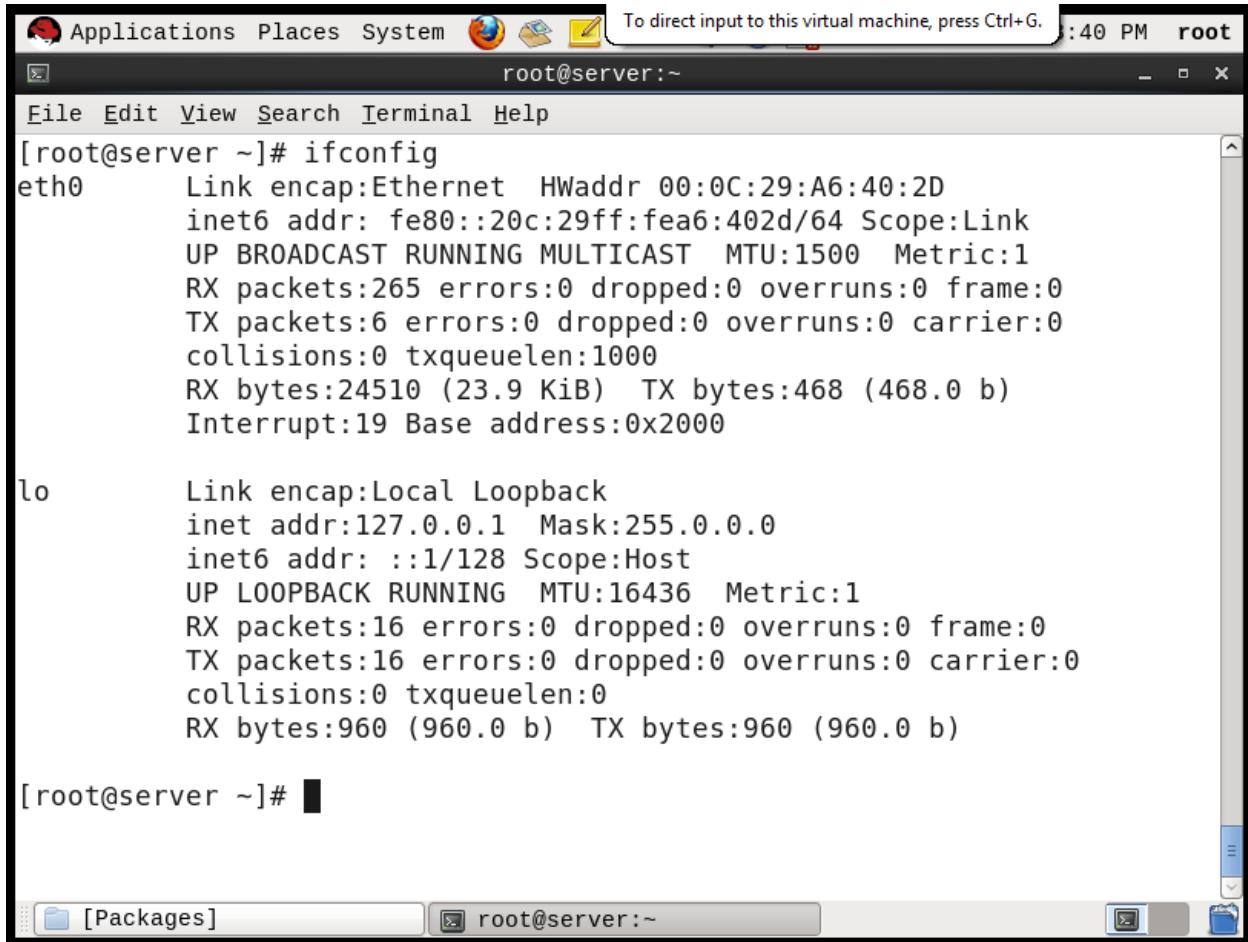


```
Click to view your appointments and tasks
root@localhost:/media/RHEL_6.0_i386_Disc_1/Packages
File Edit View Search Terminal Help
[root@localhost Packages]# rpm -qlp telnet*
warning: telnet-0.17-46.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
/usr/bin/telnet
/usr/share/man/man1/telnet.1.gz
/etc/xinetd.d/telnet
/usr/sbin/in.telnetd
/usr/share/man/man5/issue.net.5.gz
/usr/share/man/man8/in.telnetd.8.gz
/usr/share/man/man8/telnetd.8.gz
[root@localhost Packages]#
```

## Practical no 3: Basic Commands

**ifconfig :-**

The ifconfig command is used to set an IP address



A screenshot of a Linux desktop environment showing a terminal window. The terminal window has a title bar with 'root@server:~' and a status bar with 'To direct input to this virtual machine, press Ctrl+G.' and the time '1:40 PM'. The terminal content shows the output of the 'ifconfig' command:

```
File Edit View Search Terminal Help
[root@server ~]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:0C:29:A6:40:2D
          inet6 addr: fe80::20c:29ff:fea6:402d/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:265 errors:0 dropped:0 overruns:0 frame:0
          TX packets:6 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:24510 (23.9 KiB) TX bytes:468 (468.0 b)
          Interrupt:19 Base address:0x2000

lo       Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:16 errors:0 dropped:0 overruns:0 frame:0
          TX packets:16 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:960 (960.0 b) TX bytes:960 (960.0 b)

[root@server ~]#
```

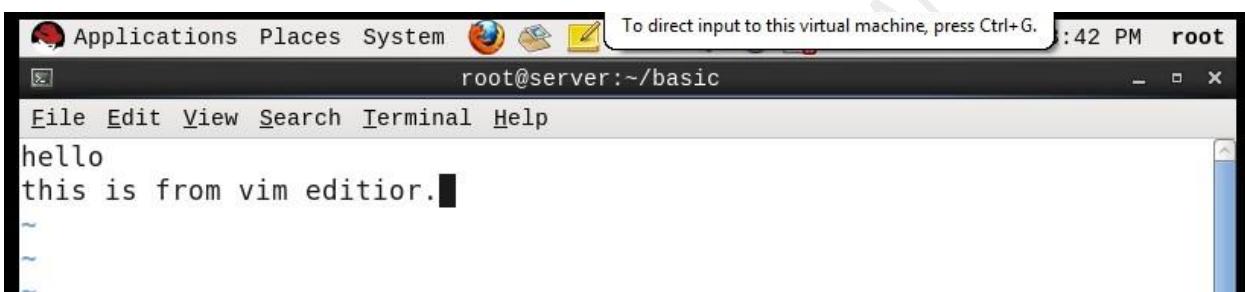
**vim/ vi :-**

**vi stands for visual editor.**

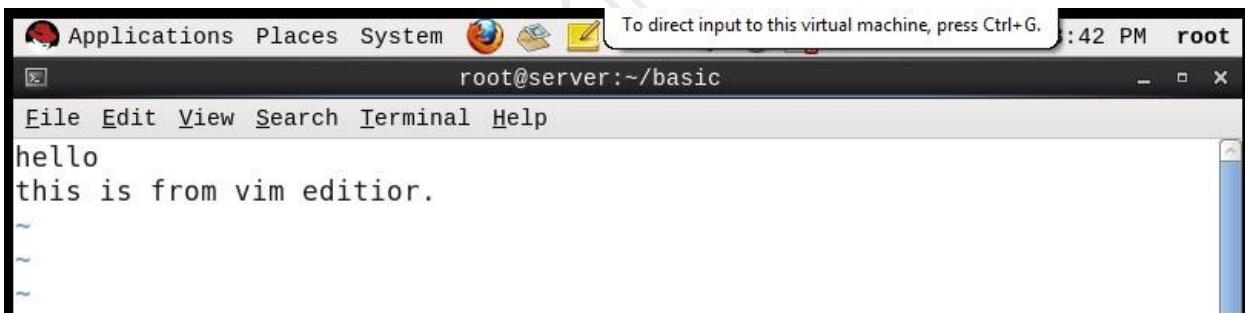
To save a file in vi press Esc key and type :wq (write and quit) or :wq!



A screenshot of a Linux desktop environment showing a terminal window. The window title is "root@server:~/basic". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The command line shows "[root@server basic]# vim newfile2". The status bar at the bottom right indicates it's 1:41 PM and the user is root.



A screenshot of a Linux desktop environment showing a terminal window. The window title is "root@server:~/basic". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The text "hello" and "this is from vim editior." is visible in the terminal window. The status bar at the bottom right indicates it's 1:42 PM and the user is root.



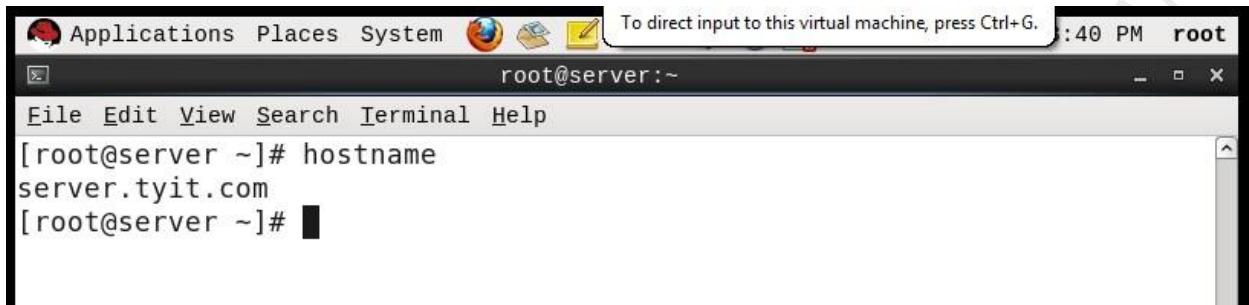
A screenshot of a Linux desktop environment showing a terminal window. The window title is "root@server:~/basic". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The text "hello" and "this is from vim editior." is visible in the terminal window, preceded by four tilde symbols (~). The status bar at the bottom right indicates it's 1:42 PM and the user is root.

## Hostname:-

The #hostname command is used to change the hostname

Syntax:

```
#hostname <>
```

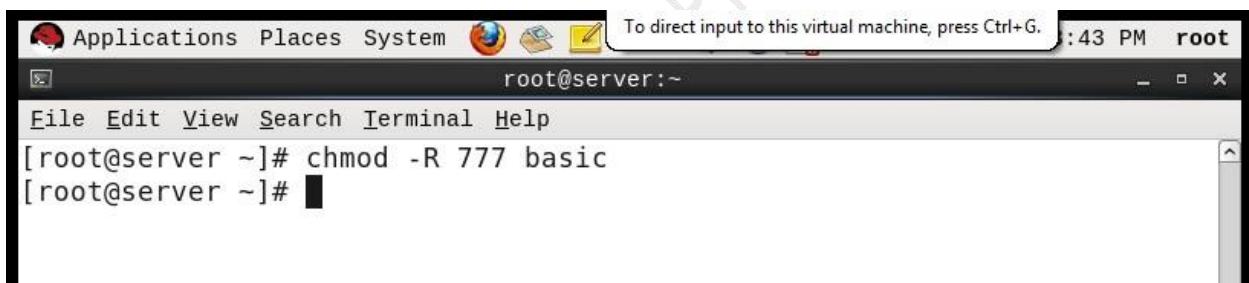


A screenshot of a Linux desktop environment showing a terminal window. The window title is 'root@server:~'. The terminal shows the command `hostname` being run, which outputs the current hostname `server.tyit.com`. The window has a standard Gnome-style interface with icons for Applications, Places, System, and a status bar indicating it's a virtual machine.

```
Applications Places System To direct input to this virtual machine, press Ctrl+G. 1:40 PM root
root@server:~
File Edit View Search Terminal Help
[root@server ~]# hostname
server.tyit.com
[root@server ~]#
```

## chmod:-

#chmod is used to give permission for a particular directory

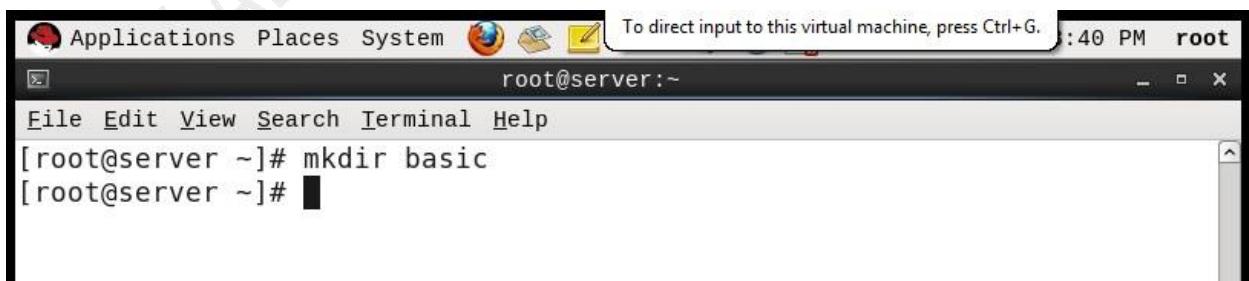


A screenshot of a Linux desktop environment showing a terminal window. The window title is 'root@server:~'. The terminal shows the command `chmod -R 777 basic` being run, which changes the permissions of the 'basic' directory. The window has a standard Gnome-style interface with icons for Applications, Places, System, and a status bar indicating it's a virtual machine.

```
Applications Places System To direct input to this virtual machine, press Ctrl+G. 1:43 PM root
root@server:~
File Edit View Search Terminal Help
[root@server ~]# chmod -R 777 basic
[root@server ~]#
```

## mkdir :-

The mkdir is used to create a new directory

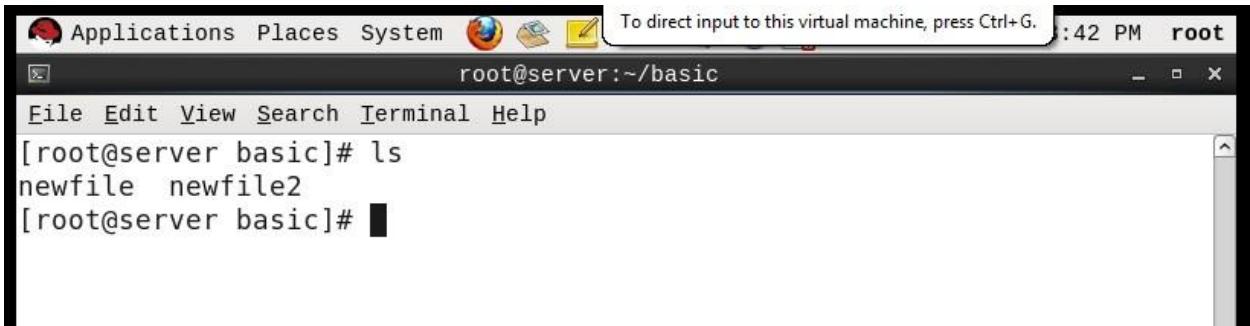


A screenshot of a Linux desktop environment showing a terminal window. The window title is 'root@server:~'. The terminal shows the command `mkdir basic` being run, which creates a new directory named 'basic'. The window has a standard Gnome-style interface with icons for Applications, Places, System, and a status bar indicating it's a virtual machine.

```
Applications Places System To direct input to this virtual machine, press Ctrl+G. 1:40 PM root
root@server:~
File Edit View Search Terminal Help
[root@server ~]# mkdir basic
[root@server ~]#
```

## ls :-

The ls command is used to list all the files in a particular folder

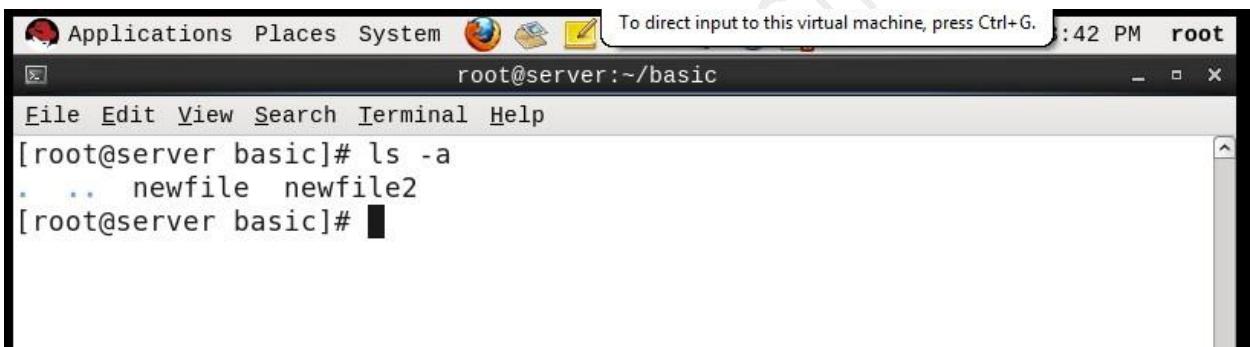


A screenshot of a Linux desktop environment showing a terminal window. The window title is 'root@server:~/basic'. The terminal prompt is '[root@server basic]#'. The user has run the command 'ls' which lists two files: 'newfile' and 'newfile2'. The window has a standard title bar with icons for Applications, Places, System, and a browser. A status bar at the top right shows 'To direct input to this virtual machine, press Ctrl+G.' and the time '1:42 PM'. The window is titled 'root'.

```
[root@server basic]# ls
newfile newfile2
[root@server basic]#
```

## ls-a :-

The ls-a command is used to list all files in a particular directory.



A screenshot of a Linux desktop environment showing a terminal window. The window title is 'root@server:~/basic'. The terminal prompt is '[root@server basic]#'. The user has run the command 'ls -a' which lists three entries: '.', '..', and 'newfile' and 'newfile2'. The window has a standard title bar with icons for Applications, Places, System, and a browser. A status bar at the top right shows 'To direct input to this virtual machine, press Ctrl+G.' and the time '1:42 PM'. The window is titled 'root'.

```
[root@server basic]# ls -a
. ..
newfile newfile2
[root@server basic]#
```

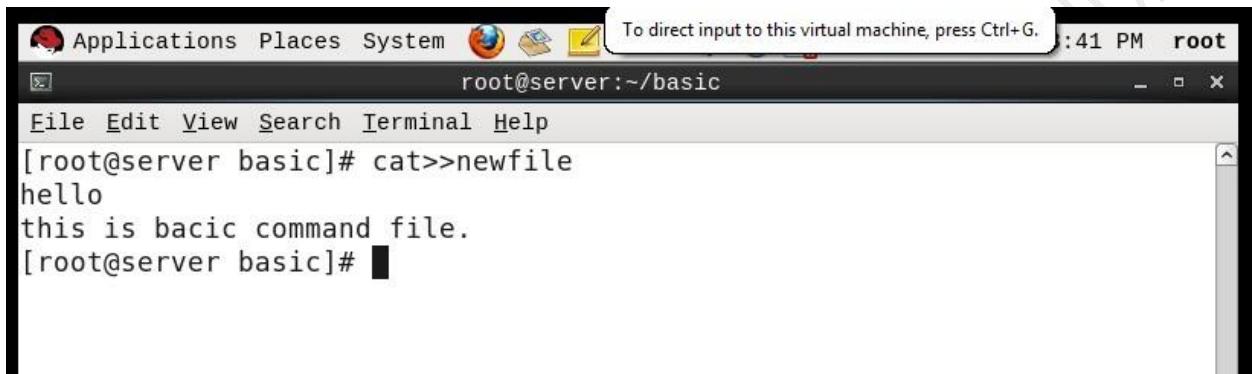
**cat :-**

The cat command is used to create a new file.

Syntax:

`cat>>[filename]`

To save a file `ctrl+d`



A screenshot of a Linux desktop environment showing a terminal window. The window title is 'root@server:~/basic'. The terminal shows the command `cat>>newfile` being run, followed by the text "hello" and "this is basic command file.". The terminal window has a standard window title bar with icons for Applications, Places, System, and a maximize/minimize/close button. The status bar at the bottom right shows the time as 1:41 PM and the user as root.

```
[root@server basic]# cat>>newfile
hello
this is basic command file.
[root@server basic]#
```

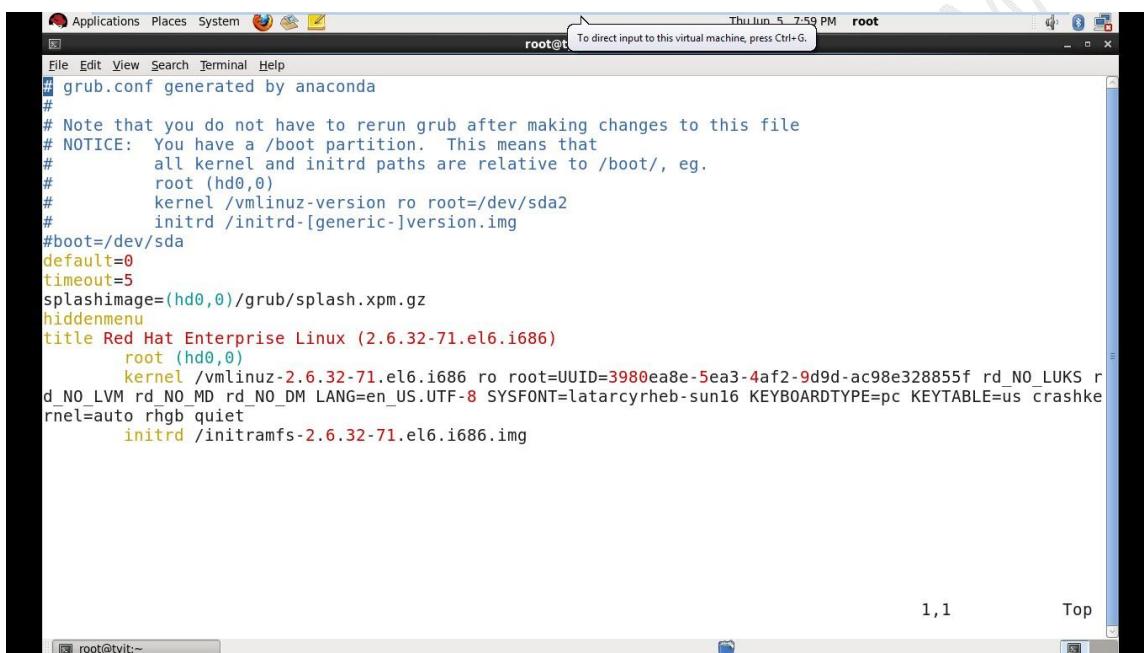
## Practical no 4: Introduction to Grub.conf

### What is GRUB?

GRUB stands for Grand Unified Boot Loader.

- (1) On RedHat open the GRUB configuration file (/boot/grub/grub.conf) in any text editor as follows:

```
[root@tyit ~]#vim /boot/grub/grub.conf
```



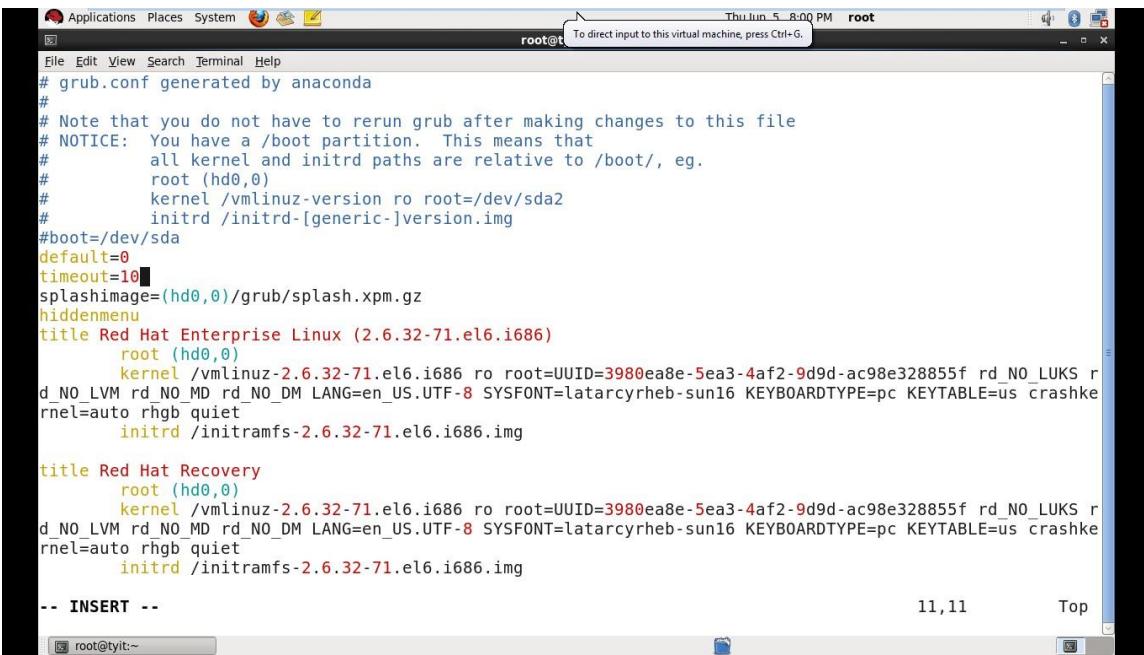
```
Thu Jun 5 7:59 PM root
File Edit View Search Terminal Help
grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/sda2
#          initrd /initrd-[generic]-version.img
#boot=/dev/sda
default=0
timeout=5
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Red Hat Enterprise Linux (2.6.32-71.el6.i686)
    root (hd0,0)
    kernel /vmlinuz-2.6.32-71.el6.i686 ro root=UUID=3980ea8e-5ea3-4af2-9d9d-ac98e328855f rd_NO_LUKS r
d_NO_LVM rd_NO_MD rd_NO_DM LANG=en_US.UTF-8 SYSFONT=latarcyrheb-sun16 KEYBOARDTYPE=pc KEYTABLE=us crashke
rnel=auto rhgb quiet
        initrd /initramfs-2.6.32-71.el6.i686.img
```

### To edit the configuration file : Go to Insert mode (press 'i')

- (2) Add a new entry to the configuration file:

- The new entry should have the title “Red Hat Recovery”.
- The new entry should not be the default.
- Change the timeout of the boot selection to 10 seconds.

# Linux Administration Practical Manual



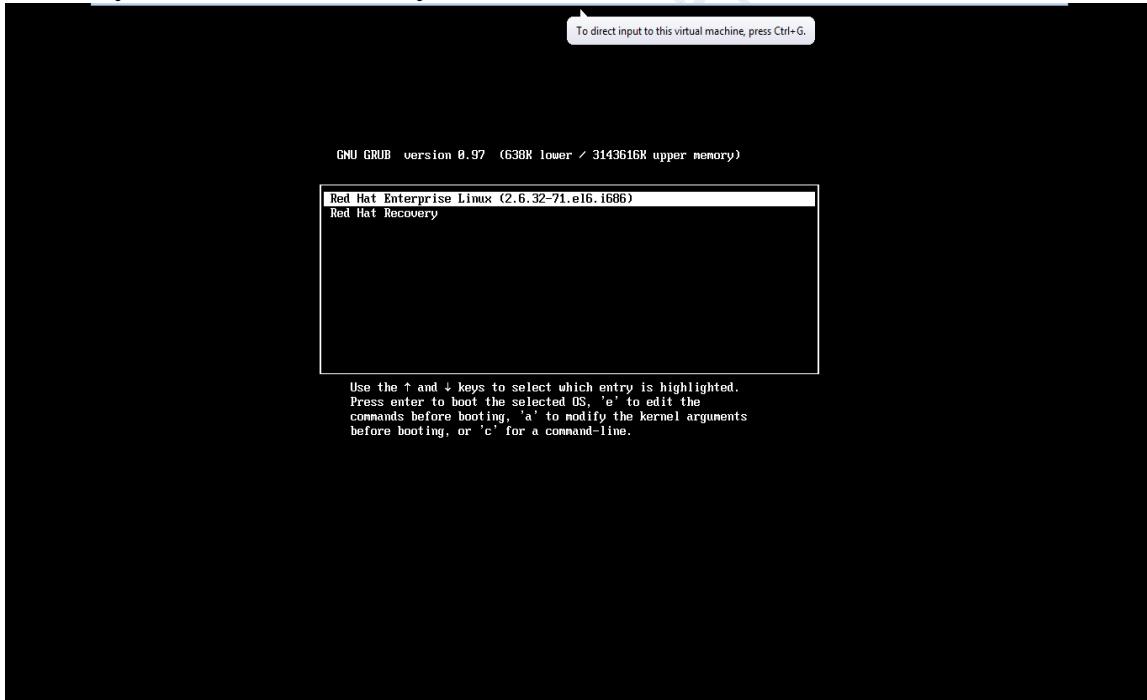
The screenshot shows a terminal window titled "root@tyit:~" with the date "Thu Jun 5 8:00 PM". The window contains the content of the /etc/grub.conf file. The file includes comments about Anaconda generation, kernel paths relative to /boot/, and two main entries: "Red Hat Enterprise Linux (2.6.32-71.el6.i686)" and "Red Hat Recovery". Both entries use the same kernel parameters: root=UUID=3980ea8e-5ea3-4af2-9d9d-ac98e328855f, rd\_NO\_LUKS, rd\_NO\_LVM, rd\_NO\_MD, rd\_NO\_DM, LANG=en\_US.UTF-8, SYSFONT=latarcyrheb-sun16, KEYBOARDTYPE=pc, KEYTABLE=us, crashke, rrel=auto, rhgb, quiet, and initrd=/initramfs-2.6.32-71.el6.i686.img. A message at the bottom of the file says "-- INSERT --". The terminal window has a status bar at the bottom with "root@tyit:~" and "11,11 Top".

```
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/sda2
#          initrd /initrd-[generic]-version.img
#boot=/dev/sda
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Red Hat Enterprise Linux (2.6.32-71.el6.i686)
    root (hd0,0)
    kernel /vmlinuz-2.6.32-71.el6.i686 ro root=UUID=3980ea8e-5ea3-4af2-9d9d-ac98e328855f rd_NO_LUKS rd_NO_LVM rd_NO_MD rd_NO_DM LANG=en_US.UTF-8 SYSFONT=latarcyrheb-sun16 KEYBOARDTYPE=pc KEYTABLE=us crashke rrel=auto rhgb quiet
        initrd /initramfs-2.6.32-71.el6.i686.img

title Red Hat Recovery
    root (hd0,0)
    kernel /vmlinuz-2.6.32-71.el6.i686 ro root=UUID=3980ea8e-5ea3-4af2-9d9d-ac98e328855f rd_NO_LUKS rd_NO_LVM rd_NO_MD rd_NO_DM LANG=en_US.UTF-8 SYSFONT=latarcyrheb-sun16 KEYBOARDTYPE=pc KEYTABLE=us crashke rrel=auto rhgb quiet
        initrd /initramfs-2.6.32-71.el6.i686.img

-- INSERT --
```

The task is complete when the system boots with both entries in the GRUB menu and they both work correctly.



## The grub.conf configuration file is explained in detail below.

- **Default=0** - This line tells grub to boot the kernel with the first title in the file.
- **Timeout=5** - This line tells the grub to boot the default kernel after 5 seconds. The default timeout can be edited too.

- **Splashimage=(hd0,0)/grub/splash.xpm.gz** - This line helps grub to identify the path of splash image it displays for the menu. Although user can create his own image but it has to be kept in the same path.
- **Hiddenmenu** - This line tells the GRUB not to display the menu and to boot the default kernel after the timeout expires.
- **Title** - This line helps GRUB to set title as boot name on the menu.

### **The lines following the title are :**

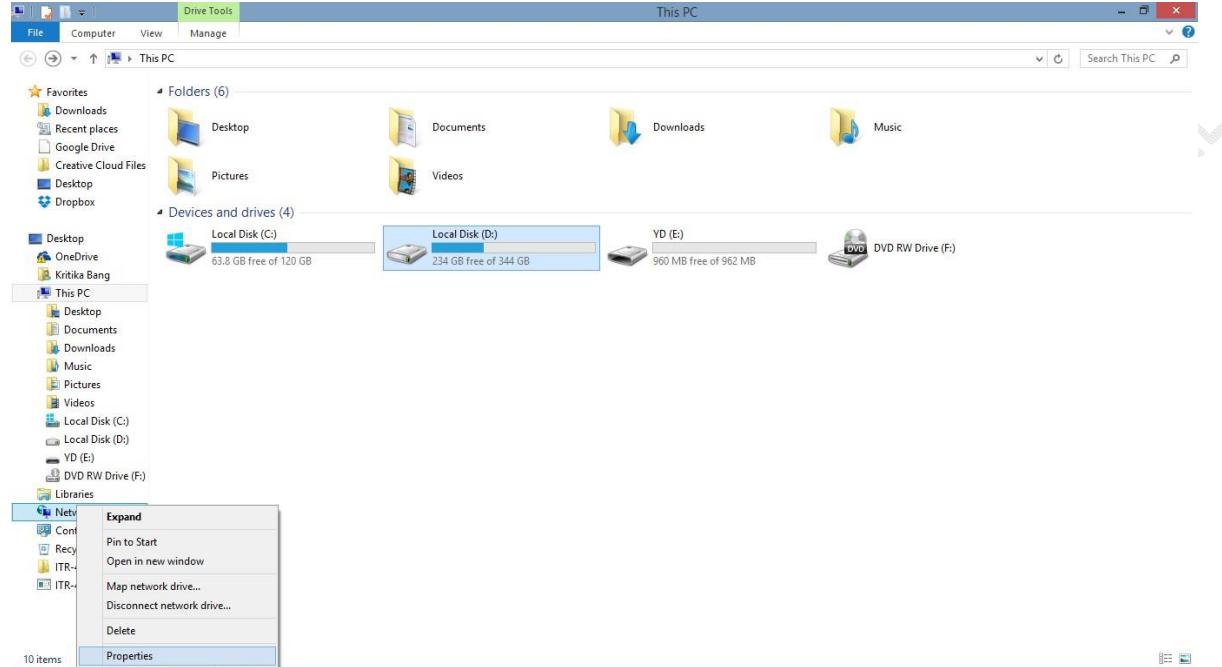
- **Root (hd0,0)** - This line instructs the GRUB to boot the system from the first partition o the first hard disk.
- **kernel /vmlinuz-2.6.18-8.el5 ro root=LABEL=/ rhgb quiet** - Specifies the kernel location which is inside the /boot folder as well as passes the parameters to the kernel. There are already two parameters i.e. rhgb tells the system to use the graphical boot whereas quite option tells the system to be quiet and not to display everything that happens at the time of system boot.
- **initrd /initrd-2.6.18-8.el5.img** - This line tells the GRUB location of the initial ramdisk image that is used to load special drivers for the system during boot process.

### **Practical no 5: Setting up Samba Server**

- Samba is basically used for establishing connection among linux to windows, with help of samba file sharing can be done using Windows file-sharing protocol and connect your Red Hat Enterprise network to a windows network to share files and printers.
- Windows use a protocol called Server Message Block (SMB) to communicate with each other and to share services such as file and print sharing.
- With Samba, the Linux PC icon appears in the Windows Network Places window and the files on the Linux PC can be browsed using Windows Explorer.
- The Windows File system can be mounted on your Linux System , and you can browse the Windows files from your Linux PC.
- Before using Samba to connect to the Windows computers, it must first be installed on the Linux PC.
- All current distributions of Linux include three Samba packages:
  - Samba
  - Samba-client
  - Samba-common

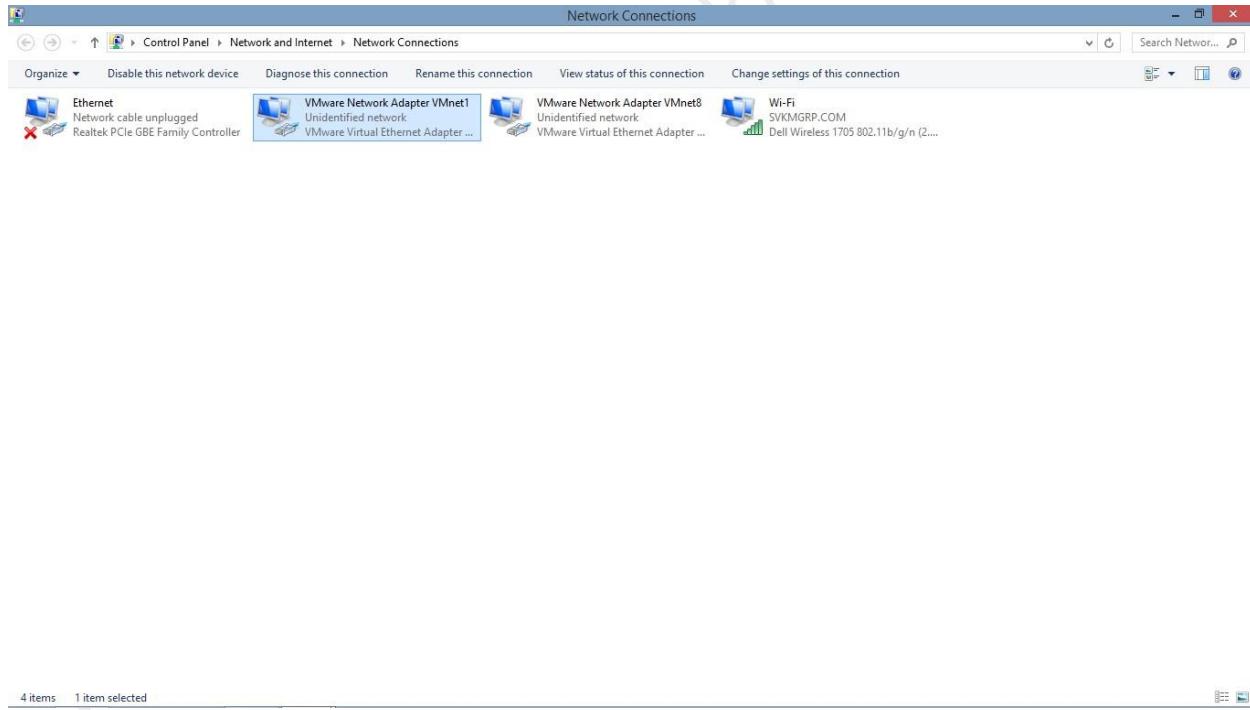
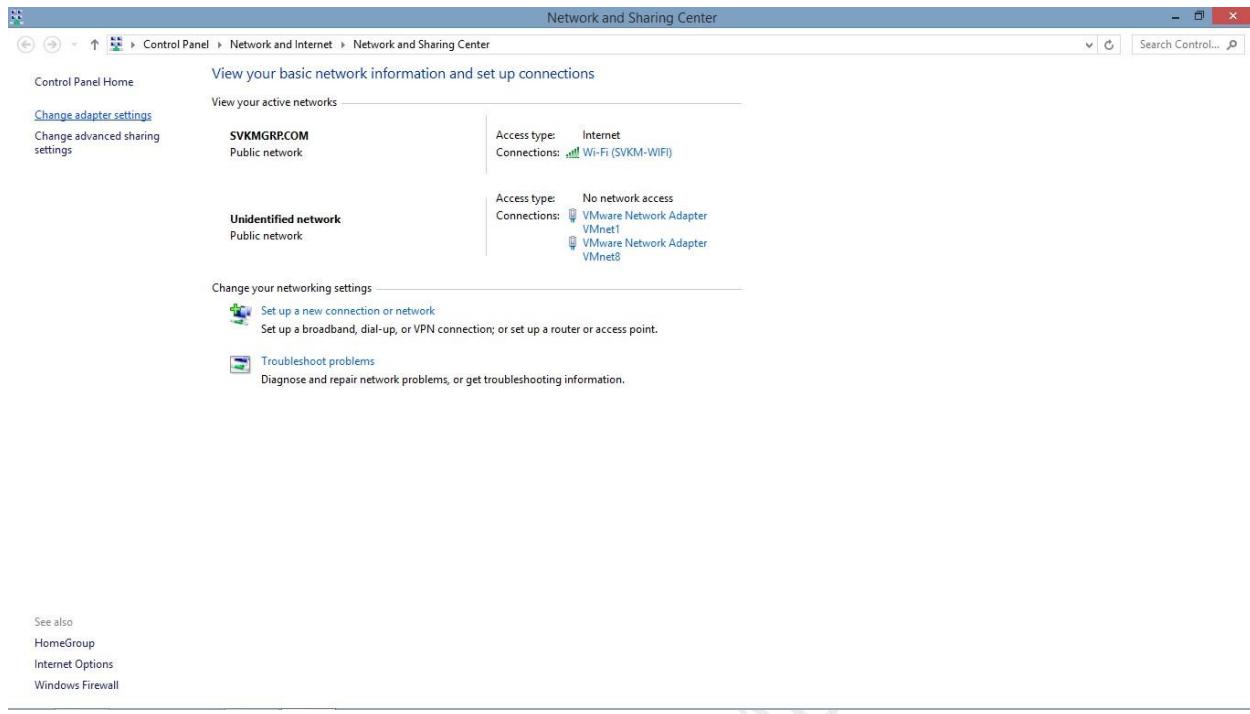
## **Settings to be done in Windows**

Go to “My Computer” -> “Network” -> Right Click on “Properties”

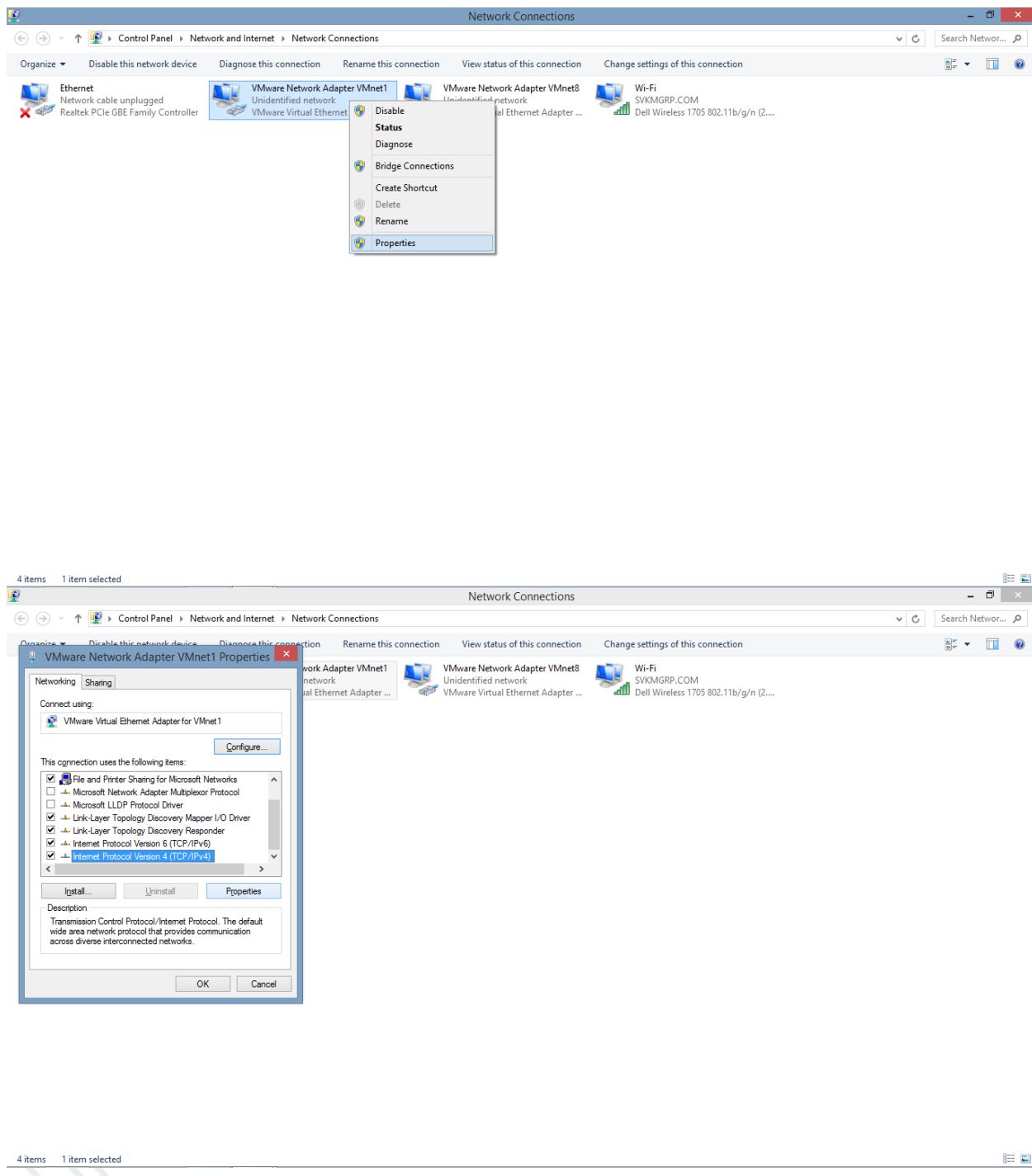


Go to the option “Change adapter settings” -> Right click on “VMWare Network Adapter VMnet1” -> Click “IPV4” -> Click on “Properties” button -> Set IP Address Example : 192.168.1.1 -> Click “OK” -> Click “Close”.

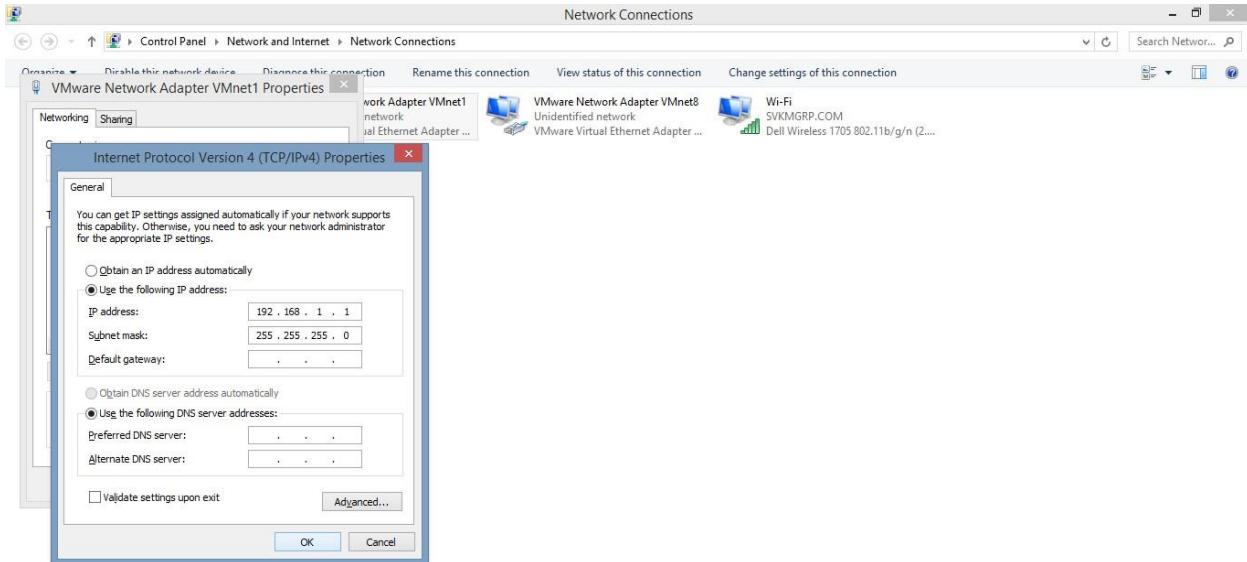
# Linux Administration Practical Manual



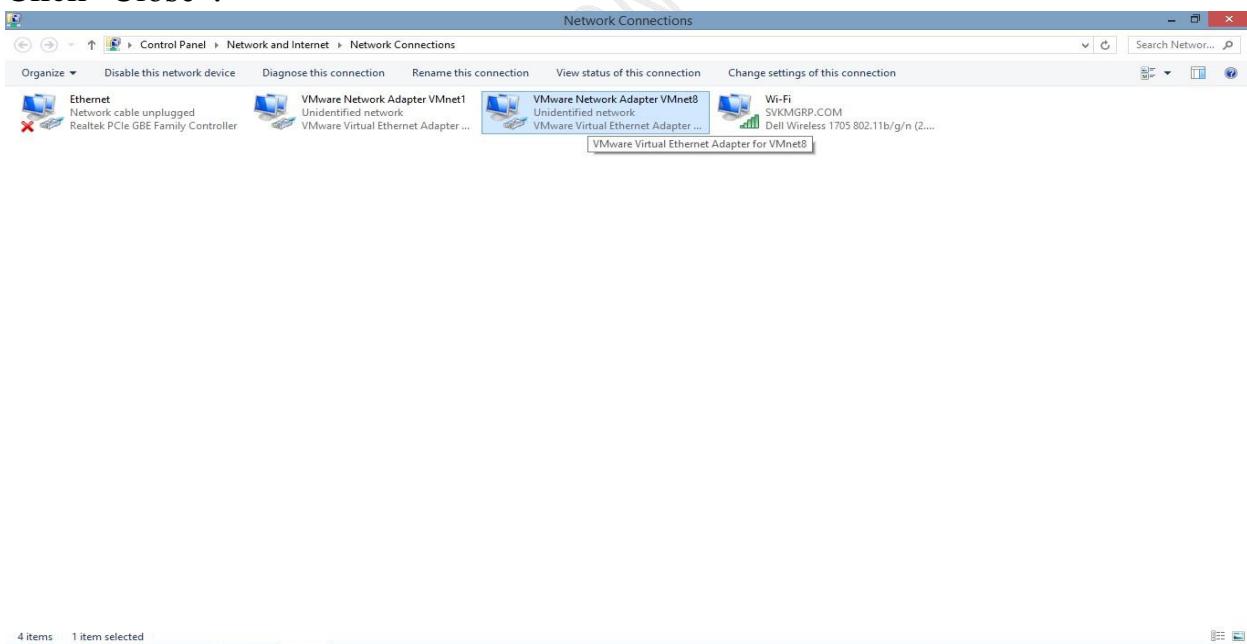
# Linux Administration Practical Manual



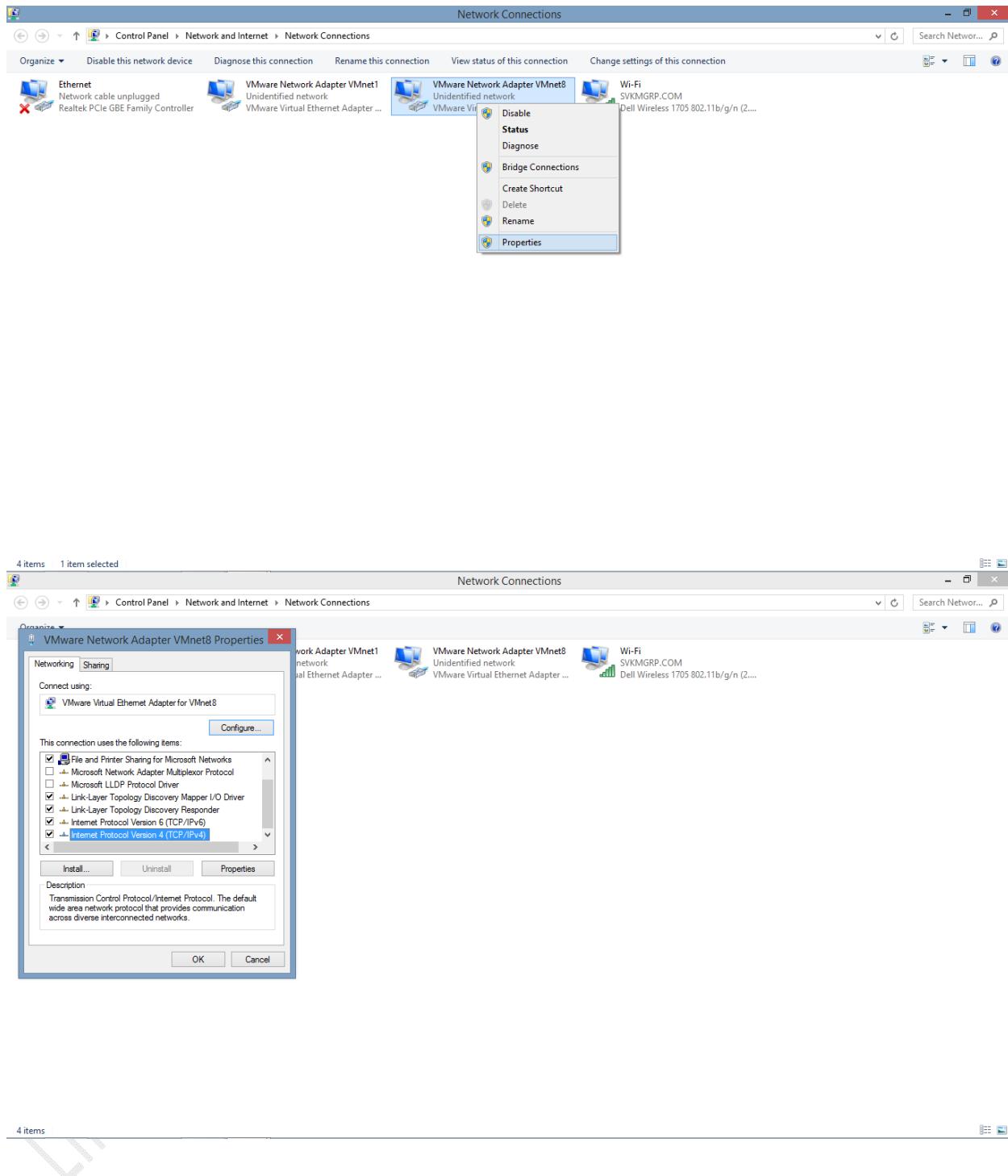
# Linux Administration Practical Manual



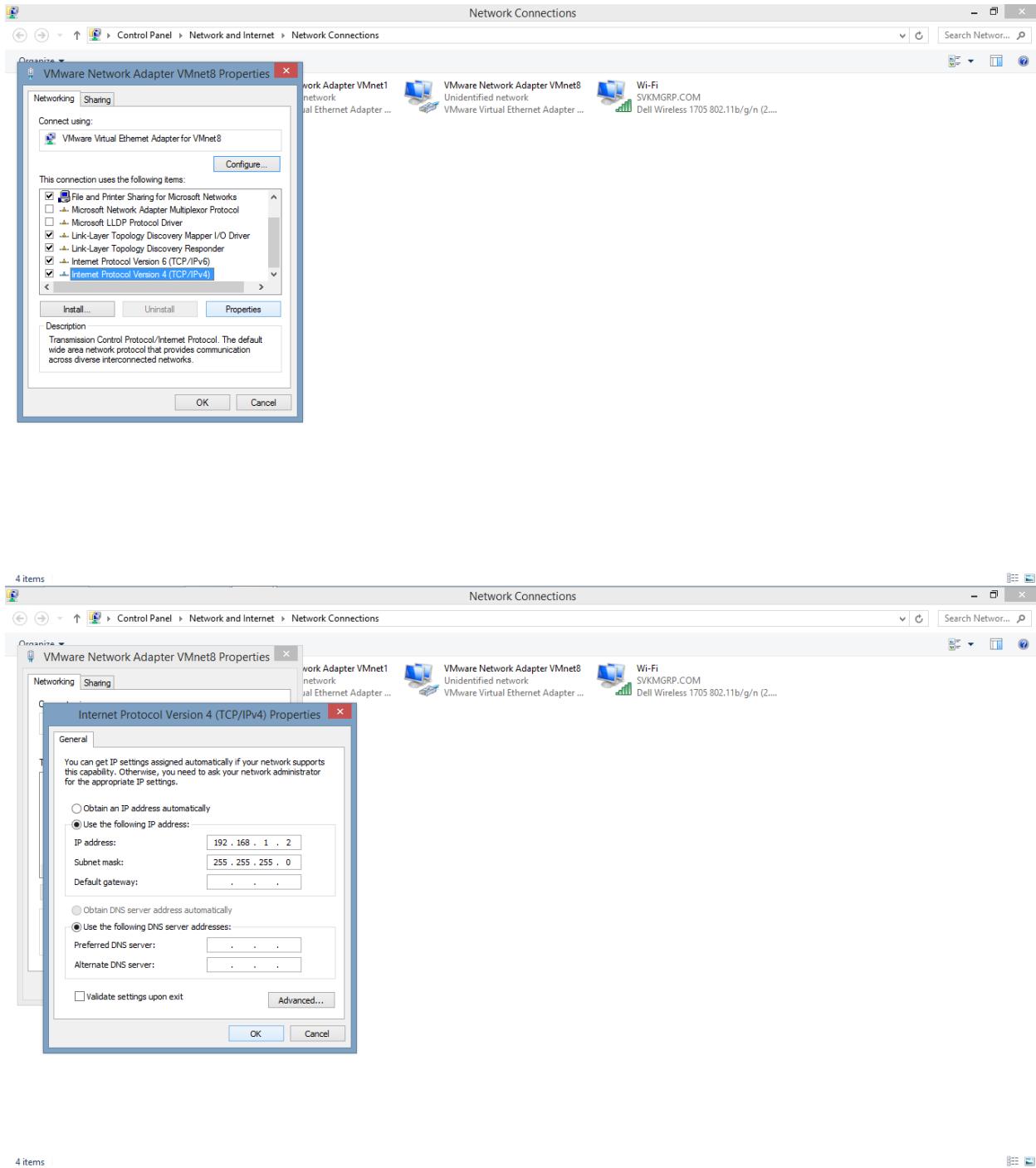
Right click on “VMWare Network Adapter VMnet8” -> Click “IPV4” - > Click on “Properties” button -> Set IP Address Example : 192.168.1.2 -> Click “OK” -> Click “Close”.



# Linux Administration Practical Manual



# Linux Administration Practical Manual



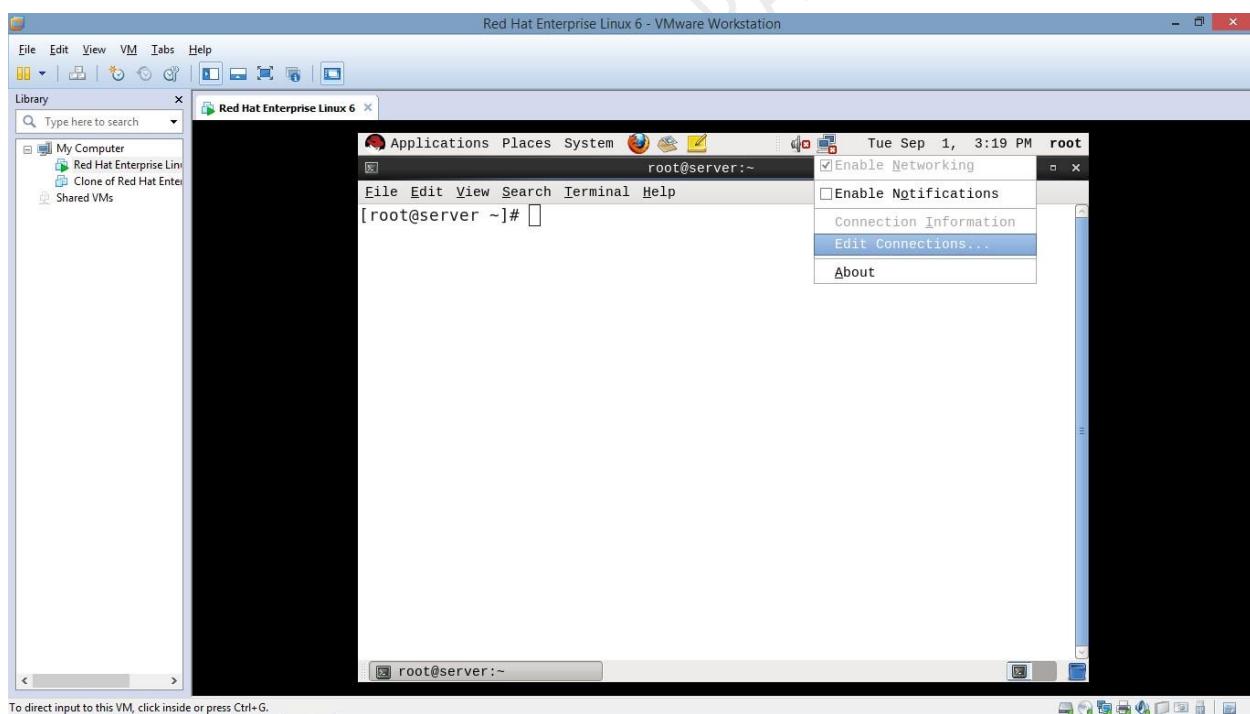
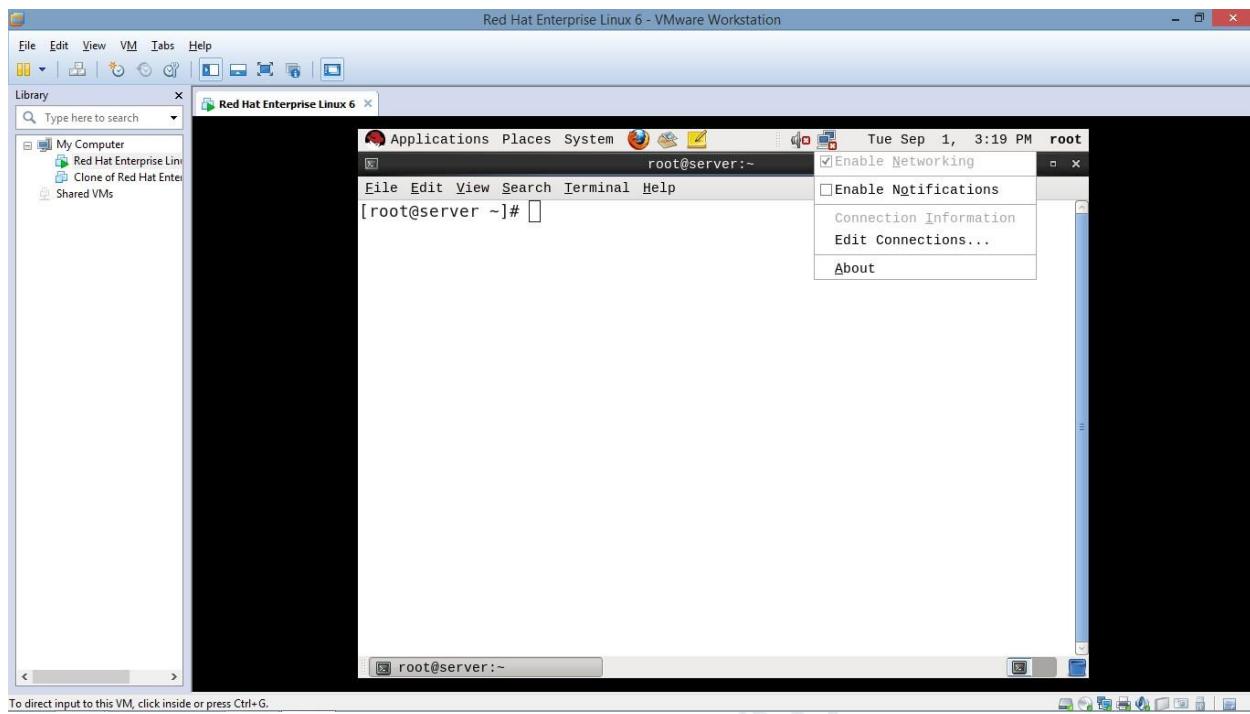
## Now Open “VMWare”– Linux Virtual machine

Set the IP Address to 192.168.1.3

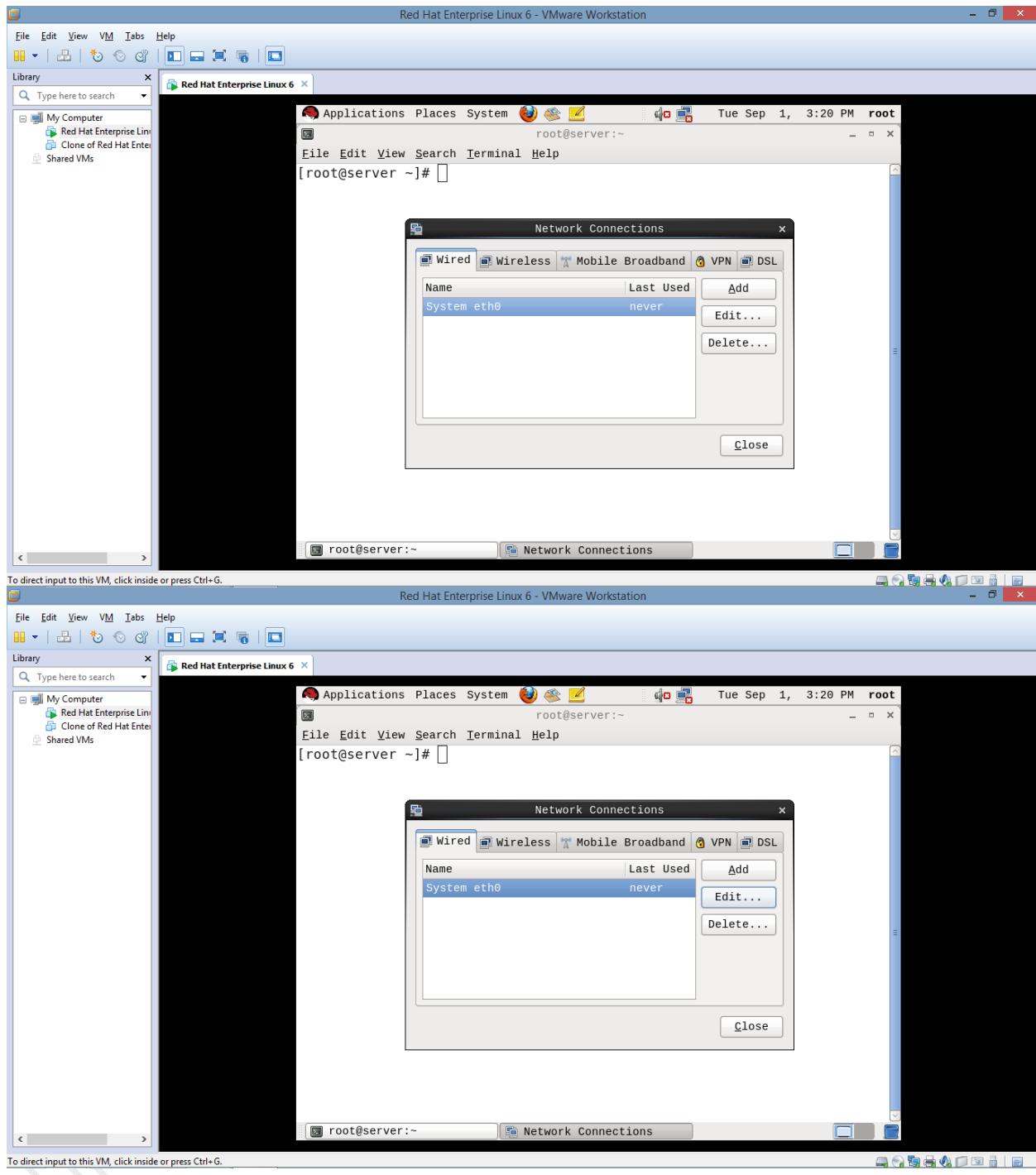
To do so follow the steps :

Right click on top of “Network symbol” -> Go to “Edit Connections” ->Select “eth0” ->Click on “Edit” button -> Select IPV4 - >Select “Manual” .

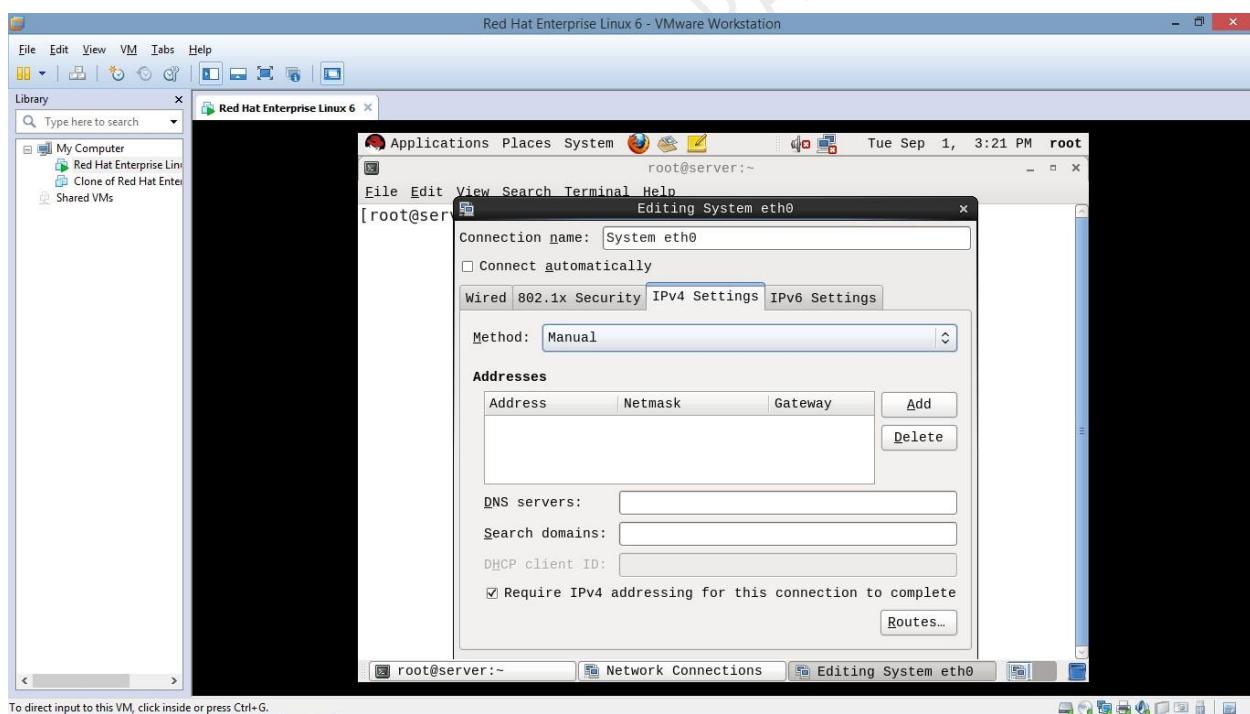
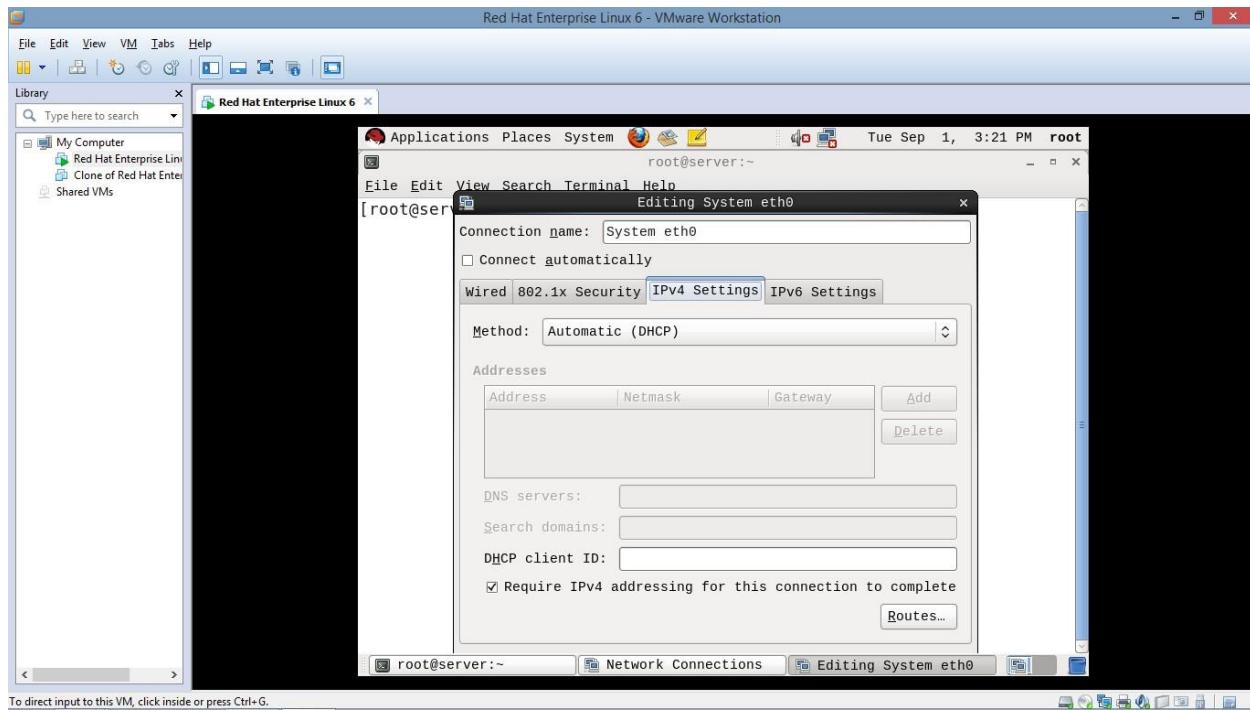
# Linux Administration Practical Manual



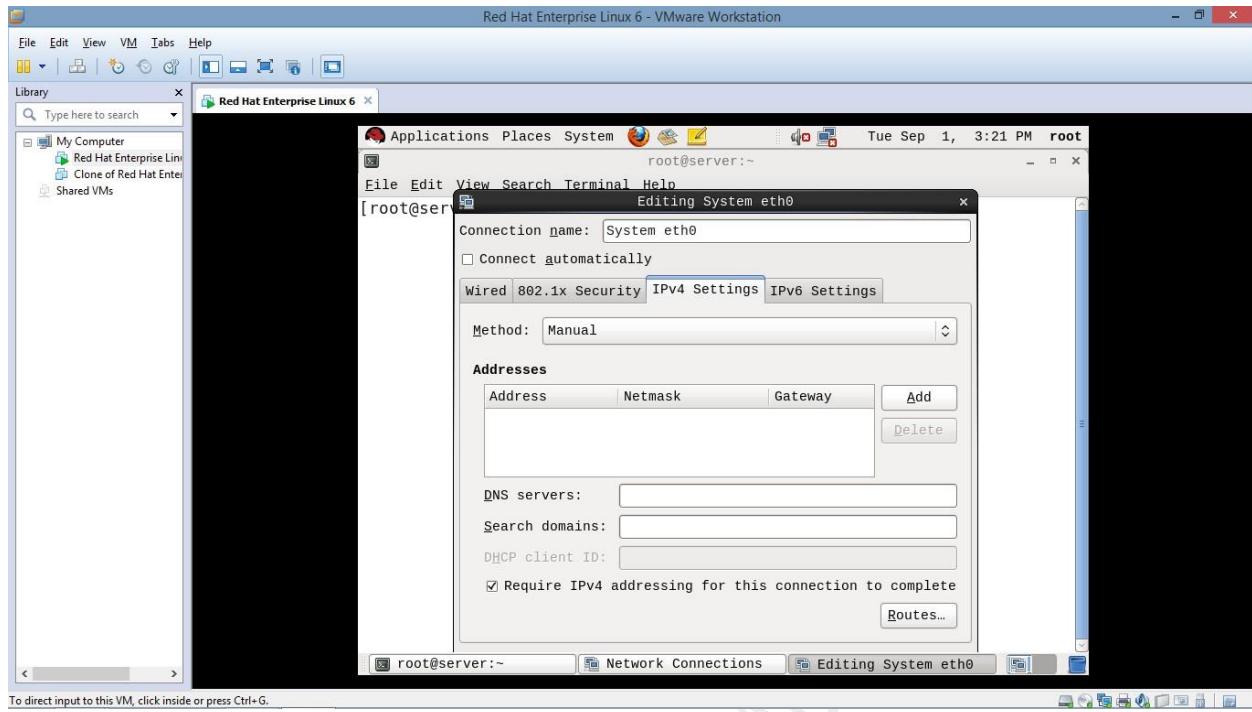
# Linux Administration Practical Manual



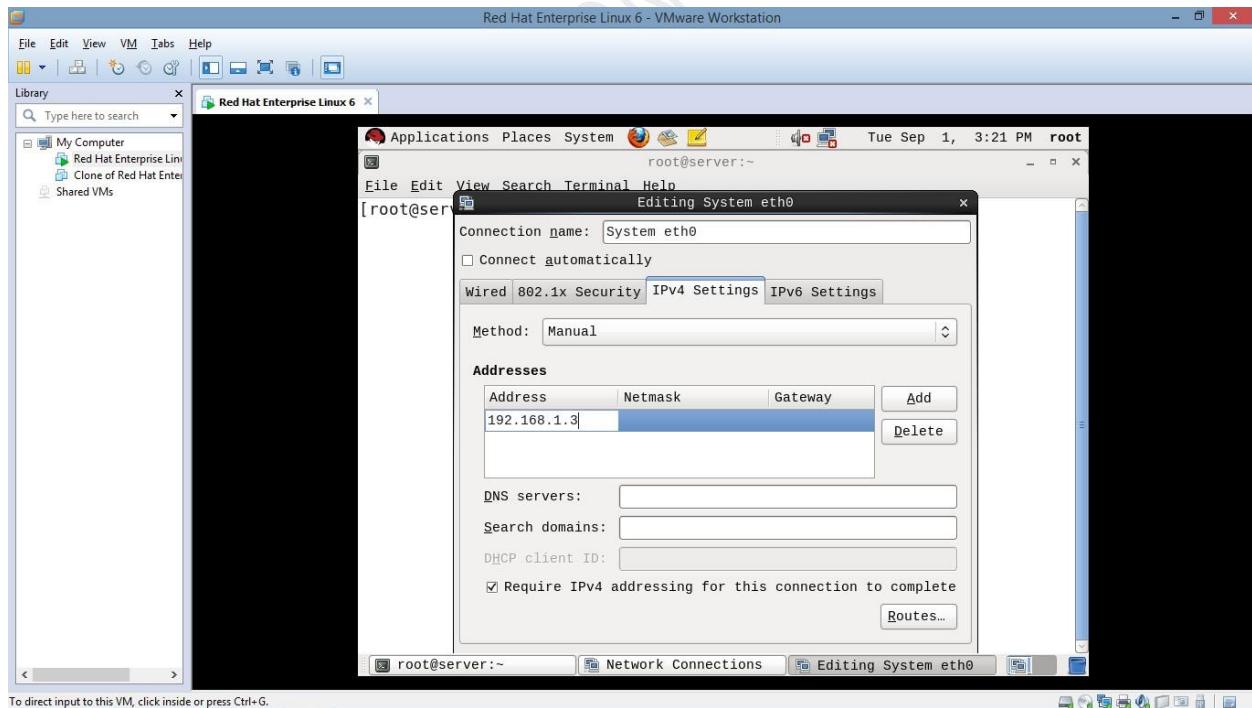
# Linux Administration Practical Manual



# Linux Administration Practical Manual

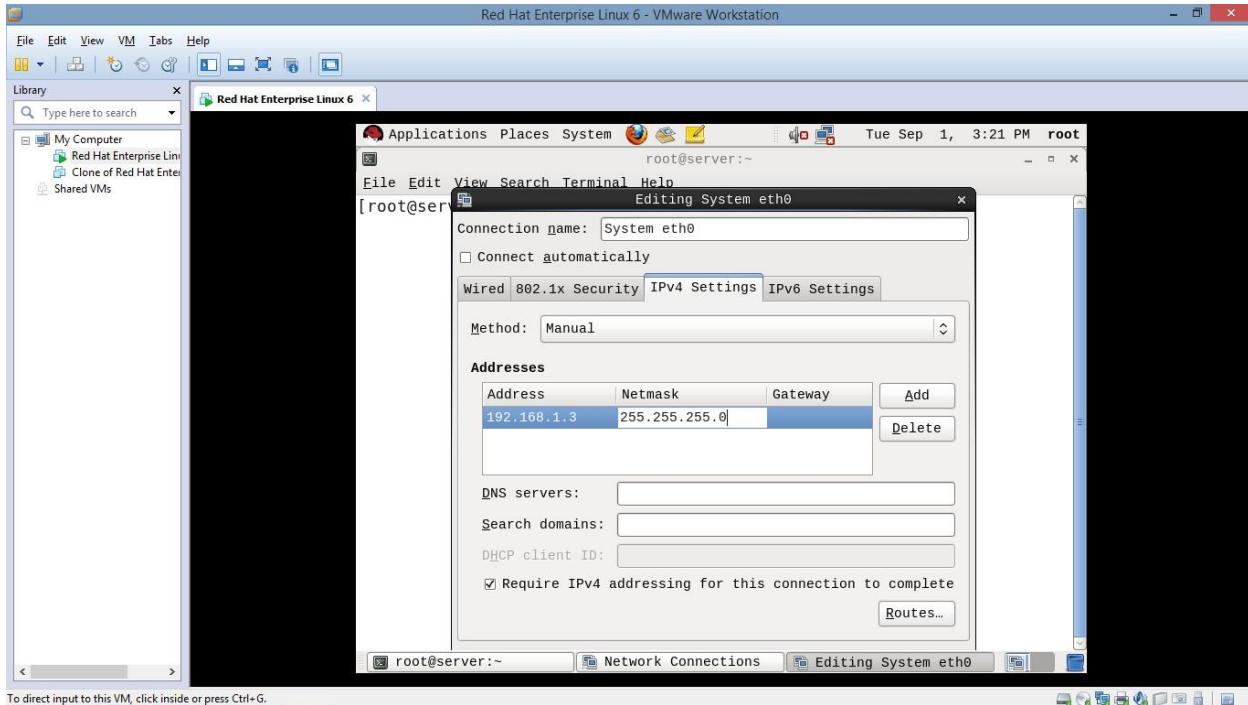


Now set IP Address to 192.168.1.3

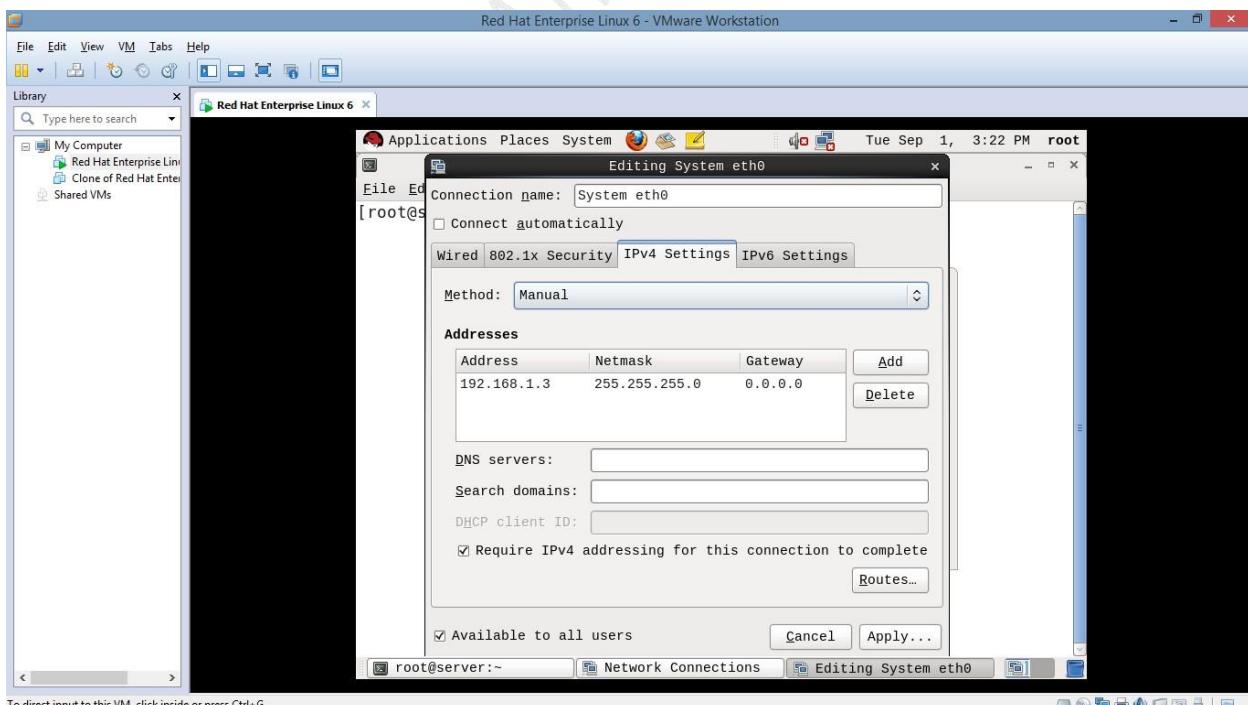


# Linux Administration Practical Manual

Set the Netmask as 255.255.255.0

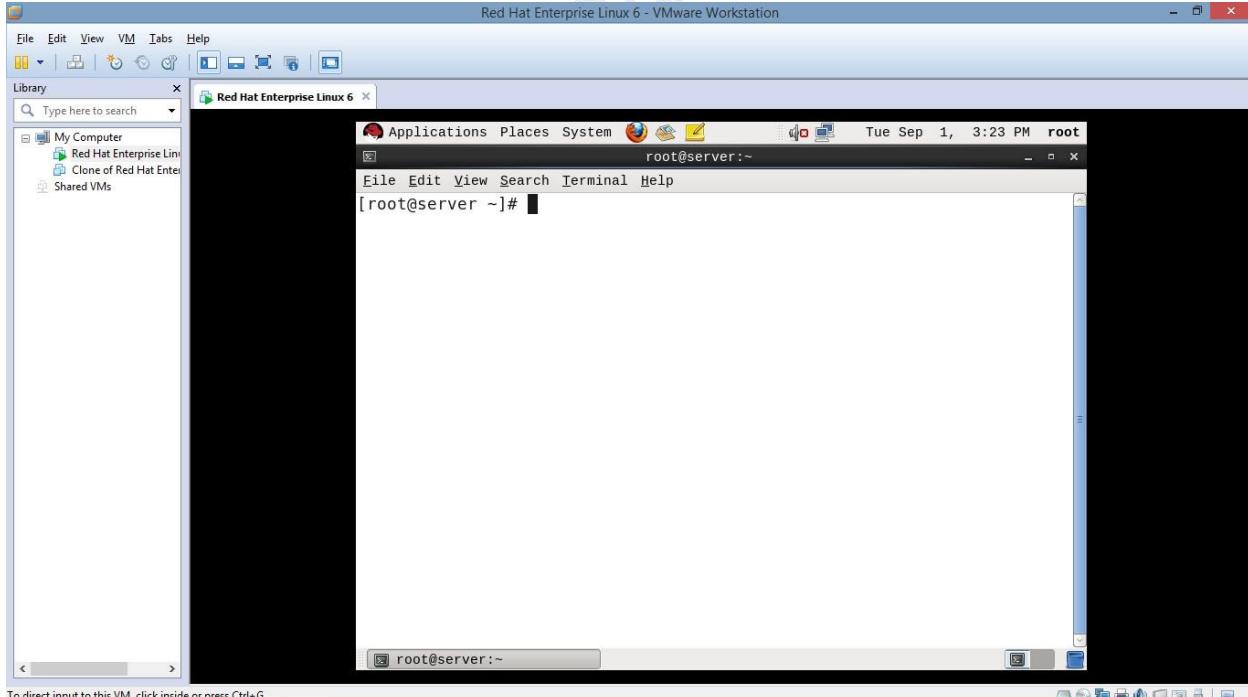
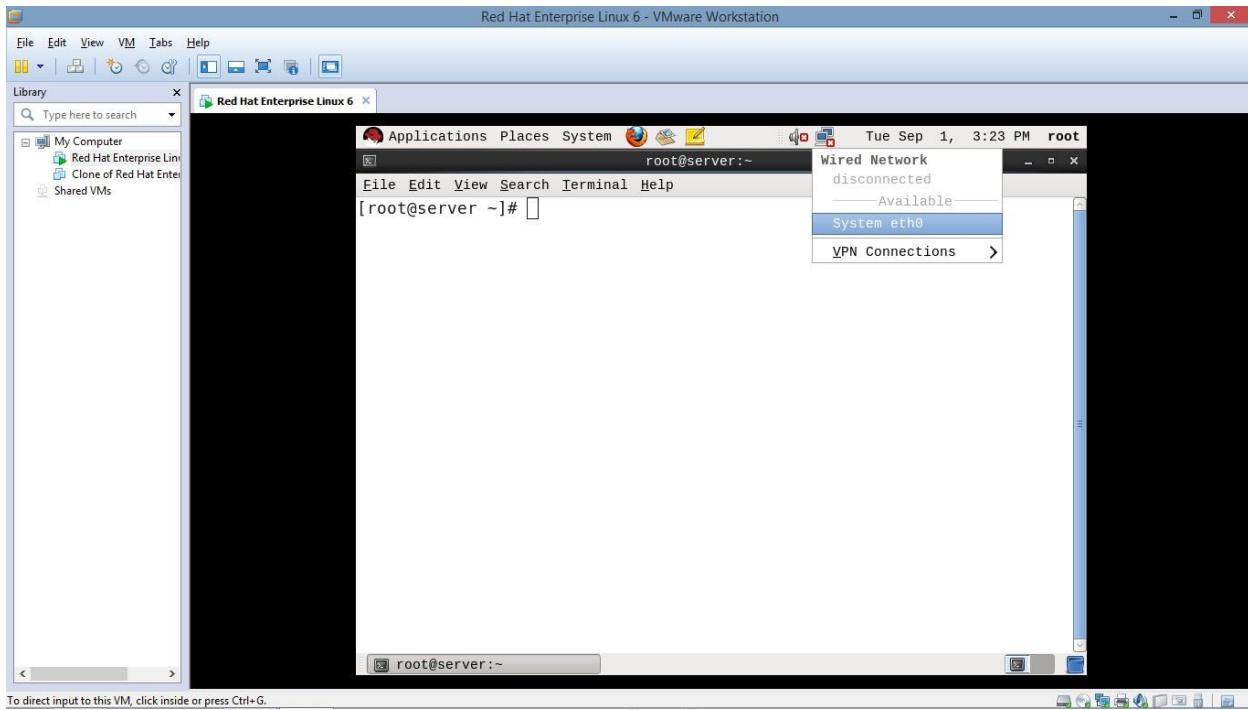


Click on “Apply” button -> Click on “Close” button.



# Linux Administration Practical Manual

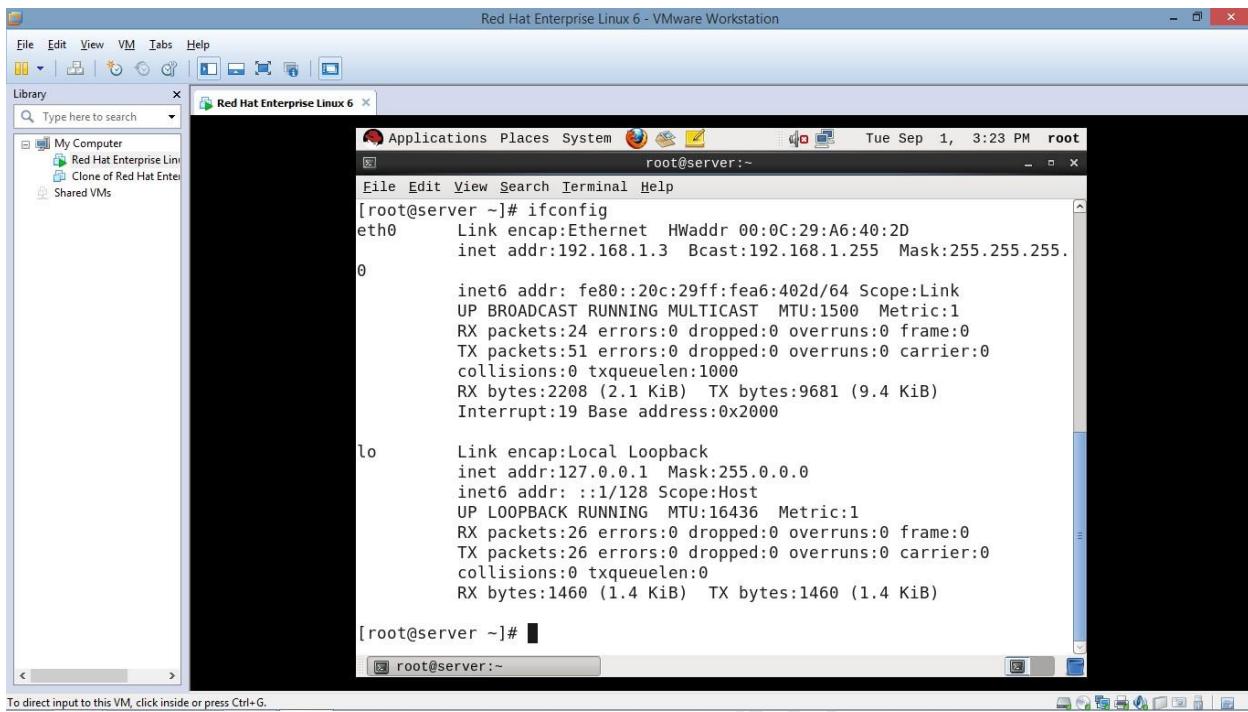
Now connect your network - > To do so double click on Network icon.



To check whether IP Address is set :

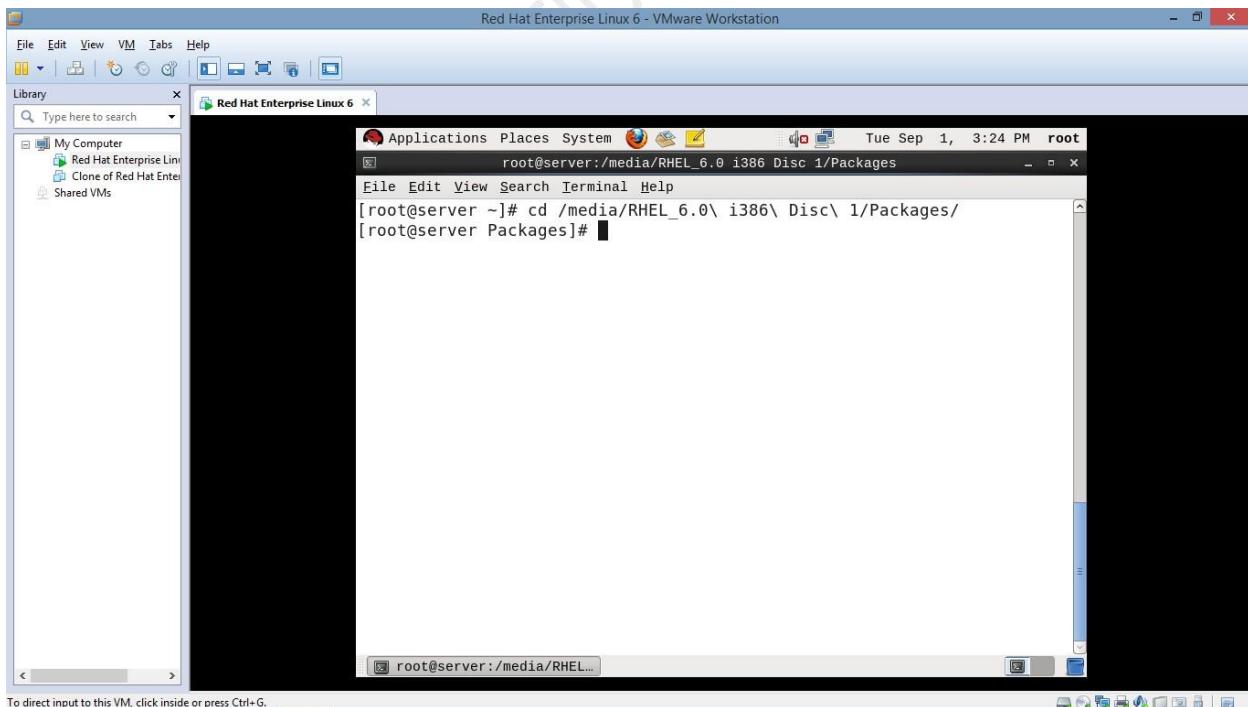
**# ifconfig**

# Linux Administration Practical Manual



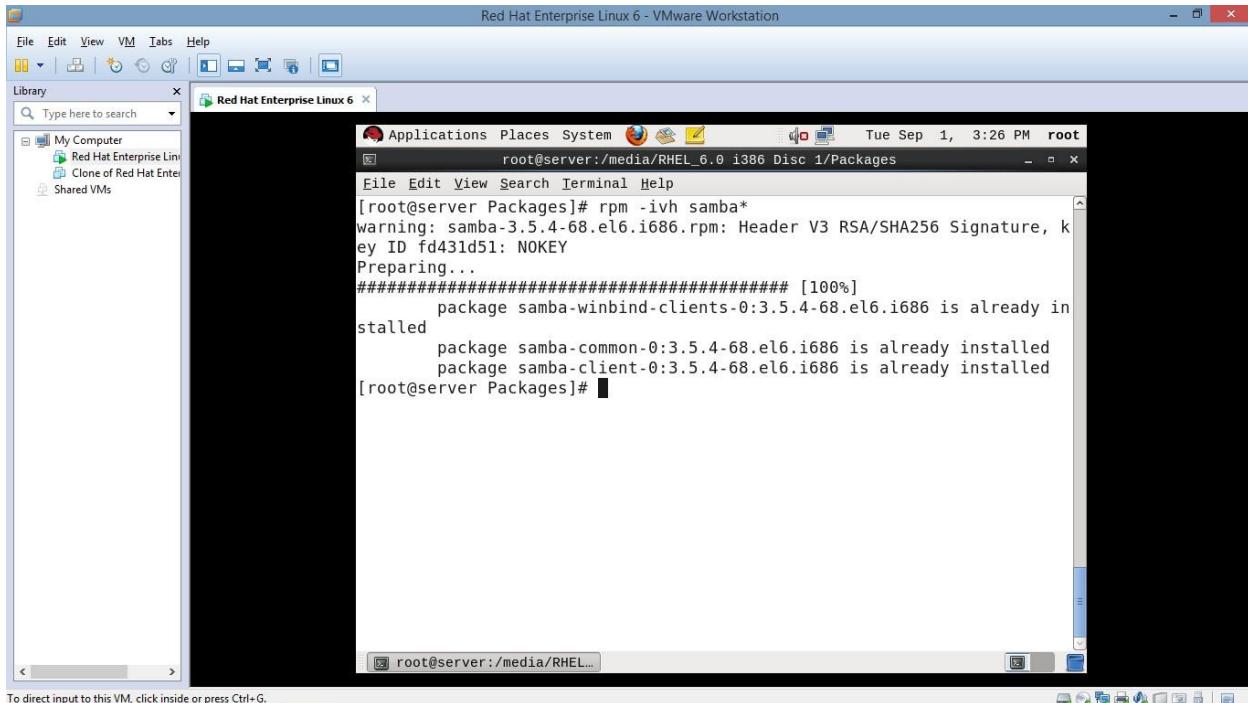
To install the samba package :

```
# cd /media/RHEL_6.0\i386\Disc\1/Packages
```



# Linux Administration Practical Manual

Packages] # **rpm -ivh samba\***

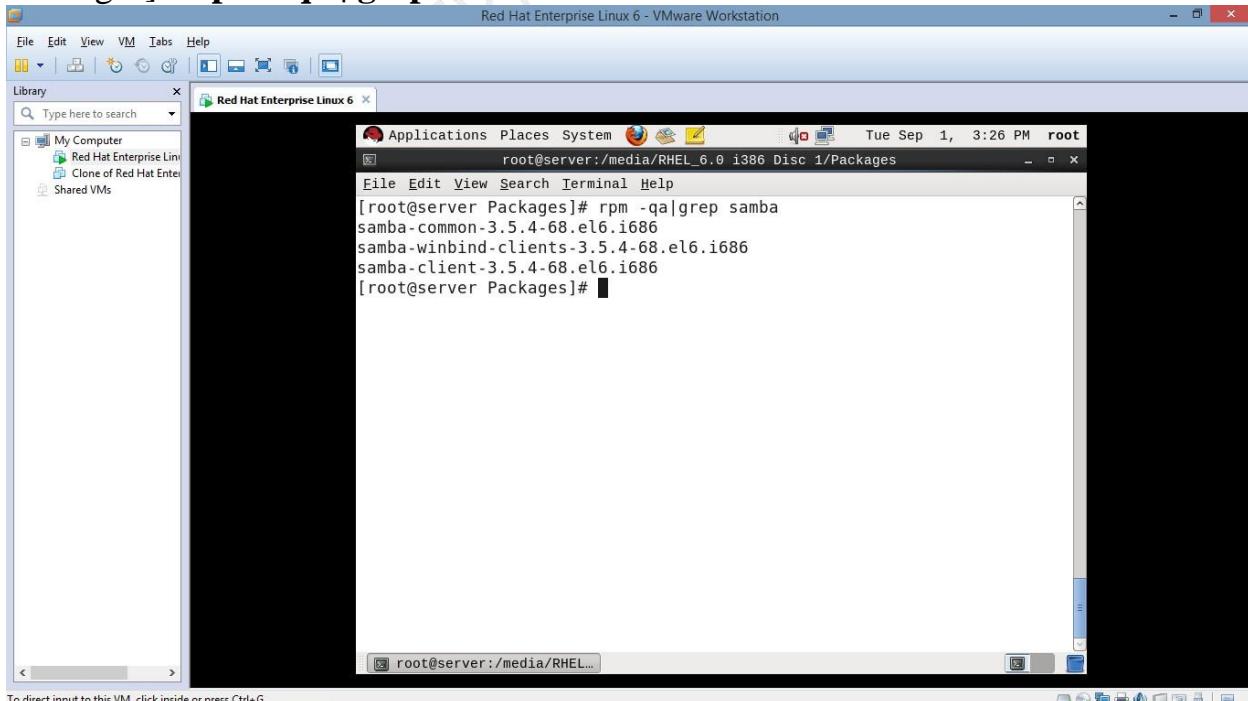


To verify service package of samba

Packages] # **rpmquery -qa | grep samba**

OR

Packages] # **rpm -qa | grep samba**



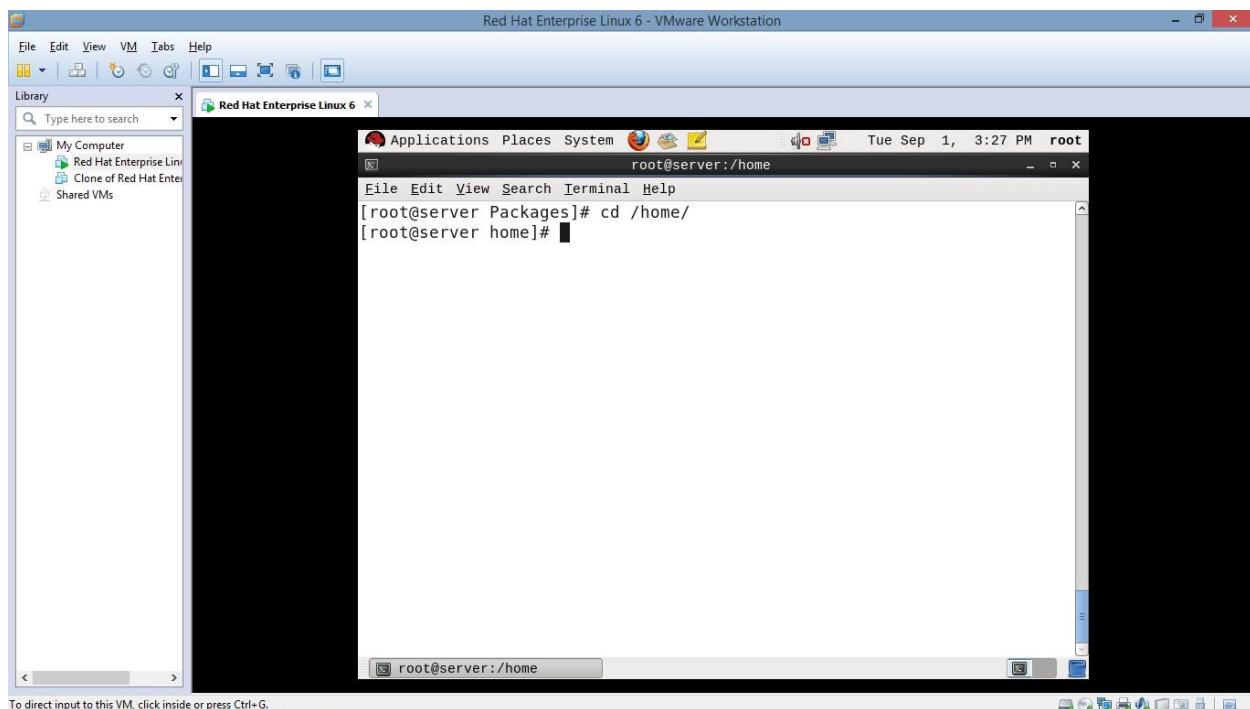
# Linux Administration Practical Manual

---

The following package with the version number should be installed – “samba-3.5.4-68.el6.i686”.

Now go to your home directory:

```
# cd /home
```



# Linux Administration Practical Manual

---

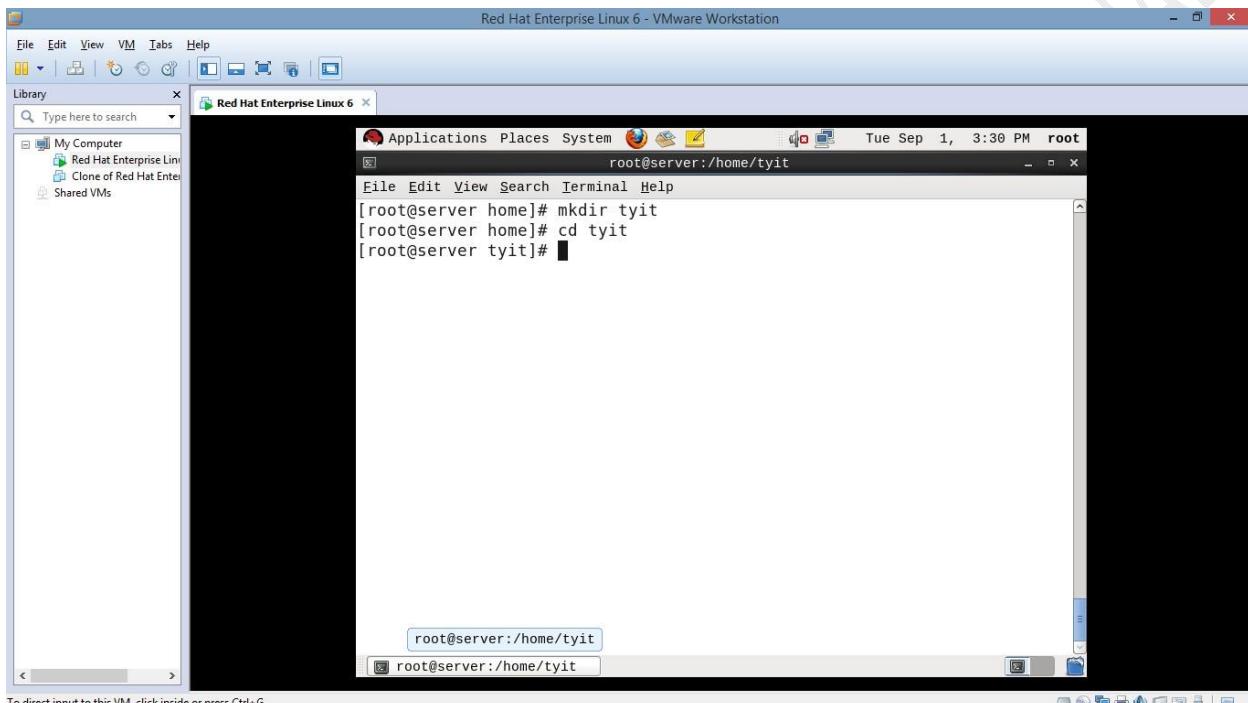
Now create a directory and create few files into it. You can also write the contents in the file.

This is a directory to be shared by samba.

**mkdir tyit**

Go inside tyit directory to create files into it

**cd tyit** (// change directory )



**touch f1 f2 f3** (creating 3 files with touch command – 3 files (f1 , f2, f3) with zero byte size will be created)

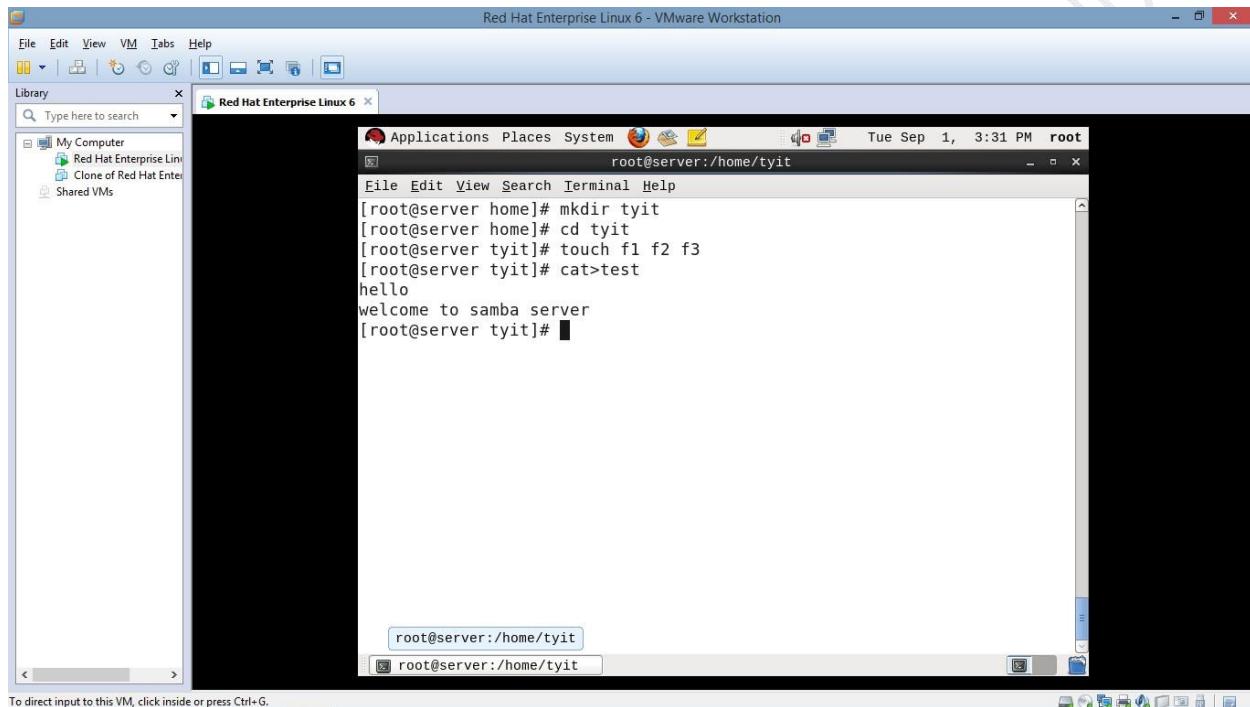
Creating a file named as ‘test’ with cat command

**cat > test**

// Write the contents

Hello my First Samba file to be shared

Press <ctrl+d> to save the file.

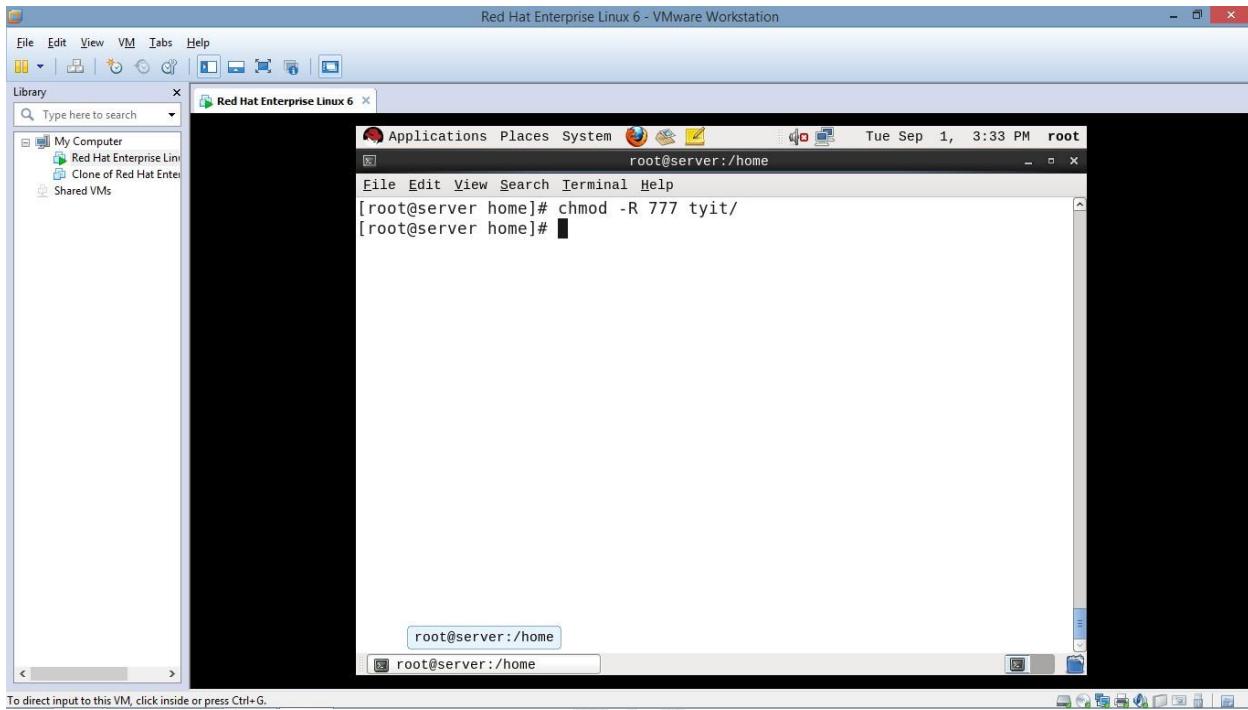


# Linux Administration Practical Manual

---

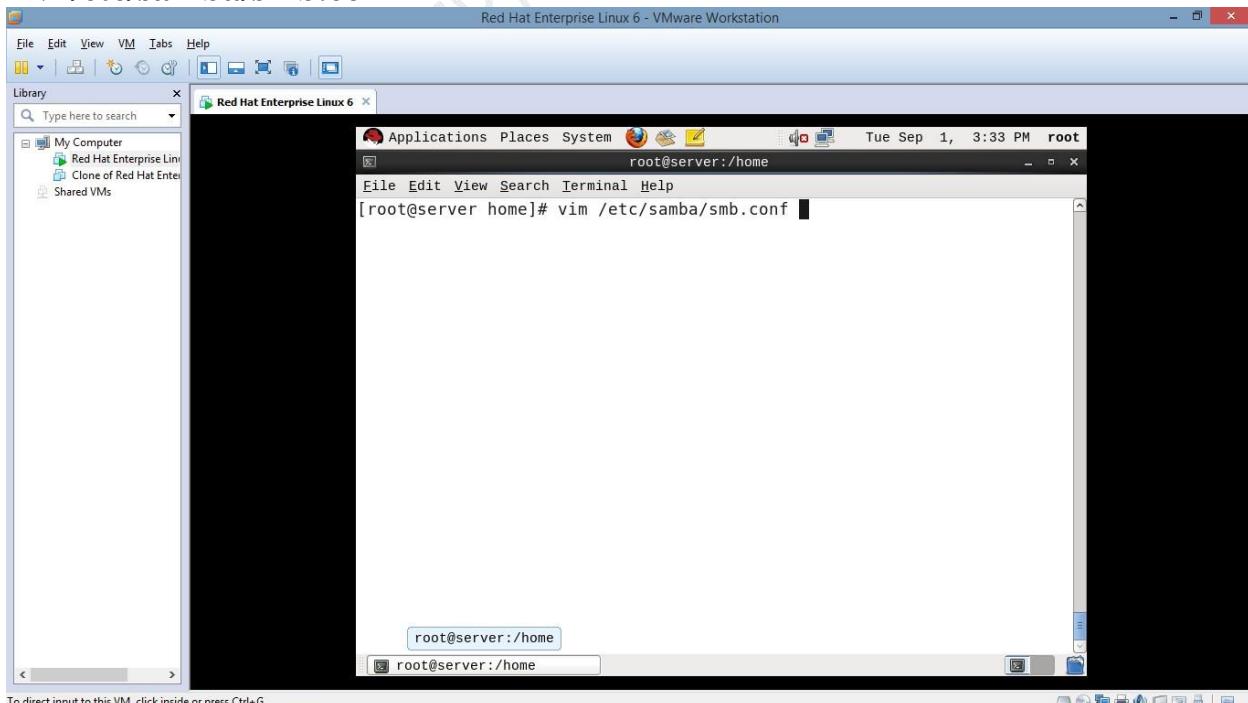
Also give this directory full permission.

**chmod -R 777 /tyit/**



Open the samba configuration file :

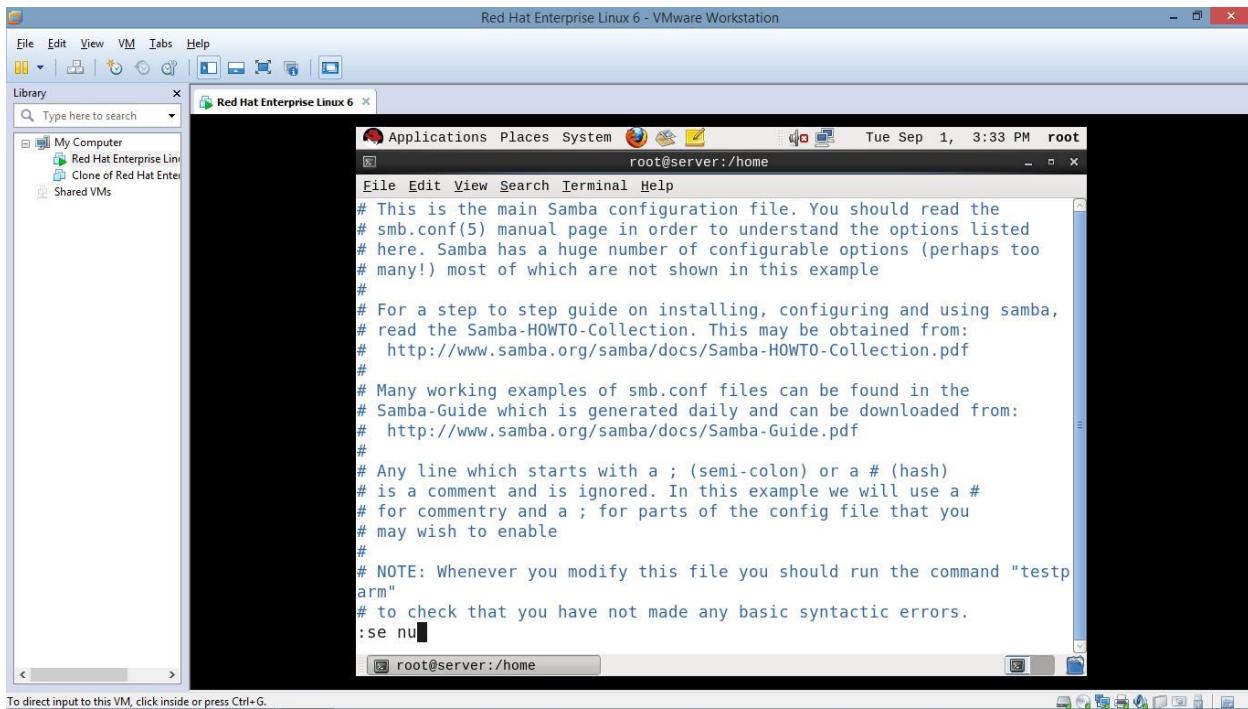
**# vi /etc/samba/smb.conf**



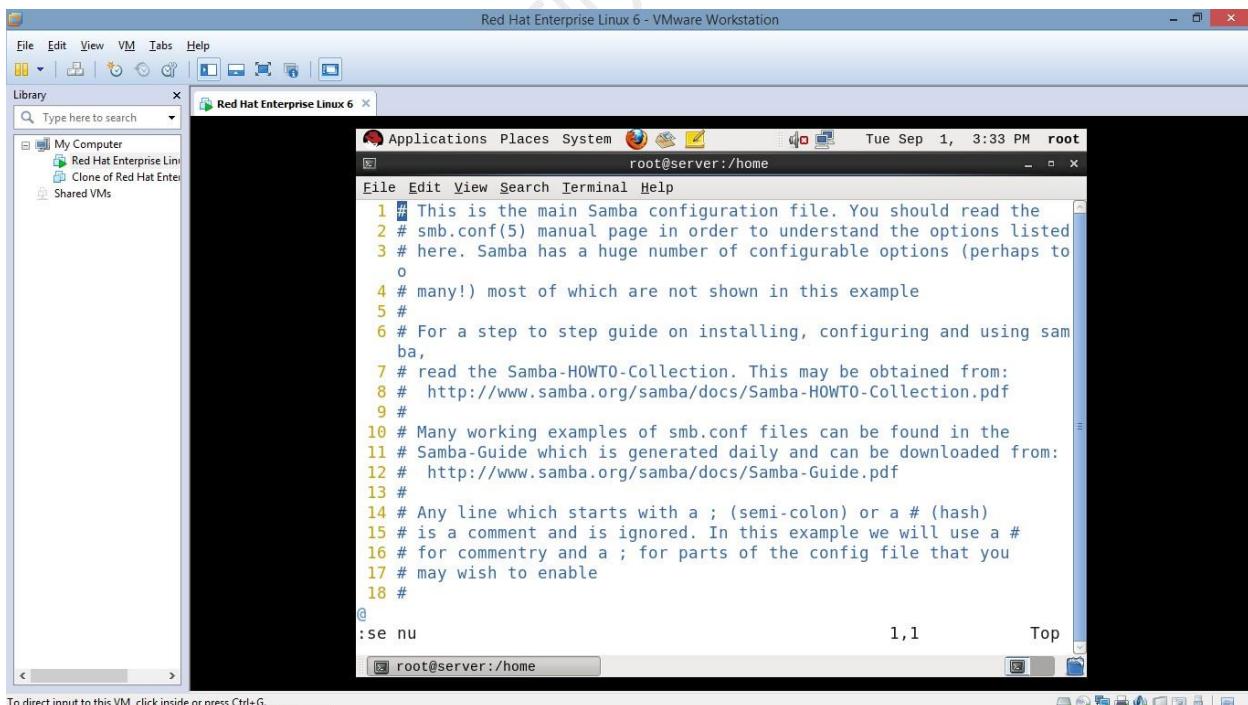
# Linux Administration Practical Manual

Make the following changes:

To set the line numbers - :se nu



```
# This is the main Samba configuration file. You should read the
# smb.conf(5) manual page in order to understand the options listed
# here. Samba has a huge number of configurable options (perhaps too
# many!) most of which are not shown in this example
#
# For a step to step guide on installing, configuring and using samba,
# read the Samba-HOWTO-Collection. This may be obtained from:
# http://www.samba.org/samba/docs/Samba-HOWTO-Collection.pdf
#
# Many working examples of smb.conf files can be found in the
# Samba-Guide which is generated daily and can be downloaded from:
# http://www.samba.org/samba/docs/Samba-Guide.pdf
#
# Any line which starts with a ; (semi-colon) or a # (hash)
# is a comment and is ignored. In this example we will use a #
# for commentary and a ; for parts of the config file that you
# may wish to enable
#
# NOTE: Whenever you modify this file you should run the command "testparm"
# to check that you have not made any basic syntactic errors.
:se nu
```



```
1 # This is the main Samba configuration file. You should read the
2 # smb.conf(5) manual page in order to understand the options listed
3 # here. Samba has a huge number of configurable options (perhaps to
4 # many!) most of which are not shown in this example
5 #
6 # For a step to step guide on installing, configuring and using sam
7 # ba,
8 # read the Samba-HOWTO-Collection. This may be obtained from:
9 # http://www.samba.org/samba/docs/Samba-HOWTO-Collection.pdf
10 #
11 # Many working examples of smb.conf files can be found in the
12 # Samba-Guide which is generated daily and can be downloaded from:
13 # http://www.samba.org/samba/docs/Samba-Guide.pdf
14 #
15 # Any line which starts with a ; (semi-colon) or a # (hash)
16 # is a comment and is ignored. In this example we will use a #
17 # for commentary and a ; for parts of the config file that you
18 #

@:se nu
```

# Linux Administration Practical Manual

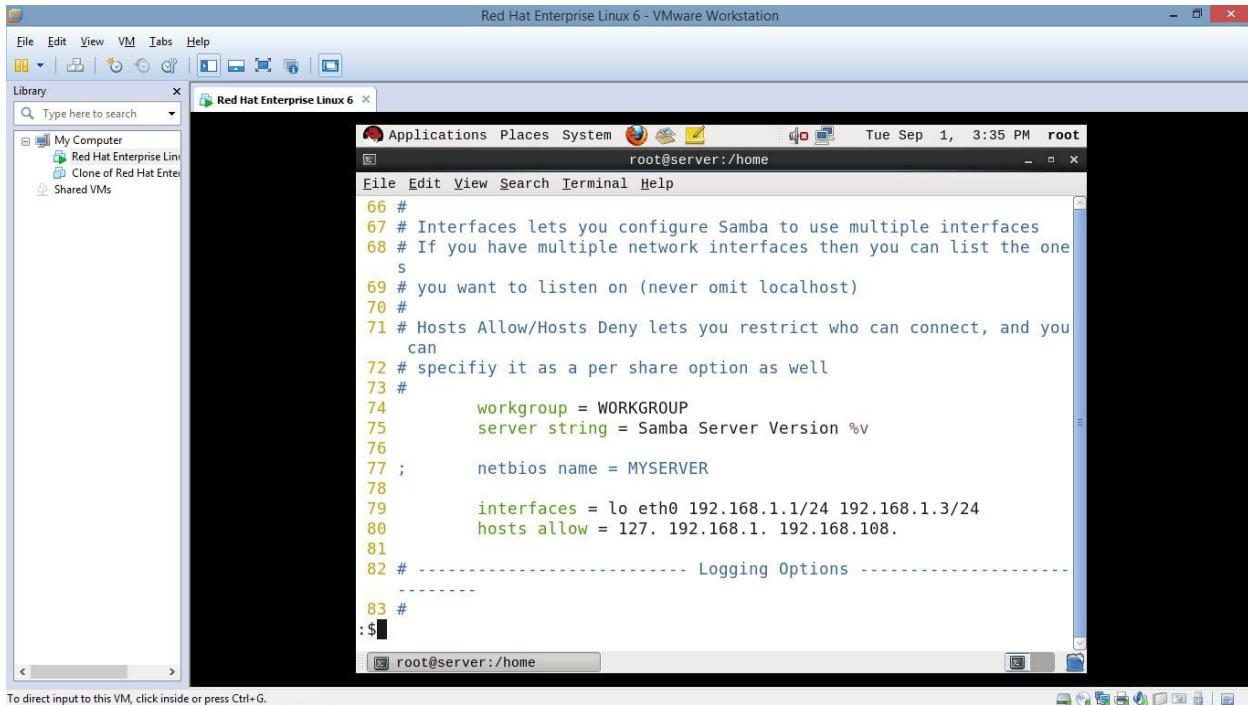
- a) Line no 74: workgroup=MYGROUP To workgroup=WORKGROUP(windows workgroup)
- b) Line no 79: eth0 192.168.1.1/24 192.168.1.3/24
- c) Line no 80: 127. 192.168.1. 192.168.108.

```
root@server:/home
File Edit View Search Terminal Help
1 # This is the main Samba configuration file. You should read the
2 # smb.conf(5) manual page in order to understand the options listed
3 # here. Samba has a huge number of configurable options (perhaps to
4 # many!) most of which are not shown in this example
5 #
6 # For a step to step guide on installing, configuring and using sam-
ba,
7 # read the Samba-HOWTO-Collection. This may be obtained from:
8 # http://www.samba.org/samba/docs/Samba-HOWTO-Collection.pdf
9 #
10 # Many working examples of smb.conf files can be found in the
11 # Samba-Guide which is generated daily and can be downloaded from:
12 # http://www.samba.org/samba/docs/Samba-Guide.pdf
13 #
14 # Any line which starts with a ; (semi-colon) or a # (hash)
15 # is a comment and is ignored. In this example we will use a #
16 # for commentary and a ; for parts of the config file that you
17 # may wish to enable
18 #
@:74
```

```
root@server:/home
File Edit View Search Terminal Help
66 #
67 # Interfaces lets you configure Samba to use multiple interfaces
68 # If you have multiple network interfaces then you can list the one
# s
69 # you want to listen on (never omit localhost)
70 #
71 # Hosts Allow/Hosts Deny lets you restrict who can connect, and you
# can
72 # specify it as a per share option as well
73 #
74     workgroup = WORKGROUP
75     server string = Samba Server Version %v
76
77 ;     netbios name = MYSERVER
78
79     interfaces = lo eth0 192.168.1.1/24 192.168.1.3/24
80     hosts allow = 127. 192.168.1. 192.168.108.
81
82 # ----- Logging Options -----
83 #
```

# Linux Administration Practical Manual

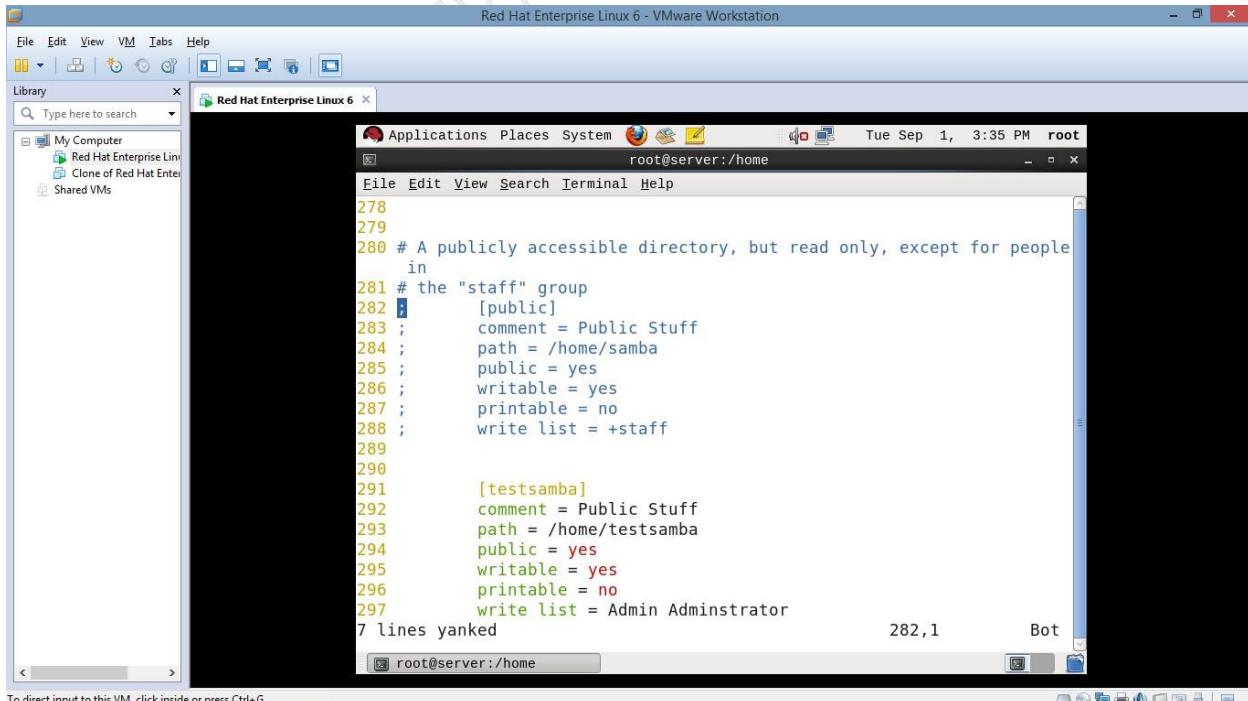
Now go to end of the file -> Press Esc -> :\$



```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library Type here to search
My Computer
Red Hat Enterprise Lin
Clone of Red Hat Ente
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System root@server:/home Tue Sep 1, 3:35 PM root
File Edit View Search Terminal Help
66 #
67 # Interfaces lets you configure Samba to use multiple interfaces
68 # If you have multiple network interfaces then you can list the one
   s
69 # you want to listen on (never omit localhost)
70 #
71 # Hosts Allow/Hosts Deny lets you restrict who can connect, and you
   can
72 # specify it as a per share option as well
73 #
74      workgroup = WORKGROUP
75      server string = Samba Server Version %v
76
77 ;      netbios name = MYSERVER
78
79      interfaces = lo eth0 192.168.1.1/24 192.168.1.3/24
80      hosts allow = 127. 192.168.1. 192.168.108.
81
82 # ----- Logging Options -----
83 #
:$
```

To direct input to this VM, click inside or press Ctrl+G.

- d) At the end of the file copy 7 lines and paste it.
- e) To copy 7 lines - type 7yy

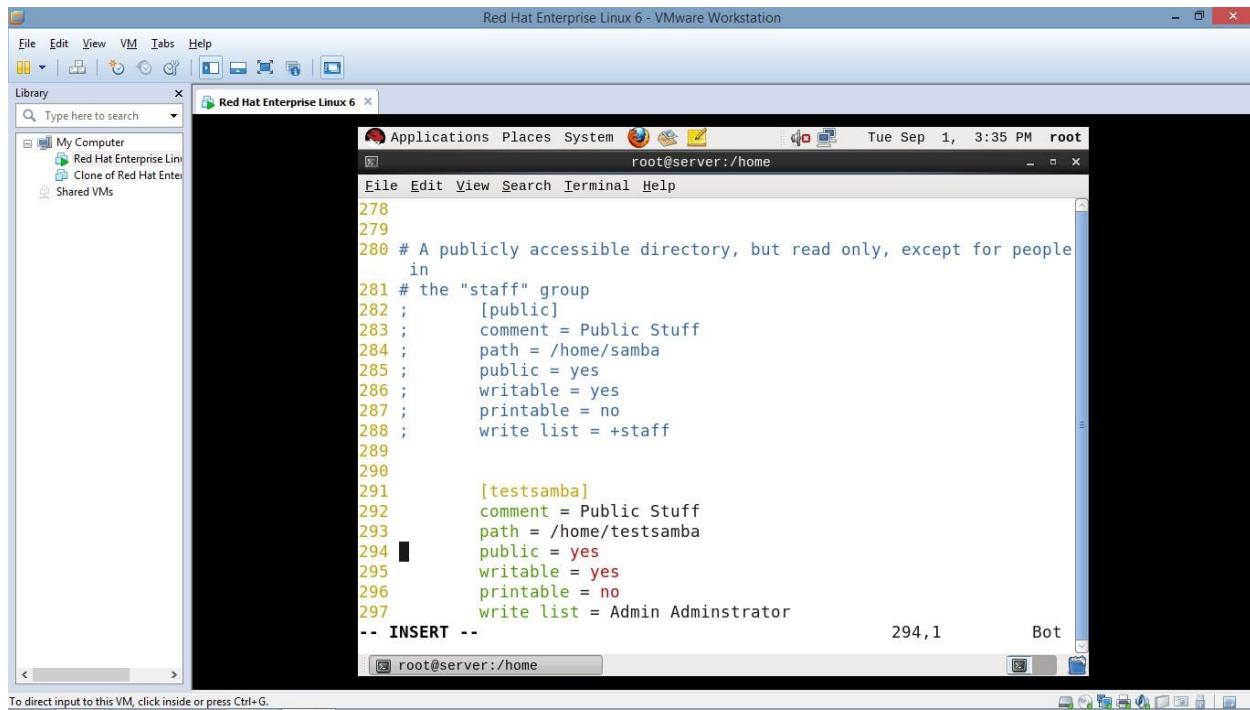


```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library Type here to search
My Computer
Red Hat Enterprise Lin
Clone of Red Hat Ente
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System root@server:/home Tue Sep 1, 3:35 PM root
File Edit View Search Terminal Help
278
279
280 # A publicly accessible directory, but read only, except for people
   in
281 # the "staff" group
282 ;      [public]
283 ;      comment = Public Stuff
284 ;      path = /home/samba
285 ;      public = yes
286 ;      writable = yes
287 ;      printable = no
288 ;      write list = +staff
289
290
291      [testsamba]
292      comment = Public Stuff
293      path = /home/testsamba
294      public = yes
295      writable = yes
296      printable = no
297      write list = Admin Administrator
7 lines yanked
282,1
Bot
```

To direct input to this VM, click inside or press Ctrl+G.

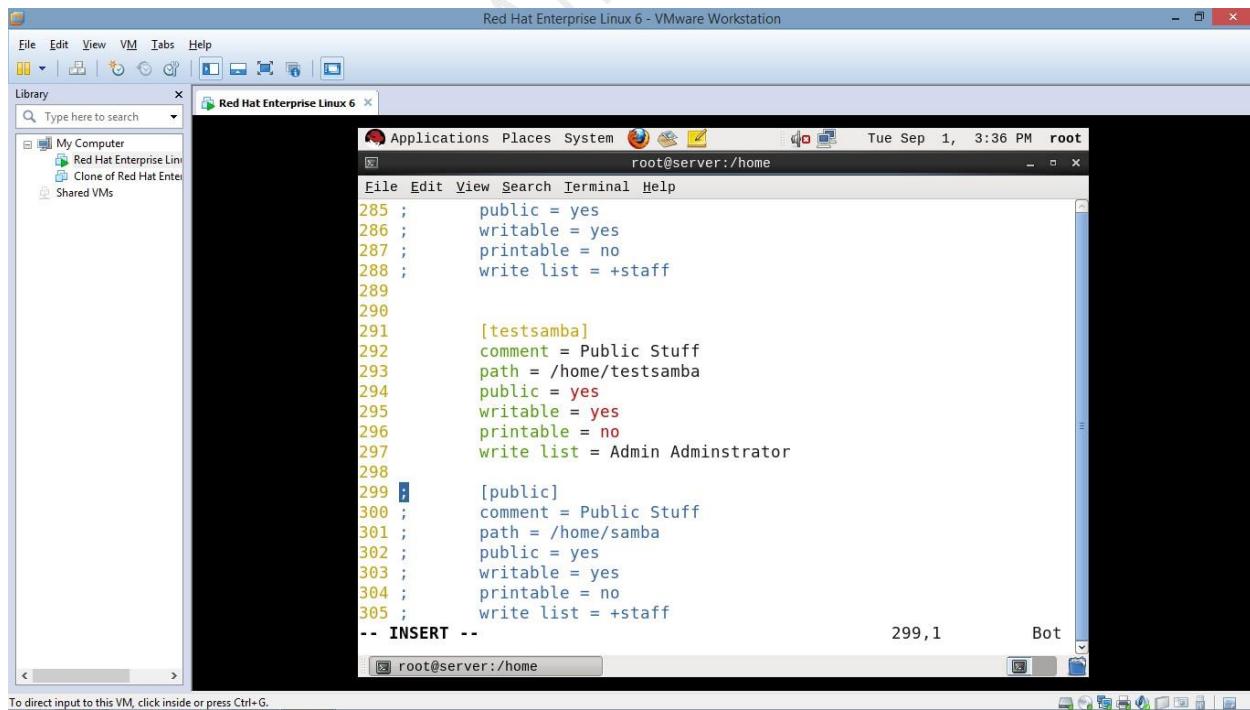
# Linux Administration Practical Manual

Go to Insert mode -> press ‘ i ’ -> press Enter and now paste it at the end



```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library Type here to search
My Computer Red Hat Enterprise Lin Clone of Red Hat Ent Shared VMs
Red Hat Enterprise Linux 6
Applications Places System Tue Sep 1, 3:35 PM root
root@server:/home
File Edit View Search Terminal Help
278
279
280 # A publicly accessible directory, but read only, except for people
in
281 # the "staff" group
282 ; [public]
283 ; comment = Public Stuff
284 ; path = /home/samba
285 ; public = yes
286 ; writable = yes
287 ; printable = no
288 ; write list = +staff
289
290
291 ; [testsamba]
292 ; comment = Public Stuff
293 ; path = /home/testsamba
294 ; public = yes
295 ; writable = yes
296 ; printable = no
297 ; write list = Admin Administrator
-- INSERT --
294,1 Bot
root@server:/home
To direct input to this VM, click inside or press Ctrl+G.
```

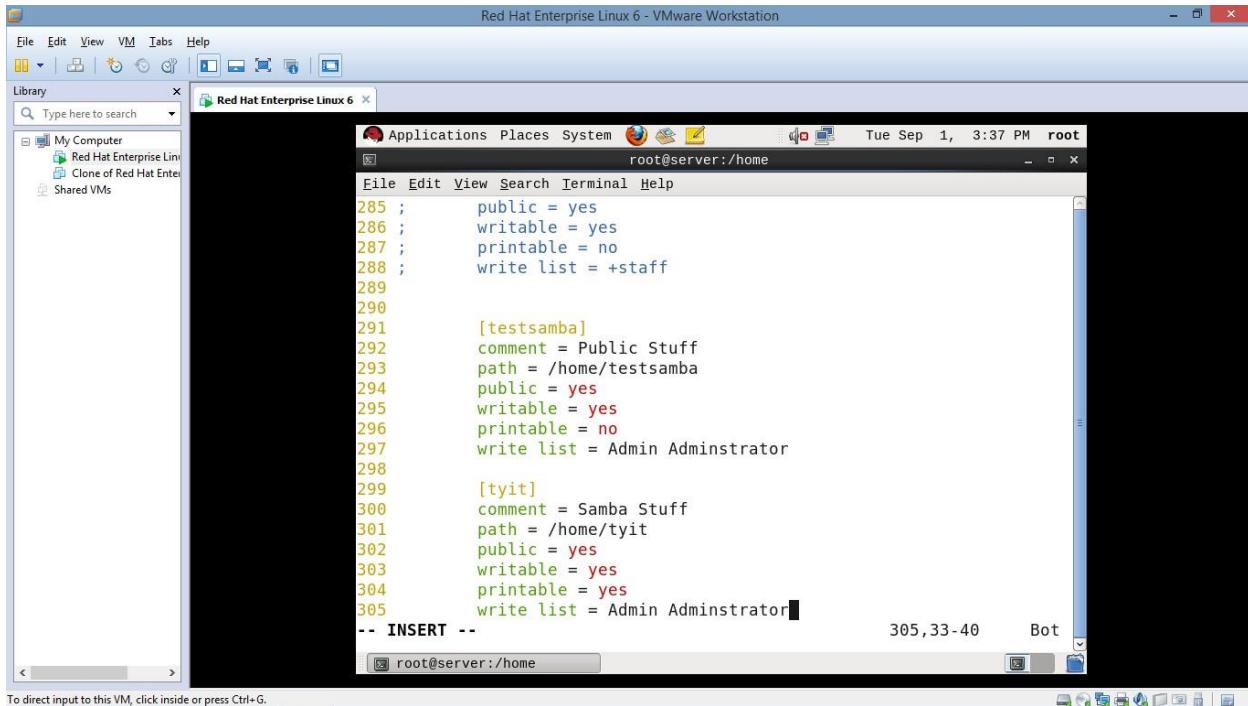
To paste come out of Insert Mode – Press Esc Key -> press ‘p’



```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library Type here to search
My Computer Red Hat Enterprise Lin Clone of Red Hat Ent Shared VMs
Red Hat Enterprise Linux 6
Applications Places System Tue Sep 1, 3:36 PM root
root@server:/home
File Edit View Search Terminal Help
285 ; public = yes
286 ; writable = yes
287 ; printable = no
288 ; write list = +staff
289
290
291 ; [testsamba]
292 ; comment = Public Stuff
293 ; path = /home/testsamba
294 ; public = yes
295 ; writable = yes
296 ; printable = no
297 ; write list = Admin Administrator
298
299 ; [public]
300 ; comment = Public Stuff
301 ; path = /home/samba
302 ; public = yes
303 ; writable = yes
304 ; printable = no
305 ; write list = +staff
-- INSERT --
299,1 Bot
root@server:/home
To direct input to this VM, click inside or press Ctrl+G.
```

# Linux Administration Practical Manual

Uncomment all the 7 lines and make the following changes.

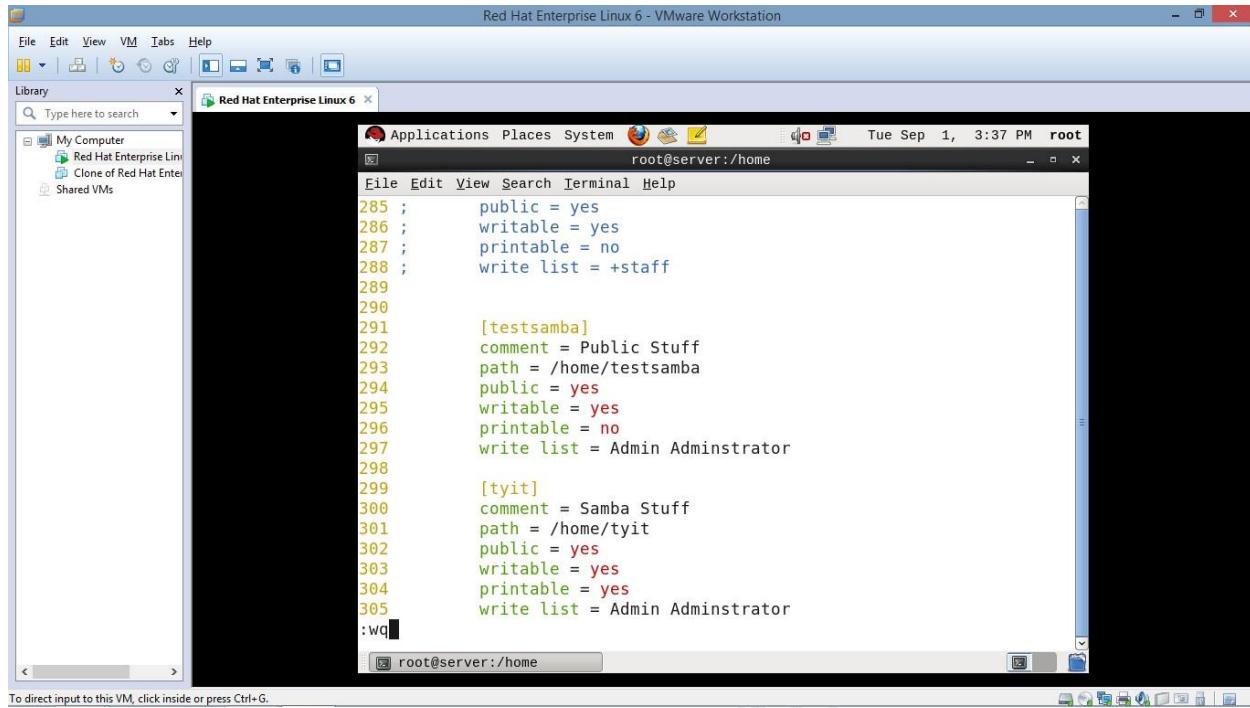


After changes line should look as follows:

[tyit]  
comment = samba stuff  
path = /tyit  
public=yes  
writable =yes  
;printable =yes  
write list = Admin Administrator

Save the configuration file - > Press Esc Key and type :wq

# Linux Administration Practical Manual

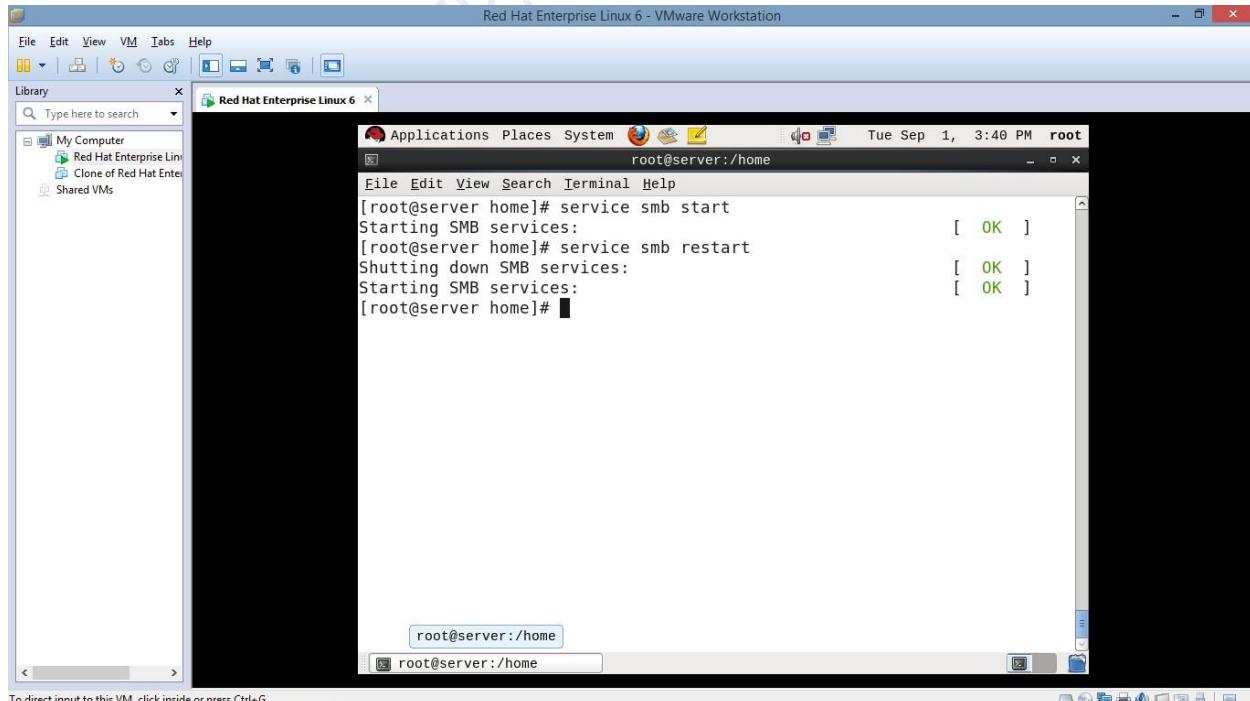


```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library Type here to search
My Computer
Red Hat Enterprise Lin
Clone of Red Hat Ente
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System root@server:/home
Tue Sep 1, 3:37 PM root
File Edit View Search Terminal Help
285 ; public = yes
286 ; writable = yes
287 ; printable = no
288 ; write list = +staff
289
290
291 [testsamba]
292 comment = Public Stuff
293 path = /home/testsamba
294 public = yes
295 writable = yes
296 printable = no
297 write list = Admin Administrator
298
299 [tyit]
300 comment = Samba Stuff
301 path = /home/tyit
302 public = yes
303 writable = yes
304 printable = yes
305 write list = Admin Administrator
:wq
root@server:/home
```

To direct input to this VM, click inside or press Ctrl+G.

Now start the smb service

```
#] service smb start
#] service smb restart
```

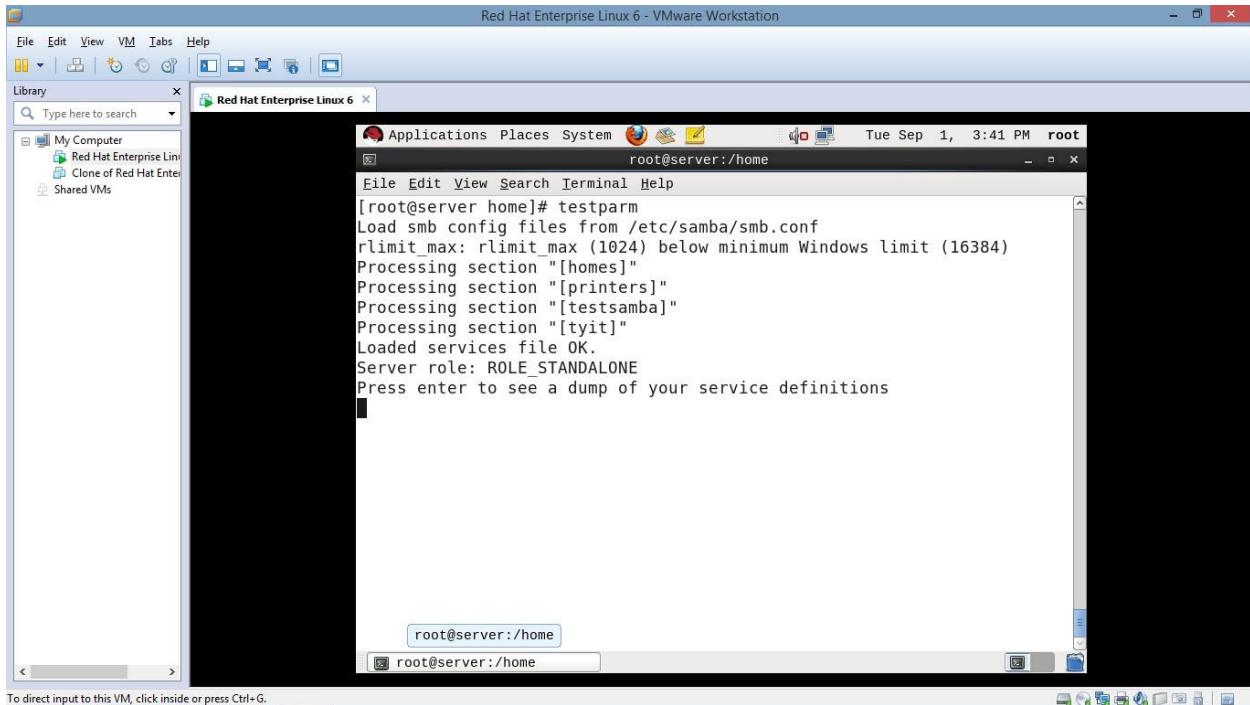


```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library Type here to search
My Computer
Red Hat Enterprise Lin
Clone of Red Hat Ente
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System root@server:/home
Tue Sep 1, 3:40 PM root
File Edit View Search Terminal Help
[root@server home]# service smb start
Starting SMB services: [ OK ]
[root@server home]# service smb restart
Shutting down SMB services: [ OK ]
Starting SMB services: [ OK ]
[root@server home]#
```

To direct input to this VM, click inside or press Ctrl+G.

# Linux Administration Practical Manual

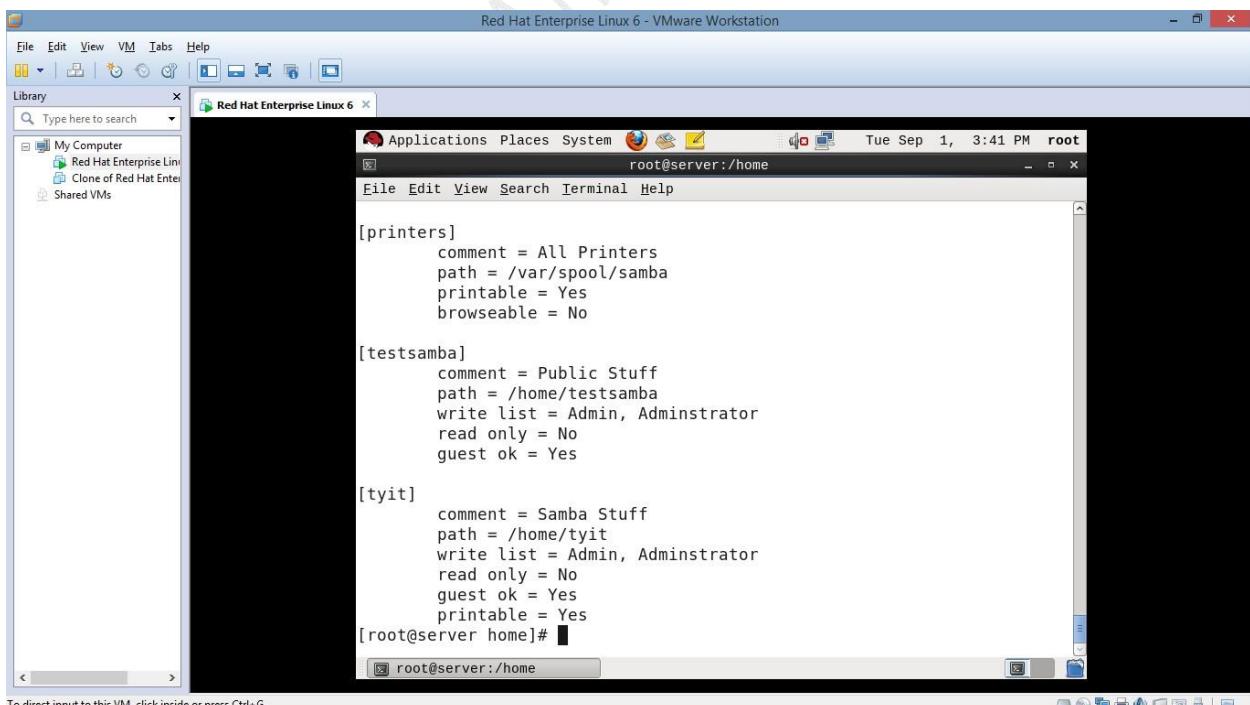
Execute the command testparm to test the parameters



```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Red Hat Enterprise Lin
Clone of Red Hat Ente
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System root@server:/home Tue Sep 1, 3:41 PM root
File Edit View Search Terminal Help
[root@server ~]# testparm
Load smb config files from /etc/samba/smb.conf
rlimit_max: rlimit_max (1024) below minimum Windows limit (16384)
Processing section "[homes]"
Processing section "[printers]"
Processing section "[testsamba]"
Processing section "[tyit]"
Loaded services file OK.
Server role: ROLE_STANDALONE
Press enter to see a dump of your service definitions
[

root@server:/home
root@server:/home
```

To direct input to this VM, click inside or press Ctrl+G.



```
Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Red Hat Enterprise Lin
Clone of Red Hat Ente
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System root@server:/home Tue Sep 1, 3:41 PM root
File Edit View Search Terminal Help
[printers]
comment = All Printers
path = /var/spool/samba
printable = Yes
browseable = No

[testsamba]
comment = Public Stuff
path = /home/testsamba
write list = Admin, Administrator
read only = No
guest ok = Yes

[tyit]
comment = Samba Stuff
path = /home/tyit
write list = Admin, Administrator
read only = No
guest ok = Yes
printable = Yes
[root@server ~]#
```

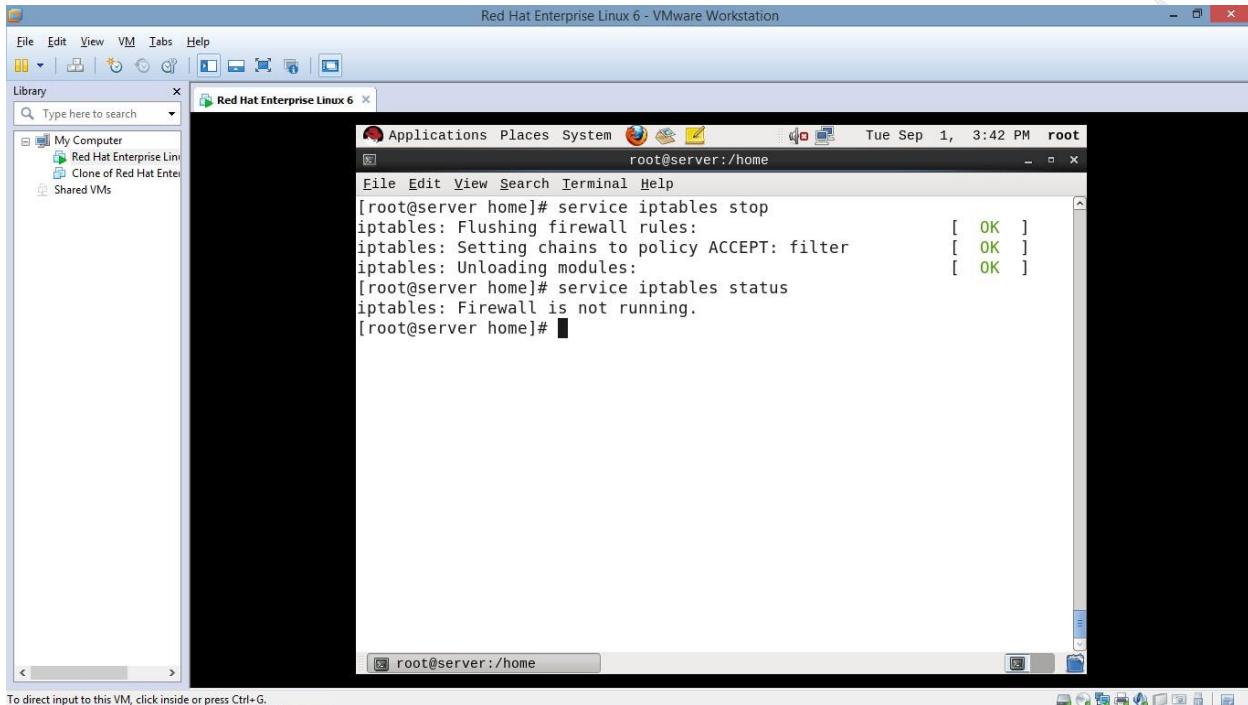
To direct input to this VM, click inside or press Ctrl+G.

## Stop Firewalls

```
# service iptables stop
```

To check whether firewalls are stopped

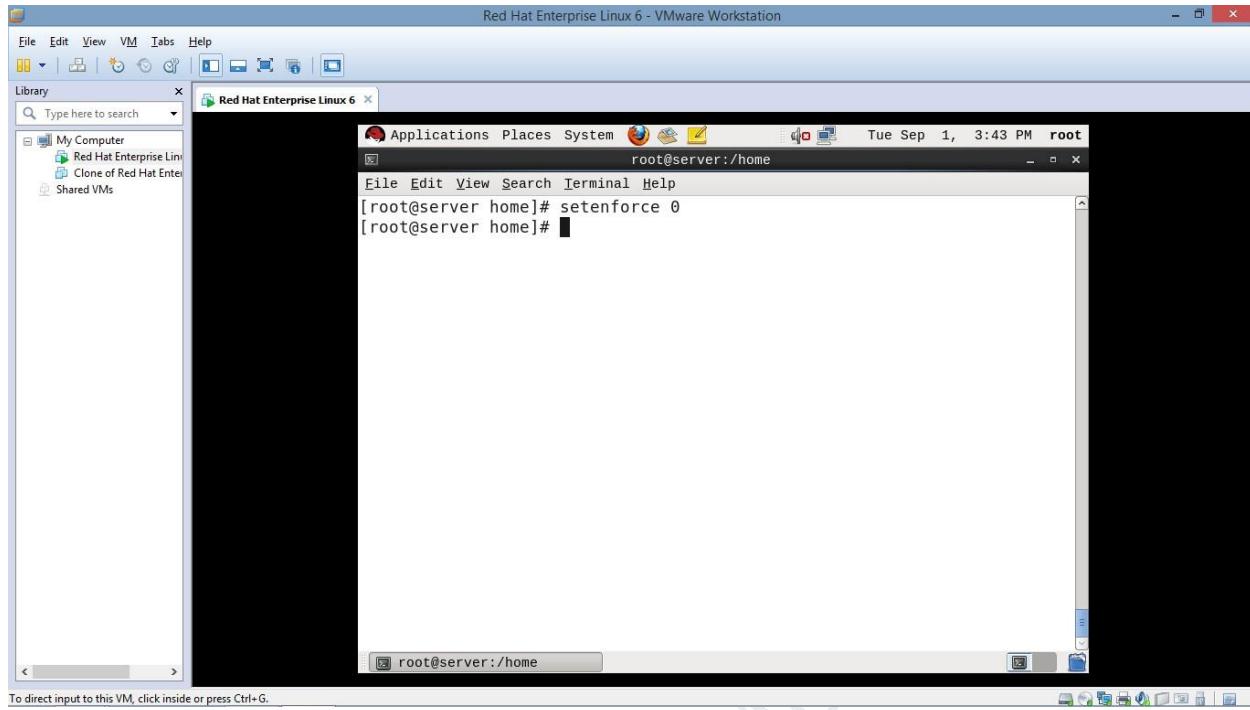
```
# service iptables status
```



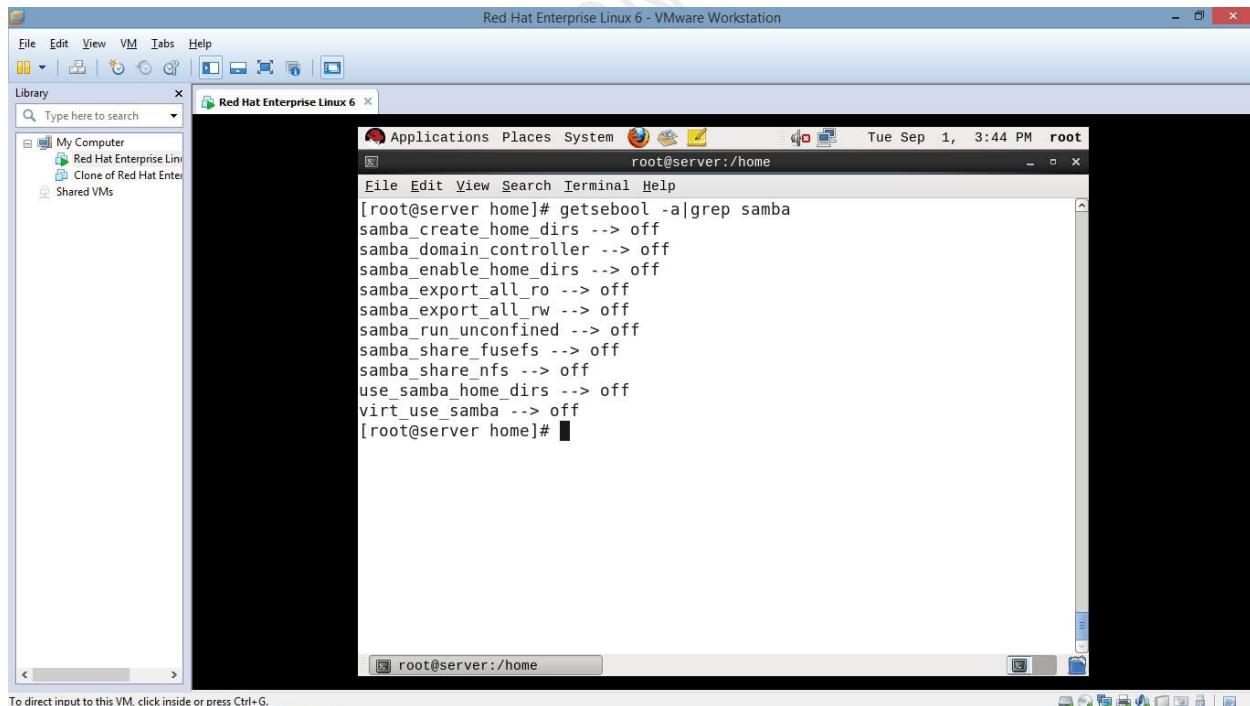
To give temporary read only permissions

```
# setenforce 0
```

# Linux Administration Practical Manual



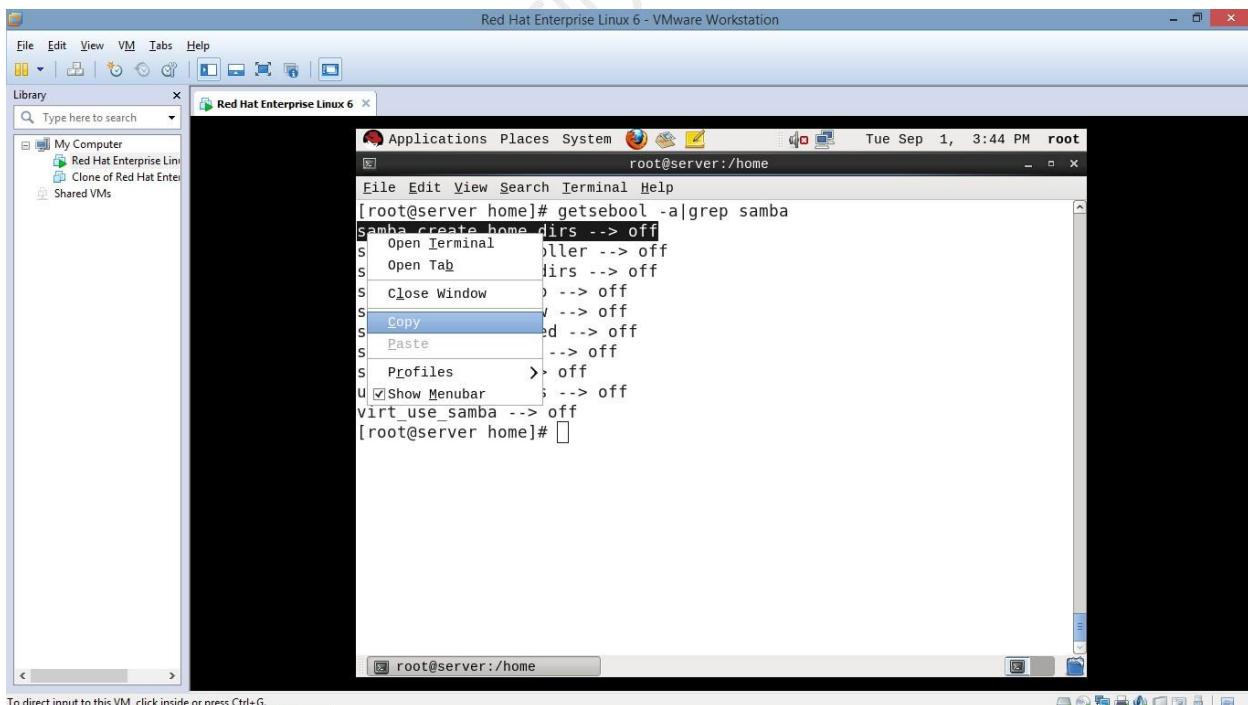
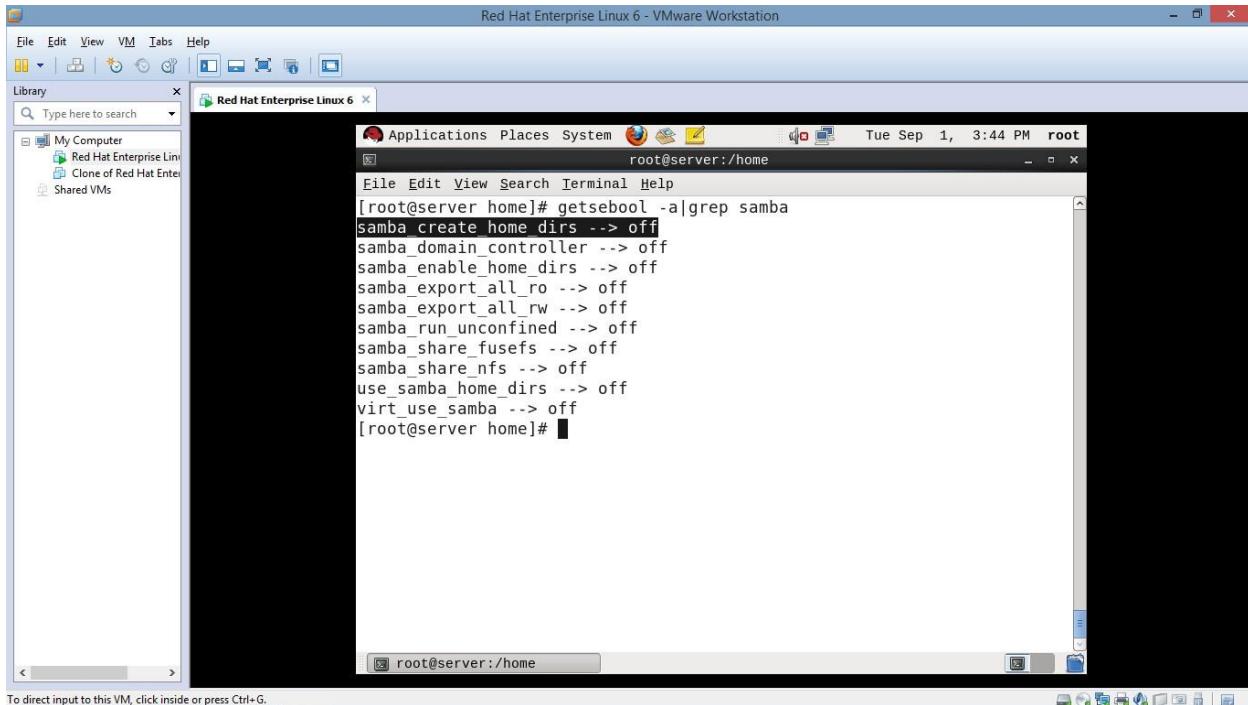
```
# getsebool -a | grep samba
```



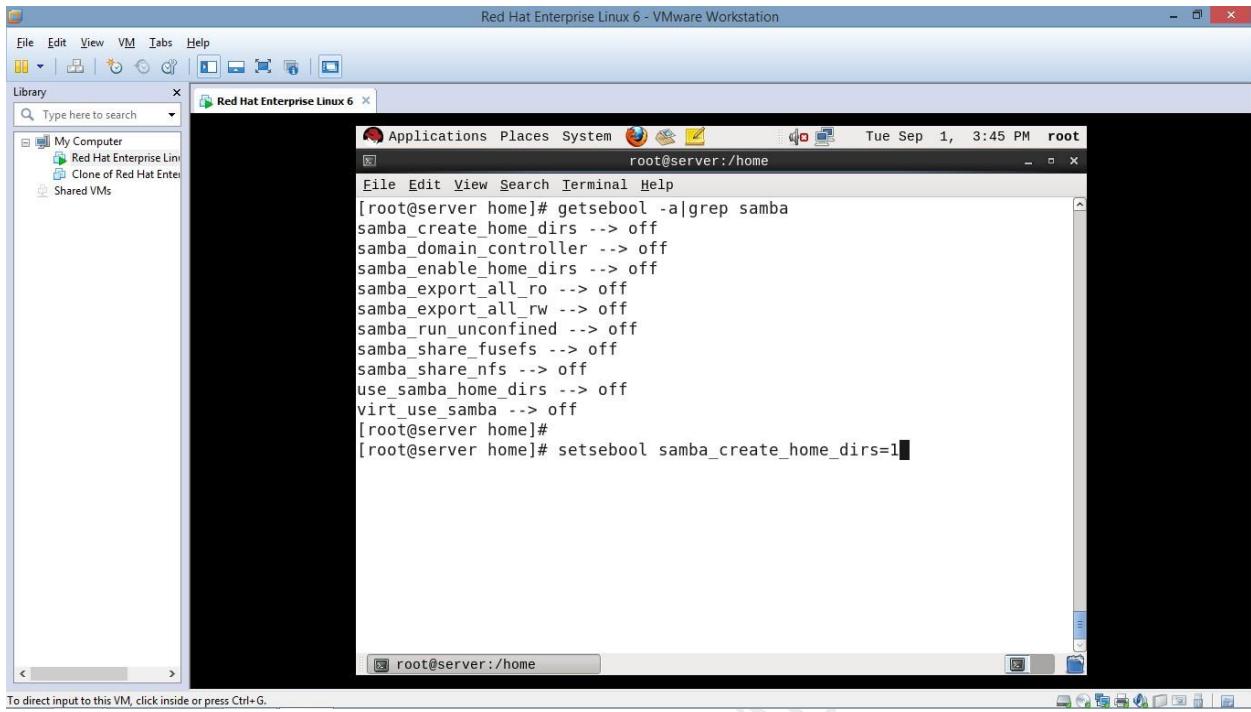
In this file home directory is off

To make it on copy first line and paste with setsebool command as follows

#setsebool samba\_enable\_home\_dirs=1



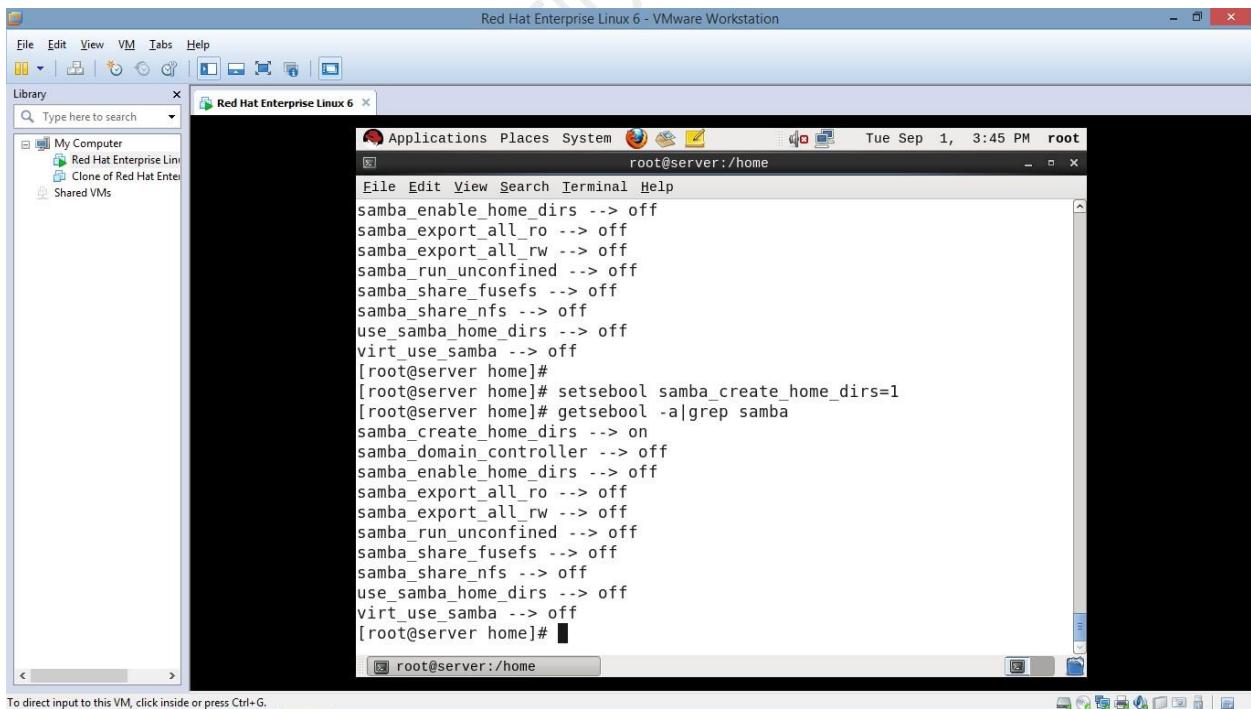
# Linux Administration Practical Manual



```
File Edit View Terminal Help
[root@server home]# getsebool -a|grep samba
samba_create_home_dirs --> off
samba_domain_controller --> off
samba_enable_home_dirs --> off
samba_export_all_ro --> off
samba_export_all_rw --> off
samba_run_unconfined --> off
samba_share_fusefs --> off
samba_share_nfs --> off
use_samba_home_dirs --> off
virt_use_samba --> off
[root@server home]#
[root@server home]# setsebool samba_create_home_dirs=1
```

Now to check whether home directory is enabled:

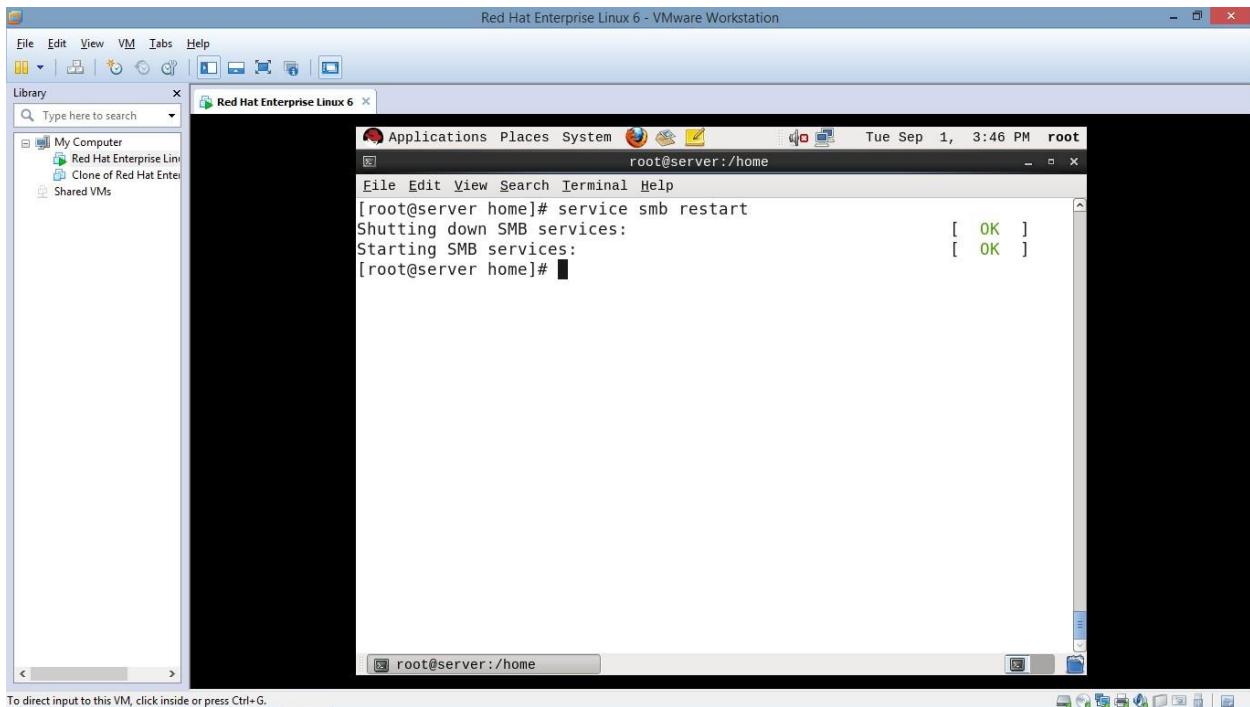
**# getsebool –a | grep samba**



```
File Edit View Terminal Help
[root@server home]# getsebool -a|grep samba
samba_enable_home_dirs --> off
samba_export_all_ro --> off
samba_export_all_rw --> off
samba_run_unconfined --> off
samba_share_fusefs --> off
samba_share_nfs --> off
use_samba_home_dirs --> off
virt_use_samba --> off
[root@server home]#
[root@server home]# setsebool samba_create_home_dirs=1
[root@server home]# getsebool -a|grep samba
samba_create_home_dirs --> on
samba_domain_controller --> off
samba_enable_home_dirs --> off
samba_export_all_ro --> off
samba_export_all_rw --> off
samba_run_unconfined --> off
samba_share_fusefs --> off
samba_share_nfs --> off
use_samba_home_dirs --> off
virt_use_samba --> off
[root@server home]#
```

Restart the samba service

```
# service smb restart
```



Create a samba user and assign password

```
# useradd test1
```

```
# smbpasswd -a test1
```

# Linux Administration Practical Manual

Enter the password and confirm password

The screenshot shows a VMware Workstation interface with a single virtual machine running Red Hat Enterprise Linux 6. The terminal window is titled "Red Hat Enterprise Linux 6". The command history shows:

```
[root@server ~]# useradd test1
[root@server ~]# smbpasswd -a test1
New SMB password:
Retype new SMB password:
Added user test1.
```

The terminal window has a title bar with "root@server:/home" and a status bar at the bottom. The VMware toolbar and library are visible on the left.

Restart the service

**# service smb restart**

The screenshot shows a VMware Workstation interface with a single virtual machine running Red Hat Enterprise Linux 6. The terminal window is titled "Red Hat Enterprise Linux 6". The command history shows:

```
[root@server ~]# service smb restart
Shutting down SMB services: [ OK ]
Starting SMB services: [ OK ]
```

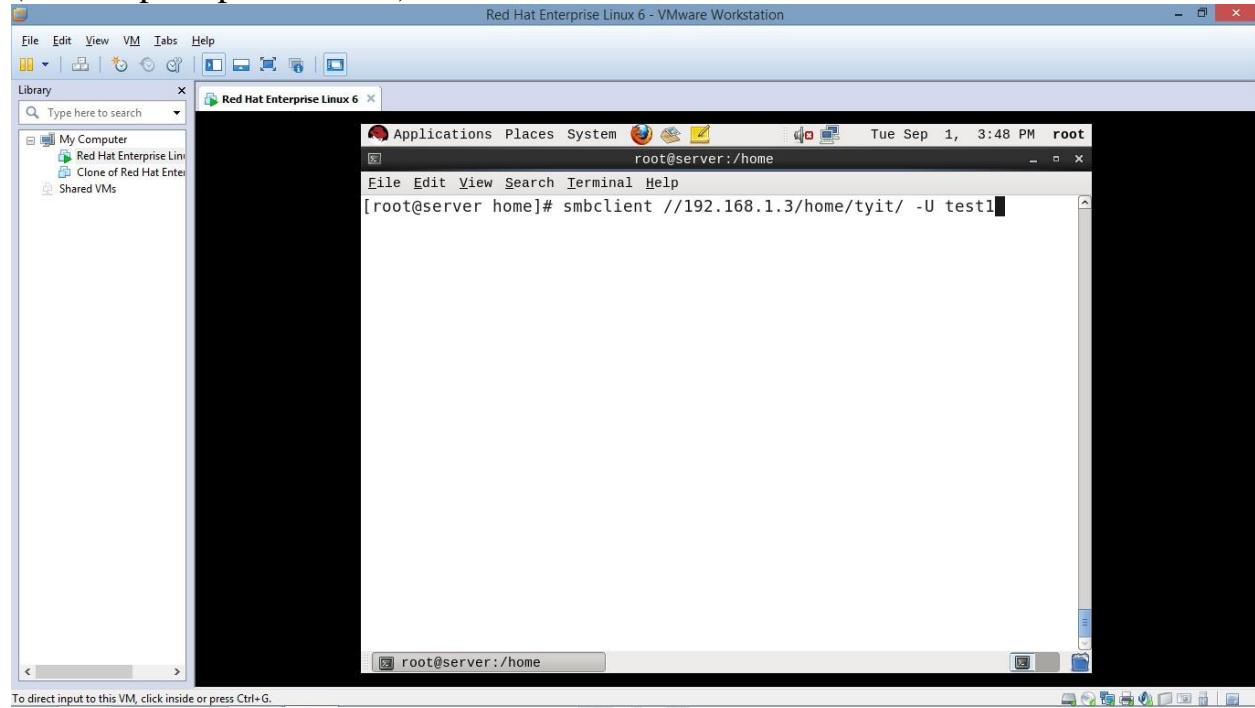
The terminal window has a title bar with "root@server:/home" and a status bar at the bottom. The VMware toolbar and library are visible on the left.

# Linux Administration Practical Manual

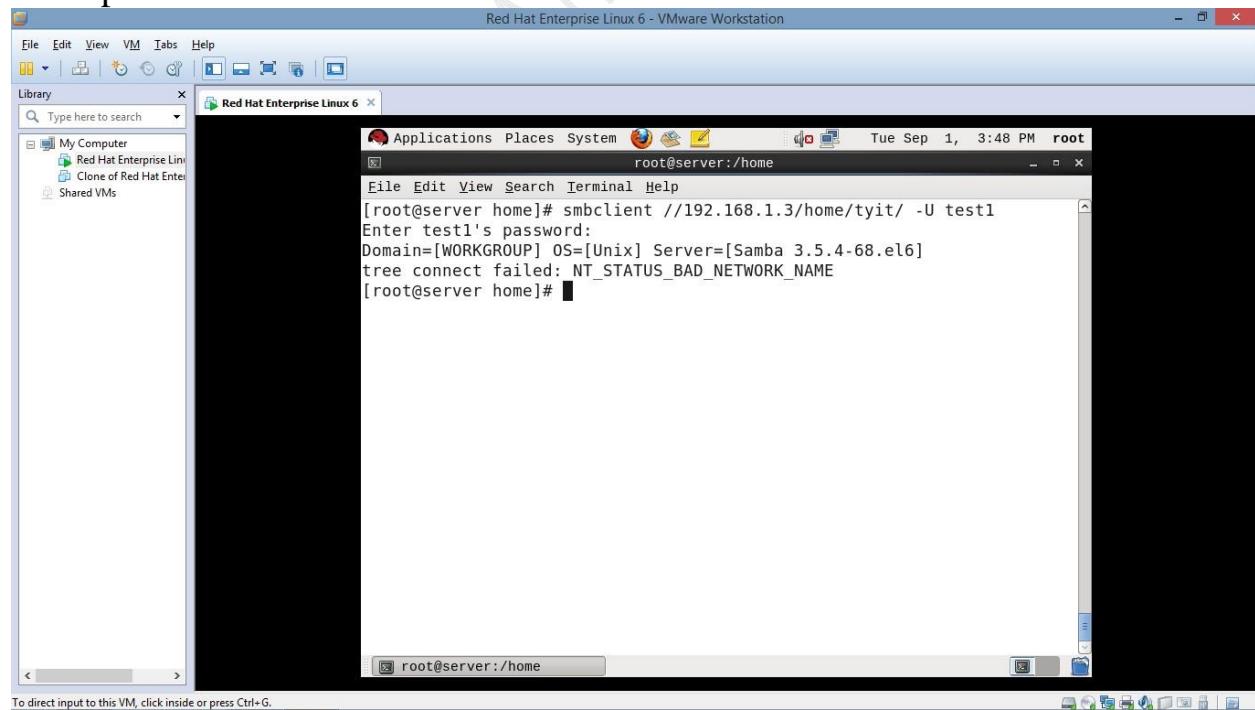
---

**#smbclient //192.168.1.3/home/tyit/ -U test1**

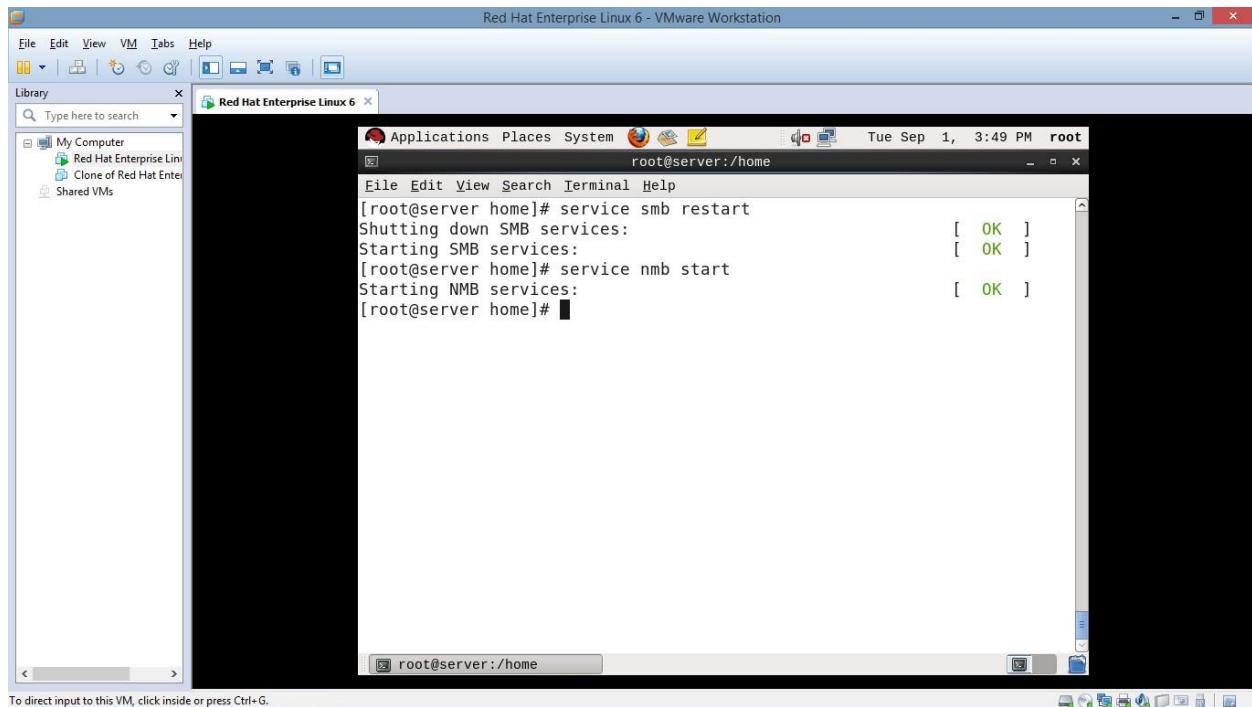
(-U will prompt username)



Enter password :



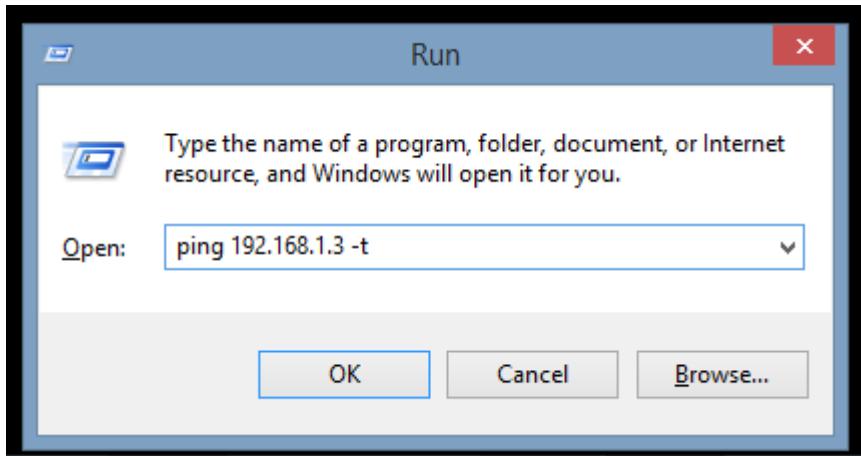
```
# service smb restart  
# service nmb start //start network services
```



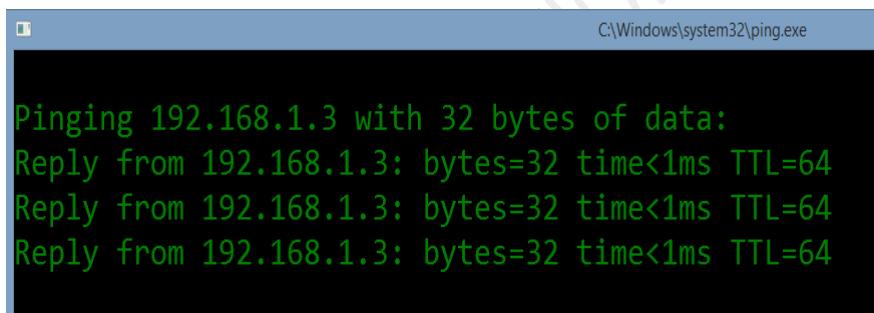
## Go to Windows

Run Command

Type **ping 192.168.1.3 -t**



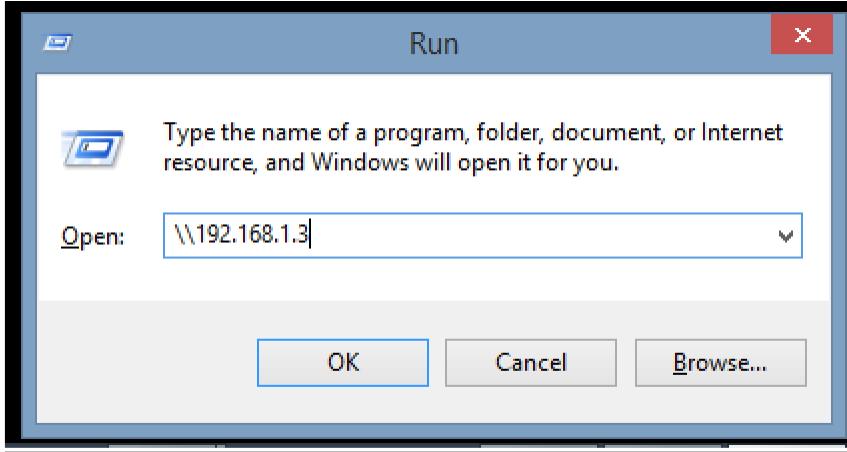
Check whether reply and response is working fine.



Close

Now to check whether files are been transferred from Samba to Windows

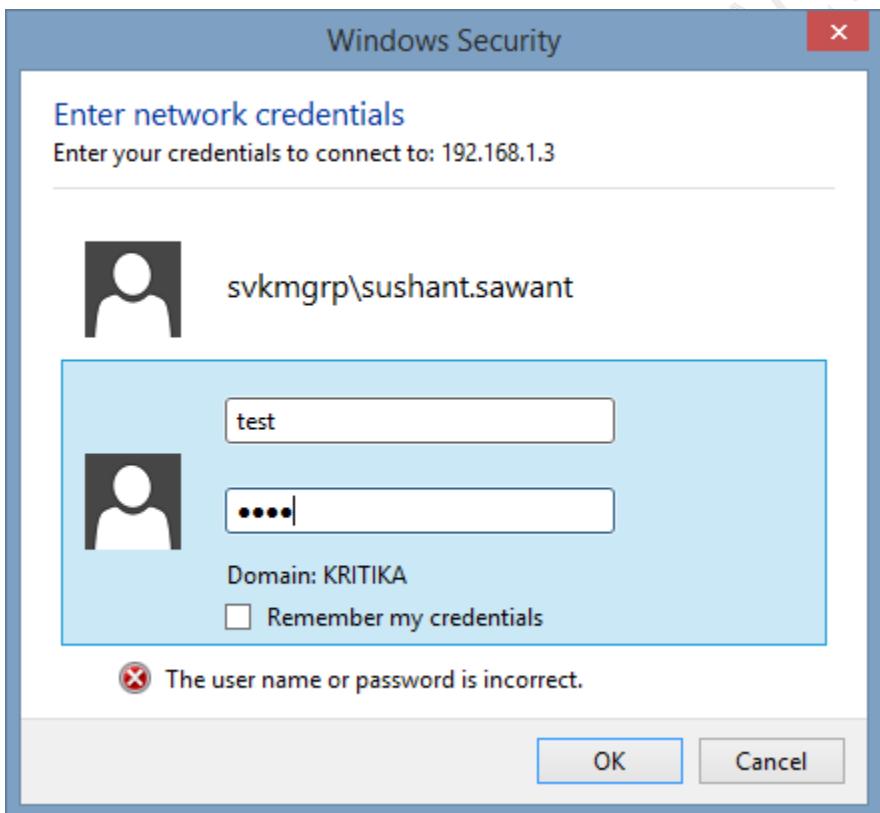
Run -> <\\192.168.1.3>



It will prompt one dialog box asking for username and password

Enter Username – test1

Enter Password - \*\*\*\*\*

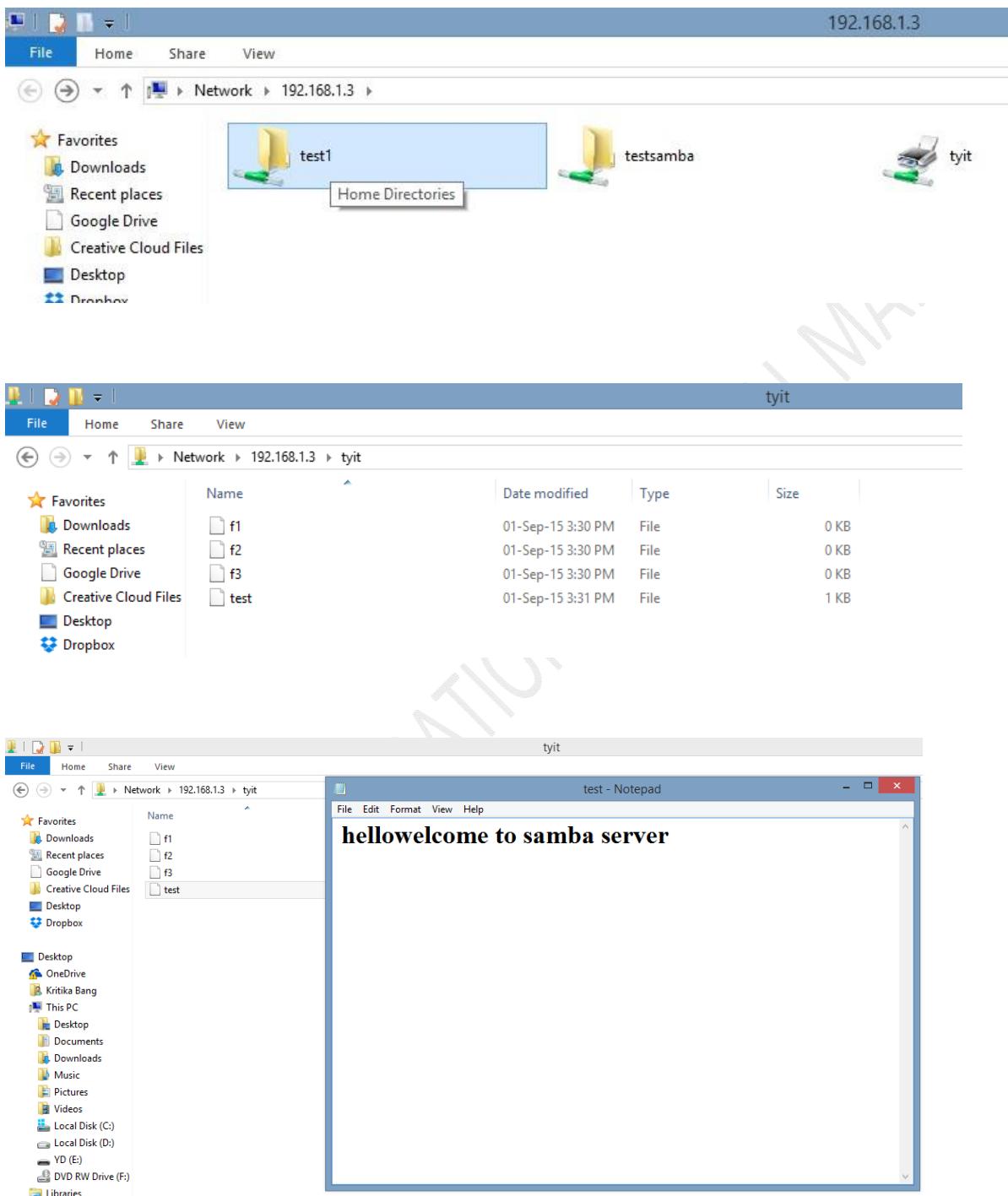


Now you will be able to see that files are transferred.

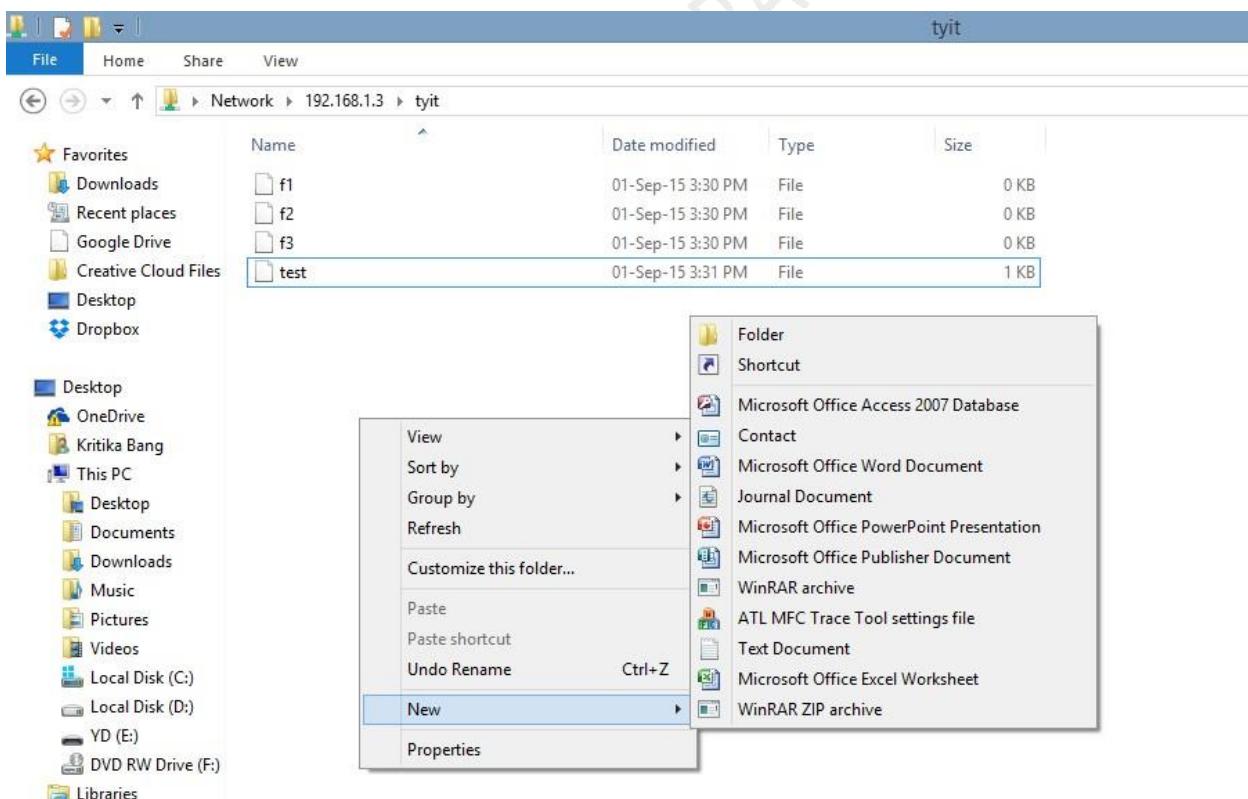
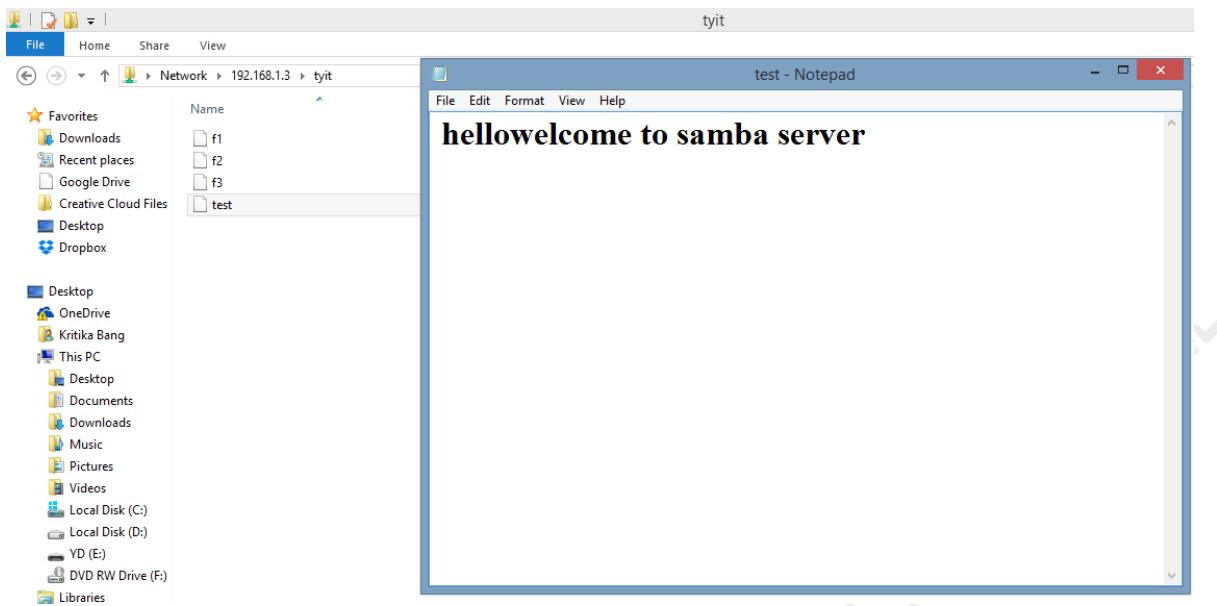
Now create a folder in Windows and check whether files from windows are

# Linux Administration Practical Manual

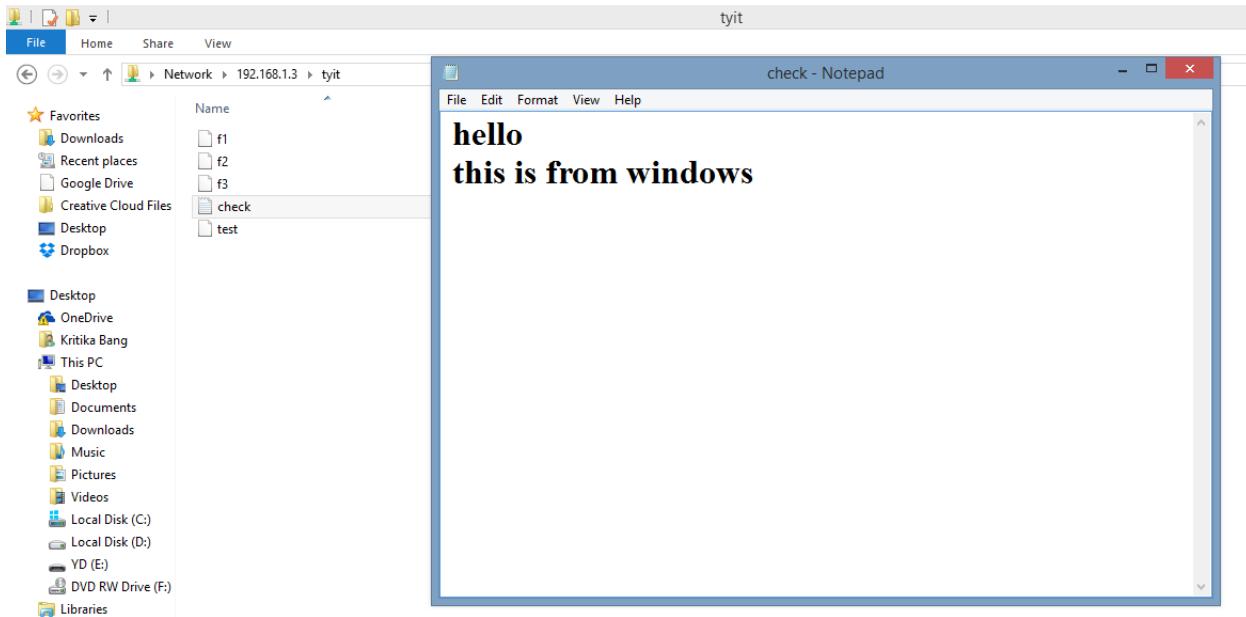
transferred to Linux



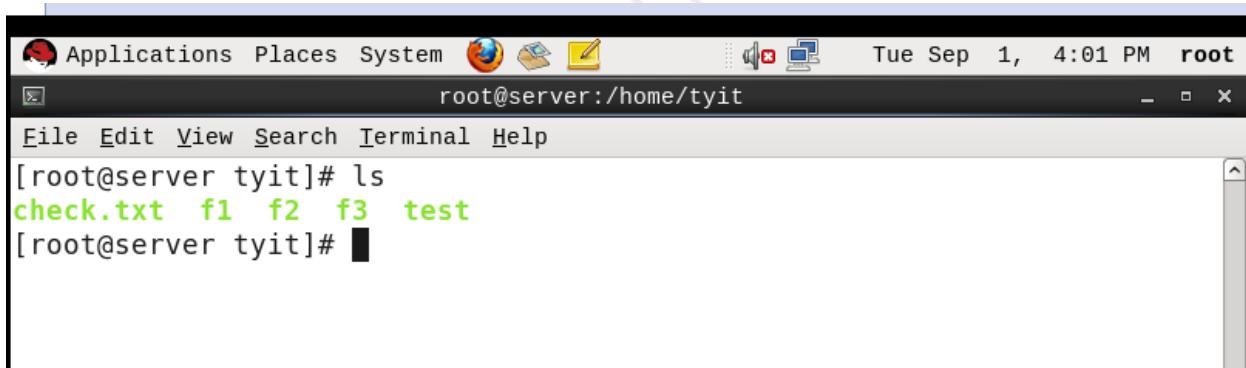
# Linux Administration Practical Manual



# Linux Administration Practical Manual



In Linux – # ls



Files are transferred.

**Summary :** This practical shows how files are transferred from Linux to Windows and Windows to Linux.

## **Practical no 6: Configure DHCP server and client**

DHCP, or Dynamic Host Configuration Protocol, allows an administrator to configure network settings for all clients on a central server. The DHCP clients request an IP address and other network settings from the DHCP server on the network. The DHCP server in turn leases the client an IP address within a given range or leases the client an IP address based on the MAC address of the client's network interface card (NIC). The information includes its IP address, along with the network's name server, gateway, and proxy addresses including the netmask. Nothing has to be configured manually on the local system, except to specify the DHCP server it should get its network configuration from. If an IP address is assigned according to the MAC address of the client's NIC, the same IP address can be leased to the client every time the client requests one. DHCP makes network administration easier and less prone to error.

### **Configure dhcp server**

We will configure a dhcp server and will lease ip address to clients. we are using two systems one linux server one linux clients. dhcp rpm is required to configure dhcp server.

Step 1 :- First we have to check whether DHCP is available on our machine or not that we can check with rpm command.

**#rpm -qa dhcp**

Step 2:- If DHCP package is not installed. Use the following command to install DHCP Package.

First move to Package Folder.

**#cd /media/RHEL/Package**



```
[root@localhost ~]# rpm -qa | grep dhcp
[root@localhost ~]# cd /media/RHEL_6.0\ i386\ Disc\ 1/Packages/
```

**#pwd**

Output : -/media/RHEL/Package

Now install DHCP Package

**#rpm -ivh DHCP\***

NOTE :- rpm is executable command which is use to run rpm command, I for

install,v for verbose, h for hash format output or human readable format.

The screenshot shows a terminal window titled "root@localhost:/media/RHEL\_6.0 i386 Disc 1/Packages". The window includes a menu bar with File, Edit, View, Search, Terminal, and Help. The terminal content shows the command "rpm -qa | grep dhcp" being run, followed by "cd /media/RHEL\_6.0\ i386\ Disc\ 1/Packages/", and then "rpm -ivh dhcp\*". A warning message about a RSA/SHA256 signature is displayed. The package "dhcp-4.1.1-12.P1.el6.i686.rpm" is being prepared and installed, with progress bars indicating 100% completion for both steps. The final command shown is "[root@localhost Packages] #".

**#rpm -qa | grep dhcp**

```
[root@localhost Packages]# rpm -qa | grep dhcp
dhcp-4.1.1-12.P1.el6.i686
[root@localhost Packages]#
```

Step 3 :- Check the hostname of your linux system.

**#hostname**

```
[root@localhost Packages]# hostname
localhost.localdomain
[root@localhost Packages]#
```

Step 4:- Now check dhcpcd service in system service it should be on

**#setup**

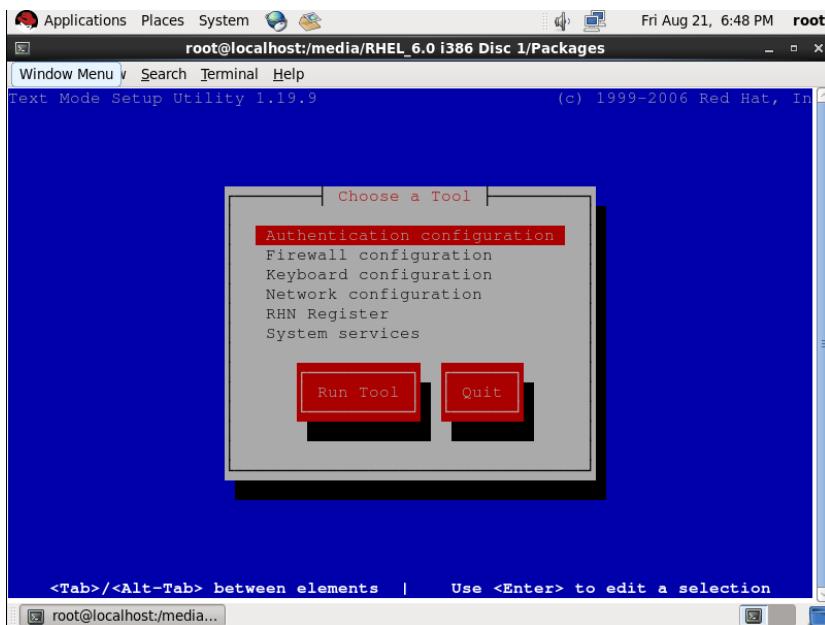
```
[root@localhost Packages]# hostname
localhost.localdomain
[root@localhost Packages]# setup
```

**To assign IP to dhcp server**

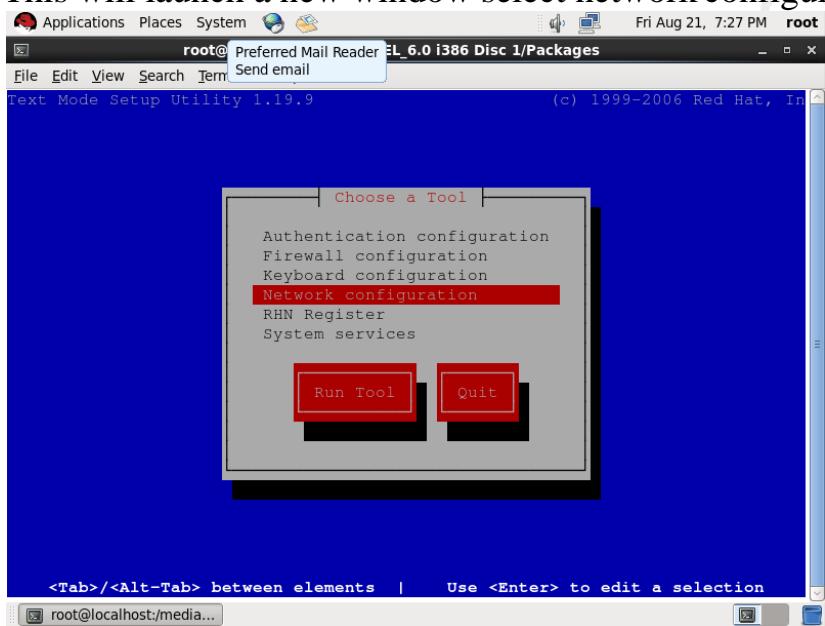
DHCP server have a static a IP address. First configure the IP address 192.168.1.3 with netmask of 255.255.255.0 on server.

Run setup command form root user

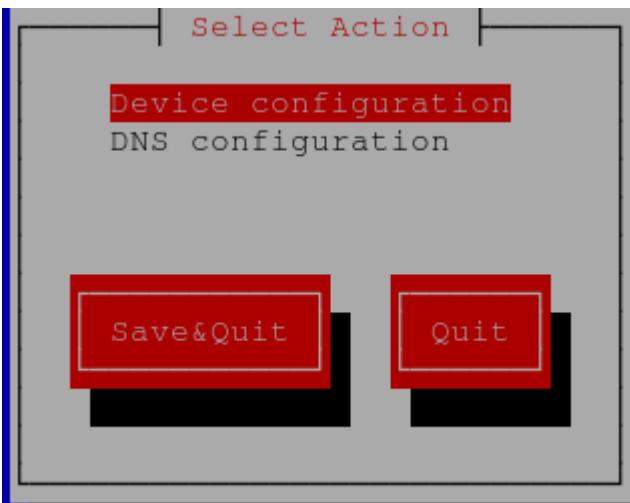
# Linux Administration Practical Manual



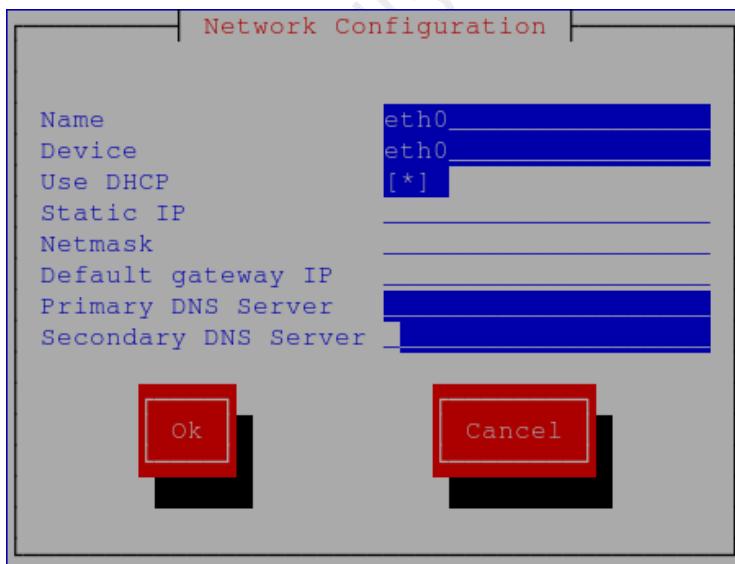
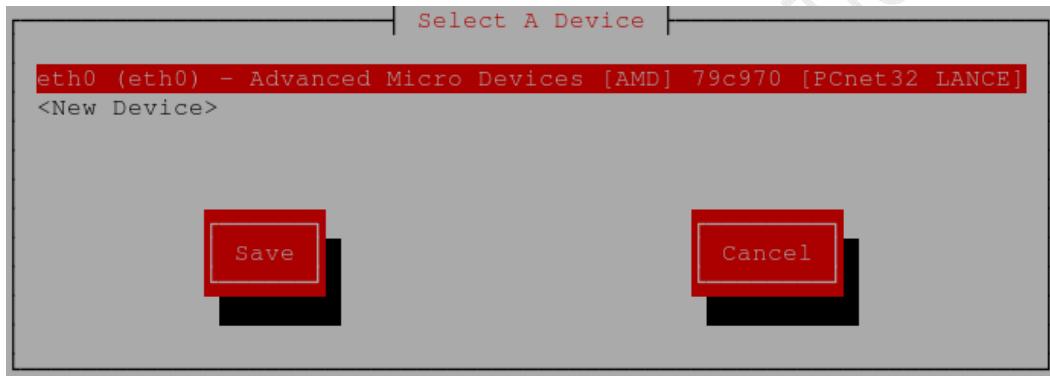
This will launch a new window select network configuration.



# Linux Administration Practical Manual

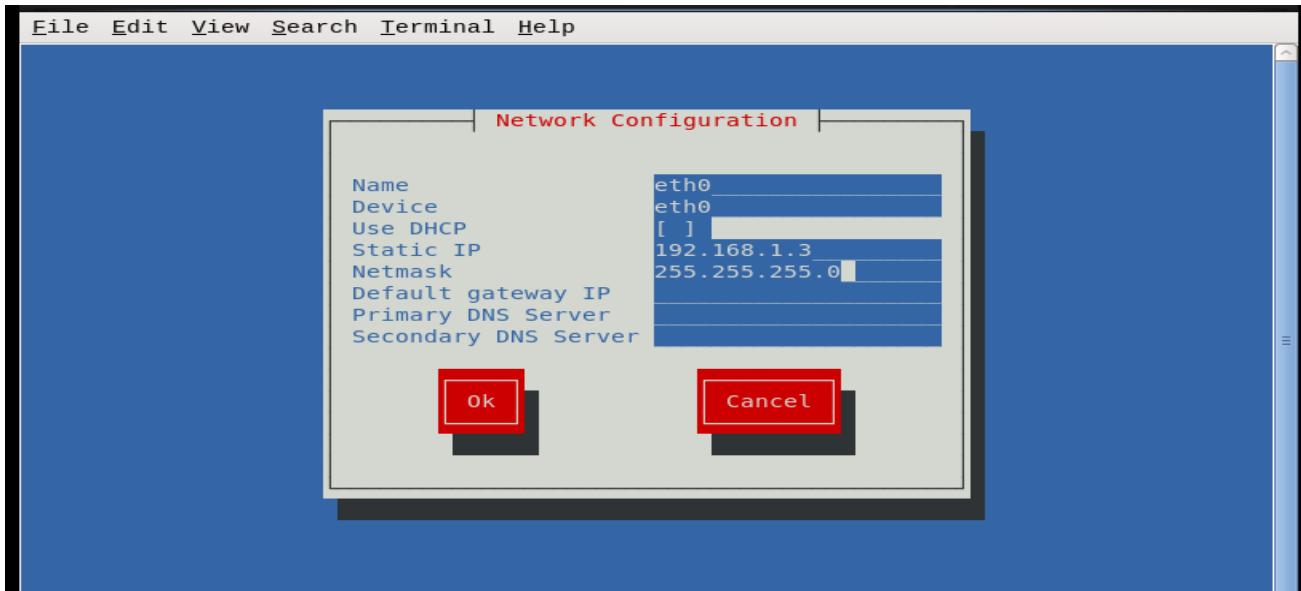


Now a new window will show you all available LAN card select your LAN card (if you don't see any LAN card here mean you don't have install driver)



Select Use DHCP Option and remove the [\*] dhcpd option. now enter static IP

Address.



Click on OK, quit and again quit to come back on root prompt.

Step 5:- Restart the network service so new ip address can take place on LAN card

To disable network we use following command

**#ifdown eth0**

To disable network we use following command

**#ifup eth0**

Step 6 :- main configuration file of dhcp server is dhcpcd.conf. This file located on /etc directory. If this file is not present there or you have corrupted this file, then copy new file first, if ask for overwrite press “y”.



# Linux Administration Practical Manual

```
# DHCP Server Configuration file.
#   see /usr/share/doc/dhcp*/dhcpd.conf.sample
#   see 'man 5 dhcpd.conf'
#
#~
```

by default when you install DHCP Package it will create dhcpd.conf.sample file in /usr directory (/usr/share/doc/dhcp-4.1.2/dhcpd.conf.sample)  
now copy the file to /etc directory and replace with the old file.

```
[root@localhost Packages]# setup
[root@localhost Packages]# vi /etc/dhcp/dhcpd.conf
[root@localhost Packages]# cp /usr/share/doc/dhcp-4.1.1/dhcpd.conf.sample /etc
/dhcp/dhcpd.conf
cp: overwrite `/etc/dhcp/dhcpd.conf'? y
[root@localhost Packages]#
```

Step 7 :- Now open /etc/dhcp/dhcpd.conf

```
[root@localhost Packages]# setup
[root@localhost Packages]# vi /etc/dhcp/dhcpd.conf
[root@localhost Packages]# cp /usr/share/doc/dhcp-4.1.1/dhcpd.conf.sample /etc
/dhcp/dhcpd.conf
cp: overwrite `/etc/dhcp/dhcpd.conf'? y
[root@localhost Packages]# vi /etc/dhcp/dhcpd.conf
```

#vi /etc/dhcp/dhcpd.conf

default entry is this file look like this.

# Linux Administration Practical Manual

```
# Applications Places System 
root@localhost:/media/RHEL_6.0 i386 Disc 1/Packages
File Edit View Search Terminal Help
# dhcpd.conf
#
# Sample configuration file for ISC dhcpcd
#
# option definitions common to all supported networks...
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;

default-lease-time 600;
max-lease-time 7200;

# Use this to enable / disable dynamic dns updates globally.
#ddns-update-style none;

# If this DHCP server is the official DHCP server for the local
# network, the authoritative directive should be uncommented.
#authoritative;

# Use this to send dhcp log messages to a different log file (you also
# have to hack syslog.conf to complete the redirection).
log-facility local7;

# No service will be given on this subnet, but declaring it helps the
# DHCP server to understand the network topology.
:se nu[

root@localhost:/media...
```

Change option domain-name “example.org” to option domain-name “Your Machine Domain-name for e.g tyit.com”

Change option domain-name-servers ns1.example.org, ns2.example.org; to option fully qualify domain-name-server “Your Machine Domain-name for e.g server.tyit.com”;

Step 8 :- Uncomment line no. 18 # authoritative (Remove # mark)

```
16 # If this DHCP server is the official DHCP server for the local
17 # network, the authoritative directive should be uncommented.
18 #authoritative;
--
```

```
16 # If this DHCP server is the official DHCP server for the local
17 # network, the authoritative directive should be uncommented.
18 authoritative;
```

Authoritative says that the DHCP server is authenticated server and DHCP client can connect to DHCP server, if the option is not uncommented the DHCP client not able to connect to DHCP Server.

Step 9 :- Comment Line No 27 and 28

Change these lines no 32

Subnet 10.254.239.0 netmask 255.255.255.224

{

Range 10.254.239.10 10.254.239.20;

Option routers rtr-239-0-1.example.org,rtr-239-0-2.example.org

}

Following lines after changes

Subnet 198.168.1.0 netmask 255.255.255.0 (subnet ip is the first IP of your network.)

{

Range 192.168.1.10 192.168.1.20; (Range means the range of IP Address server want to assign to DHCP Client)

#Option routers rtr-239-0-1.example.org,rtr-239-0-2.example.org

}

## Save the file.

```
27 #subnet 10.152.187.0 netmask 255.255.255.0 {
28 #
29
30 # This is a very basic subnet declaration.
31
32 subnet 192.168.1.0 netmask 255.255.255.0 {
33   range 192.168.1.10 192.168.1.20;
34 #■ option routers rtr-239-0-1.example.org, rtr-239-0-2.example.org;
35 }
36
37 # This declaration allows BOOTP clients to get dynamic addresses,
38 # which we don't really recommend.
39
40 subnet 10.254.239.32 netmask 255.255.255.224 {
41   range dynamic-bootp 10.254.239.40 10.254.239.60;
42   option broadcast-address 10.254.239.31;
-- INSERT --                                     34,2          26%
```

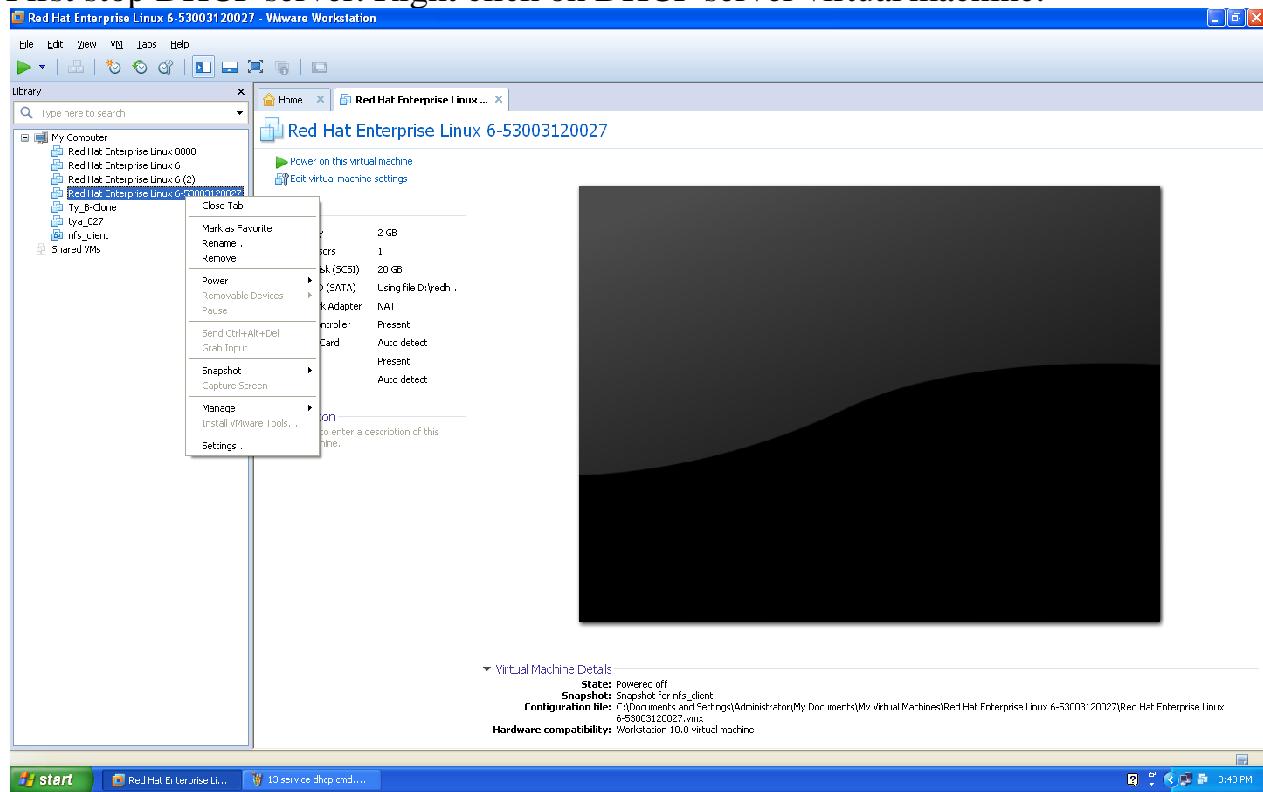
```
#service dhcpcd start  
#service dhcpcd restart  
#chkconfig dhcp on  
#chkconfig --list dhcp  
#service iptables stop  
#setenforce 0
```

```
[root@localhost Packages]# service dhcpcd status  
dhcpcd is stopped  
[root@localhost Packages]# service dhcpcd start  
Starting dhcpcd: [ OK ]  
[root@localhost Packages]# service dhcpcd restart  
Shutting down dhcpcd: [ OK ]  
Starting dhcpcd: [ OK ]  
[root@localhost Packages]# chkconfig --list dhcpcd  
dhcpcd      0:off  1:off  2:off  3:off  4:off  5:off  6:off  
[root@localhost Packages]# chkconfig dhcpcd on  
[root@localhost Packages]# chkconfig --list dhcpcd  
dhcpcd      0:off  1:off  2:on   3:on   4:on   5:on   6:off  
[root@localhost Packages]# █
```

## **DHCP Client**

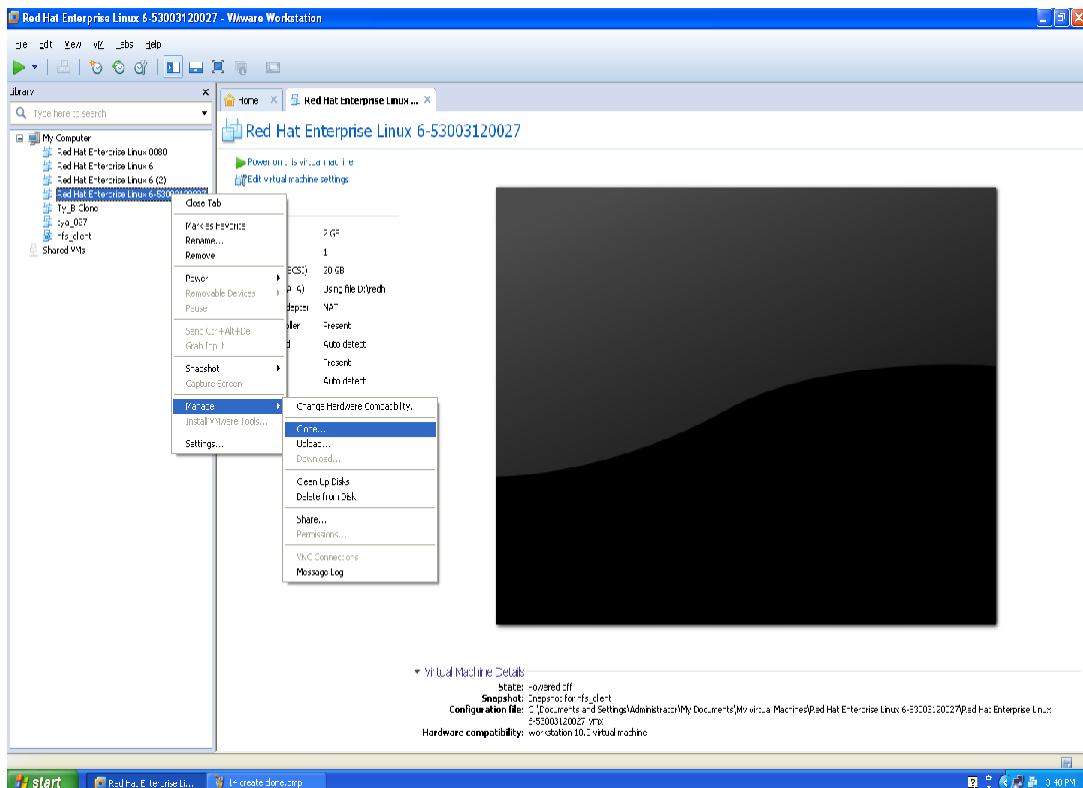
### **How to create Clone Machine :-**

First stop DHCP server. Right click on DHCP server virtual machine.

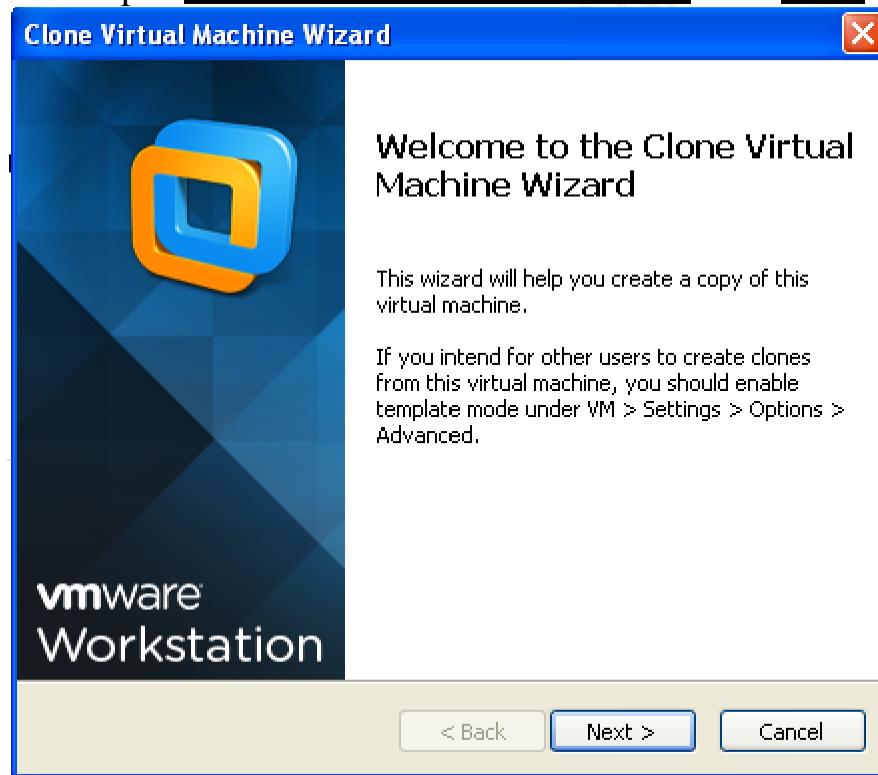


Go to manage and select clone option

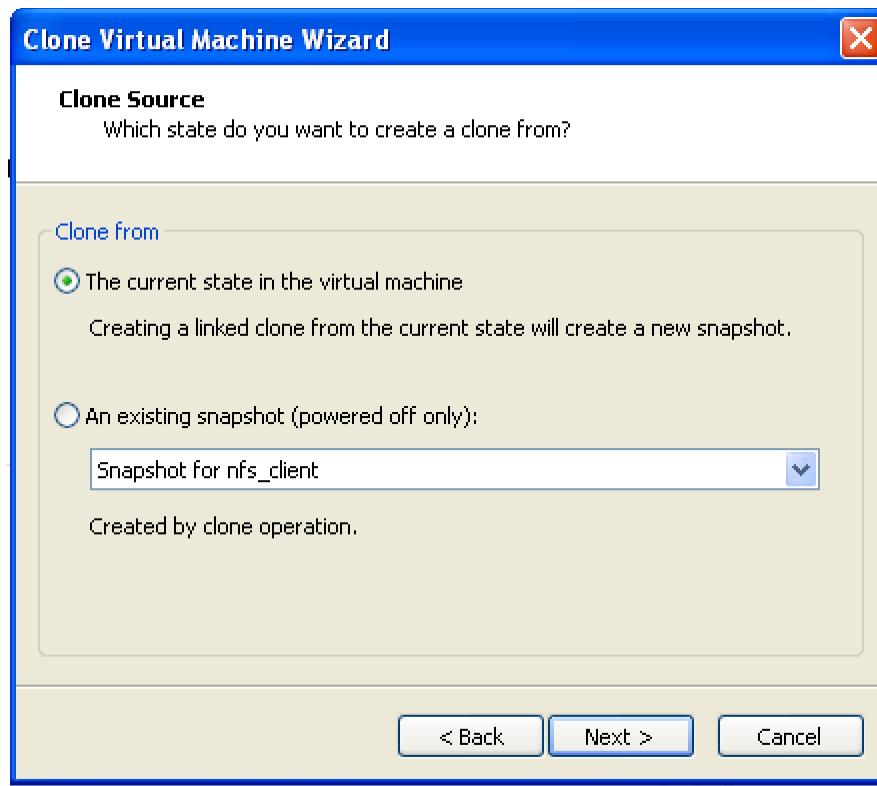
# Linux Administration Practical Manual



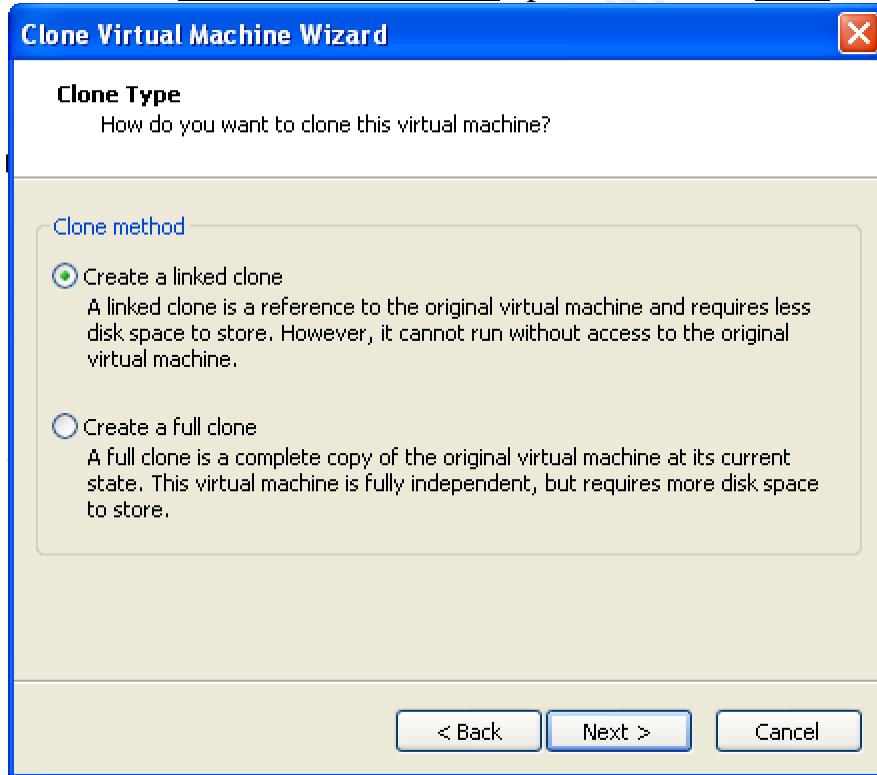
It will open **Clone Virtual Machine Wizard**. Click **Next** to proceed.



Here select the first option **The Current State in the virtual machine** and click **Next** to Proceed.

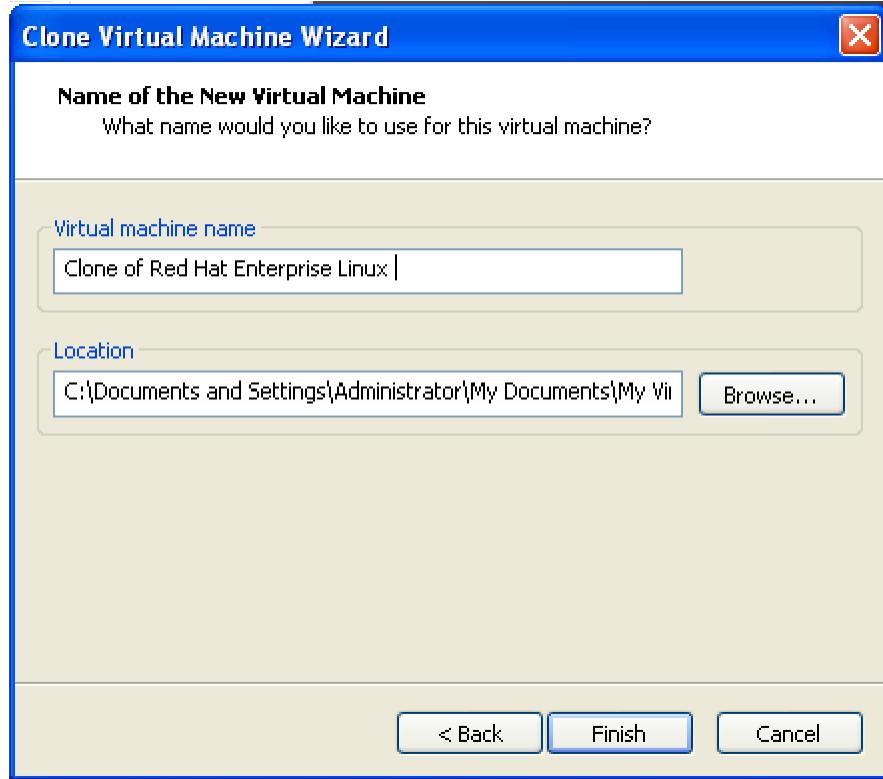


Now select **Create a Full Clone** Option and click **Next**.

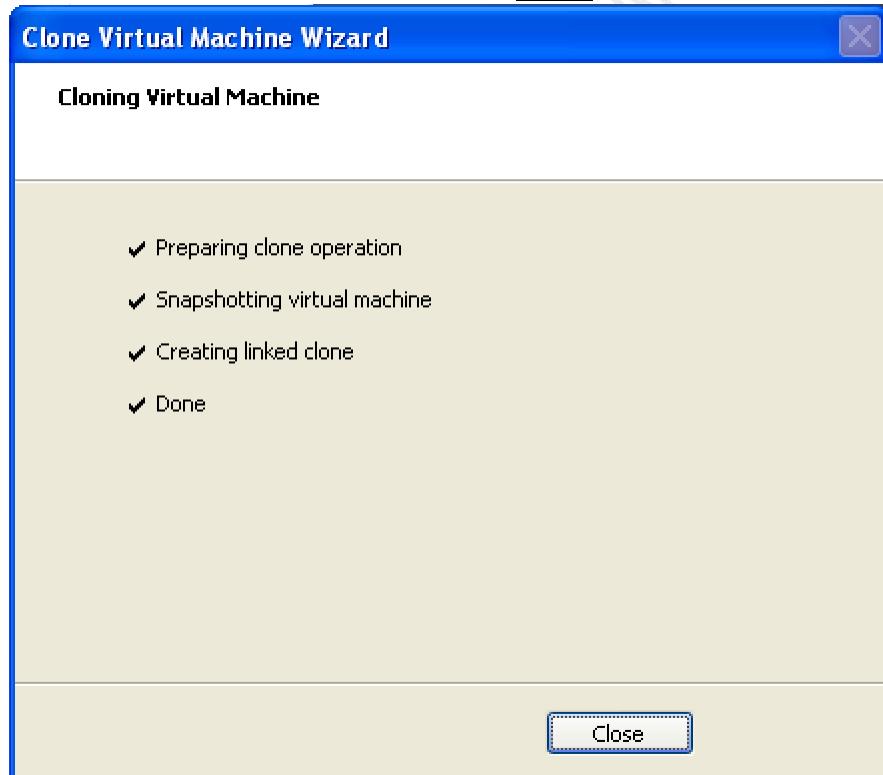


Now Provide name to your Virtual Machine or set it default **Clone of Red Hat Enterprise Linux**

# Linux Administration Practical Manual



Once the clone is created click on close



Now our clone machine is ready to use. First start DHCP Server and then start Clone/client virtual machine.

## Linux Administration Practical Manual

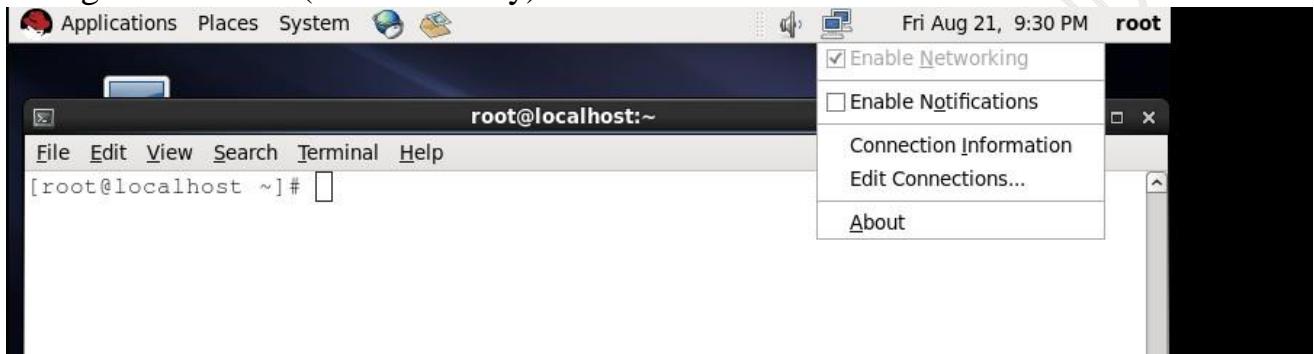
Now we are on client machine and we will check whether through dhcp, ip address can be given to our client machine or not before that we have to check currently our machine is configured manual or dhcp.

Through wizard we will check on network

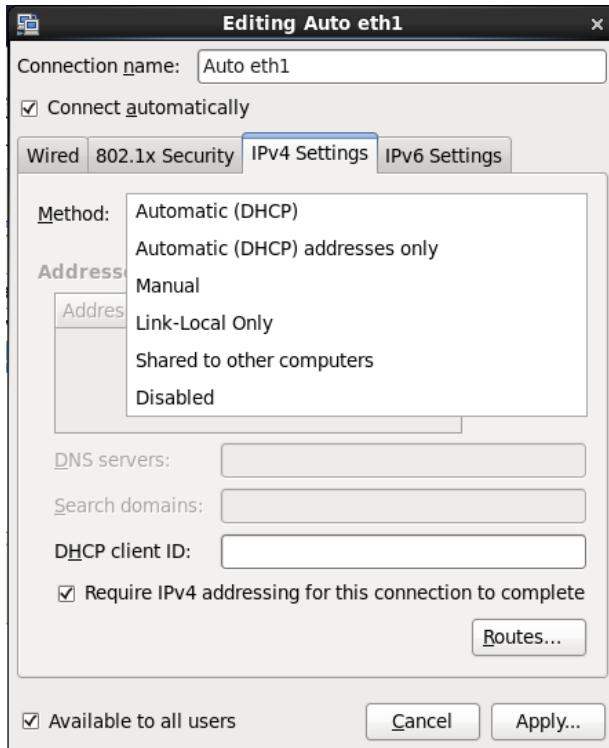
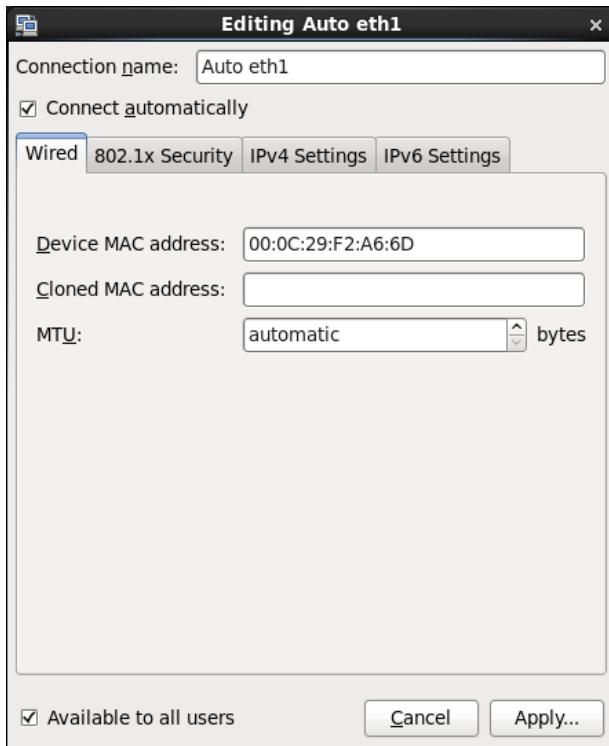
Right click on Network icon at right top corner on desktop → Edit Connection → Select system eth0

→ Click on Edit button → select IPv4 setting option → see the method manual

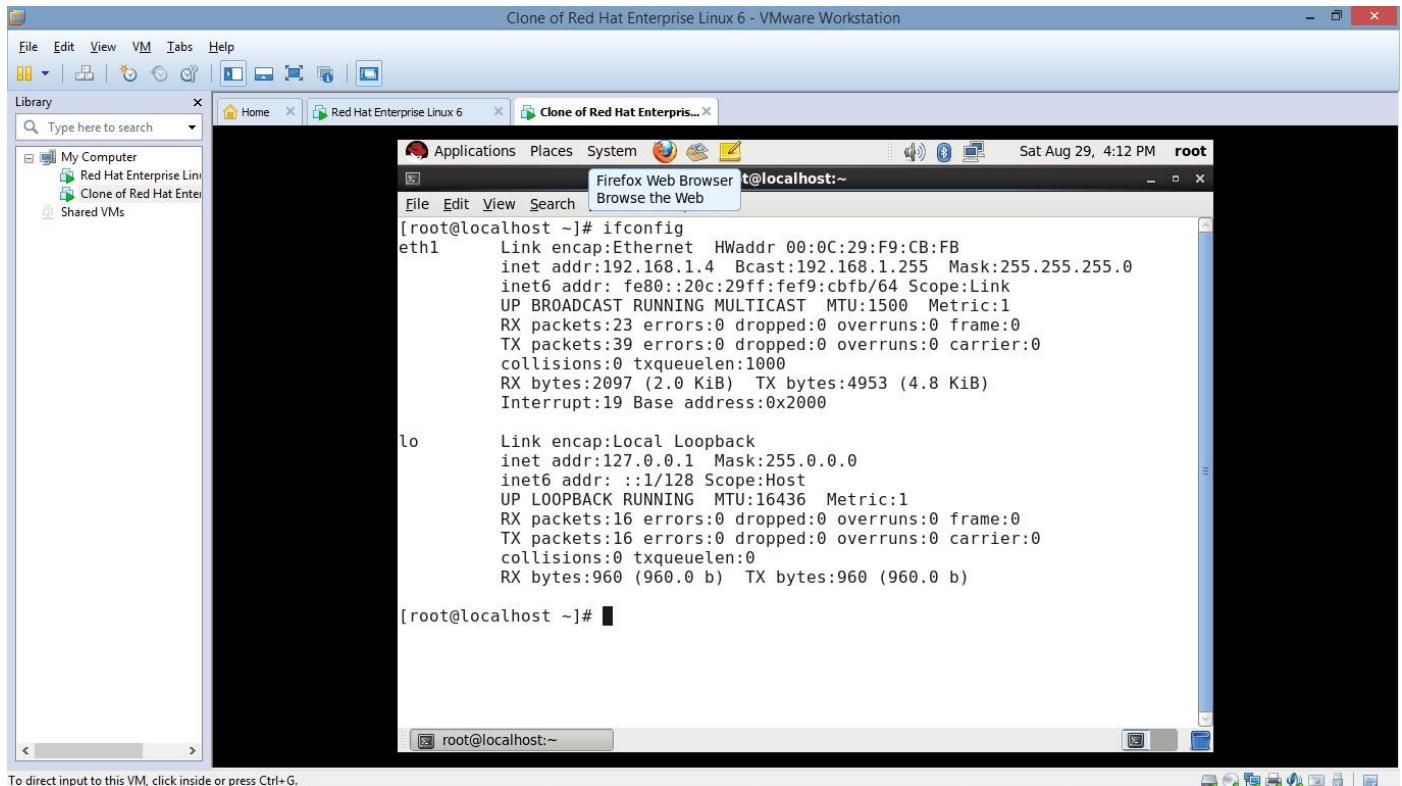
Change it to DHCP (Automatically)



# Linux Administration Practical Manual



# Linux Administration Practical Manual



**# ifconfig**

OR

This command is used to check network configuration and IP address.

**#vi /etc/sysconfig/network-scripts/ifcfg-eth0**

Change BOOTPROTO = dhcp

Save the file.

**#service network restart**

Now use ifconfig command to check whether dhcp client get the ip address and all network information from dhcp client or not.

## **Practical No.7: Configuring DNS Server**

- Name address resolution is simply the conversion of people friendly names into computer friendly numbers.
- It means that every interface on the network has a unique group of numbers called as IP address.
- These group of numbers present to the computers in the network but it is difficult for the users to by heart, learn or remember them.
- DNS makes possible for the users to enter the names and then these names get converted into numbers.
- The main function of name address resolution is to create an efficient user and computer interaction.
- For this name address resolution there is need that how to install and configure the Domain Name System.
- To understand, take a look on the domain and understand its working. For eg. example.com.
- In the above eg: The first part of the domain name is the name of the company or institution or an organization. The next part after the period/dot is called as top-level domain (TLD).

There are many TLD listed below

- .com - A TLD used to register a business
- .edu – A TLD for educational institution
- .name – A TLD used to register sites for individuals
- .gov – A TLD given to government
- .mil – A TLD used for military
- .org – A TLD used by a non-commercial organization

Following files are used while Configuring DNS Server.

- ➔ named.conf – It is main Configuration file that contains global properties and other sources. It is found in / etc/ directory.
- ➔ named.ca – The file contains the name and address of root servers. Used for the purpose of caching of forward zone. It is found in /var/named.
- ➔ named.local – The file provides information for resolving the loopback address for the local host. Also called as named.empty, used for the purpose of caching of reverse zone.

It is found in /var/named/

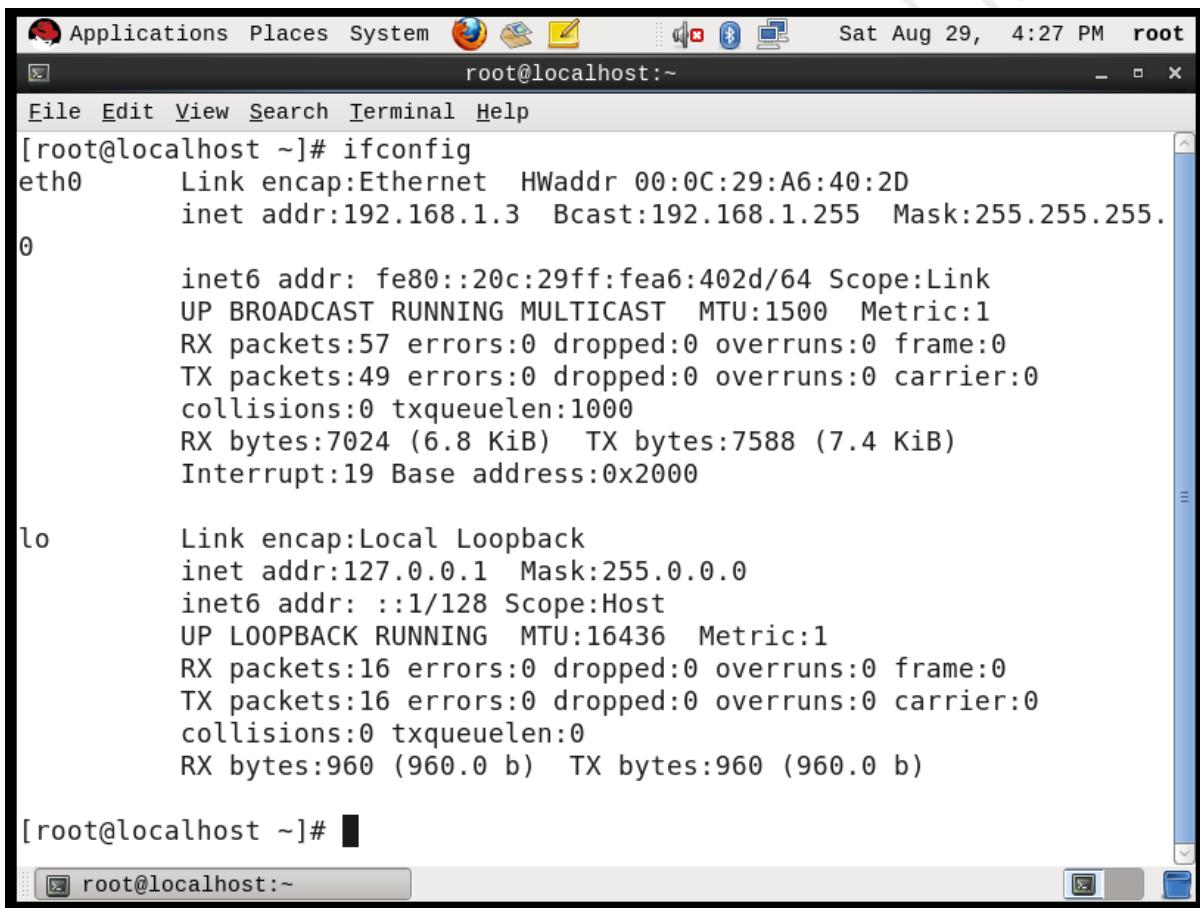
The 2 additional files required for the master domain server are:

(i)zone – This file contains the names and addresses of hosts in the local domain and maps names to IP address.

(ii)reverse.zone – This file provides information to map ip-address to names Hence reverse.

## DNS Configuration

### 1) root@server ~]#ifconfig



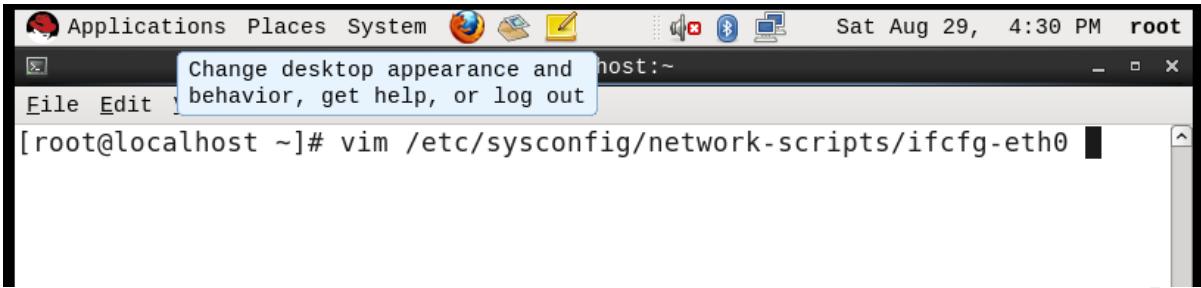
A screenshot of a Linux terminal window titled "root@localhost:~". The window shows the output of the "ifconfig" command. The output details network interfaces eth0 and lo. Interface eth0 has an IPv4 address of 192.168.1.3 and an IPv6 address of fe80::20c:29ff:fea6:402d. Interface lo has an IPv4 address of 127.0.0.1. Both interfaces are up and running.

```
root@localhost ~]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:0C:29:A6:40:2D
          inet addr:192.168.1.3 Bcast:192.168.1.255 Mask:255.255.255.0
                 inet6 addr: fe80::20c:29ff:fea6:402d/64 Scope:Link
                      UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
                      RX packets:57 errors:0 dropped:0 overruns:0 frame:0
                      TX packets:49 errors:0 dropped:0 overruns:0 carrier:0
                      collisions:0 txqueuelen:1000
                      RX bytes:7024 (6.8 KiB) TX bytes:7588 (7.4 KiB)
                      Interrupt:19 Base address:0x2000

lo       Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
                      UP LOOPBACK RUNNING MTU:16436 Metric:1
                      RX packets:16 errors:0 dropped:0 overruns:0 frame:0
                      TX packets:16 errors:0 dropped:0 overruns:0 carrier:0
                      collisions:0 txqueuelen:0
                      RX bytes:960 (960.0 b) TX bytes:960 (960.0 b)

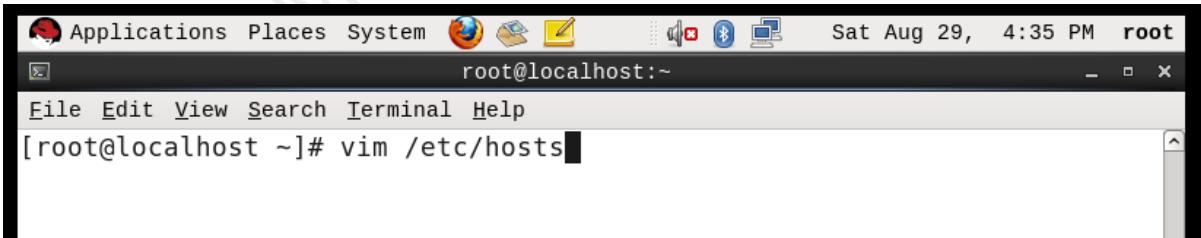
[root@localhost ~]#
```

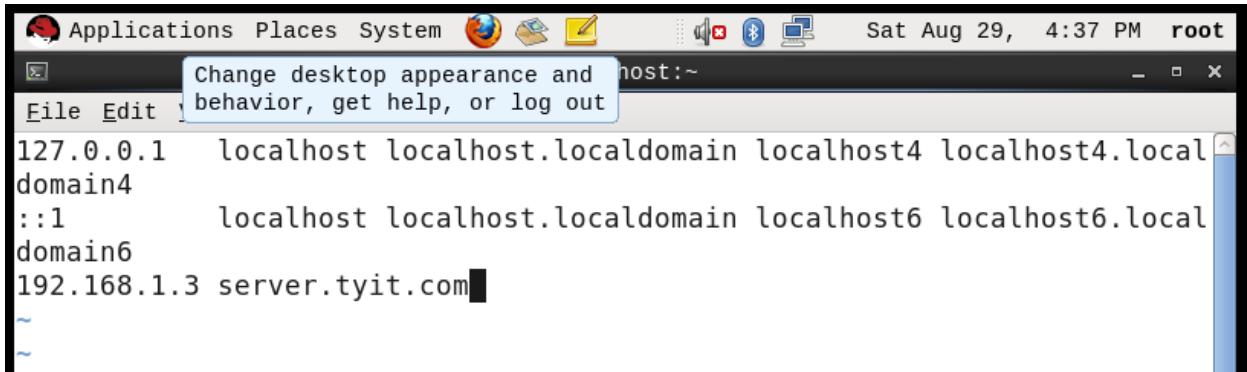
### 2) root@server ~]#vim /etc/sysconfig/network-script/ifcfg – eth0



```
DEVICE=eth0
NM_CONTROLLED=yes
ONBOOT=no
HWADDR=00:0c:29:a6:40:2d
TYPE=Ethernet
BOOTPROTO=none
DNS1=192.168.1.3
IPADDR=192.168.1.3
PREFIX=24
DEFROUTE=yes
IPV4_FAILURE_FATAL=yes
IPV6INIT=no
NAME="System eth0"
UUID=5fb06bd0-0bb0-7ffb-45f1-d6edd65f3e03
NETMASK=255.255.255.0
USERCTL=no
```

3) **root@server ~]#vim /etc/hosts**



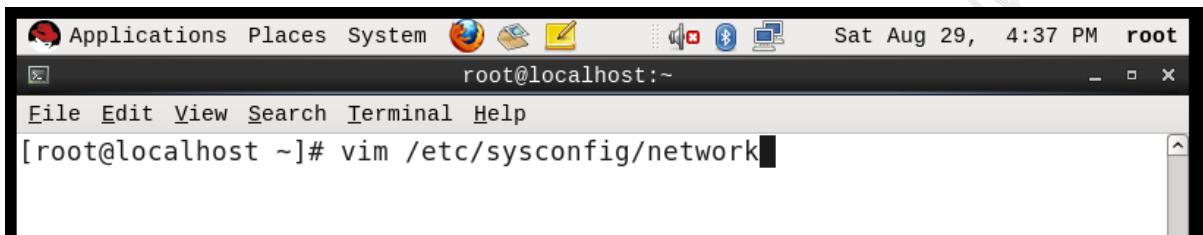


A screenshot of a Linux desktop environment. The terminal window shows the command:

```
root@server ~]# vim /etc/sysconfig/network
```

The terminal window title bar says "root@server ~]# vim /etc/sysconfig/network". The status bar at the bottom of the terminal window shows the command being typed.

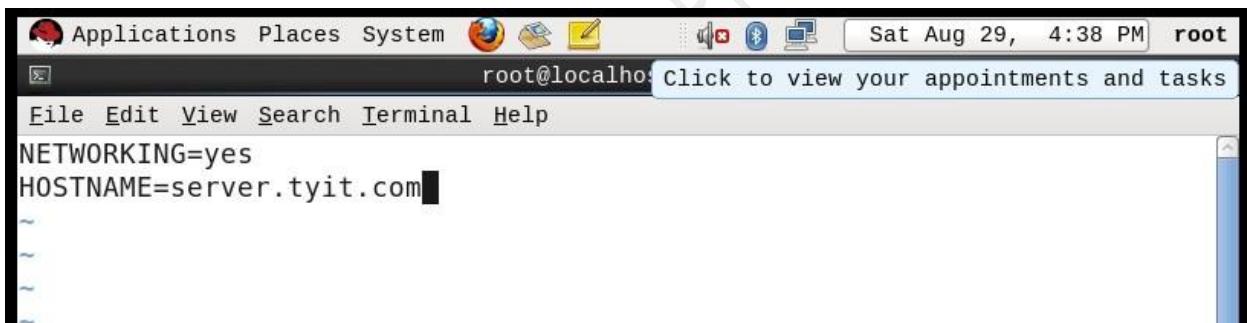
## 4) root@server ~]#vim /etc/sysconfig/network



A screenshot of a Linux desktop environment. The terminal window shows the command:

```
[root@localhost ~]# vim /etc/sysconfig/network
```

The terminal window title bar says "[root@localhost ~]# vim /etc/sysconfig/network". The status bar at the bottom of the terminal window shows the command being typed.

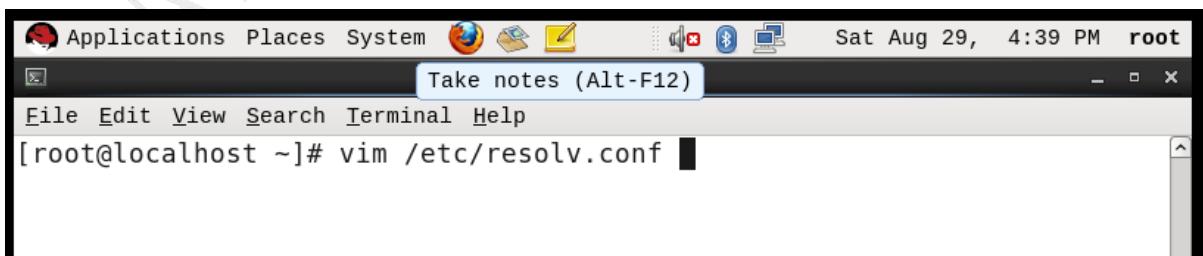


A screenshot of a Linux desktop environment. The terminal window shows the command:

```
[root@localhost ~]# vim /etc/sysconfig/network
```

The terminal window title bar says "[root@localhost ~]# vim /etc/sysconfig/network". The status bar at the bottom of the terminal window shows the command being typed.

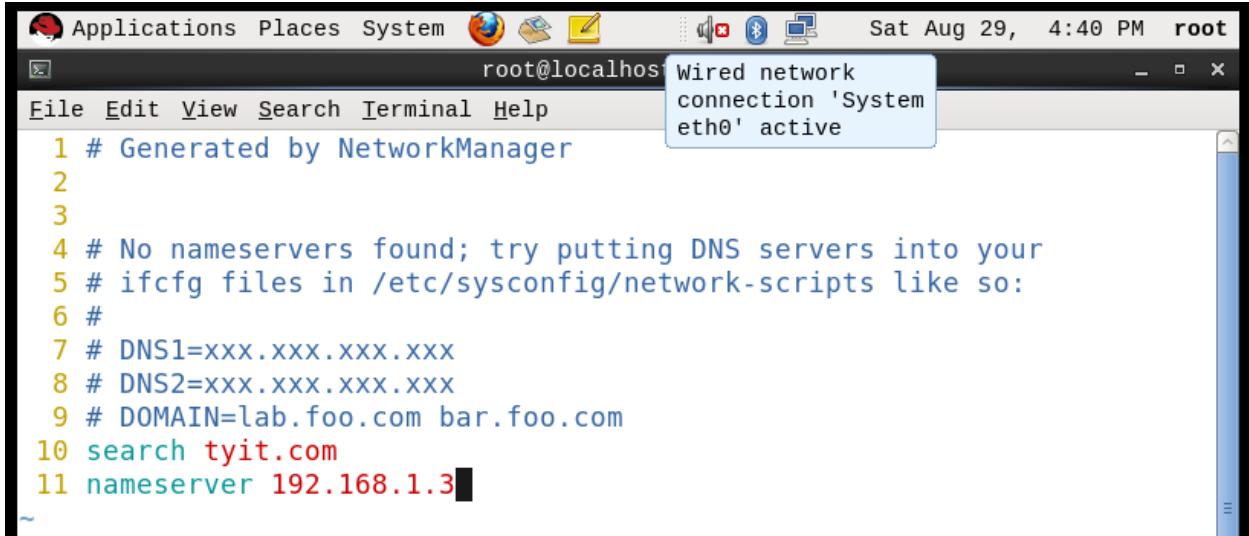
## 5) root@server ~]#vim /etc/resolv.conf



A screenshot of a Linux desktop environment. The terminal window shows the command:

```
[root@localhost ~]# vim /etc/resolv.conf
```

The terminal window title bar says "[root@localhost ~]# vim /etc/resolv.conf". The status bar at the bottom of the terminal window shows the command being typed.



```
root@localhost:~# cat /etc/NetworkManager/NetworkManager.conf
[main]
# No nameservers found; try putting DNS servers into your
# ifcfg files in /etc/sysconfig/network-scripts like so:
#
# DNS1=xxx.xxx.xxx.xxx
# DNS2=xxx.xxx.xxx.xxx
# DOMAIN=lab.foo.com bar.foo.com
[connection]
search tyit.com
nameserver 192.168.1.3
```

Wired network connection 'System eth0' active

6) **root@server ~]service network restart**

7) **To install bind package :-**

Desktop -> CD -> Package -> bind -> install

```
File Edit View Search Terminal Help
[root@localhost ~]# cd /media/RHEL_6.0\ i386\ Disc\ 1/Packages/
[root@localhost Packages]# rpm -q bind
package bind is not installed
[root@localhost Packages]# rpm -ivh bind*
warning: bind-9.7.0-5.P2.el6.i686.rpm: Header V3 RSA/SHA256 Signature,
key ID fd431d51: NOKEY
Preparing...
#####
[100%]
      package bind-libs-32:9.7.0-5.P2.el6.i686 is already installed
      package bind-utils-32:9.7.0-5.P2.el6.i686 is already installed
[root@localhost Packages]# rpm -q bind
package bind is not installed
[root@localhost Packages]# rpm -ivh bind-9.7.0-5.P2.el6.i686.rpm
warning: bind-9.7.0-5.P2.el6.i686.rpm: Header V3 RSA/SHA256 Signature,
key ID fd431d51: NOKEY
Preparing...
#####
[100%]
  1:bind
#####
[100%]
```

root@server ~]vim /etc/named.conf.

- Line no.11 :- Listen – on port 53 { 192.168.1.3}

Change this from 127.0.0.1 to current  
Machine IP address.

- Line no.12 :- Comment it using “#”  
# listen –on –v6 port 53{ ::1:};
- Line no.17 :- allow –query{any;}
- Check and Notedown the last line of the file :-

```
Applications Places System Sat Aug 29, 4:52 PM root
root@localhost:/media/RHEL_6.0 Click to view your appointments and tasks
File Edit View Search Terminal Help
[root@localhost Packages]# vim /etc/named.conf
```

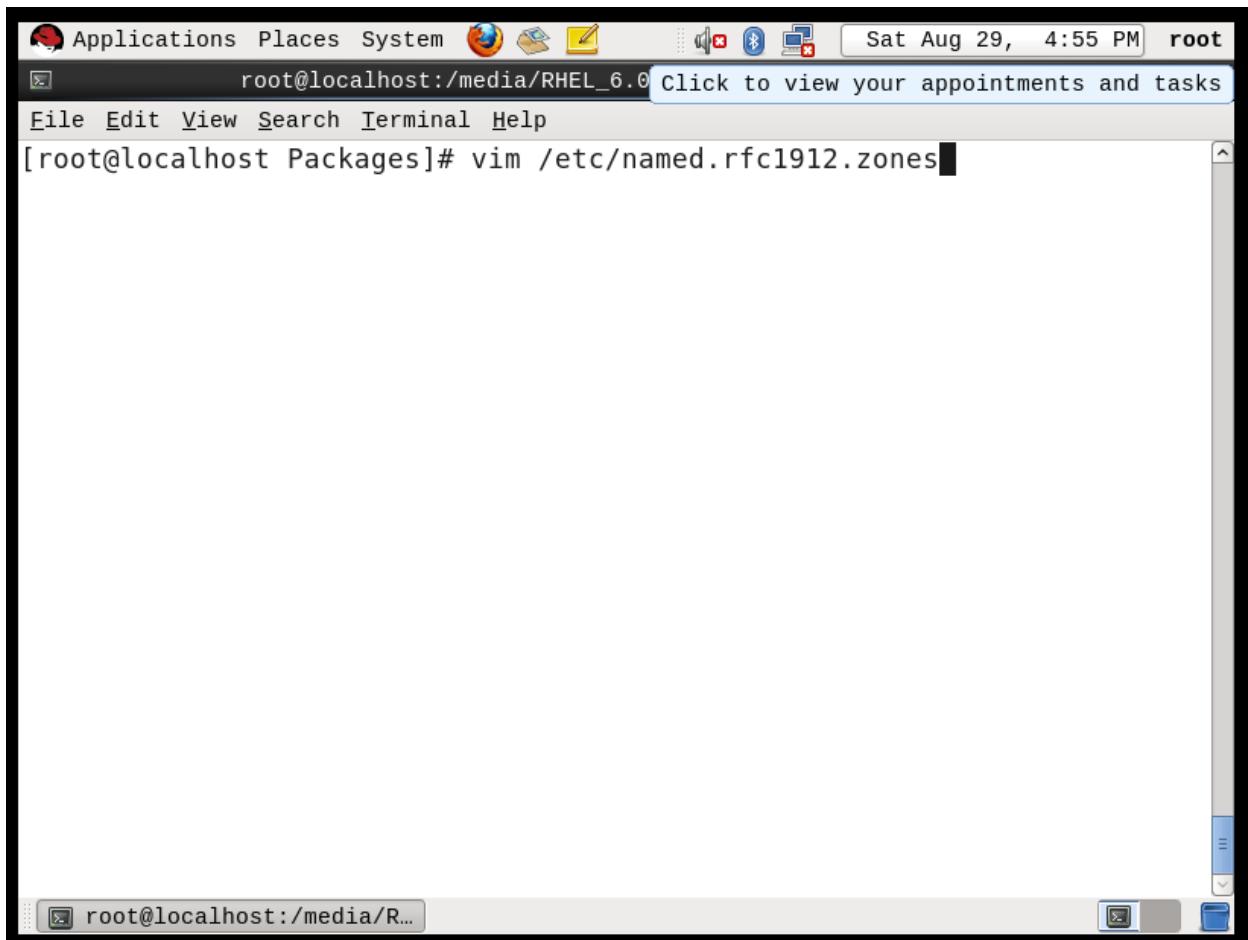
The screenshot shows a terminal window titled "root@localhost:/media/RHEL\_6.0". The window displays the contents of the file "/etc/named.rfc1912.zones". The file contains configuration options for the named daemon, including listen-on, directory, dump-file, statistics-file, memstatistics-file, allow-query, recursion, dnssec-enable, dnssec-validation, dnssec-lookaside, bindkeys-file, and logging channels. The Vim status bar at the bottom right indicates the cursor is at line 10, column 10, with 45% completion.

```
10 options {
11     listen-on port 53 { 192.168.1.3; };
12 #     listen-on-v6 port 53 { ::1; };
13     directory      "/var/named";
14     dump-file      "/var/named/data/cache_dump.db";
15     statistics-file "/var/named/data/named_stats.txt";
16     memstatistics-file "/var/named/data/named_mem_stats.txt";
17     allow-query    { any; };
18     recursion yes;
19
20     dnssec-enable yes;
21     dnssec-validation yes;
22     dnssec-lookaside auto;
23
24     /* Path to ISC DLV key */
25     bindkeys-file "/etc/named.iscdlv.key";
26 };
27
28 logging {
29     channel default_debug {
30         file "data/named.run";
-- INSERT --
```

8) root@server ~] #vim /etc/named.rfc1912.zones

# Linux Administration Practical Manual

---



LINUX ADMINISTRATION

```
file "forward.zone";
allow-update { none; };

};

zone "localhost" IN {
    type master;
    file "named.localhost";
    allow-update { none; };
};

zone "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa" IN {
    type master;
    file "named.loopback";
    allow-update { none; };
};

zone "1.168.192.in-addr.arpa" IN {
    type master;
    file "reverse.zone";
    allow-update { none; };
};

-- INSERT --
```

Save the file :- :wq

9) **root@server ~]#cd /var/named**

The screenshot shows a terminal window titled "Take notes (Alt-F12) ed" running as root on a Linux system. The terminal displays the following command-line session:

```
[root@localhost Packages]# cd /var/named/  
[root@localhost named]# ls  
data      named.ca      named.localhost  slaves  
dynamic   named.empty   named.loopback  
[root@localhost named]# cp named.localhost forward.zone  
[root@localhost named]# cp named.loopback reverse.zone  
[root@localhost named]# ls  
data      forward.zone  named.empty       named.loopback  slaves  
dynamic   named.ca      named.localhost  reverse.zone  
[root@localhost named]#
```

The terminal window has a dark blue header bar with icons for Applications, Places, System, and various system status indicators. The title bar says "Take notes (Alt-F12) ed". The status bar at the bottom shows "root@localhost:/var/named...".

- 10) root@server named]#cp named.localhost forward.zone
- 11) root@server named]#cp named.loopback reverse.zone

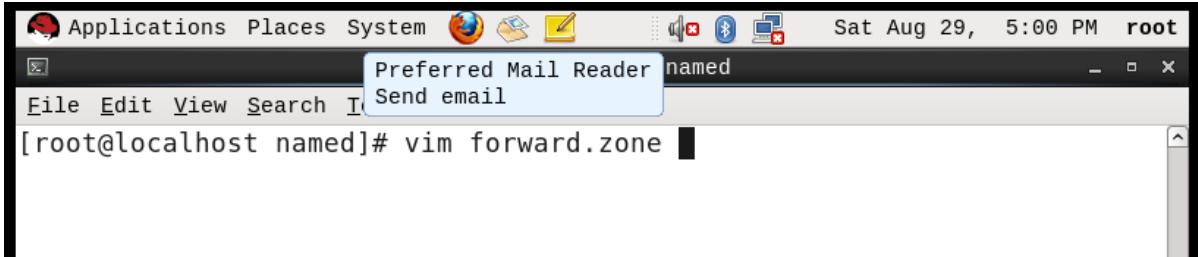
# Linux Administration Practical Manual

The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "Take notes (Alt-F12) ed". The window content shows a command-line session as root:

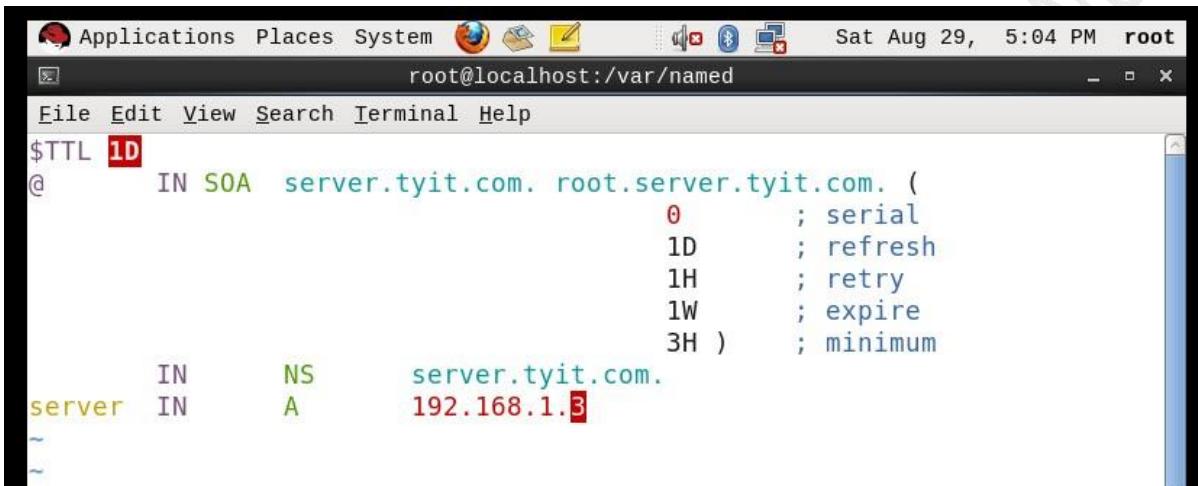
```
[root@localhost Packages]# cd /var/named/  
[root@localhost named]# ls  
data      named.ca      named.localhost  slaves  
dynamic   named.empty   named.loopback  
[root@localhost named]# cp named.localhost forward.zone  
[root@localhost named]# cp named.loopback reverse.zone  
[root@localhost named]# ls  
data      forward.zone  named.empty      named.loopback  slaves  
dynamic   named.ca      named.localhost  reverse.zone  
[root@localhost named]#
```

The terminal window has a dark theme with light-colored text. The desktop background is visible behind the window, showing a faint watermark of the text "LINUX ADMINISTRATION".

root@server named]#vim forward.zone

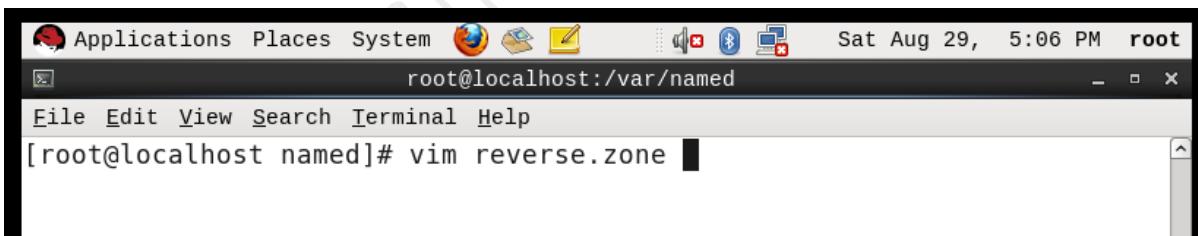


```
[root@localhost named]# vim forward.zone
```

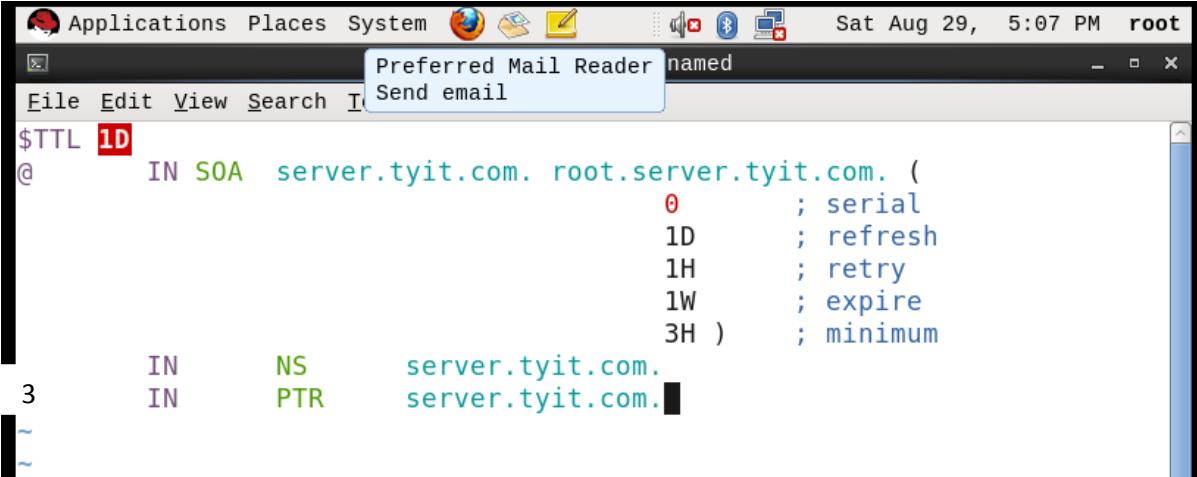


```
$TTL 1D
@ IN SOA server.tyit.com. root.server.tyit.com. (
          0           ; serial
          1D          ; refresh
          1H          ; retry
          1W          ; expire
          3H )        ; minimum
server IN NS      server.tyit.com.
server IN A       192.168.1.3
```

12) root@server named]#vim reverse.zone



```
[root@localhost named]# vim reverse.zone
```



A screenshot of a terminal window titled "Preferred Mail Reader named". The window shows the contents of the /var/named zone configuration file. The file contains the following entries:

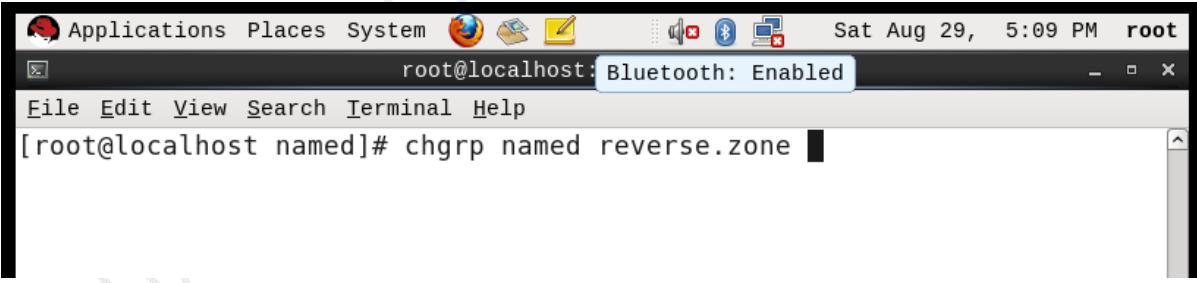
```
$TTL 1D
@      IN SOA  server.tyit.com. root.server.tyit.com. (
                      0          ; serial
                      1D         ; refresh
                      1H         ; retry
                      1W         ; expire
                      3H )       ; minimum
3      IN      NS      server.tyit.com.
3      IN      PTR     server.tyit.com.
```

13) **root@server named]#chgrp named forward.zone**



A screenshot of a terminal window titled "Firefox Web Browser /var/named". The window shows the command `[root@localhost named]# chgrp named forward.zone` being entered.

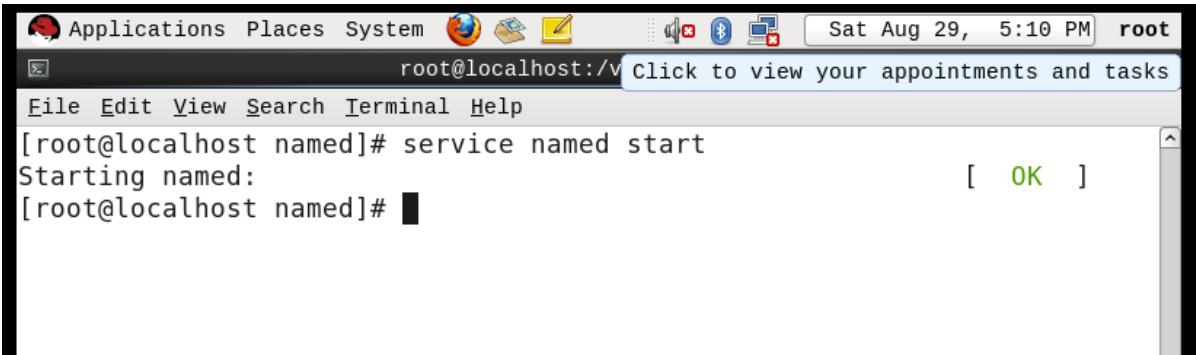
14) **root@server named]#chgrp named reverse.zone**



A screenshot of a terminal window titled "root@localhost: Bluetooth: Enabled". The window shows the command `[root@localhost named]# chgrp named reverse.zone` being entered.

15) **root@server named]#server named start**

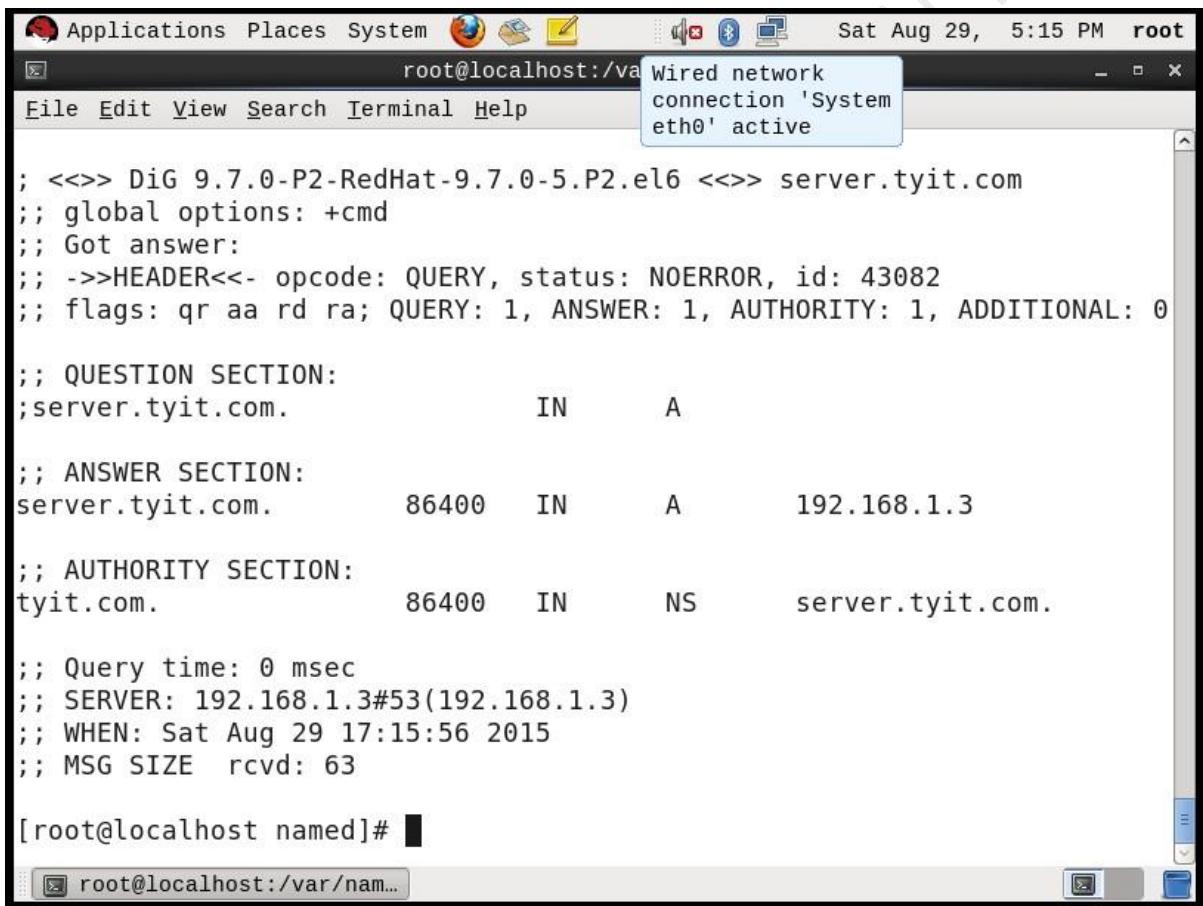
## Linux Administration Practical Manual



```
[root@localhost ~]# service named start
Starting named: [ OK ]
```

- 16) To check whether DNS is working type the following

- 1) dig server.tyit.com
- 2) dig -x 192.168.1.3



```
; <>> DiG 9.7.0-P2-RedHat-9.7.0-5.P2.el6 <>> server.tyit.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 43082
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 0

;; QUESTION SECTION:
server.tyit.com.           IN      A

;; ANSWER SECTION:
server.tyit.com.        86400   IN      A      192.168.1.3

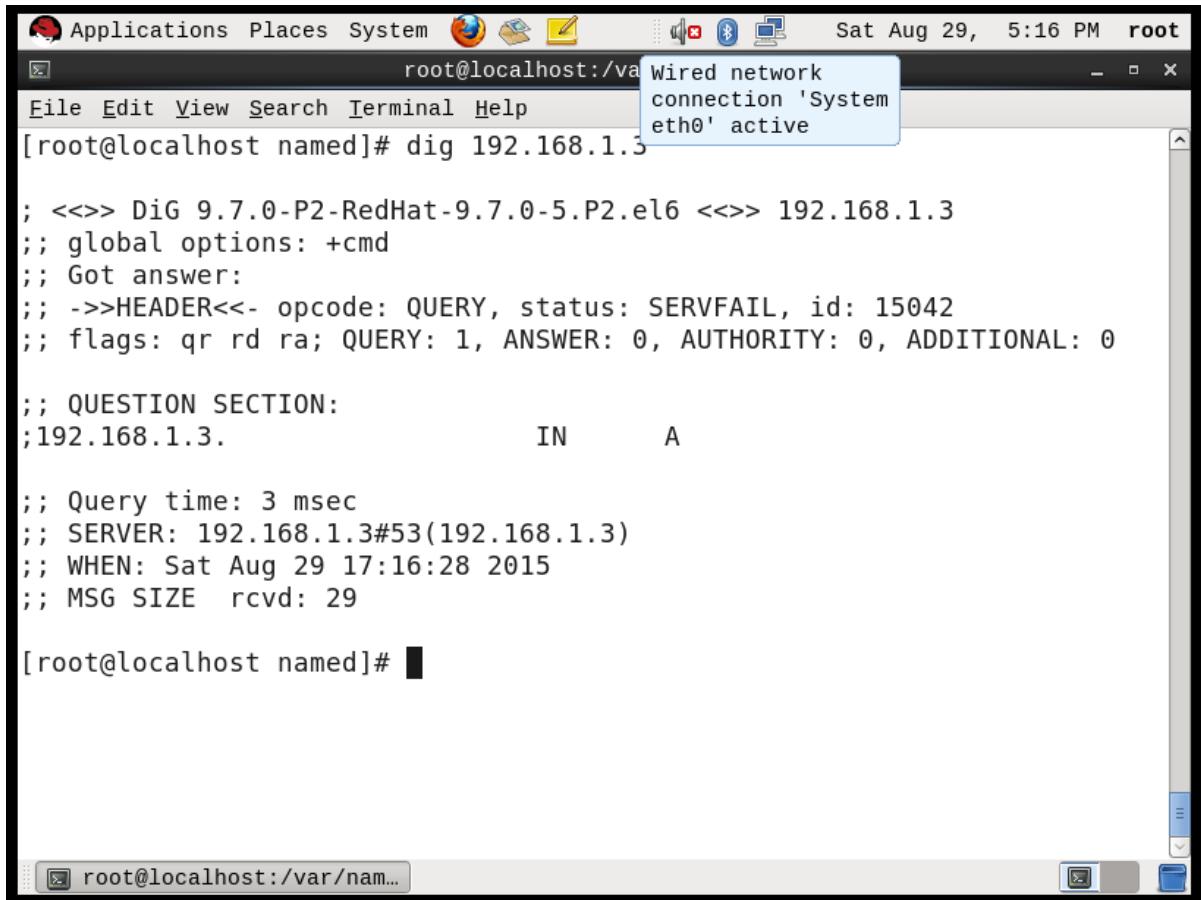
;; AUTHORITY SECTION:
tyit.com.                 86400   IN      NS     server.tyit.com.

;; Query time: 0 msec
;; SERVER: 192.168.1.3#53(192.168.1.3)
;; WHEN: Sat Aug 29 17:15:56 2015
;; MSG SIZE  rcvd: 63
```

- 17) To check in the network,type the following

- (i)ns lookup  
>server.tyit.com  
>192.168.1.3  
>exit.

# Linux Administration Practical Manual



```
[root@localhost ~]# dig 192.168.1.3

; <>> DiG 9.7.0-P2-RedHat-9.7.0-5.P2.el6 <>> 192.168.1.3
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: SERVFAIL, id: 15042
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;192.168.1.3.          IN      A

;; Query time: 3 msec
;; SERVER: 192.168.1.3#53(192.168.1.3)
;; WHEN: Sat Aug 29 17:16:28 2015
;; MSG SIZE  rcvd: 29

[root@localhost ~]#
```

### **Practical no 8 : Configure a Linux Server and transfer files to windows client.(Setting up NFS File Server)**

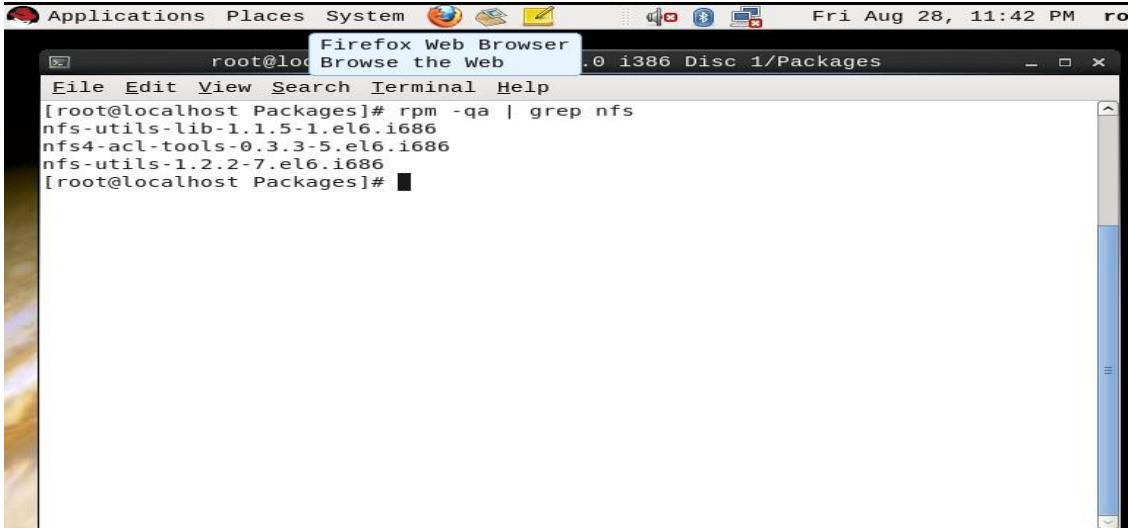
- The Network File System (**NFS**) is a way of mounting Linux directories over a network. An NFS server can export one or more directories that can then be mounted on a remote Linux machine.
- The main use of NFS in the home context is to share out data on a central server to all the PC's in the house.
- This way you can have a single copy of data accessible from a central location.
- The Network File System is the mostly used method for providing file sharing services on Linux networks.
- It enables local access to remote disks and file system in a distributed manner.
- NFS uses a standard Client-Server architecture.
- The NFS contains all those file systems that user wants to share along with daemon making those shares visible.
- This way of sharing file by NFS is called as **NFS exports**.
- The NFS server daemons provide remote access to the expected file system, enabling file locking over the network and allows to enable disk quotas on the NFS exports.
- On the Client side, NFS Client simply mounts the expected file system locally.

The mounted file system is known as **NFS mount**.

#### **Setting Up NFS Server:**

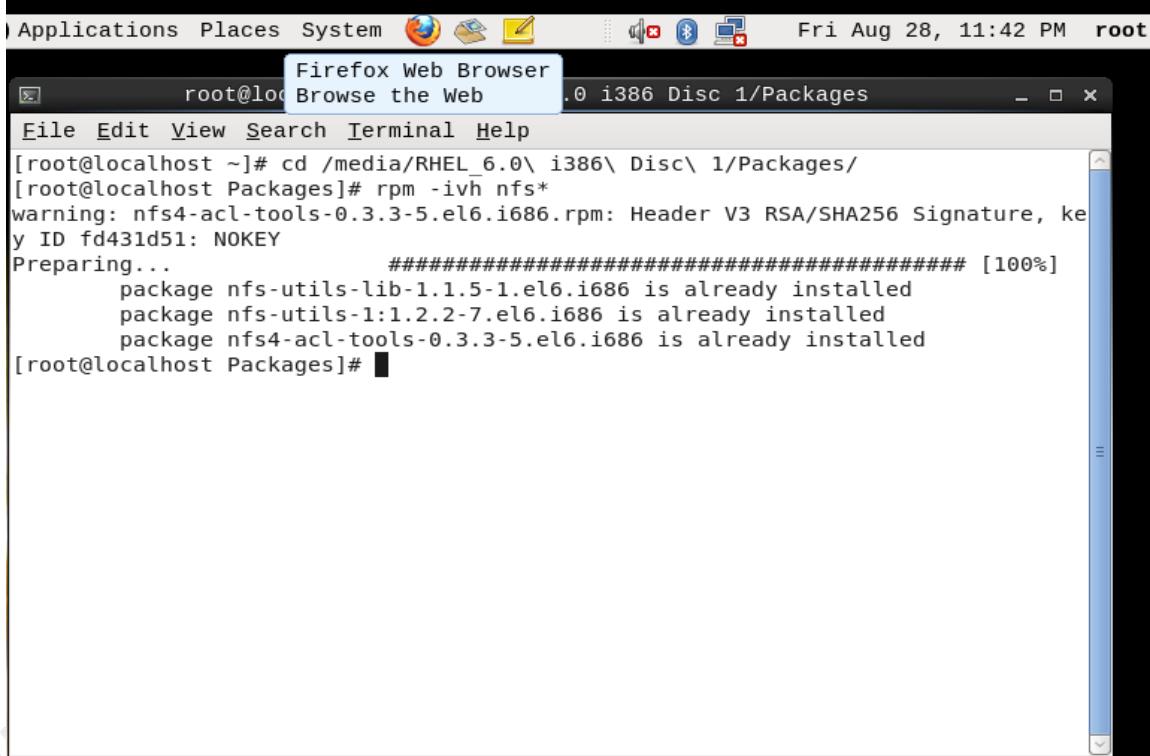
- (1) Verify the package of NFS whether installed as shown below:

# Linux Administration Practical Manual



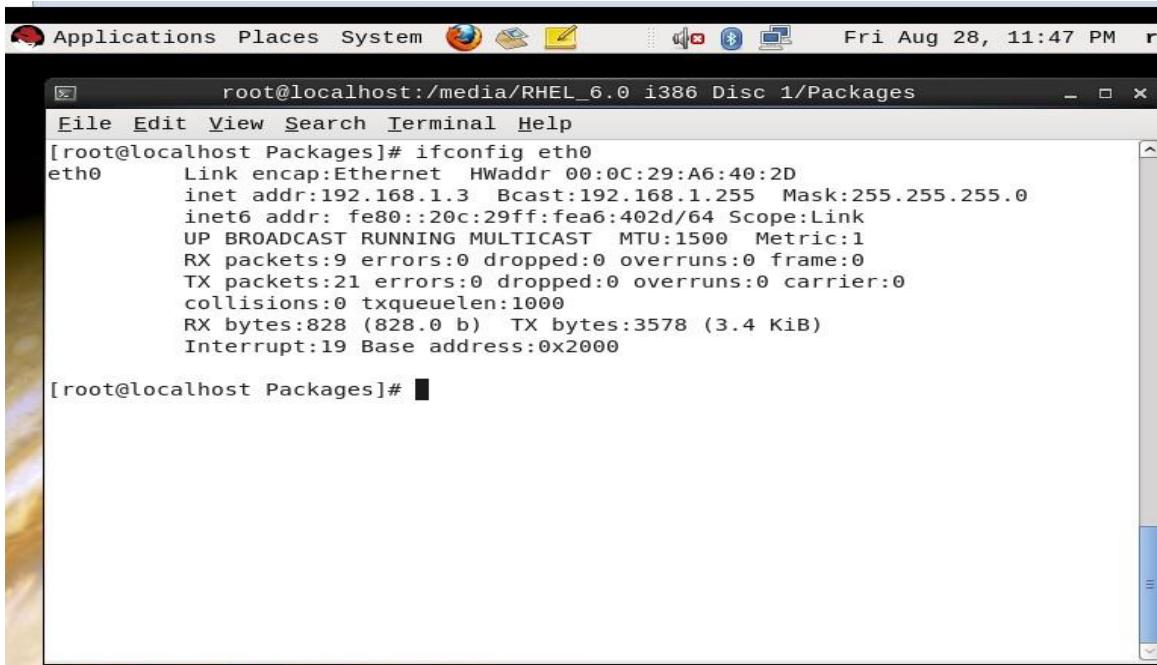
```
[root@localhost Packages]# rpm -qa | grep nfs
nfs-utils-lib-1.1.5-1.el6.i686
nfs4-acl-tools-0.3.3-5.el6.i686
nfs-utils-1.2.2-7.el6.i686
[root@localhost Packages]#
```

(2) If not installed on your system, then execute the following command:



```
[root@localhost ~]# cd /media/RHEL_6.0\ i386\ Disc\ 1/Packages/
[root@localhost Packages]# rpm -ivh nfs*
warning: nfs4-acl-tools-0.3.3-5.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
Preparing... ################################################ [100%]
      package nfs-utils-lib-1.1.5-1.el6.i686 is already installed
      package nfs-utils-1:1.2.2-7.el6.i686 is already installed
      package nfs4-acl-tools-0.3.3-5.el6.i686 is already installed
[root@localhost Packages]#
```

(3) Verify IP address of the linux machine to be setup as NFS Server:

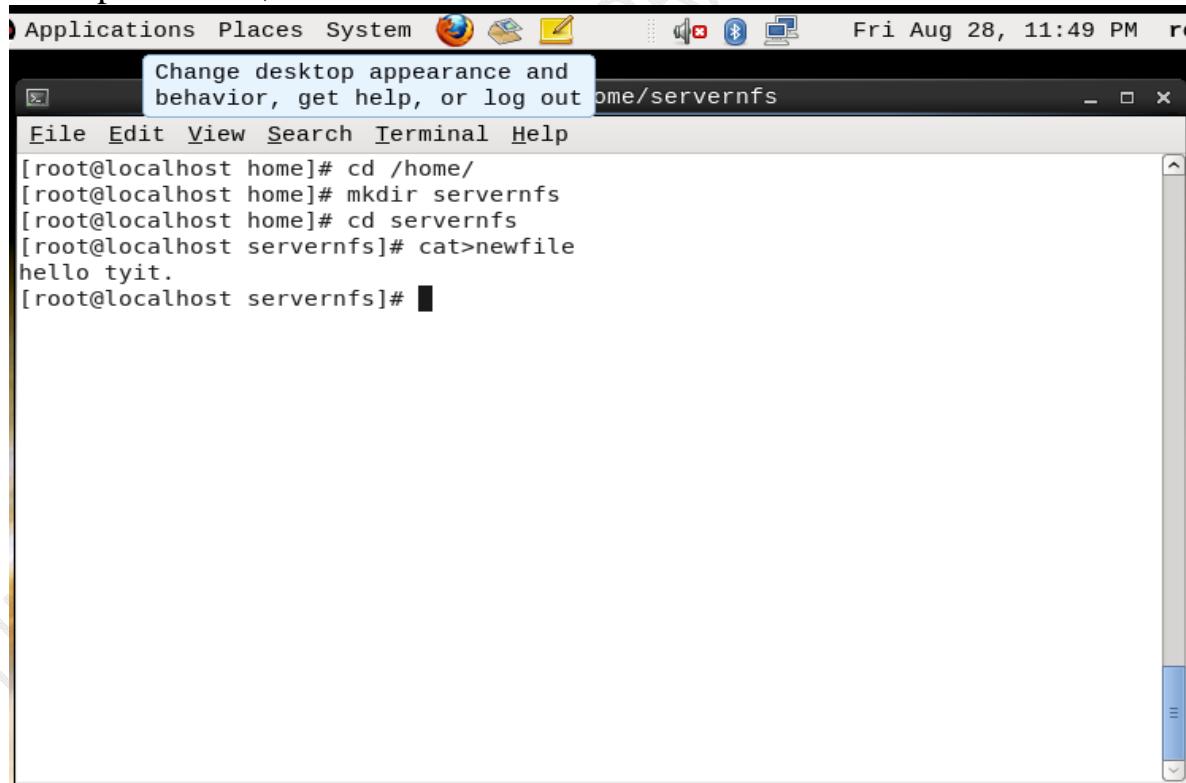


A screenshot of a Linux desktop environment showing a terminal window. The terminal window title bar reads "root@localhost:/media/RHEL\_6.0 i386 Disc 1/Packages". The window content shows the output of the "ifconfig eth0" command:

```
root@localhost Packages]# ifconfig eth0
eth0      Link encap:Ethernet HWaddr 00:0C:29:A6:40:2D
          inet addr:192.168.1.3 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fea6:402d/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:9 errors:0 dropped:0 overruns:0 frame:0
          TX packets:21 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:828 (828.0 b) TX bytes:3578 (3.4 KiB)
          Interrupt:19 Base address:0x2000

[root@localhost Packages]#
```

- (4) Make a directory to be exported, create few files into it and give it full permission, as follows:

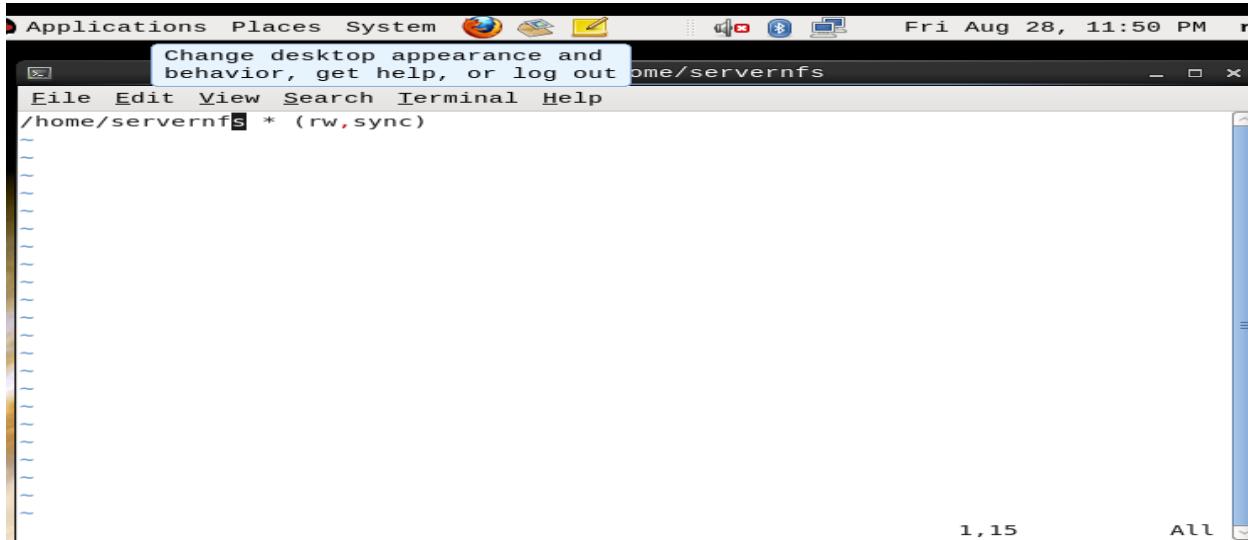


A screenshot of a Linux desktop environment showing a terminal window. The terminal window title bar has a tooltip "Change desktop appearance and behavior, get help, or log out" and the main title is "home/servernfs". The window content shows the following commands being run:

```
File Edit View Search Terminal Help
[root@localhost home]# cd /home/
[root@localhost home]# mkdir servernfs
[root@localhost home]# cd servernfs
[root@localhost servernfs]# cat>newfile
hello tyit.
[root@localhost servernfs]#
```

- (5) Open the configuration file of NFS, i.e., /etc/exports and write the following lines under it:

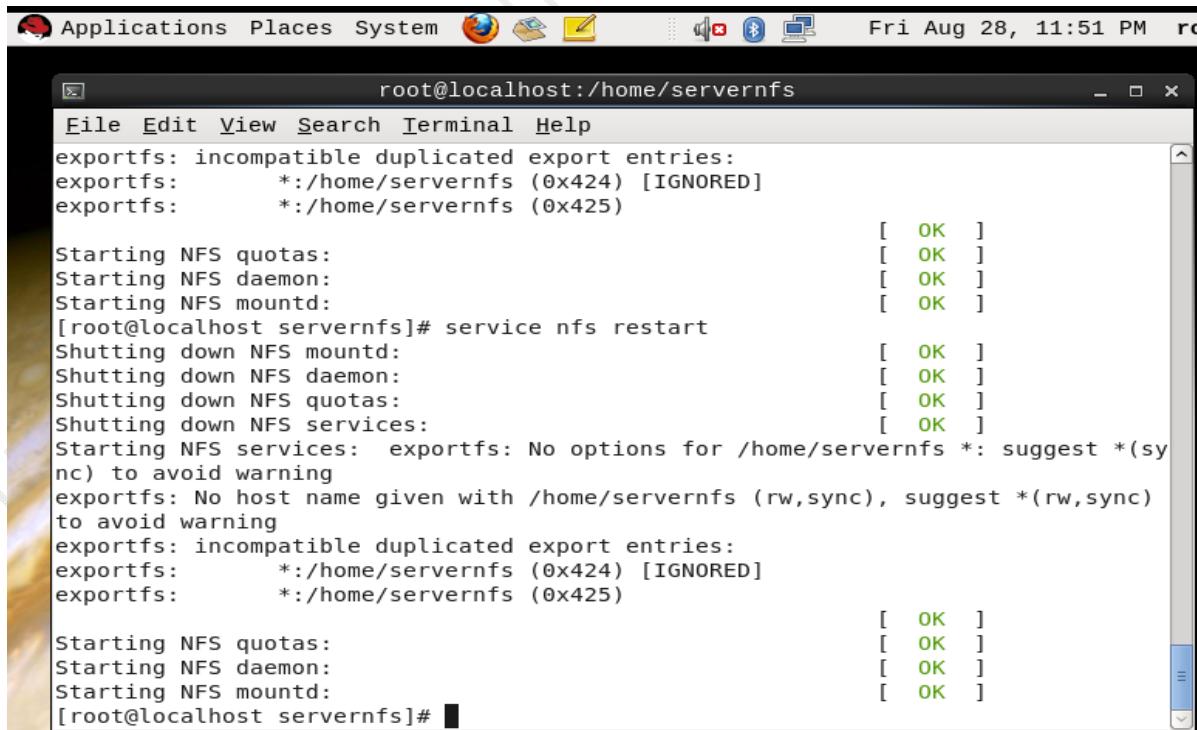
```
[root@diamond ~] # vi /etc/exports.
```



```
Change desktop appearance and
behavior, get help, or log out home/servernfs
File Edit View Search Terminal Help
/home/servernfs * (rw,sync)
1,15 All
```

The above entry says that server export directory has been exported to the network 192.168.1.3

- (6) Save and quit the file. Restart the service of nfs and enable it from boot as shown below :

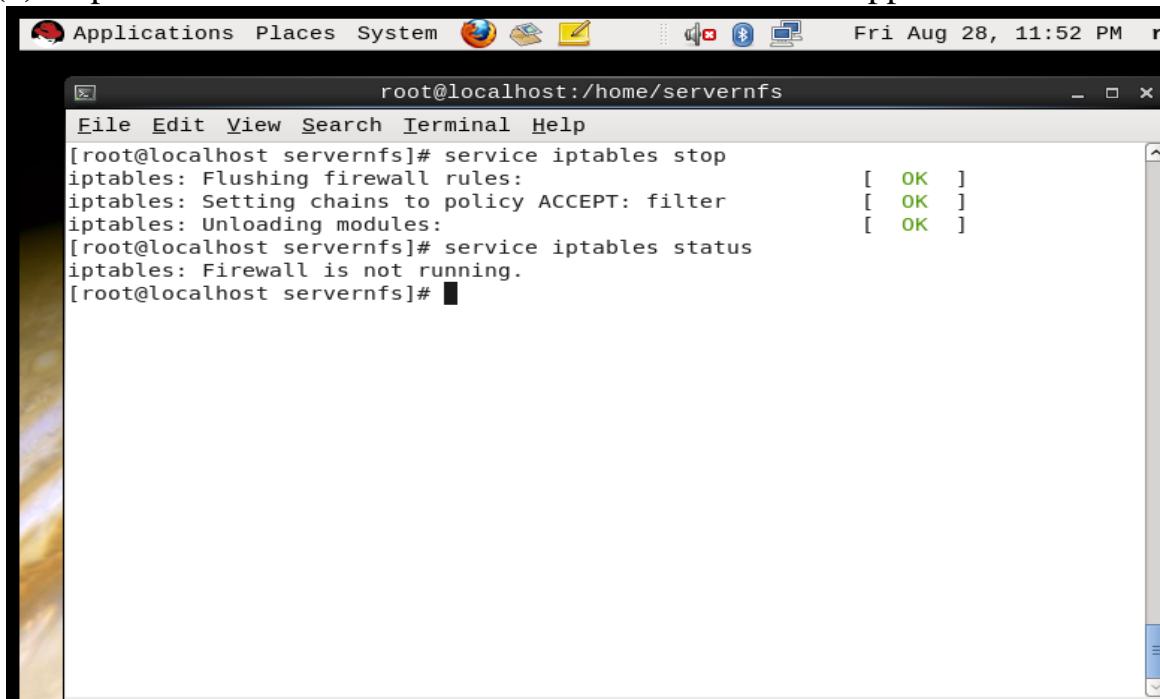


```
root@localhost:/home/servernfs
File Edit View Search Terminal Help
exportfs: incompatible duplicated export entries:
exportfs:      *:/home/servernfs (0x424) [IGNORED]
exportfs:      *:/home/servernfs (0x425)

Starting NFS quotas: [ OK ]
Starting NFS daemon: [ OK ]
Starting NFS mountd: [ OK ]
[root@localhost servernfs]# service nfs restart
Shutting down NFS mountd: [ OK ]
Shutting down NFS daemon: [ OK ]
Shutting down NFS quotas: [ OK ]
Shutting down NFS services: [ OK ]
Starting NFS services: exportfs: No options for /home/servernfs *: suggest *(sync) to avoid warning
exportfs: No host name given with /home/servernfs (rw,sync), suggest *(rw,sync) to avoid warning
exportfs: incompatible duplicated export entries:
exportfs:      *:/home/servernfs (0x424) [IGNORED]
exportfs:      *:/home/servernfs (0x425)

Starting NFS quotas: [ OK ]
Starting NFS daemon: [ OK ]
Starting NFS mountd: [ OK ]
[root@localhost servernfs]#
```

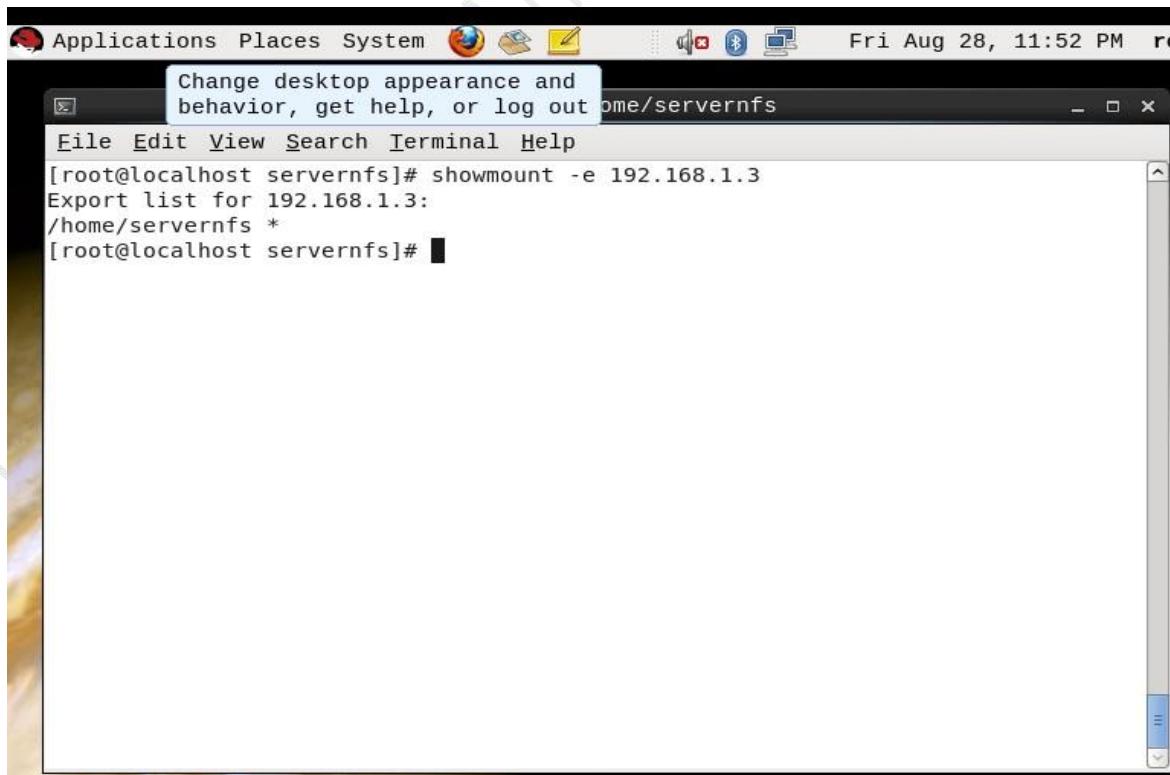
(7) Stop the Firewalls and check the status whether it is stopped.



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "root@localhost:/home/servernfs". The window contains the following command and its output:

```
[root@localhost servernfs]# service iptables stop
iptables: Flushing firewall rules:                                [ OK ]
iptables: Setting chains to policy ACCEPT: filter                 [ OK ]
iptables: Unloading modules:                                         [ OK ]
[root@localhost servernfs]# service iptables status
iptables: Firewall is not running.
[root@localhost servernfs]#
```

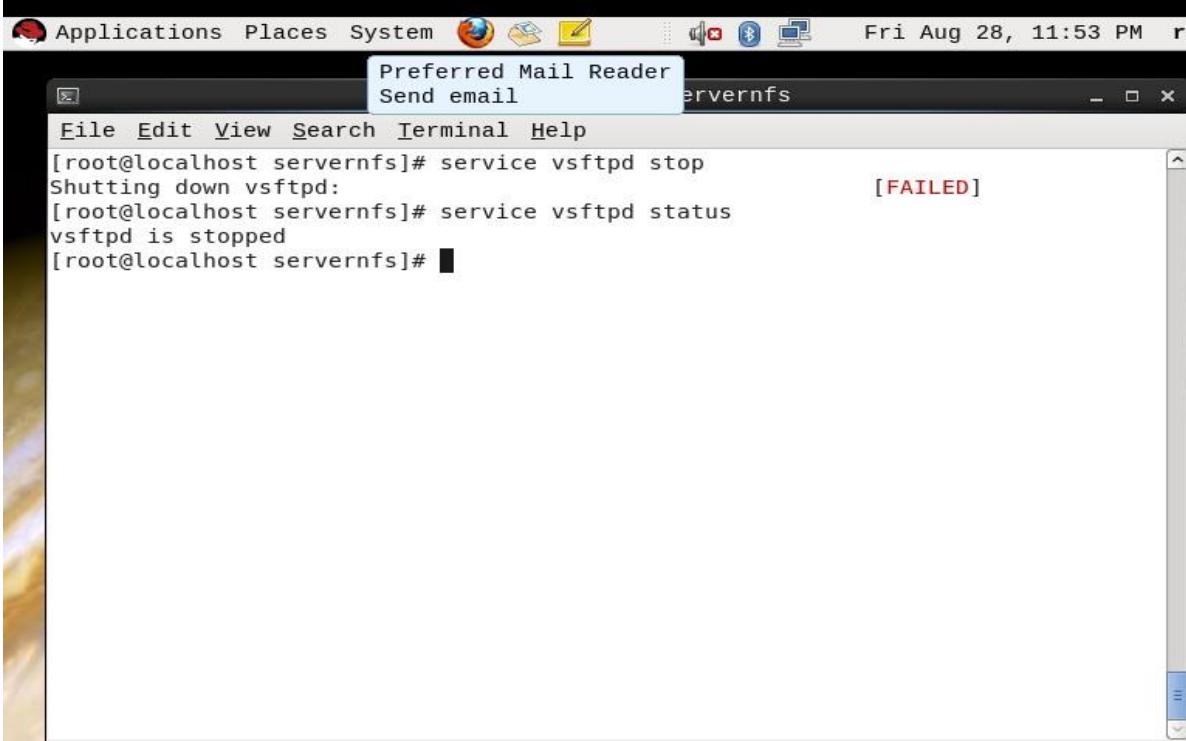
(8) Showmount command shows you all shared directories in given IP address.(Server)



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "root@localhost:/home/servernfs". A tooltip above the window says "Change desktop appearance and behavior, get help, or log out". The window contains the following command and its output:

```
File Edit View Search Terminal Help
[root@localhost servernfs]# showmount -e 192.168.1.3
Export list for 192.168.1.3:
/home/servernfs *
[root@localhost servernfs]#
```

(9) Stop the ftp service - vsftpd services and NFS services clash with each other.



A screenshot of a Linux desktop environment. At the top, there is a menu bar with "Applications", "Places", "System", and icons for a browser, file manager, and terminal. The date and time "Fri Aug 28, 11:53 PM" are shown on the right. Below the menu is a terminal window titled "Preferred Mail Reader" with the command "Send email". The terminal content shows:

```
[root@localhost servernfs]# service vsftpd stop
Shutting down vsftpd: [FAILED]
[root@localhost servernfs]# service vsftpd status
vsftpd is stopped
[root@localhost servernfs]#
```

(10) Give full permissions to the shared folder.

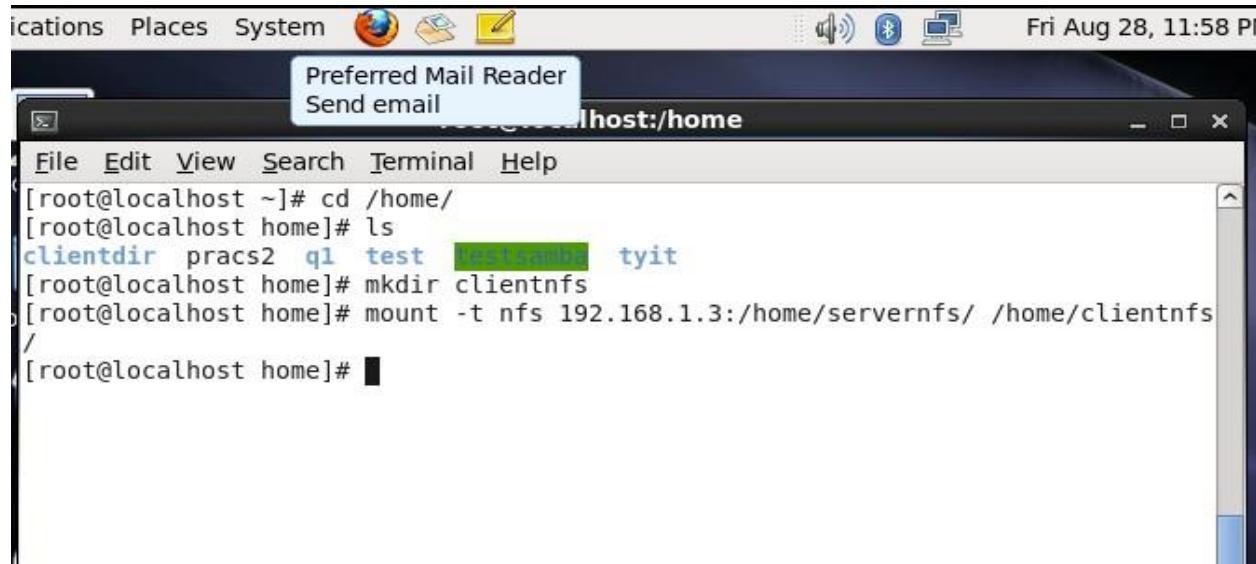


A screenshot of a Linux desktop environment. At the top, there is a menu bar with "Applications", "Places", "System", and icons for a browser, file manager, and terminal. The date and time "Fri Aug 28, 11:53 PM" are shown on the right. Below the menu is a terminal window titled "Firefox Web Browser" with the command "Browse the Web" and the URL "home/servernfs". The terminal content shows:

```
[root@localhost servernfs]# chmod -R 777 /home/servernfs/
[root@localhost servernfs]#
```

## NFS Client:

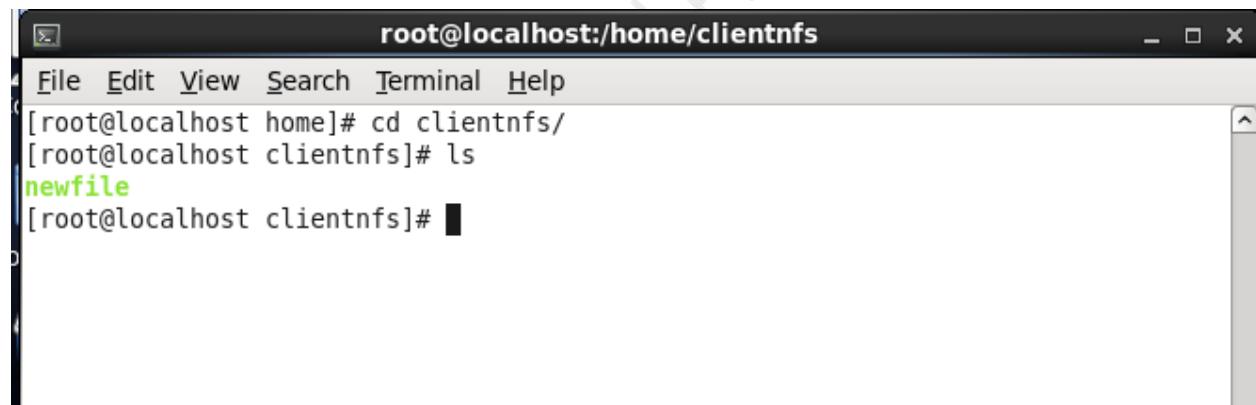
As NFS Client make a directory / nfsclient and mount the server exported directory on it, as shown:



A screenshot of a Linux desktop environment. At the top, there is a menu bar with "Applications", "Places", "System", and icons for a browser, file manager, and terminal. The system tray shows the date and time as "Fri Aug 28, 11:58 PM". A tooltip window titled "Preferred Mail Reader" with the sub-options "Send email" is visible. Below the menu bar is a terminal window titled "localhost:home". The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal itself displays the following command-line session:

```
[root@localhost ~]# cd /home/
[root@localhost home]# ls
clientdir pracs2 ql test  testfile1  tyit
[root@localhost home]# mkdir clientnfs
[root@localhost home]# mount -t nfs 192.168.1.3:/home/servernfs/ /home/clientnfs
/
[root@localhost home]#
```

On listing, it show up the content of server export directory.



A screenshot of a Linux terminal window titled "root@localhost:home/clientnfs". The terminal has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal displays the following command-line session:

```
[root@localhost home]# cd clientnfs/
[root@localhost clientnfs]# ls
newfile
[root@localhost clientnfs]#
```

### **Practical no 9: Configure to the Internet**

Proxy servers operate as an intermediary between a local network and Internet. Requests from local clients for web services can be handled by the proxy server. Squid is a high-performance HTTP and FTP caching proxy server. It is also known as a Web proxy cache. As it stores data from frequently used Web pages and files, it can often give your users the data they need without their systems having to look to the Internet.

From squid web proxy server you can control what should be access on your network from internet. It could be act as a filter that could filter everything from porn site to advertise , videos.

In our example we will configure squid web proxy server and filter sites and deny permission to specific host from accessing internet.

First we set Network Adapter cards in VM-ware. We required two NIC cards.

- 1) First NIC Directly connected to ISP for internet connection
- 2) Second NIC is used to connect client and give internet connection to Client and also used to control internet access to client.

We require one NIC card to communicate with windows which receives internet connection from Windows (ISP). So set it as NAT. and second NIC we set as Host-Only .

Configure squid web proxy server

Step 1 :- rpm query is used to check whether squid is install or not.

**#rpm -qa squid**

```
[root@server ~]# rpm -qa | grep squid
squid-3.1.4-1.el6.i686
```

If the package is not installed the install with following command.

move to Package Directory.

```
#cd /media/THEL_6.0\ i386\ Disc\ 1/Package
```

Now use rpm command to install SQUID Package.

```
#rpm -ivh squid*
```

Step 2 :- check the hostname and ip address of server it will be use in editing of squid.conf

```
#hostname
```

```
#ifconfig
```

```
[root@server ~]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:0C:29:48:13:2A
          inet addr:192.168.1.1 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe48:132a/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:201 errors:0 dropped:0 overruns:0 frame:0
            TX packets:21 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:12847 (12.5 KiB) TX bytes:2441 (2.3 KiB)
            Interrupt:19 Base address:0x2000
```

Main Squid configuration file is squid.conf in the /etc/squid/ directory. But only a few are active by default. Most of this file is filled with comments that describe most directives and associated options.

To make editing easier use show line numbers options and locate desire tag from line number.( set the line numbers by :set nu)**open /etc/squid/squid.conf for editing.**

```
#Vi /etc/squid/squid.conf
```

```
1 #
2 # Recommended minimum configuration:
3 #
4 acl manager proto cache_object
5 acl localhost src 127.0.0.1/32
6 acl localhost src ::1/128
7 acl to_localhost dst 127.0.0.0/8 0.0.0.0/32
8 acl to_localhost dst ::1/128
9
10 # Example rule allowing access from your local networks.
11 # Adapt to list your (internal) IP networks from where browsing
12 # should be allowed
13 acl localnet src 10.0.0.0/8      # RFC1918 possible internal network
14 acl localnet src 172.16.0.0/12    # RFC1918 possible internal network
15 acl localnet src 192.168.0.0/16   # RFC1918 possible internal network
16 acl localnet src fc00::/7       # RFC 4193 local private network range
17 acl localnet src fe80::/10     # RFC 4291 link-local (directly plugged) machines
18
19 acl SSL_ports port 443
20 acl Safe_ports port 80          # http
21 acl Safe_ports port 21          # ftp
22 acl Safe_ports port 443         # https
23 acl Safe_ports port 70          # gopher
24 acl Safe_ports port 210         # wais
25 acl Safe_ports port 1025-65535 # unregistered ports
26 acl Safe_ports port 280         # http-mgmt
27 acl Safe_ports port 488         # gss-http
28 acl Safe_ports port 591         # filemaker
29 acl Safe_ports port 777         # multiling http
30 acl CONNECT method CONNECT
31 #
32 # Recommended minimum Access Permission configuration:
:se nu
```

## Squid.conf file

Insert to Line no 34 write acl deny\_host src 192.168.1.14

The above line deny access to IP Address 192.168.1.14 network.

Insert Line no 35 write acl allow\_network src 192.168.1.0/24

The above line allow to 192.168.1.all network IP to access internet via 192.168.1.1 server.

Insert Line no 36 write acl web\_deny dstdomain "/etc/squid/web\_deny"

The above line block access to web site enter in web deny file. At present the web\_deny file is not there we have to create that file.

```
32 # Recommended minimum Access Permission configuration:
33 #
34 acl deny_host src 192.168.1.14
35 acl allow_network src 192.168.1.0/24
36 acl web_deny dstdomain "/etc/squid/web_deny"
```

Now we apply above acl rules. Go to line no .55 and insert following line after line No. 55

# Linux Administration Practical Manual

```
53 #
54 # INSERT YOUR OWN RULE(S) HERE TO ALLOW ACCESS FROM YOUR CLIENTS
55 #
56 http_access deny deny_host
57 http_access deny web_deny
58 http_access allow allow_network
59
```

Squid proxy server uses port no 3128 for communication.

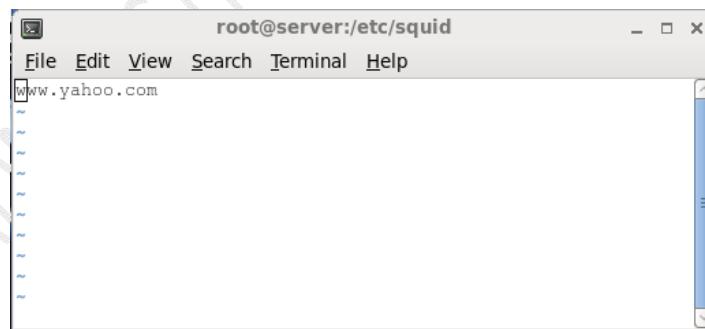
```
-->
69 # Squid normally listens to port 3128
70 http_port 3128
```

:wq

Save the file.

Now we create web\_deny file which we declare at line no. 36. At /etc/squid directory. Open the file with command # vi /etc/squid/web\_deny and add web site name www.yahoo.com

```
[root@server ~]# cd /etc/squid/
[root@server squid]# ls
cachemgr.conf          errorpage.css.default  msntauth.conf           squid.conf.default
cachemgr.conf.default   mime.conf             msntauth.conf.default  web_deny
errorpage.css           mime.conf.default     squid.conf
[root@server squid]# vi web_deny
```



Now save and close file with :wq

Now restart the service so the changes get applied.

**#service squid start**

Now set the squid service to start at boot time.

**#chkconfig squid on**

```
[root@server ~]# chkconfig squid on
```

Now restart the squid service

**#service squid restart**

```
[root@server ~]# service squid restart
Stopping squid: .....
Starting squid: .
[root@server ~]#
```

[ OK ]  
[ OK ]

We are done with the squid server configuration.

## **SOQUID CLIENT Configuration**

Go to client side/clone side

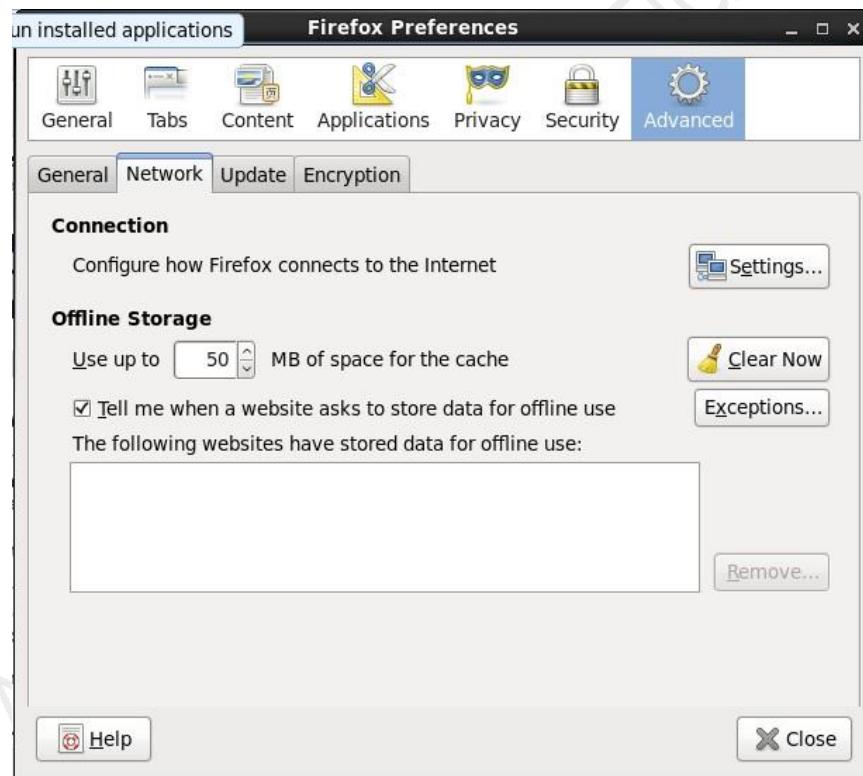
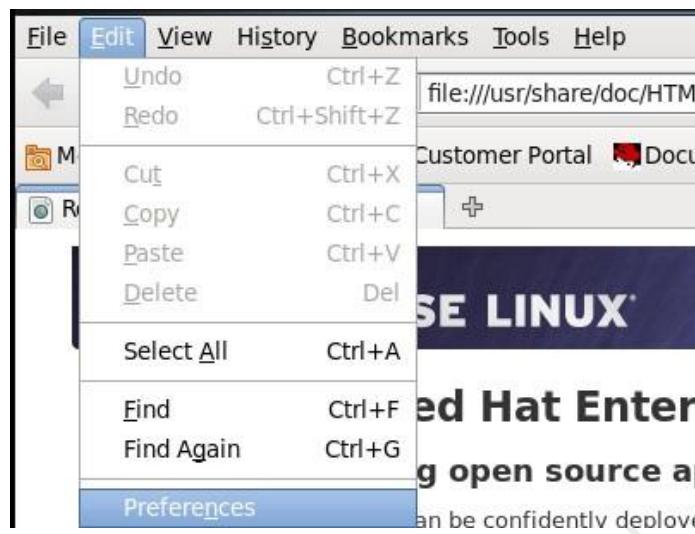
Go to firefox browser-open firefox

Go to Edit→Preference→advanced→ network tools→ click settings→ select manual proxy configuration→ HTTP Proxy and enter Squid proxy server IP Address 192.168.1.1 and Port no as 8080

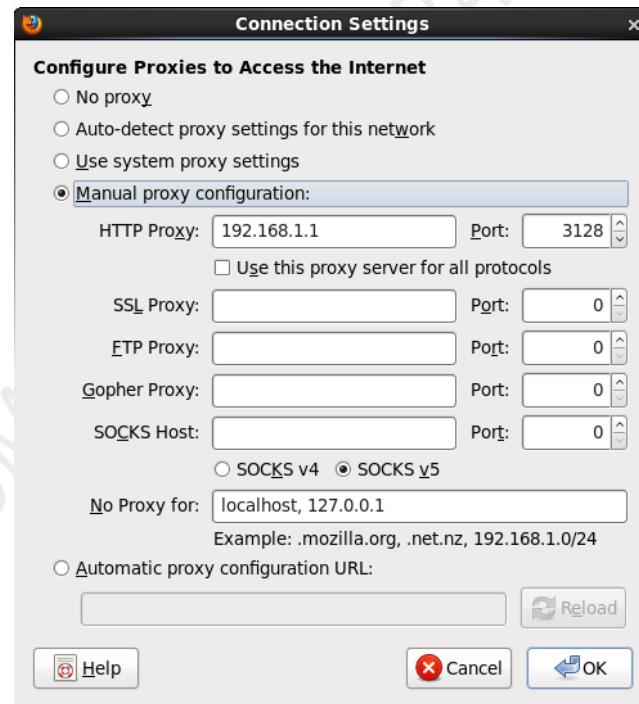
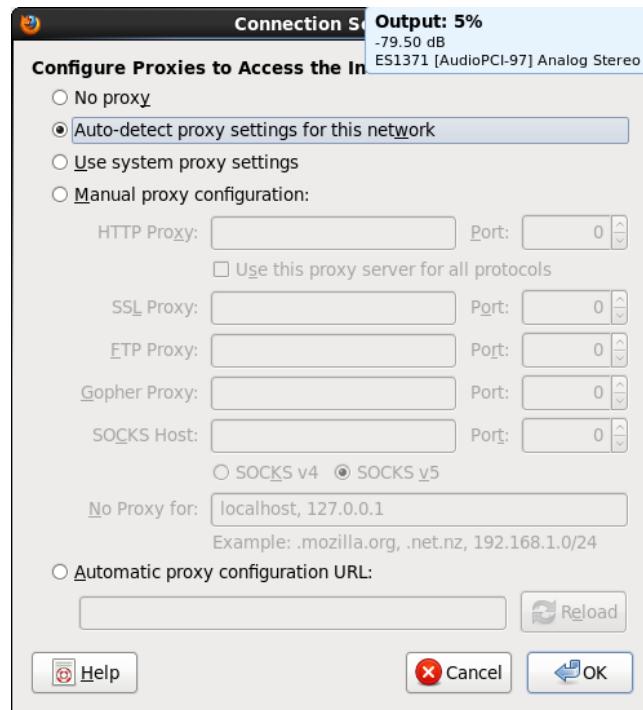
Click on OK and Apply.



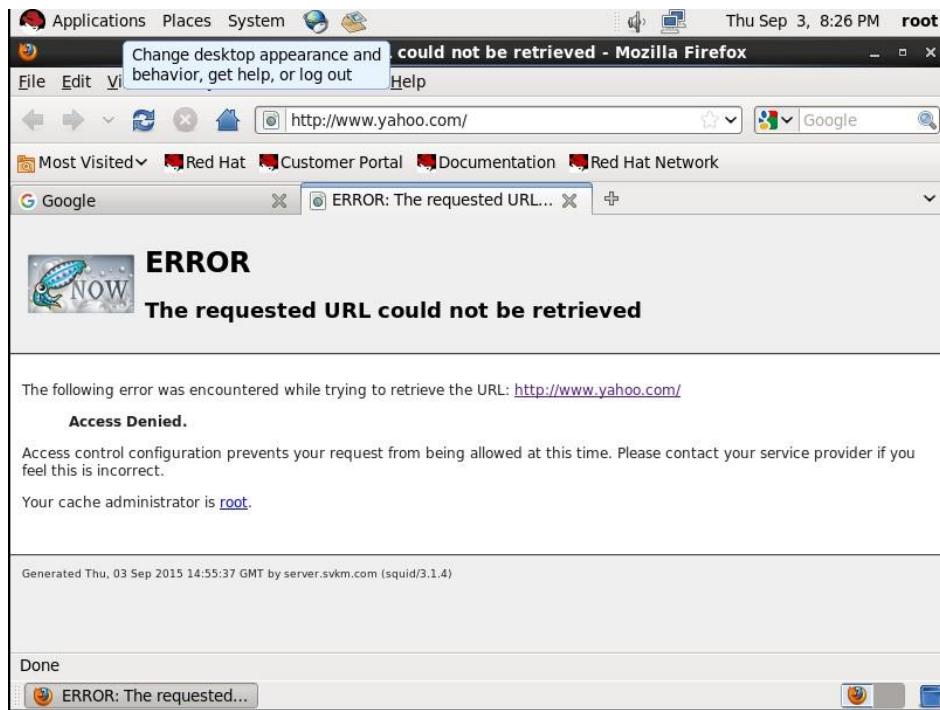
# Linux Administration Practical Manual



# Linux Administration Practical Manual



# Linux Administration Practical Manual



## **Practical no 10: Configuring Mail Server**

A number of Mail Transport Agents are available for RedHat Enterprise Linux .

MTA is a program which plays a vital role in transferring the mail. It is responsible for sending messages across the network.

The most widely used MTA is sendmail.

Sendmail is not a client program, which you use to read your email.

Sendmail is one of the behind-the-scenes programs which move email over the internet.

- Normally it runs as a background daemon.
- Can even be run out of the super daemon (xinetd)

### **Configuring Sendmail (Server Side)**

Before configuring sendmail, verify whether it is installed or not as follows:

```
#rpmquery -qa | grep sendmail
```

It gives the output that whether sendmail is installed and also shows the version of the installed package if installed

If not found , then install the package as follows:

```
#rpm -ivh sendmail*
```

```
[root@server ~]# cd /media/RHEL 6.0/i386/Disc1/Packages/  
[root@server Packages]# rpm -ivh sendmail*  
warning: sendmail-8.14.4-8.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY  
Preparing... ################################ [100%]  
1:sendmail ################################ [ 50%]  
2:sendmail-cf ################################ [100%]  
[root@server Packages]#  
  
[root@server Packages]# rpm -qa | grep sendmail  
sendmail-cf-8.14.4-8.el6.noarch  
sendmail-8.14.4-8.el6.i686  
[root@server Packages]#
```

By default, Sendmail Server allows to connect to localhost only

So we should edit the /etc/mail/sendmail.mc file to allow connect to other hosts.

To open the configuration file of sendmail, the command is as follows:

```
# vim /etc/mail/sendmail.mc
```

```
[root@server Packages]# vi m/etc/mail/sendmail.mc
```

```
dnl vert(-1) dnl
dnl #
dnl # This is the sendmail macro config file for m4. If you make changes to
dnl # /etc/mail/sendmail.mc, you will need to regenerate the
dnl # /etc/mail/sendmail.cf file by confirming that the sendmail-cf package is
dnl # installed and then performing a
dnl #
dnl #     /etc/mail/make
dnl #
i ncl ude(`/usr/share/sendmail-cf/m4/cf.m4') dnl
VERS ION D(`set up for li nux') dnl
OSTYPE(`li nux') dnl
dnl #
dnl # Do not advertize sendmail version.
dnl #
dnl def i ne(`conf SMTP_LOGI N_MSG', `$j Sendmail; $b') dnl
dnl #
dnl # default logging level is 9, you might want to set it higher to
dnl # debug the configuration
dnl #
dnl def i ne(`conf LOG_LEVEL', `9') dnl
dnl #
dnl # Uncomment and edit the following line if your outgoing mail needs to
dnl # be sent out through an external mail server:
dnl #
dnl def i ne(`SMART_HOST', `smtp.your.provider') dnl
dnl #
def i ne(`conf DEF_USER_ID', ``8:12') dnl
"/etc/mail/sendmail.mc" 176L, 7202C
```

1, 1

Top

Show hidden line with :se nu option on vi editor command mode.

Go to line number 116

DAEMON\_OPTIONS ('Port = smtp , Addr =192.168.1.1, Name='MTA')

You can allow other computers to use your sendmail server by commenting.

In the sendmail.mc file, lines that begin with dn1 , which stands to delete new line are constant.

Some lines end with dn1, but lines ending with dn1 are not comments.

Comment this line with dn1 keyword followed by # sign

**dn1 # DAEMON\_OPTIONS ('Port = smtp , Addr =192.168.1.1 , Name='MTA')**

116 dn1 # DAEMON\_OPTIONS('Port = smtp, Addr =127.0.0.1, Name=MTA') dn1

Save this file with :wq and Exit

Now generate new sendmail.cf file by using m4 command as shown below.

**m4 /etc/mail/sendmail.mc > /etc/mail/sendmail.cf**

m4 is a macro processor i.e. a tool that follows principle of shorthand writing.

Macro is a symbolic link for a long string of characters.

```
[root@server Packages]# vi m /etc/mail/sendmail.mc
[root@server Packages]# m4 /etc/mail/sendmail.mc > /etc/mail/sendmail.cf
[root@server Packages]#
```

## **Now check DNS Configuration:**

- A linux server with IP address 192.168.1.3 and hostname server.tyit.com
- A Configured DNS server on Linux server
- Updated /etc/hosts file
- Running portmap and xinetd services ( service xinetd stop , service portmap stop )
- Firewall should be off on server ( service iptables stop ) We have configured all these steps in our previous article.

## **Check DNS server**

Before start configuration of **sendmail server** we have to check whether our DNS is properly configured or not .

Eg: use dig command ( dig server.svkm.com & dig -x 192.168.1.1).

```
[root@server Packages]# dig server.svkm.com
; <>> Di G 9.7.0-P2-RedHat-9.7.0-5.P2.el6 <>> server.svkm.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<< opcode: QUERY, status: NOERROR, id: 29411
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 0

;; QUESTION SECTION:
server.svkm.com.           IN      A

;; ANSWER SECTION:
server.svkm.com.       86400   IN      A      192.168.1.1

;; AUTHORITY SECTION:
svkm.com.                 86400   IN      NS      server.svkm.com

;; Query time: 65 msec
;; SERVER: 192.168.1.1#53(192.168.1.1)
;; WHEN: Sun Aug 30 21:08:07 2015
;; MSG SIZE rcvd: 63

[root@server Packages]#
```

Now open forward.zone file from named directory

```
# vi /var/named/forward.zone
```

Add MX Entry in forward.zone as follows:

```
IN      MX      192.168.1.3
```

```
$TTL 1D
@ IN SOA server.svkm.com
                                root.server.svkm.com (
        0           ; serial
        1D          ; refresh
        1H          ; retry
        1W          ; expire
        3H )        ; minimum
server IN NS    server.svkm.com
              192.168.1.1
server IN A     192.168.1.1
```

Now restart sendmail service

```
# service sendmail restart
```

```
[root@server Packages]# vi /var/named/forward.zone
[root@server Packages]# service sendmail restart
Shutting down sendmail:
Starting sendmail:
Starting smclient:
[root@server Packages]# [OK]
```

If sendmail service restart without any error means you have configured sendmail successfully.

## Configuring sendmail Client Side

Here we are going to test sendmail server by sending and receiving mails.

Now create one user

```
# useradd test
```

Set the password for that user

```
# passwd test
```

```
[root@server ~] # useradd test
[root@server ~] # passwd test
Changing password for user test.
New password:
BAD PASSWORD: it is based on a dictionary word
Retype new password:
passwd: all authentication tokens updated successfully.
[root@server ~] #
```

# mail [test@server.nm.com](mailto:test@server.nm.com)

It will ask for the Subject and Body of the mail

Example: Subject: **testmail**

Body: **Hi Everyone.**

**This is my First sendmail program.**

Save the file by pressing keys <ctrl+d> which indicates End of file.

```
[root@server ~] # mail test@server.upgcm.com
Subject: test mail
Hi Everyone.
this is my sendmail program
EOT
[root@server ~] #
```

Type **su – test**

The above command switch to the user name test.To check whether mail has received or not , type mail command

# mail

The above command open the mailbox for the current login user.It will give you the details of mail received by the subject name.

```
test@server ~]$ su - test
Password:
test@server ~]$ mail
Mozilla Mail version 12.4 7/29/08. Type ? for help.
'/var/spool/mail/test': 1 message 1 new
>N 1 test@server.svkm.com Sun Aug 30 21:27 20/733 "hi"
s
```

## Linux Administration Practical Manual

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New emails are shown with letter **N** at starting and unread mail shown with letter **U** at starting. Once you read the mail **U** and **N** notification get cleared.

To read that mail type the number which will be given in previous output

# 1

You can now read the contents of mail.

To exit type <Ctrl+d>

```
[test@server ~]$ mail test@server.svkm.com
Subject: hi
test
EOT
[test@server ~]$
[test@server ~]$ mail
No mail for test
[test@server ~]$ su - test
Password:
[test@server ~]$ mail
Heirloom Mail version 12.4 7/29/08. Type ? for help.
"/var/spool/mail/test": 1 message 1 new
>N 1 test@server.svkm.com Sun Aug 30 21:27 20/733 "hi"
& 1
Message 1:
From: test@server.svkm.com Sun Aug 30 21:27:56 2015
Return-Path: <test@server.svkm.com>
From: test@server.svkm.com
Date: Sun, 30 Aug 2015 21:27:35 +0530
To: test@server.svkm.com
Subject: hi
User-Agent: Heirloom mailx 12.4 7/29/08
Content-Type: text/plain; charset=us-ascii
Status: R

test
& ]
```

### **Practical no 11: Configure FTP Server on Linux server**

- FTP server is used to transfer files between server and clients.
- All major operating system supports FTP.
- FTP is the most used protocol over internet to transfer files. Like most Internet operations, FTP works on a client/ server model.
- FTP client programs can enable users to transfer files to and from a remote system running an FTP server program.
- Any Linux system can operate as an FTP server.
- It has to run only the server software—an FTP daemon with the appropriate configuration. Transfers are made between user accounts on client and server systems.
- A user on the remote system has to log in to an account on a server and can then transfer files to and from that account's directories only.
- A special kind of user account, named FTP, allows any user to log in to it with the username “anonymous.”
- This account has its own set of directories and files that are considered public, available to anyone on the network who wants to download them.
- The numerous FTP sites on the Internet are FTP servers supporting FTP user accounts with anonymous login.
- Any Linux system can be configured to support anonymous FTP access, turning them into network FTP sites. Such sites can work on an intranet or on the Internet.

#### **Configuring the FTP Server**

- The vsftpd RPM package is required to configure a Red Hat Enterprise Linux system as an ftp server.
- If it is not already installed, install it with rpm commands.
- After it is installed, start the service as root with the command service vsftpd start .
- The system is now an ftp server and can accept connections.
- To configure the server to automatically start the service at boot time, execute the command chkconfig vsftpd on as root.
- To stop the server, execute the command service vsftpd stop.

- To verify that the server is running, use the command service vs ftpd status.

1) Verify the package vsftpd for FTP. If installed create few files in pub. it is shown below.

```
#rpm -qa | grep vsftpd
```

This command returns the version of vsftpd. If package vsftpd is not installed then install using following command.

```
#rpm -ivh vsftpd*
```

```
#rpm -ivh ftp*
```

```
[root@localhost Packages]# rpm -qa | grep vsftpd
[root@localhost Packages]# rpm -ivh vsftpd*
warning: vsftpd-2.2.2-6.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID
fd431d51: NOKEY
Preparing...                                                 (100%
#####
[100%]
1:vsftpd
#####
[100%]
[root@localhost Packages]# █
```

```
[root@localhost Packages]# rpm -ivh ftp*
warning: ftp-0.17-51.1.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID f
d431d51: NOKEY
Preparing...                                                 (100%
#####
[100%]
1:ftp
#####
[100%]
```

Check whether the package is install or not with #rpm -qa | grep ftp command

```
[root@localhost Packages]# rpm -qa | grep ftp
report-plugin-ftp-0.18-7.el6.i686
vsftpd-2.2.2-6.el6.i686
report-config-ftp-0.18-7.el6.i686
ftp-0.17-51.1.el6.i686
[root@localhost Packages]# █
```

Now use following command to start vsftpd services at boot time using chkconfig command.

**# chkconfig vsftpd on**

```
[root@localhost Packages]# chkconfig vsftpd on
[root@localhost Packages]# chkconfig --list | grep ftp
vsftpd      0:off  1:off  2:on   3:on   4:on   5:on   6:off
[root@localhost Packages]# █
```

**# cd /var/ftp/pub/**

**#cat > ftpfile**

```
[root@localhost Packages]# cd /var/ftp/pub/
[root@localhost pub]# cat > ftpfile
hi....
This is my FTP file for testing.
[root@localhost pub]# █
```

This is my ftp file for testing.

Use ctrl+d to save and exit.

2) Verify IP address of linux machine to be configured as FTP.

**#ifconfig**

Set IP Address to 192.168.1.1

# Linux Administration Practical Manual

---

```
[root@localhost pub]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:0C:29:48:13:2A
          inet addr:192.168.252.130 Bcast:192.168.252.255 Mask:255.255.255.
0
          inet6 addr: fe80::20c:29ff:fe48:132a/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:507 errors:0 dropped:0 overruns:0 frame:0
            TX packets:55 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:42782 (41.7 KiB) TX bytes:7769 (7.5 KiB)
            Interrupt:19 Base address:0x2000

eth1-eth0 Link encap:Ethernet HWaddr 00:0C:29:48:13:34
          inet addr:192.168.1.1 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe48:1334/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:49 errors:0 dropped:0 overruns:0 frame:0
            TX packets:29 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:4760 (4.6 KiB) TX bytes:4144 (4.0 KiB)
            Interrupt:16 Base address:0x2080

lo        Link encap:Local Loopback
```

---

3) Open the configuration file and make the following changes :

- I.    Uncomment anonymous\_enable = YES
- II.    Uncomment local\_enable = YES
- III.    Uncomment anonymous\_upload\_enable = YES
- IV.    Uncomment listen = YES

All the required steps are as follows:

#vi /etc/vsftpd/vsftpd.conf

```
[root@localhost pub]# vi /etc/vsftpd/vsftpd.conf
```

# Linux Administration Practical Manual

---

```
1 # Example config file /etc/vsftpd/vsftpd.conf
2 #
3 # The default compiled in settings are fairly paranoid. This sample f
ile
4 # loosens things up a bit, to make the ftp daemon more usable.
5 # Please see vsftpd.conf.5 for all compiled in defaults.
6 #
7 # READ THIS: This example file is NOT an exhaustive list of vsftpd op
tions.
8 # Please read the vsftpd.conf.5 manual page to get a full idea of vsf
tpd's
9 # capabilities.
10 #
11 # Allow anonymous FTP? (Beware - allowed by default if you comment th
is out).
12 anonymous_enable=YES
13 #
14 # Uncomment this to allow local users to log in.
15 local_enable=YES
16 #
17 # Uncomment this to enable any form of FTP write command.
18 write_enable=YES
19 #
:se nu
```

---

Once the file is open do the above changes to configuration file And restart the vsftpd service.

**#service vsftpd restart**

```
[root@localhost pub]# vi /etc/vsftpd/vsftpd.conf
[root@localhost pub]# service vsftpd start
Starting vsftpd for vsftpd: [ OK ]
[root@localhost pub]# service vsftpd status
vsftpd (pid 3114) is running...
[root@localhost pub]# service vsftpd restart
Shutting down vsftpd: [ OK ]
Starting vsftpd for vsftpd: [ OK ]
[root@localhost pub]# █
```

4) Login with anonymous user.

Now you can login with [ftp 192.168.1.1](ftp://192.168.1.1)

We can use Username: anonymous and password for same is blank.

Here you can use ls –a command to view the content of ftp home directory.

**ftp> ls –a**

```
[root@localhost pub]# cd
[root@localhost ~]# ftp 192.168.1.1
Connected to 192.168.1.1 (192.168.1.1).
220 (vsFTPd 2.2.2)
Name (192.168.1.1:root): anonymous
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ls -a
227 Entering Passive Mode (192,168,1,1,33,125).
150 Here comes the directory listing.
drwxr-xr-x 3 0 0 4096 May 26 2010 .
drwxr-xr-x 3 0 0 4096 May 26 2010 ..
drwxr-xr-x 2 0 0 4096 Sep 02 13:04 pub
226 Directory send OK.
ftp> bye
```

To Log off from ftp we use bye command

- 5) Now allow ftp anonymous write enable as follows:

```
#getsebool -a | grep ftp
#setsebool -P allow_ftp_anon_write on or =1
#getsebool -a | grep ftp
```

```
[root@localhost ~]# getsebool -a | grep ftp
allow_ftpd_anon_write --> off
allow_ftpd_full_access --> off
allow_ftpd_use_cifs --> off
allow_ftpd_use_nfs --> off
ftp_home_dir --> off
ftpd_connect_db --> off
httpd_enable_ftp_server --> off
sftpd_anon_write --> off
sftpd_enable_homedirs --> off
sftpd_full_access --> off
sftpd_write_ssh_home --> off
tftp_anon_write --> off
[root@localhost ~]# █
```

Allow System user to get access to ftp server.

```
#getsebool -a | grep ftp  
  
#setsebool -P ftp_home_dir on  
  
#getsebool -a | grep ftp
```

```
[root@localhost ~]# setsebool -P allow_ftpd_anon_write=1  
[root@localhost ~]# setsebool -P ftp_home_dir on  
[root@localhost ~]# getsebool -a | grep ftp  
allow_ftpd_anon_write --> on  
allow_ftpd_full_access --> off  
allow_ftpd_use_cifs --> off  
allow_ftpd_use_nfs --> off  
ftp_home_dir --> on  
ftpd_connect_db --> off  
httpd_enable_ftp_server --> off  
sftpd_anon_write --> off  
sftpd_enable_homedirs --> off  
sftpd_full_access --> off  
sftpd_write_ssh_home --> off  
tftp_anon_write --> off  
[root@localhost ~]# █
```

6) By default /var/ftp is ftp user Home directory. Check the context of file /var/ftp/pub and change to ftp

```
#ls -ldz /var/ftp/pub  
  
#chgrp ftp /var/ftp/pub  
  
#chown ftp /var/ftp/pub  
  
#ls -ldz /var/ftp/pub
```

```
[root@localhost ~]# ls -ldZ /var/ftp/pub/  
drwxr-xr-x. root root system_u:object_r:public_content_t:s0 /var/ftp/pub/  
[root@localhost ~]# chown ftp /var/ftp/pub/  
[root@localhost ~]# chgrp ftp /var/ftp/pub/  
[root@localhost ~]# ls -ldZ /var/ftp/pub/  
drwxr-xr-x. ftp ftp system_u:object_r:public_content_t:s0 /var/ftp/pub/  
[root@localhost ~]# █
```

7) now go to pub directory and create one file.

```
#cd /var/ftp/pub
```

```
#touch T1 T2 T3
```

```
#cat > ftptest
```

Welcome to ftp server

To save the document use ctrl+d

```
[root@localhost ~]# cd /var/ftp/pub/
[root@localhost pub]# pwd
/var/ftp/pub
[root@localhost pub]# touch T1 T2 T3
[root@localhost pub]# cat > ftpfile.txt
Hi...
This file is for FTP server testing.
[root@localhost pub]# ls
ftpfile.txt  T1  T2  T3
[root@localhost pub]# █
```

8) Restart the service of vsftpd and enable it from boot.

Also give full permission to the directory /var/ftp/pub.

```
service vsftpd start
```

```
#service vsftpd restart
```

```
#chkconfig vsftpd on
```

```
#chkconfig --list | grep vsftpd
```

```
[root@localhost Packages]# chkconfig vsftpd on
[root@localhost Packages]# chkconfig --list | grep ftp
vsftpd           0:off   1:off   2:on    3:on    4:on    5:on    6:off
[root@localhost Packages]# █
```

Now FTP is configured. Test as FTP client from other machine.

Use the following command.

```
#ftp 192.168.1.1
```

It will prompt for username and password. If you're using ftp as username it will not prompt for password as ftp is anonymous user

### 9) Disabling anonymous FTP login :

Open configuration file.

```
#vi /etc/vsftpd/vsftpd.conf
```

- i) Go to directive anonymous\_enable = YES and make it anonymous\_enable = NO.
- ii) Go to directive anonymous\_upload\_enable = YES and make it anonymous\_upload\_enable = NO.

Now restart the vsftpd service.

```
#service vsftpd restart
```

And try to log in with username anonymous. It will not allow to log in with anonymous username and gives you log in fail message

```
#ftp 192.168.1.1
```

```
[root@localhost pub]# vi /etc/vsftpd/vsftpd.conf
[root@localhost pub]# service vsftpd restart
Shutting down vsftpd: [ OK ]
Starting vsftpd for vsftpd: [ OK ]
[root@localhost pub]# ftp 192.168.1.1
Connected to 192.168.1.1 (192.168.1.1).
220 (vsFTPd 2.2.2)
Name (192.168.1.1:root) : anonymous
331 Please specify the password.
Password:
530 Login incorrect.
Login failed.
ftp> 
```

## 10) Block System user (normal user) for ftp login :

Now add two users to your system. e.g. add new user manish and shreyash

We use following command to add user.

**#useradd manish**

**#passwd manish //this command use to set password.**

**#useradd shreyash**

**#passwd shreyash**

```
[root@localhost pub]# useradd manish
[root@localhost pub]# passwd manish
Changing password for user manish.
New password:
BAD PASSWORD: it is based on a dictionary word
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost pub]# useradd shreyash
[root@localhost pub]# passwd shreyash
Changing password for user shreyash.
New password:
BAD PASSWORD: it is based on a dictionary word
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost pub]# █
```

Now try to login with users one by one.

When you login with system user ftp home directory change to login user home directory

**ftp>pwd**

**ftp>ls**

**ftp>bye**

```
[root@localhost ~]# ftp 192.168.1.1
Connected to 192.168.1.1 (192.168.1.1).
220 (vsFTPd 2.2.2)
Name (192.168.1.1:root): manish
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> pwd
257 "/home/manish"
ftp> ls
227 Entering Passive Mode (192,168,1,1,167,59).
150 Here comes the directory listing.
226 Directory send OK.
ftp> █
```

we can use ftp\_users and users\_list files to user control the access to ftp server.

Suppose I want to block user manish to get access to ftp server. Then open the user\_list file and add user name manish at the end of directory. Save and exit from file.

#vi /etc/vsftpd/user\_list

```
[root@localhost ~]# cd /etc/vsftpd/
[root@localhost vsftpd]# ls
ftpusers user_list vsftpd.conf vsftpd_conf_migrate.sh vsftpd.conf.rpmsave
[root@localhost vsftpd]# vi user_list

# vsftpd userlist
# If userlist_deny=NO, only allow users in this file
# If userlist_deny=YES (default), never allow users in this file, and
# do not even prompt for a password.
# Note that the default vsftpd pam config also checks /etc/vsftpd/ftpusers
# for users that are denied.
root
bin
daemon
adm
lp
sync
shutdown
halt
mail
news
uucp
operator
games
nobody
manish
```

Restart the vsftpd services

**#service vsftpd restart.**

And try to login with user name manish.

It will block the user name and gives you error message.

```
[root@localhost vsftpd]# service vsftpd restart
Shutting down vsftpd:                                     [  OK  ]
Starting vsftpd for vsftpd:                               [  OK  ]
[root@localhost vsftpd]# ftp 192.168.1.1
Connected to 192.168.1.1 (192.168.1.1).
220 (vsFTPd 2.2.2)
Name (192.168.1.1:root): manish
530 Permission denied.
Login failed.
ftp>
```

8) get and put command to upload and download the file.

Now create one txt file at shreyash /home directory

**#cd /home**

**#pwd**

**#cd shreyash**

**#pwd**

**#cat > test.txt**

hi... this file is created by shreyash.

To save and exit press ctrl+d

## Linux Administration Practical Manual

---

```
[root@localhost ~]# cd /home/shreyash/
[root@localhost shreyash]# ls
[root@localhost shreyash]# cat > ftpfile.txt
Hello..
welcome to FTP server.
[root@localhost shreyash]# ls
ftpfile.txt
[root@localhost shreyash]# cd
[root@localhost ~]# cat > FTP_Test.txt
This file transfer from current dir. to ftp server.
[root@localhost ~]# █
```

```
[root@localhost ~]# pwd
/root
[root@localhost ~]# ls
anaconda-ks.cfg  Downloads      GreetingServer.class  install.log.syslog  Templates
backup          FTP_Test.txt    GreetingServer.java   Music           Videos
demo.txt        GreetingClient.class hello.class       Pictures
Desktop         GreetingClient.java  hello.java       Public
Documents        GreetingClient.java~ install.log      software.txt
[root@localhost ~]# █
```

Login with user name shreyash

**#ftp 192.168.1.1**

now get command to download file from ftp server and it is downloaded to your present working directory.

ftp> get test.txt

## Linux Administration Practical Manual

---

```
[root@localhost ~]# ftp 192.168.1.1
Connected to 192.168.1.1 (192.168.1.1).
220 (vsFTPd 2.2.2)
Name (192.168.1.1:root): shreyash
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ls
227 Entering Passive Mode (192,168,1,1,211,99).
150 Here comes the directory listing.
-rw-r--r-- 1 0 0 32 Sep 02 15:35 ftpfile.txt
226 Directory send OK.
ftp> get ftpfile.txt
local: ftpfile.txt remote: ftpfile.txt
227 Entering Passive Mode (192,168,1,1,229,230).
150 Opening BINARY mode data connection for ftpfile.txt (32 bytes).
226 Transfer complete.
32 bytes received in 2.5e-05 secs (1280.00 Kbytes/sec)
ftp> put FTP_Test.txt
local: FTP_Test.txt remote: FTP_Test.txt
227 Entering Passive Mode (192,168,1,1,89,237).
150 Ok to send data.
226 Transfer complete.
52 bytes sent in 1.2e-05 secs (4333.33 Kbytes/sec)
ftp> ls
227 Entering Passive Mode (192,168,1,1,69,138).
150 Here comes the directory listing.
-rw-r--r-- 1 506 506 52 Sep 02 15:41 FTP_Test.txt
-rw-r--r-- 1 0 0 32 Sep 02 15:35 ftpfile.txt
226 Directory send OK.
ftp> bye
```

Same way create one text file in your current directory and try to upload the same with put command.

**ftp> put test\_new.txt**

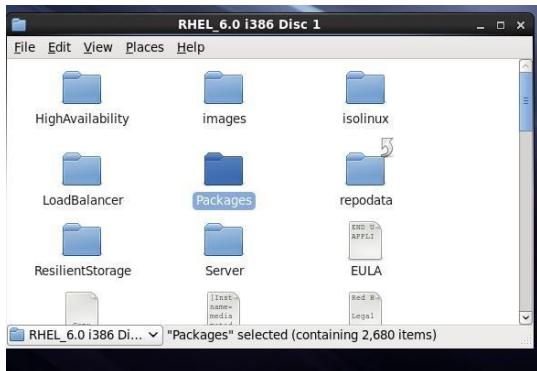
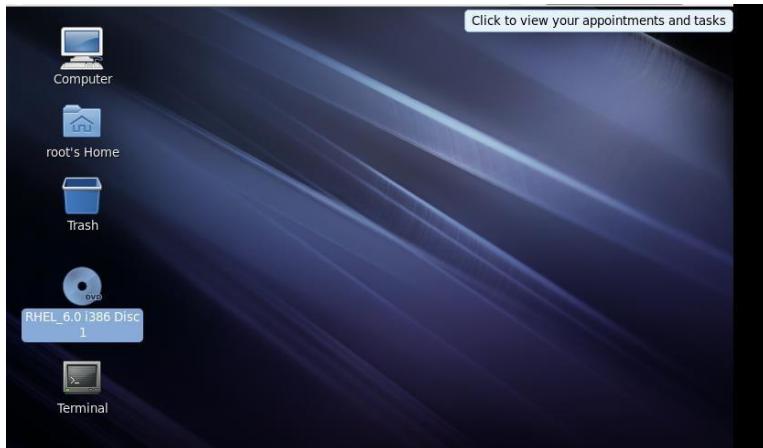
To exit from ftp use bye command.

## Practical no 12: Using gcc compiler(Programming using c)

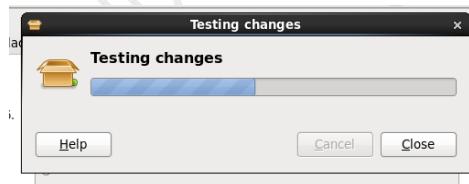
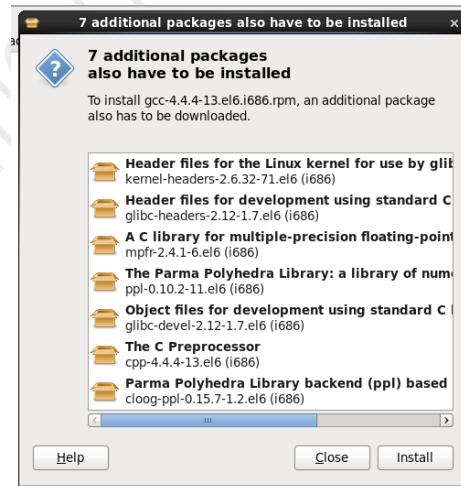
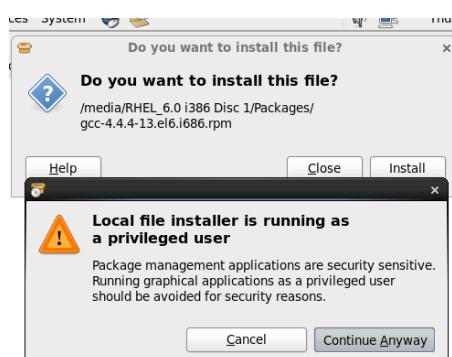
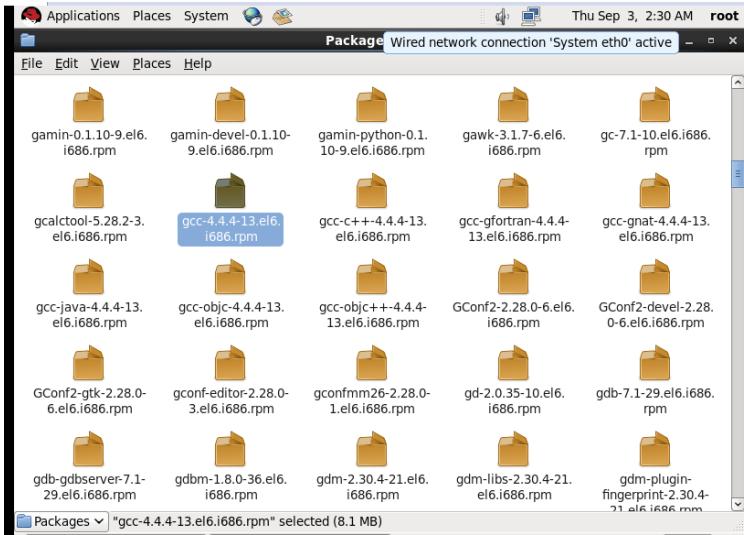
Executing shell scripts with C using gcc compiler

Installation of gcc package:

```
#rpm -ivh gcc
```



# Linux Administration Practical Manual





```
root@server:/media/RHEL_6.0 i386 Disc 1/Packages
File Edit View Search Terminal Help
[root@server ~]# cd /media/RHEL_6.0\ i386\ Disc\ 1/Packages/
[root@server Packages]# rpm -q gcc
gcc-4.4.4-13.el6.i686
[root@server Packages]#
```



```
Applications Places System Thu Sep 3, 2:38 AM root
root@server:/media/RHEL_6.0 i386 Disc 1/Packages
File Edit View Search Terminal Help
[root@server Packages]# rpm -ivh gcc*
```

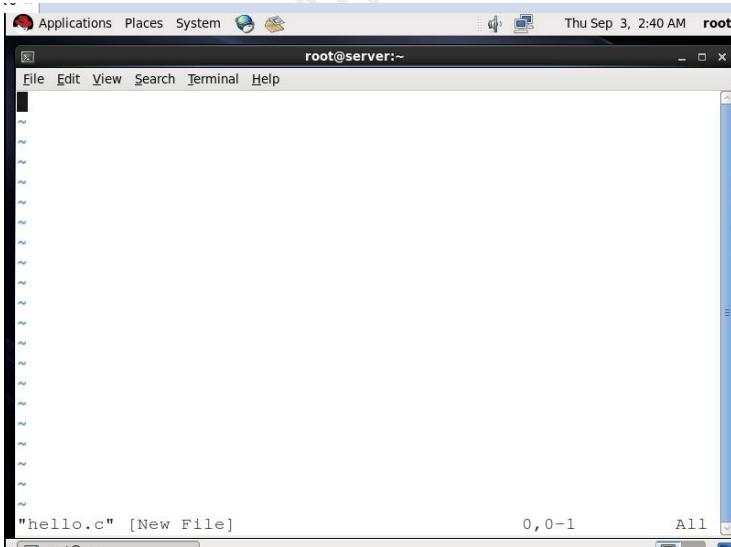
## 1. Program to display hello world:

Open vi Editor to type C program or follows:

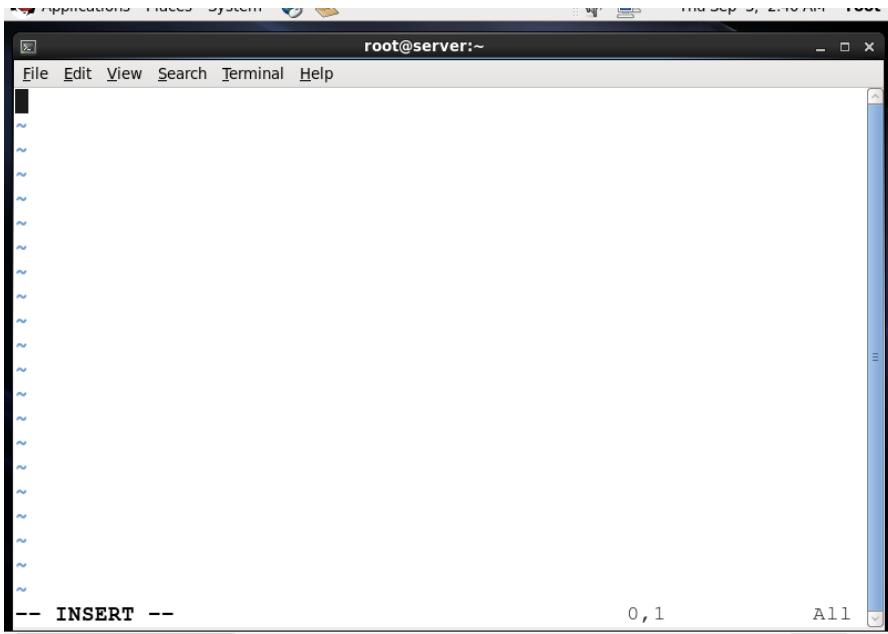
#vim hello.c



```
root@server:~
File Edit View Search Terminal Help
[root@server ~]# vim hello.c
```



```
root@server:~
File Edit View Search Terminal Help
[root@server ~]# vim hello.c
"hello.c" [New File]
0, 0-1
All
```



A screenshot of a terminal window titled "root@server:~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main area of the window is a text editor with a vertical scroll bar on the right. The status bar at the bottom shows "0, 1" and "All". The bottom line of the editor says "-- INSERT --".

Type the following code:



A screenshot of a terminal window titled "root@server:~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main area of the window is a text editor with a vertical scroll bar on the right. The status bar at the bottom shows "5, 47" and "All". The bottom line of the editor says "-- INSERT --". The code being typed is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    printf("Hello !!! Welcome to gcc Compiler");
```



A screenshot of a terminal window titled "root@server:~". The window shows a Vim editor with the following C code:

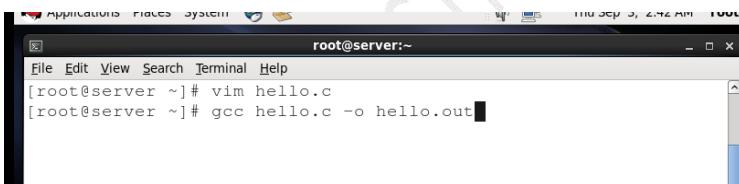
```
#include<stdio.h>
#include<conio.h>
void main()
{
    printf("Hello !!! Welcome to gcc Compiler");
}
```

The status bar at the bottom of the Vim window shows the command ":wq".

**Gcc Compiler is used to compile the program ie. GNU's collection compiler.  
By default output of the program is saved in a.out file**

**Use gcc to compile the program and create its object file as follows**

```
#gcc hello.c -o hello.out
```

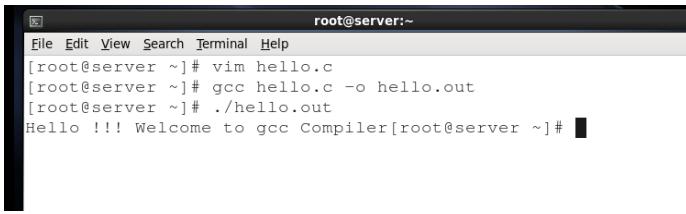


A screenshot of a terminal window titled "root@server:~". The window shows the command "gcc hello.c -o hello.out" being typed.

**Finally run the program and obtain the output**

**To Run, execute the following command:**

```
#./hello.out
```



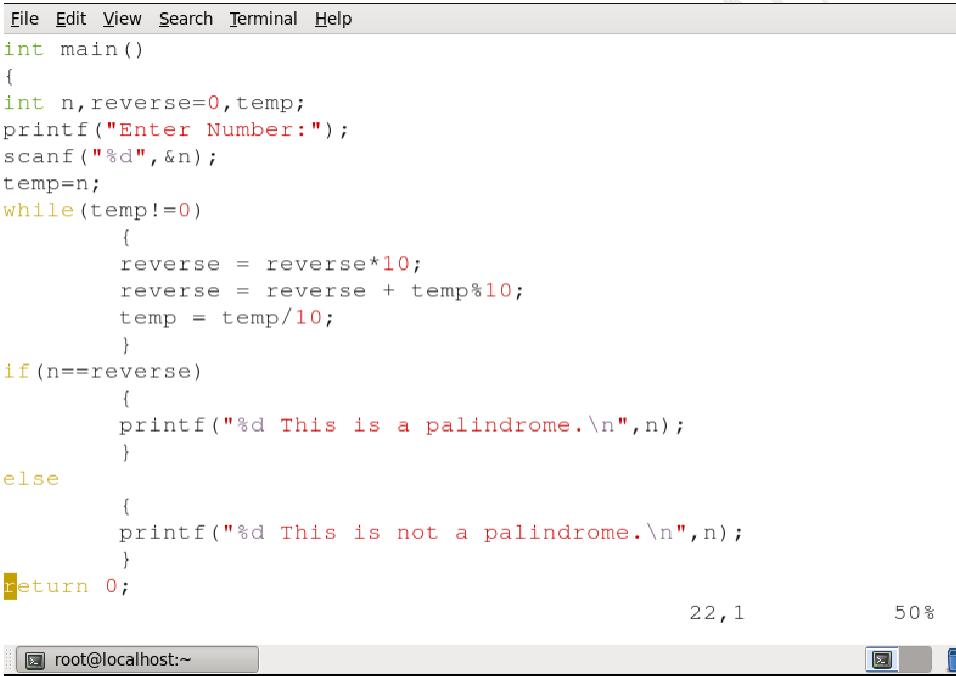
```
root@server:~#
File Edit View Search Terminal Help
[root@server ~]# vim hello.c
[root@server ~]# gcc hello.c -o hello.out
[root@server ~]# ./hello.out
Hello !!! Welcome to gcc Compiler[root@server ~]#
```

2. Write a Program to check whether a number is palindrome:

Open vi Editor to type C program or follows:

**#vim palin.c**

Type the following code:



```
File Edit View Search Terminal Help
int main()
{
int n,reverse=0,temp;
printf("Enter Number:");
scanf("%d",&n);
temp=n;
while(temp!=0)
{
    reverse = reverse*10;
    reverse = reverse + temp%10;
    temp = temp/10;
}
if(n==reverse)
{
    printf("%d This is a palindrome.\n",n);
}
else
{
    printf("%d This is not a palindrome.\n",n);
}
return 0;
```

22, 1

50%

**#gcc palin.c –o palin.out**

## Linux Administration Practical Manual

---



A screenshot of a Linux terminal window titled "root@localhost:~". The window has a standard window title bar with icons for minimize, maximize, and close. Below the title bar is a menu bar with options: File, Edit, View, Search, Terminal, and Help. The main area of the terminal shows the command: [root@localhost ~]# gcc palin.c -o palin.out. The terminal is running as root, indicated by the "root" prefix. The output of the command is shown as a black rectangular box, indicating that the output has been captured or is being processed.

Finally run the program and obtain the output

To Run, execute the following command:

# Linux Administration Practical Manual

---

**#./palin.out**

```
File Edit View Search Terminal Help
[root@localhost ~]# gcc palin.c -o palin.out
[root@localhost ~]# ./palin.out
Enter Number:123
123 This is not a palindrome.
[root@localhost ~]# █
```

3. Write a program to find Fibonacci series:

Open vi Editor to type C program or follows:

**#vim fibo.c**

Type the following code:

```
File Edit View Search Terminal Help
#include<stdio.h>
int main()
{
    int first=0,second=1,c,next,n;
    printf("\nFibonacci series");
    printf("Enter Range: ");
    scanf("%d",&n);
    printf("First %d terms are:-\n",n);
    for(c=0;c<n;c++)
    {
        if(c<=1)
        {
            next=c;
        }
        else
        {
            next=first+second;
            first=second;
            second=next;
        }
        printf("%d\n",next);
    }
    printf("\nend of program");
    return 0;
}
1, 9      All
```

**#gcc fibo.c -o fibo.out**

```
root@localhost:~#
File Edit View Search Terminal Help
[root@localhost ~]# gcc fibo.c -o fibo.out
[root@localhost ~]#
```

Finally run the program and obtain the output

To Run, execute the following command:

**./fibo.out**

# Linux Administration Practical Manual

---

```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]# gcc fibo.c -o fibo.out  
[root@localhost ~]# ./fibo.out  
  
Fibonacci seriesEnter Range: 6  
First 6 terms are:-  
0  
1  
1  
2  
3  
5  
  
end of program [root@localhost ~]# █
```

4. Write a program to find prime number:

#vim prime .c

Type the following code:

The screenshot shows a terminal window titled "root@localhost:~". The window contains a C program for determining if a number is prime. The code includes a loop from 2 to n-1 to check for factors. If a factor is found, it prints the number is not prime and breaks out of the loop. If no factors are found by the end of the loop, it prints the number is prime.

```
#include<stdio.h>
int main()
{
int n,c=2;
printf("Enter Number: ");
scanf("%d",n);
for(c=2;c<=n-1;c++)
{
    if(n%c==0)
    {
        printf("%d is not prime.\n",n);
        break;
    }
    if(c==n)
    {
        printf("%d is prime.\n",n);
    }
}
return 0;
}
```

#gcc prime.c –o prime.out

The screenshot shows a terminal window titled "root@localhost:~". The user has entered the command "gcc prime.c -o prime.out" to compile the C program into an executable file named "prime.out".

```
[root@localhost ~]# gcc prime.c -o prime.out
```

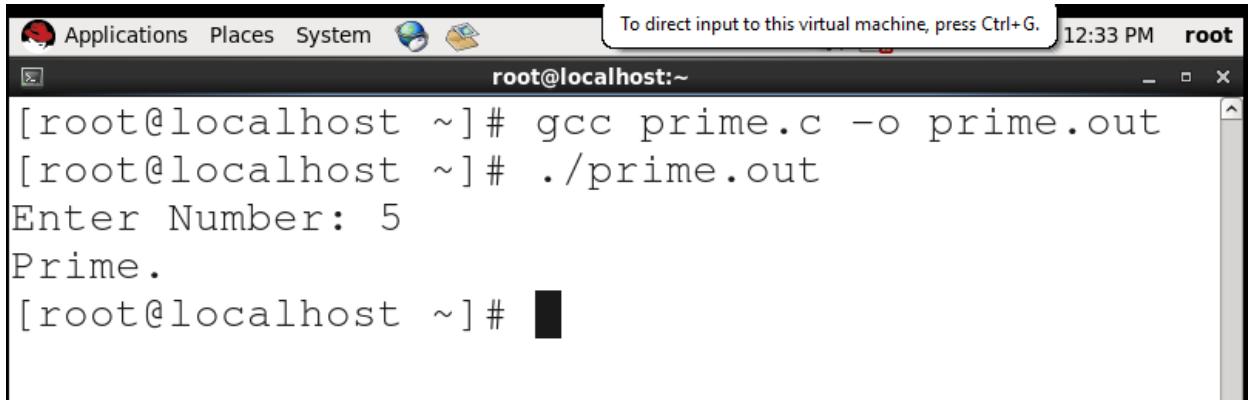
Finally run the program and obtain the output

To Run, execute the following command:

# Linux Administration Practical Manual

---

**#./prime.out**



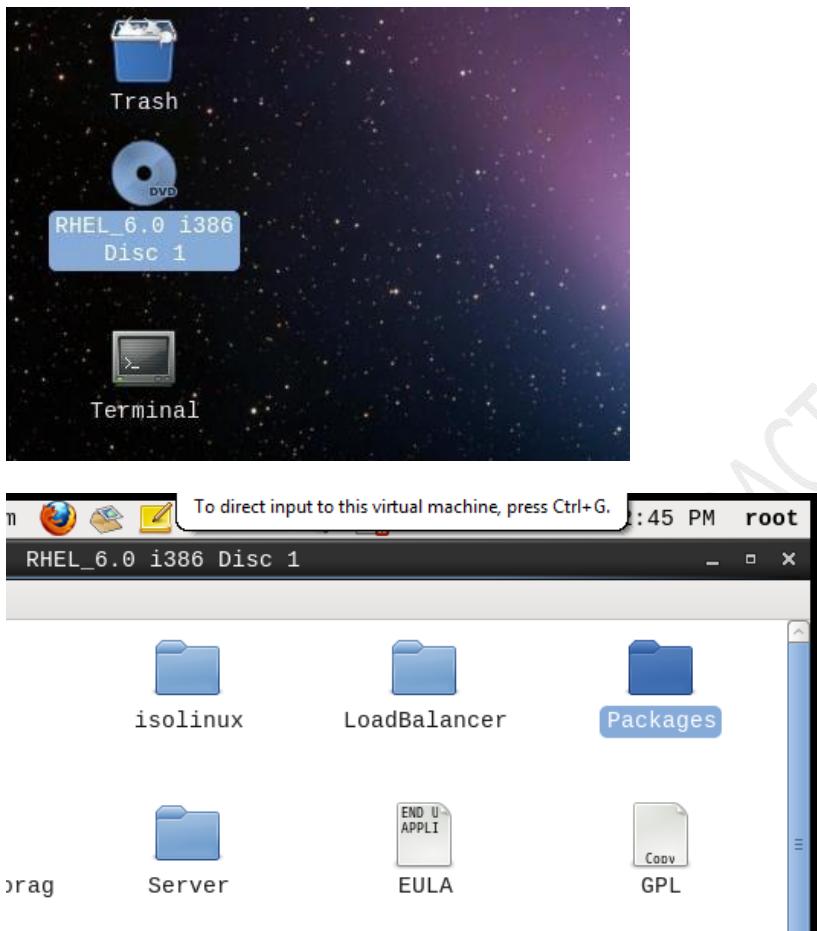
The screenshot shows a Linux terminal window with a root prompt. The user has compiled a C program named 'prime.c' into an executable file 'prime.out'. They then ran the program and entered the number '5' when prompted. The output 'Prime.' indicates that 5 is indeed a prime number.

```
To direct input to this virtual machine, press Ctrl+G. 12:33 PM root
Applications Places System 12:33 PM root
root@localhost:~ - x
[root@localhost ~]# gcc prime.c -o prime.out
[root@localhost ~]# ./prime.out
Enter Number: 5
Prime.
[root@localhost ~]#
```

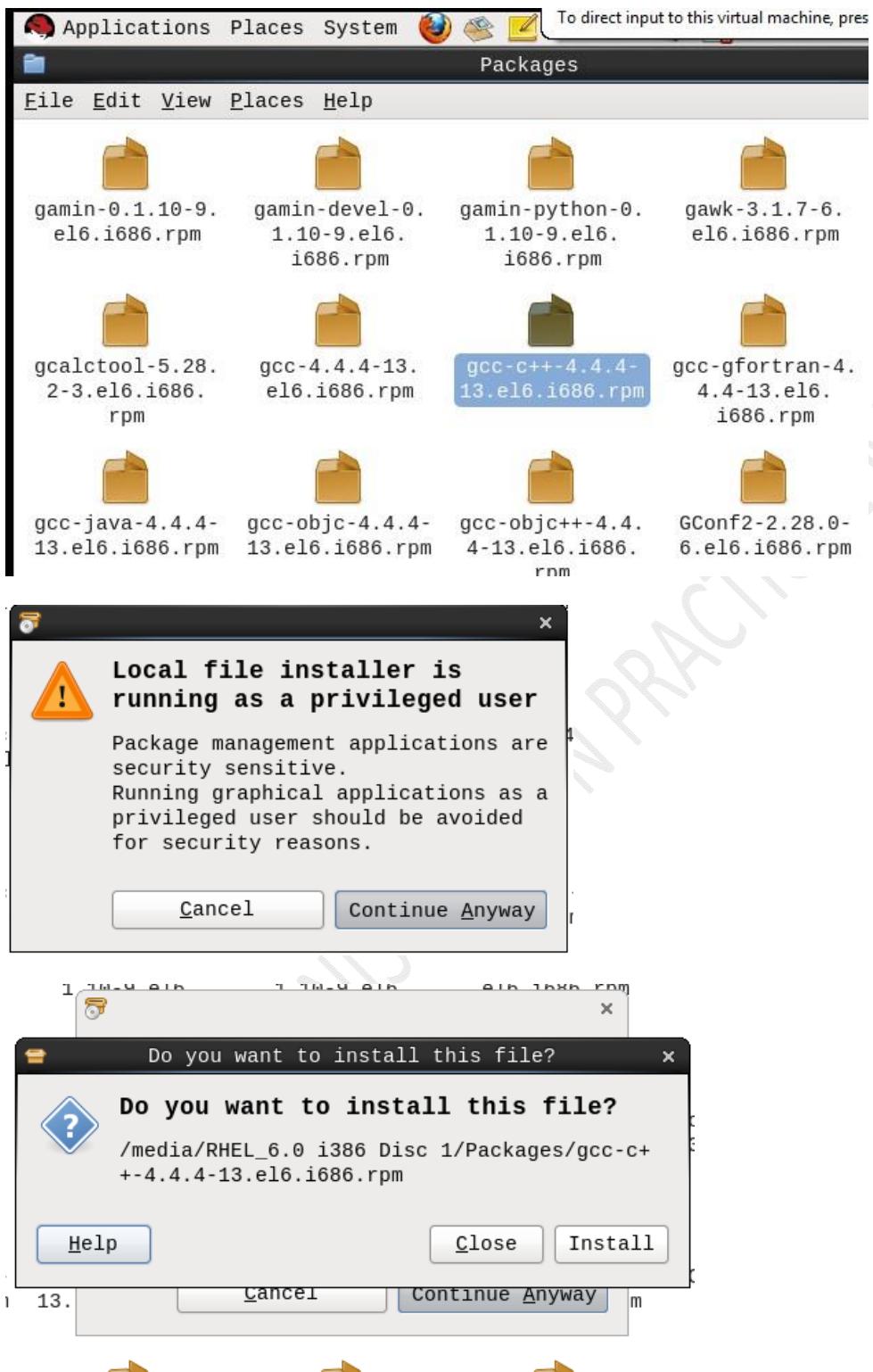
## Practical no 13: Using gc++ complier(Programming using c++)

Executing shell scripts with C++ using g++ Compiler

Installation of g++ package:



# Linux Administration Practical Manual



Open vi Editor to type C++ program as follows:

1. Write a program to display Fibonacci series:

```
# vim fibo.cpp
```

Type the following code:

```
Applications Places System To direct input to this virtual machine, press Ctrl+G. 1:44 PM root
root@server:~ 
File Edit View Search Terminal Help
using namespace std;
#include<iostream>
int main()
{
int a=0,b=1,c,num,i;
cout<<"Fibonacci Series";
cout<<"Enter the range";
cin>>num;
for(i=2;i<num;i++)
{
c=a+b;
a=b;
b=c;
if(c<num)
{
cout<<"\n"<<c;
}
}
cout<<"end of program";
return 0;
}
"fibo.cpp" 21L, 244C 20,1 All
[ Packages ] [ root@server:~ ]
```

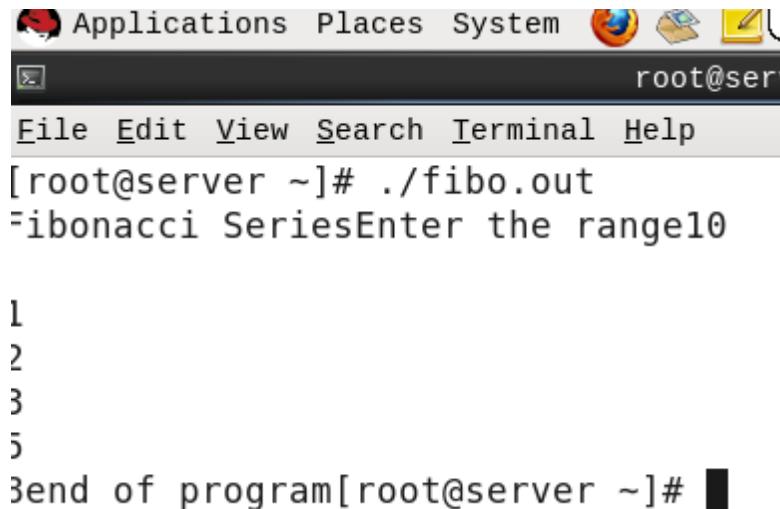
```
# g++ fibo.cpp -o fibo.out
```

```
Applications Places System root@server:~
File Edit View Search Terminal Help
[root@server ~]# g++ -o fibo.out fibo.cpp
[root@server ~]#
```

Finally run the program and obtain the output

To run, execute the following command:

**#./fibonacci.out**

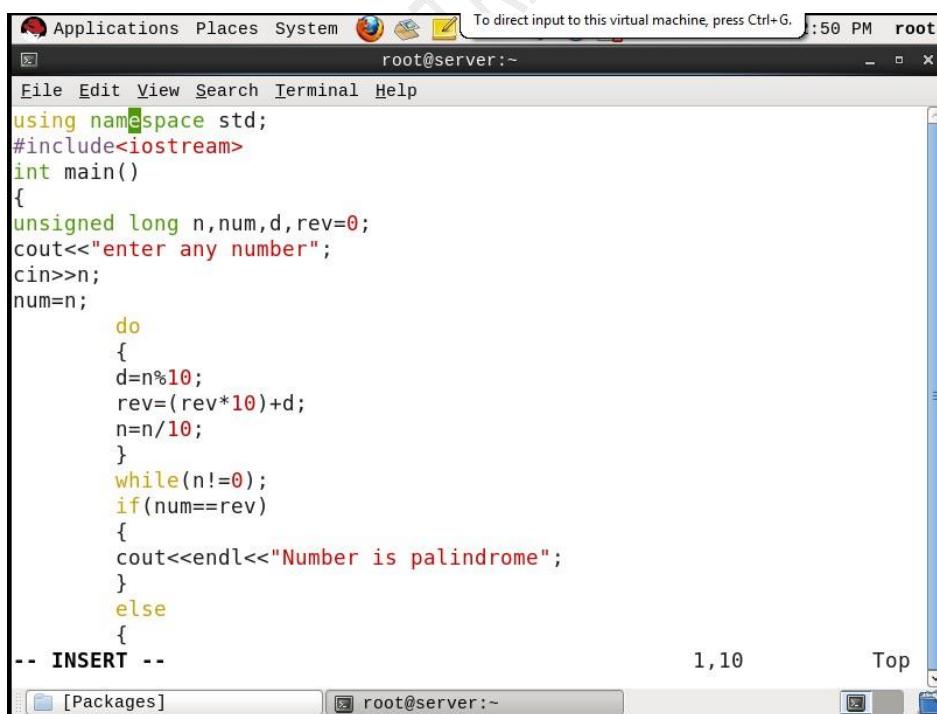


```
Applications Places System root@server ~
File Edit View Search Terminal Help
[root@server ~]# ./fibonacci.out
Fibonacci SeriesEnter the range10
1
2
3
5
8
13
21
34
55
89
144
1534
1553
1597
1618
1647
1675
1704
1733
1761
1789
1817
1845
1873
1901
1929
1957
1985
2013
2041
2069
2097
2125
2153
2181
2209
2237
2265
2293
2321
2349
2377
2405
2433
2461
2489
2517
2545
2573
2601
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2657
2685
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2741
2769
2797
2825
2853
2881
2909
2937
2965
2993
3021
3049
3077
3105
3133
3161
3189
3217
3245
3273
3301
3329
3357
3385
3413
3441
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3497
3525
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3805
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3889
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3973
3991
4019
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4075
4103
4131
4159
4187
4215
4243
4271
4309
4337
4365
4393
4421
4449
4477
4505
4533
4561
4589
4617
4645
4673
4701
4729
4757
4785
4813
4841
4869
4897
4925
4953
4981
5009
5037
5065
5093
5121
5149
5177
5205
5233
5261
5289
5317
5345
5373
5401
5429
5457
5485
5513
5541
5569
5597
5625
5653
5681
5709
5737
5765
5793
5821
5849
5877
5905
5933
5961
5989
6017
6045
6073
6101
6129
6157
6185
6213
6241
6269
6297
6325
6353
6381
6409
6437
6465
6493
6521
6549
6577
6605
6633
6661
6689
6717
6745
6773
6801
6829
6857
6885
6913
6941
6969
6997
7025
7053
7081
7109
7137
7165
7193
7221
7249
7277
7305
7333
7361
7389
7417
7445
7473
7501
7529
7557
7585
7613
7641
7669
7697
7725
7753
7781
7809
7837
7865
7893
7921
7949
7977
7995
8023
8051
8079
8107
8135
8163
8191
8219
8247
8275
8303
8331
8359
8387
8415
8443
8471
8509
8537
8565
8593
8621
8649
8677
8705
8733
8761
8789
8817
8845
8873
8901
8929
8957
8985
9013
9041
9069
9097
9125
9153
9181
9209
9237
9265
9293
9321
9349
9377
9405
9433
9461
9489
9517
9545
9573
9601
9629
9657
9685
9713
9741
9769
9797
9825
9853
9881
9909
9937
9965
9993
10000
```

3. Write a program to find whether the number is palindrome:

**# vim palin.cpp**

Type the following code:



```
Applications Places System root@server ~
File Edit View Search Terminal Help
To direct input to this virtual machine, press Ctrl+G. 1:50 PM root
[root@server ~]# vim palin.cpp
using namespace std;
#include<iostream>
int main()
{
unsigned long n,num,d,rev=0;
cout<<"enter any number";
cin>>n;
num=n;
    do
    {
        d=n%10;
        rev=(rev*10)+d;
        n=n/10;
    }
    while(n!=0);
    if(num==rev)
    {
        cout<<endl<<"Number is palindrome";
    }
    else
    {
-- INSERT --
        1,10          Top
    }
}
[root@server ~]#
```

# Linux Administration Practical Manual

A screenshot of a Linux terminal window titled "root@server:~". The window shows a C++ code snippet for checking if a number is a palindrome. The code uses a do-while loop to reverse the digits of the input number and compares it with the original number. The terminal window includes a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom shows "[Packages] root@server:~". The cursor is positioned at the end of the code, indicated by a small black square.

```
unsigned long n,num,d,rev=0;
cout<<"enter any number";
cin>>n;
num=n;
do
{
d=n%10;
rev=(rev*10)+d;
n=n/10;
}
while(n!=0);
if(num==rev)
{
cout<<endl<<"Number is palindrome";
}
else
{
cout<<endl<<"Number is not a palindrome";
}
return 0;
}■
-- INSERT --
```

25,2

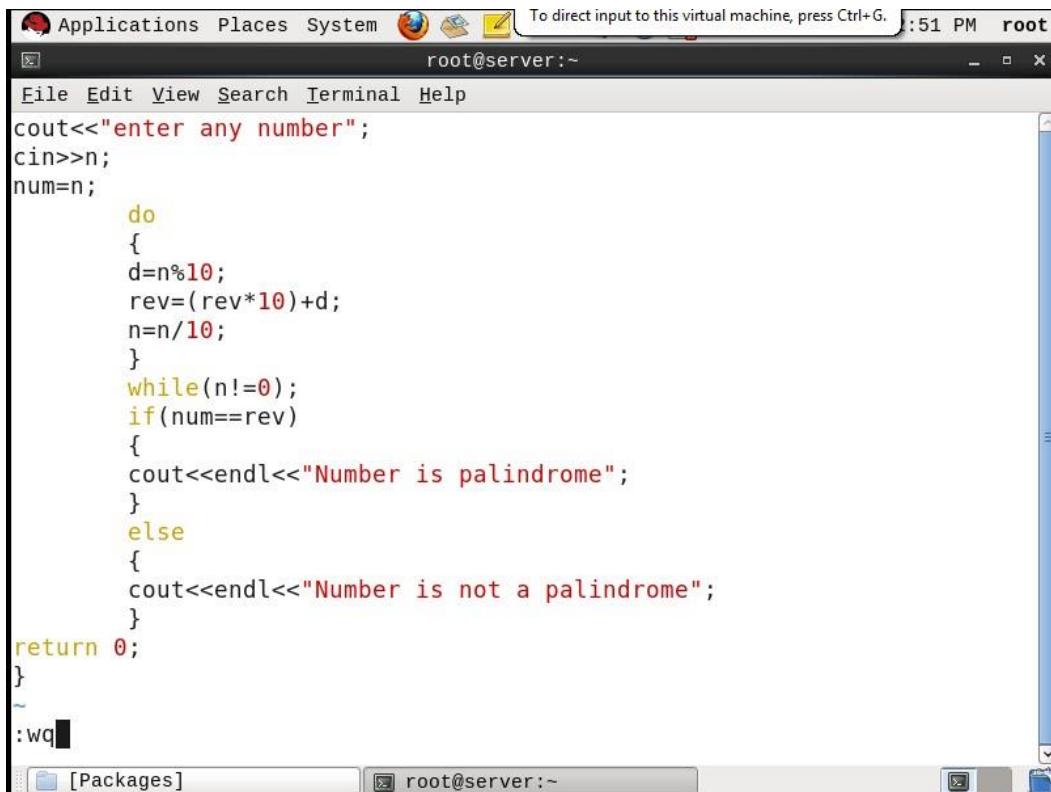
Bot

A screenshot of a Linux terminal window titled "root@server:~". The window shows the same C++ code for checking if a number is a palindrome. The code is identical to the one in the previous screenshot. The terminal window includes a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom shows "[Packages] root@server:~". The cursor is positioned at the end of the code, indicated by a small black square.

```
unsigned long n,num,d,rev=0;
cout<<"enter any number";
cin>>n;
num=n;
do
{
d=n%10;
rev=(rev*10)+d;
n=n/10;
}
while(n!=0);
if(num==rev)
{
cout<<endl<<"Number is palindrome";
}
else
{
cout<<endl<<"Number is not a palindrome";
}
return 0;
}:wq■
-- INSERT --
```

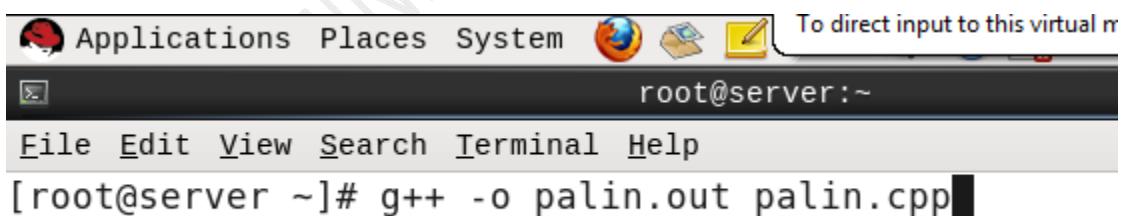
25,5

Bot



```
Applications Places System To direct input to this virtual machine, press Ctrl+G. 1:51 PM root
root@server:~ - x
File Edit View Search Terminal Help
cout<<"enter any number";
cin>>n;
num=n;
do
{
d=n%10;
rev=(rev*10)+d;
n=n/10;
}
while(n!=0);
if(num==rev)
{
cout<<endl<<"Number is palindrome";
}
else
{
cout<<endl<<"Number is not a palindrome";
}
return 0;
}
:wq
```

```
# g++ palin.cpp -o palin.out
```

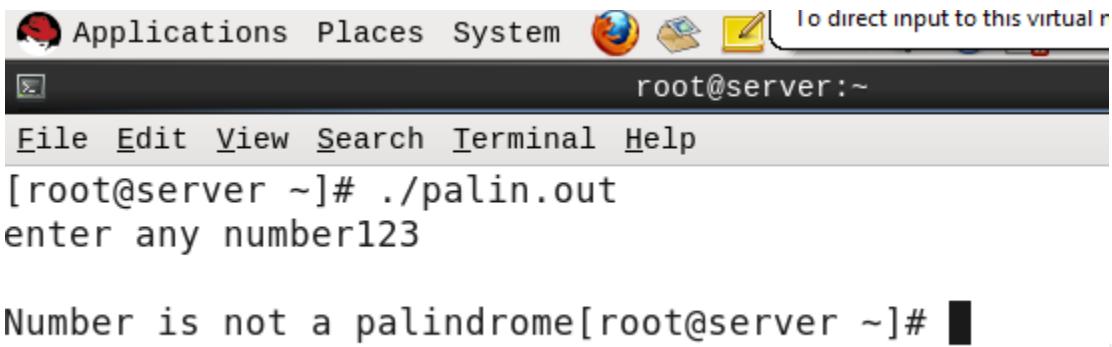


```
Applications Places System To direct input to this virtual machine, press Ctrl+G. 1:51 PM root
root@server:~ - x
File Edit View Search Terminal Help
[root@server ~]# g++ -o palin.out palin.cpp
```

Finally run the program and obtain the output

To run, execute the following command:

```
./palin.out
```

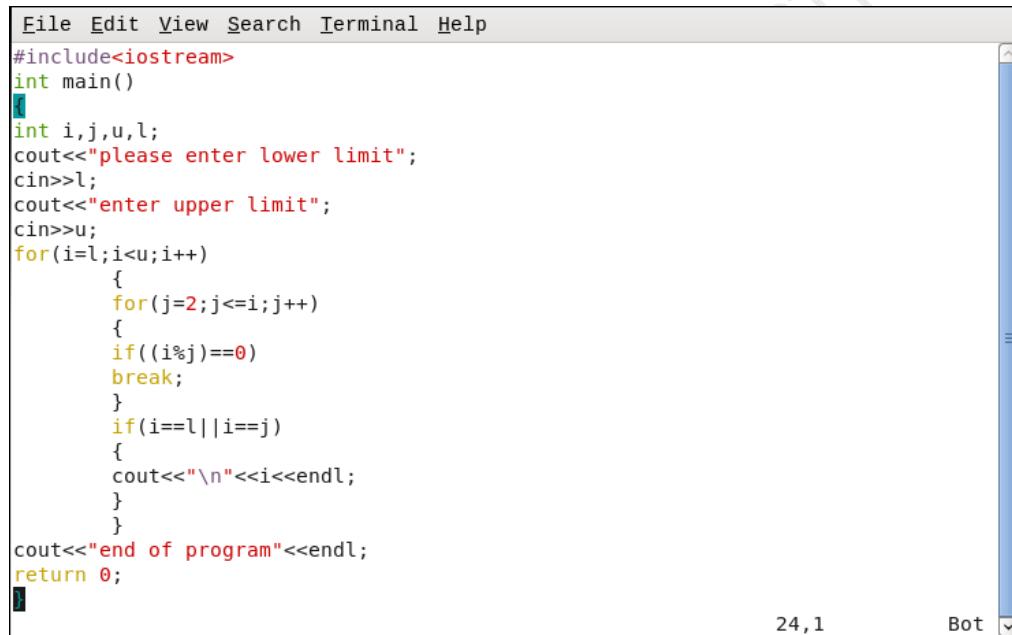


A screenshot of a Linux desktop environment. At the top is a menu bar with "Applications", "Places", "System", and icons for "Firefox", "Nautilus", and "Gedit". A status bar at the bottom says "root@server:~". Below the menu is a toolbar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal window shows the command [root@server ~]# ./palin.out followed by "enter any number123". The output "Number is not a palindrome" is displayed below the input.

4. Write a program to find prime number:

```
# vim prime.cpp
```

Type the following code:

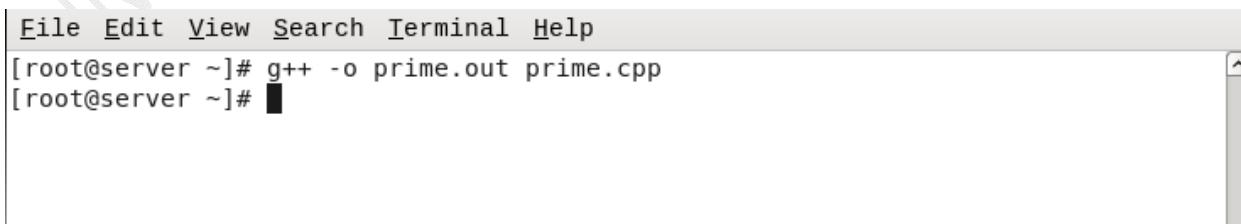


```
File Edit View Search Terminal Help
#include<iostream>
int main()
{
int i,j,u,l;
cout<<"please enter lower limit";
cin>>l;
cout<<"enter upper limit";
cin>>u;
for(i=l;i<u;i++)
{
    for(j=2;j<=i;j++)
    {
        if((i%j)==0)
            break;
    }
    if(i==l||i==j)
    {
        cout<<"\n" <<i << endl;
    }
}
cout<<"end of program" << endl;
return 0;
}
```

24,1

Bot

```
# g++ prime.cpp -o prime.out
```



```
File Edit View Search Terminal Help
[root@server ~]# g++ -o prime.out prime.cpp
[root@server ~]#
```

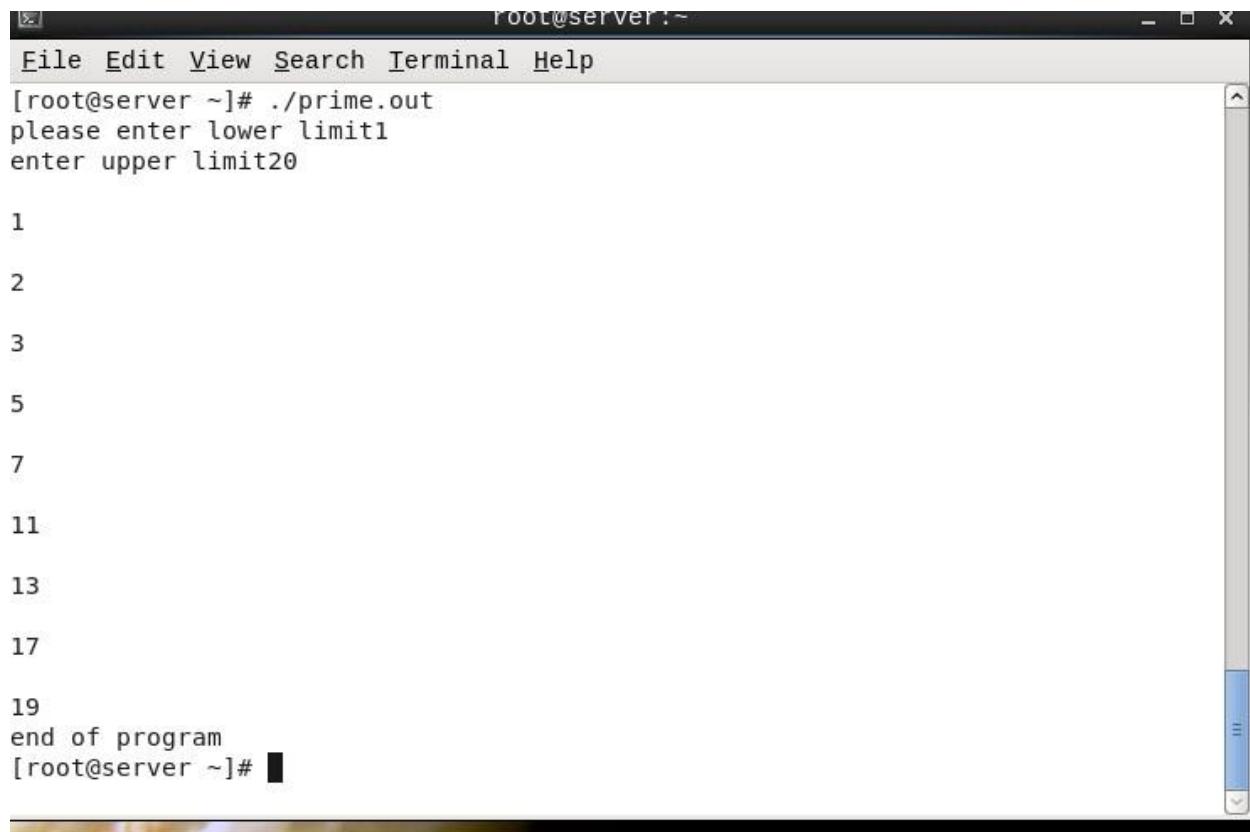
Finally run the program and obtain the output

## Linux Administration Practical Manual

---

To run, execute the following command:

**#./prime.out**



The screenshot shows a terminal window titled "root@server:~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content is as follows:

```
root@server:~# ./prime.out
please enter lower limit1
enter upper limit20

1
2
3
5
7
11
13
17
19
end of program
[root@server:~]#
```

## **Practical No : 14 Configuring Apache Web Server In Linux**

- When you view a web page over the Internet, the code to create that page must be retrieved from a server somewhere on the Internet.
- The server that sends your web browser the code to display a web page is called a web server.
- There are countless web servers all over the Internet serving countless websites to people all over the world.
- Whether you need a web server to host a website on the Internet a Red Hat Enterprise Linux server can function as a web server using the Apache HTTP server.
- The Apache HTTP server is a popular, open source server application that runs on many UNIX-based systems as well as Microsoft Windows.
- Since we had created DNS named as server.nm.com but on Linux browser it is showing unable to connect because we need to configure apache web server , so that we can display out html page on web browser with the help of our own DNS server.nm.com

### **Configure web server**

We will configure a web server. The necessary rpm for web server is httpd, httpd-level and check them for install.

```
[root@localhost ~]# cd /media/RHEL_6.0\ i386\ Disc\ 1/Packages/
```

```
#rpm -ivh httpd*
```

```
#rpm -qa | grep httpd
```

```
[root@localhost Packages]# rpm -ivh --nodeps httpd-2.2.15-5.el6.i686.rpm
warning: httpd-2.2.15-5.el6.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
Preparing... ################################ [100%]
 1:httpd ################################ [100%]
[root@localhost Packages]#
```

The above command give you the version no and name of package.

Now configure the IP address to 192.168.1.1 and check it

```
#ifconfig eth0 192.168.1.1
```

## #ifconfig

start httpd daemons and verify its running status

```
#chkconfig httpd on
```

```
#service httpd start
```

```
#service httpd status
```

## Configure virtual hosting

In this example we will host a website www.nm.com to apache web server. Create a documents root directory for this website and a index page

```
#mkdir -p /var/www/virtual/www.svkm.com/html
```

```
[root@server ~]# mkdir -P /var/www/virtual/www.svkm.com/html/
```

```
#vim /var/www/virtual/www.svkm.com/html/index.html
```

```
[root@localhost html]# vi index.html
```

for testing purpose we are writing basic html code in its index page.

```
<html>
```

```
<head>
```

```
<title> Linux Apache Website</title>
```

```
<body>
```

**Today we complete Apache web server practical.**

```
</body>
```

```
</head>
```

```
</html>
```

```
<html>
<head><title>
Linux Apache WebSite.
</title></head>
<body>
Today we completed Apache web server practical!
</body>
</html>
```

Save file : **wq** and exit

Check IP Address:-

```
[root@localhost html]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:0C:29:48:13:2A
          inet addr:192.168.1.1 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe48:132a/64 Scope:Link
              UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
              RX packets:4381 errors:0 dropped:0 overruns:0 frame:0
              TX packets:47 errors:0 dropped:0 overruns:0 carrier:0
              collisions:0 txqueuelen:1000
              RX bytes:293075 (286.2 KiB) TX bytes:9882 (9.6 KiB)
              Interrupt:19 Base address:0x2000
```

Check for DNS by following command:

**# dig -x 192.168.1.1**

```
[root@localhost html]# dig -x 192.168.1.1
; <>> DiG 9.7.0-P2-RedHat-9.7.0-5.P2.el6 <>> -x 192.168.1.1
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 63620
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 0
;;
;; QUESTION SECTION:
;1.1.168.192.in-addr.arpa. IN PTR
;;
;; AUTHORITY SECTION:
1.168.192.in-addr.arpa. 10800 IN SOA root.server.svkm.com. server.svkm.com. 0 86400 36
00 604800 10800
;;
;; Query time: 0 msec
;; SERVER: 192.168.1.1#53(192.168.1.1)
;; WHEN: Thu Sep 3 18:22:07 2015
;; MSG SIZE rcvd: 98
[root@localhost html]#
```

Now open /etc/httpd/conf/httpd.conf main configuration file of apache server.

**#vim /etc/httpd/conf/httpd.conf**

```
[root@localhost html]# vi /etc/httpd/conf/httpd.conf
```

## Locate virtual host tag

Now go in the end of file and copy last seven lines [ virtual host tag ] and paste them in the end of file. Change these seven lines as shown in following.

```
1003 #<VirtualHost *:80>
1004 #      ServerAdmin webmaster@dummy-host.example.com
1005 #      DocumentRoot /www/docs/dummy-host.example.com
1006 #      ServerName dummy-host.example.com
1007 #      ErrorLog logs/dummy-host.example.com-error_log
1008 #      CustomLog logs/dummy-host.example.com-access_log common
1009 #</VirtualHost>
1010
1011
1012 #<VirtualHost *:80>
1013 #      ServerAdmin webmaster@dummy-host.example.com
1014 #      DocumentRoot /www/docs/dummy-host.example.com
1015 #      ServerName dummy-host.example.com
1016 #      ErrorLog logs/dummy-host.example.com-error_log
1017 #      CustomLog logs/dummy-host.example.com-access_log common
1018 #</VirtualHost>
```

Remove the comments from all 7 lines

**<Virtual Host \*:80> ServerAdmin**

[root@server.svkm.com](mailto:root@server.svkm.com)

**Document Root /var/www/virtual/[server.svkm.com/html](http://server.svkm.com/html)**

**ServerName [www.svkm.com](http://www.svkm.com)**

**ErrorLog logs/server.svkm.com-error\_log**

**CustomLog logs/server.svkm.com-access\_log**

**common**

**</Virtual Host>**

now save this file :wq and exit from it

```
#<VirtualHost *:80>
#   ServerAdmin webmaster@dummy-host.example.com
#   DocumentRoot /www/docs/dummy-host.example.com
#   ServerName dummy-host.example.com
#   ErrorLog logs/dummy-host.example.com-error_log
#   CustomLog logs/dummy-host.example.com-access_log common
#</VirtualHost>

<VirtualHost 192.168.1.1:80>
  ServerAdmin root@www.server.svkm.com
  DocumentRoot /var/www/virtual/www.svkm.com/html
  ServerName server.svkm.com
  ErrorLog logs/www.svkm.com-error_log
  CustomLog logs/www.svkm.com-access_log common
</VirtualHost>
```

You have done necessary configuration now restart the httpd service and test this configuration run links command.

**#service httpd restart**

```
[root@server ~]# vim /etc/httpd/conf/httpd.conf
[root@server ~]# service httpd start
Starting httpd:
[root@server ~]# service httpd restart
Stopping httpd:                                     [  OK  ]
Starting httpd:                                     [  OK  ]
[root@server ~]# chkconfig httpd on
[root@server ~]# █
```

**chmod -R 777 /var/www/virtual/[www.svkm.com/html](http://www.svkm.com/html)**

```
[root@server ~]# chmod -R 777 /var/www/virtual/www.svkm.com/html/
[root@server ~]# █
```

**Go to the Clone and open browser and type**

**server.svkm.com OR 192.168.1.1**

You can view your web page.

**#links 192.168.1.1**

```
[root@server ~]# links 192.168.1.1█
```

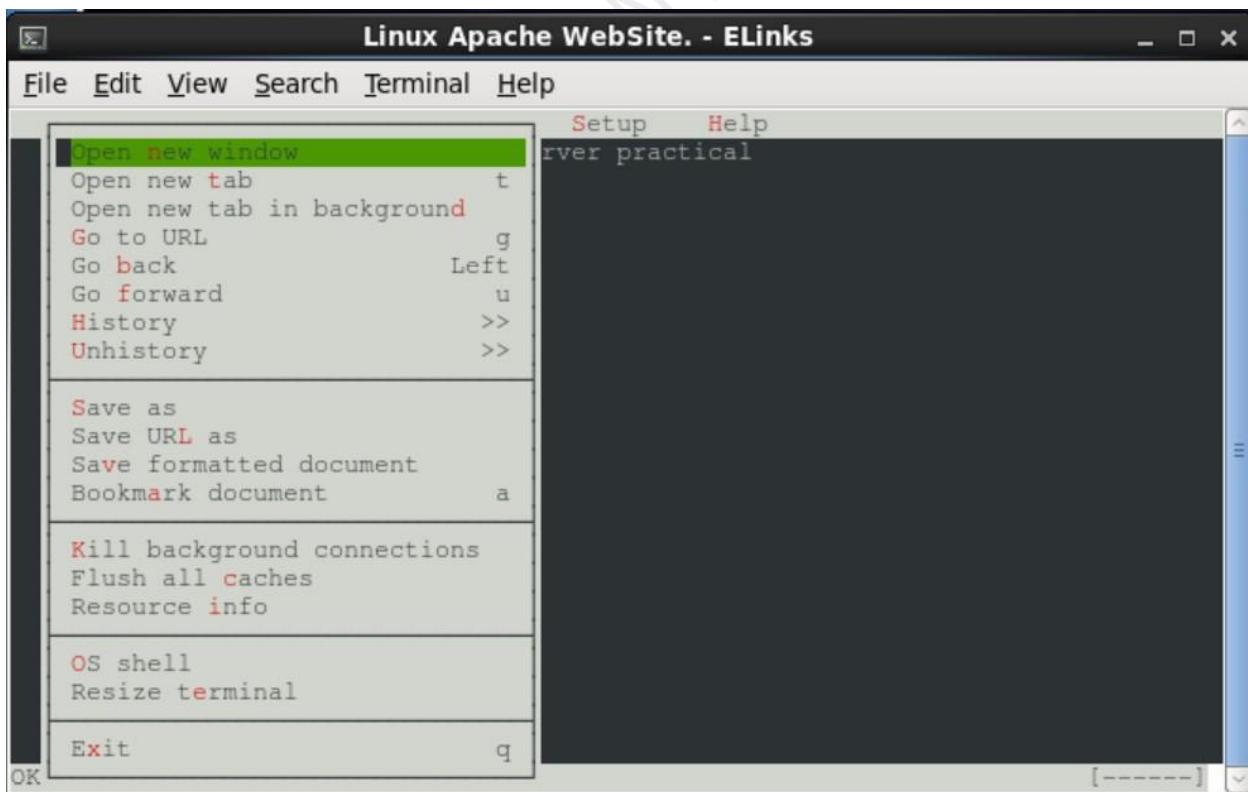
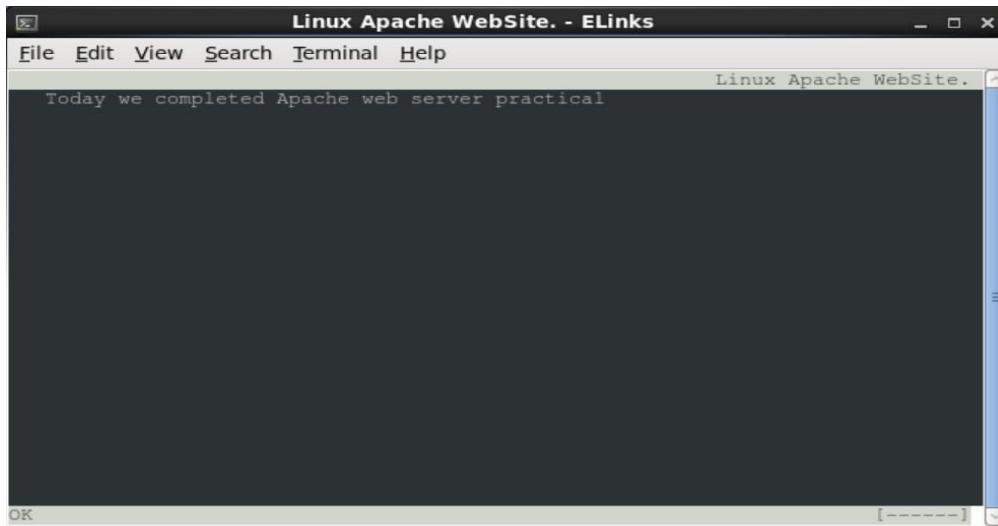
# Linux Administration Practical Manual

---

If links command retrieve your home page means you have successfully configured the virtual host now test it with site name.

#links [www.svkm.com](http://www.svkm.com)

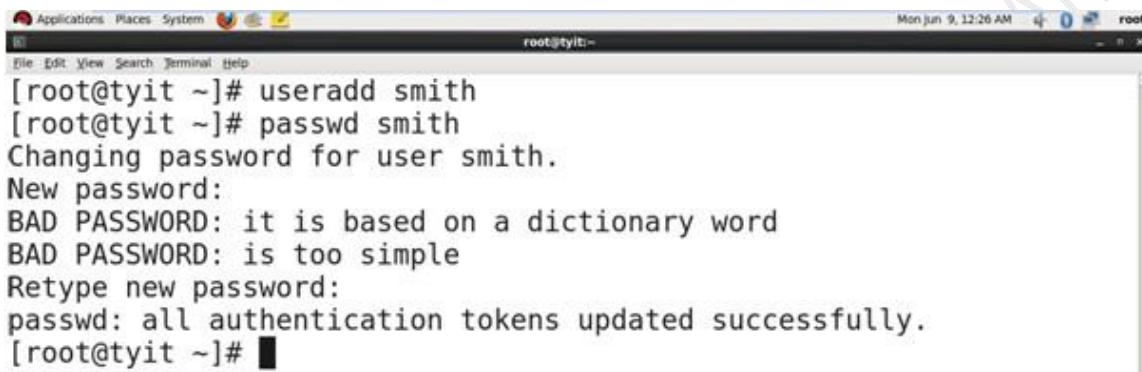
In output of links command you should see the index page of site



## **Practical no 15: Linux System Administration**

### **(A) Becoming super user:**

- (1)** Create a user account to grant him the privilege of super user, as shown below:



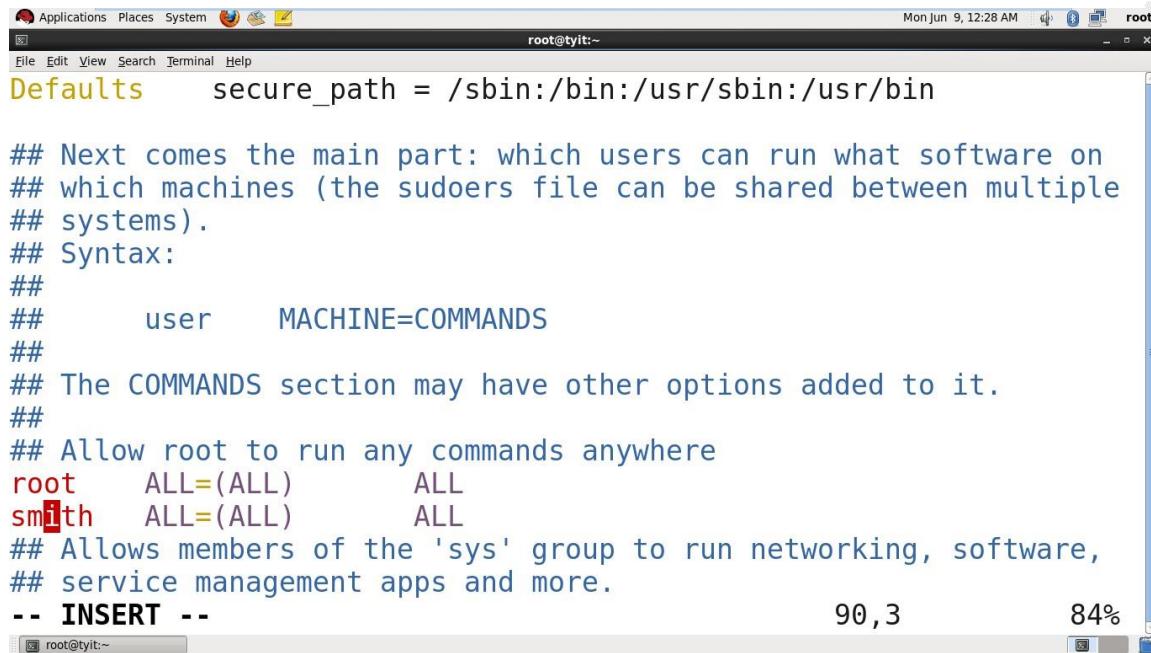
A screenshot of a Linux terminal window titled "root@tyit:~". The window shows the following command-line session:

```
[root@tyit ~]# useradd smith
[root@tyit ~]# passwd smith
Changing password for user smith.
New password:
BAD PASSWORD: it is based on a dictionary word
BAD PASSWORD: is too simple
Retype new password:
passwd: all authentication tokens updated successfully.
[root@tyit ~]#
```

- (2) Open the file /etc/sudoers and the following lines for smith:

```
SMITH      ALL = (ALL)      ALL
```

It is as shown below:



```
root@tyit:~ Mon Jun 9, 12:28 AM root
File Edit View Search Terminal Help
Defaults      secure_path = /sbin:/bin:/usr/sbin:/usr/bin
## Next comes the main part: which users can run what software on
## which machines (the sudoers file can be shared between multiple
## systems).
## Syntax:
##
##       user      MACHINE=COMMANDS
##
## The COMMANDS section may have other options added to it.
##
## Allow root to run any commands anywhere
root      ALL=(ALL)      ALL
smith    ALL=(ALL)      ALL
## Allows members of the 'sys' group to run networking, software,
## service management apps and more.
-- INSERT --
```

- (3) Run the command visudo:

```
#visudo
```

- (4) Test the configuration by making smith to login and perform any administrative activity as shown below:

- (i) Add user Jackson using sudo:



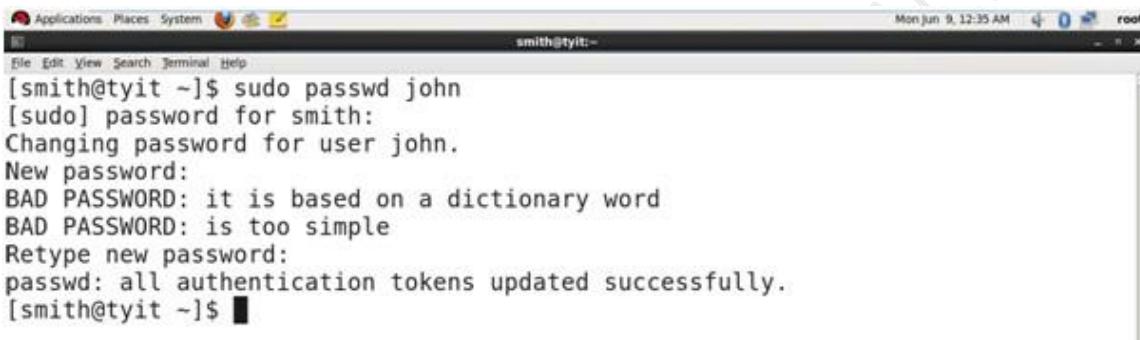
```
[root@tyit ~]# su - smith
[smith@tyit ~]$ sudo useradd jackson
```

We trust you have received the usual lecture from the local System Administrator. It usually boils down to these three things:

- #1) Respect the privacy of others.
- #2) Think before you type.
- #3) With great power comes great responsibility.

[sudo] password for smith:

**(ii) Changing password of john using sudo:**



```
[smith@tyit ~]$ sudo passwd john
[sudo] password for smith:
Changing password for user john.
New password:
BAD PASSWORD: it is based on a dictionary word
BAD PASSWORD: is too simple
Retype new password:
passwd: all authentication tokens updated successfully.
[smith@tyit ~]$
```

**(B) Temporarily changing identity with the help of su command:**

- (1)** When root changes identity temporarily, with the help of su command, the system never asks for password:



```
[root@tyit ~]# su - john
[john@tyit ~]$
```

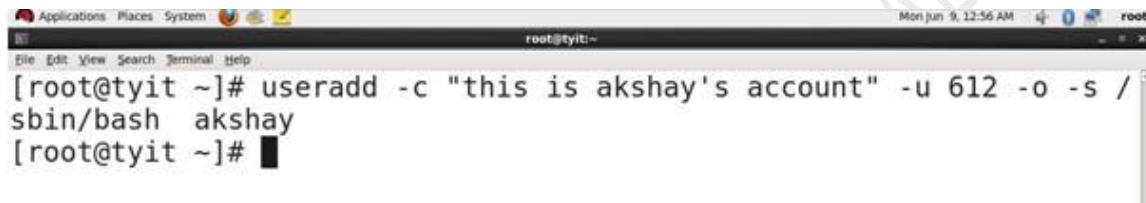
- (2)** But when any local user tries to change the identity temporarily, redhat system asks for the password as shown below:



```
[john@tyit ~]$ su - smith
Password:
[smith@tyit ~]$
```

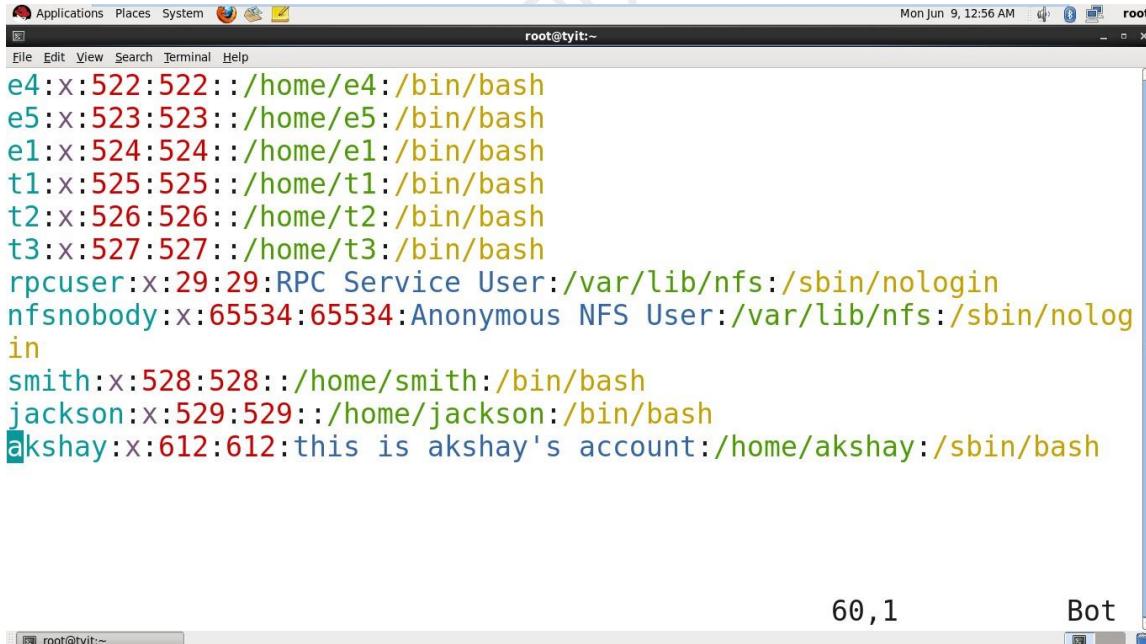
## (C) Administrative Commands:

### (1) **useradd** command with its options:



```
[root@tyit ~]# useradd -c "this is akshay's account" -u 612 -o -s /sbin/bash akshay
[root@tyit ~]#
```

The file /etc/passwd also shows the entry of the user as follow:



```
e4:x:522:522::/home/e4:/bin/bash
e5:x:523:523::/home/e5:/bin/bash
e1:x:524:524::/home/e1:/bin/bash
t1:x:525:525::/home/t1:/bin/bash
t2:x:526:526::/home/t2:/bin/bash
t3:x:527:527::/home/t3:/bin/bash
rpcuser:x:29:29:RPC Service User:/var/lib/nfs:/sbin/nologin
nfsnobody:x:65534:65534:Anonymous NFS User:/var/lib/nfs:/sbin/nologin
smith:x:528:528::/home/smith:/bin/bash
jackson:x:529:529::/home/jackson:/bin/bash
akshay:x:612:612:this is akshay's account:/home/akshay:/sbin/bash
```

### (2) **chage** command to change the age of user's password :

```
[root@tyit ~]# chage -m 10 -M 20 -E 10/10/2015 -W 7 akshay
[root@tyit ~]# chage -l akshay
Last password change : Jun 09, 2014
Password expires      : Jun 29, 2014
Password inactive    : never
Account expires       : Oct 10, 2015
Minimum number of days between password change : 10
Maximum number of days between password change : 20
Number of days of warning before password expires : 7
[root@tyit ~]#
```

The above command also affects the file /etc/shadow as follows:

```
e4:$1$gEVXQbSm$nEe.25i3yxntsGwKnhRD1:16220:0:99999:7:::
e5:$1$Znon0YoX$6P3N0cUkKk531HyOLRRIX0:16220:0:99999:7:::
e1:!:16220:0:99999:7:::
t1:$1$BuzaGjtc$86RD4V/0rWfjm/vbKmQIz1:16220:0:99999:7:::
t2:$1$rePSP8eo$dIOSzoHR1zV10MR39hUPo0:16220:0:99999:7:::
t3:!:16220:0:99999:7:::
rpcuser:!:16230::::::::::
nfsnobody:!:16230::::::::::
smith:$1$K4R0uwQp$FdZba3J.UjoGMF3f7cjFe1:16230:0:99999:7:::
jackson:!:16230:0:99999:7:::
akshay:!:16230:10:20:7:::16718:
```

### (3) passwd command to lock or unlock user's password:

```
[root@tyit ~]# passwd -u akshay
Unlocking password for user akshay.
passwd: Success
[root@tyit ~]# passwd -l akshay
Locking password for user akshay.
passwd: Success
[root@tyit ~]#
```

### (4) chsh command to change the shell of user:

```
[root@tyit ~]# chsh -s /sbin/nologin akshay
Changing shell for akshay.
Shell changed.
[root@tyit ~]#
```

**(5) Groupadd** command to create a new group and gpasswd command to add members and administrator in the group:

```
[root@tyit ~]# groupadd tyit
[root@tyit ~]# gpasswd -M john,smith,jackson -A john tyit
[root@tyit ~]# vim /etc/group
```

The above command also affect the file /etc/group as shown:

```
e4:x:522:
e5:x:523:
e1:x:524:
t1:x:525:
t2:x:526:
t3:x:527:
rpcuser:x:29:
nfsnobody:x:65534:
smith:x:528:
jackson:x:529:
akshay:x:612:
tyit:x:613:john,smith,jackson
```

## **(6) rpm:**

- (i)** The packages can be installed with the help of rpm command. For that purpose, we need to mount disk image of RedHat on linux machine. After installation, this disk image is already mounted. We can simply switch to it under media. It is as shown in the screenshot.,



```
[root@tyit ~]# cd /media/
[root@tyit media]# ls
RHEL_6.0_i386_Disc_1
[root@tyit media]# cd RHEL_6.0\ i386\ Disc\ 1/
[root@tyit RHEL_6.0 i386 Disc 1]# cd Packages/
[root@tyit Packages]#
```

- (ii) The directory Packages has all the packages. For eg, to install vsftpd, use rpm command with ‘i’ option to install.



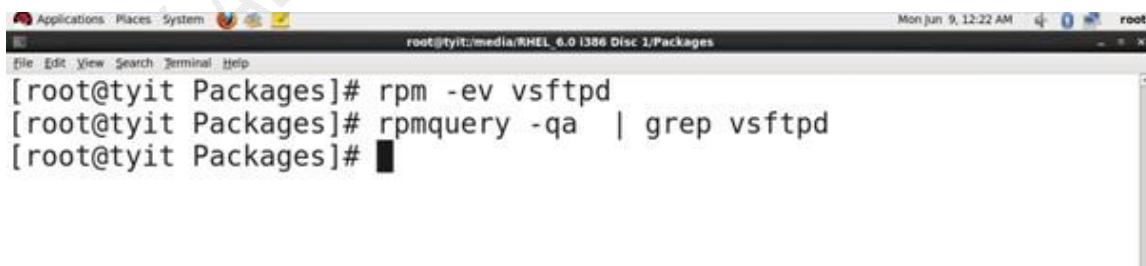
```
[root@tyit Packages]# rpm -ivh vsftpd-2.2.2-6.el6.i686.rpm
warning: vsftpd-2.2.2-6.el6.i686.rpm: Header V3 RSA/SHA256 Signature
e, key ID fd431d51: NOKEY
Preparing...
#####
[100%]
1:vsftpd
#####
[100%]
[root@tyit Packages]#
```

- (iii) To query and verify use rpmquery or rpm -qa, as shown below:



```
[root@tyit Packages]# rpmquery -qa | grep vsftpd
vsftpd-2.2.2-6.el6.i686
[root@tyit Packages]#
```

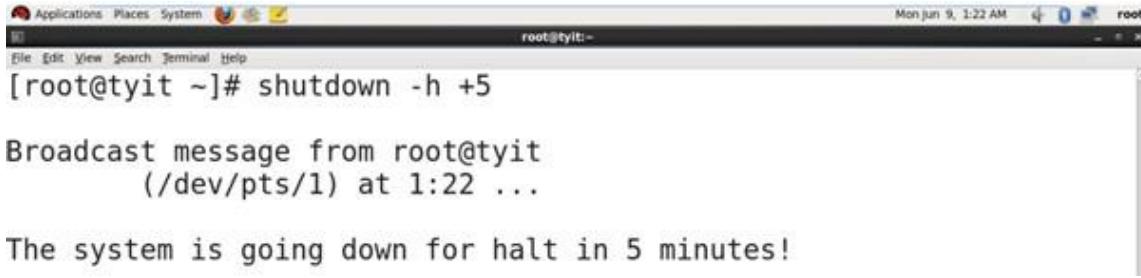
- (iv) To delete any installed package, use rpm with –e option to erase:



```
[root@tyit Packages]# rpm -ev vsftpd
[root@tyit Packages]# rpmquery -qa | grep vsftpd
[root@tyit Packages]#
```

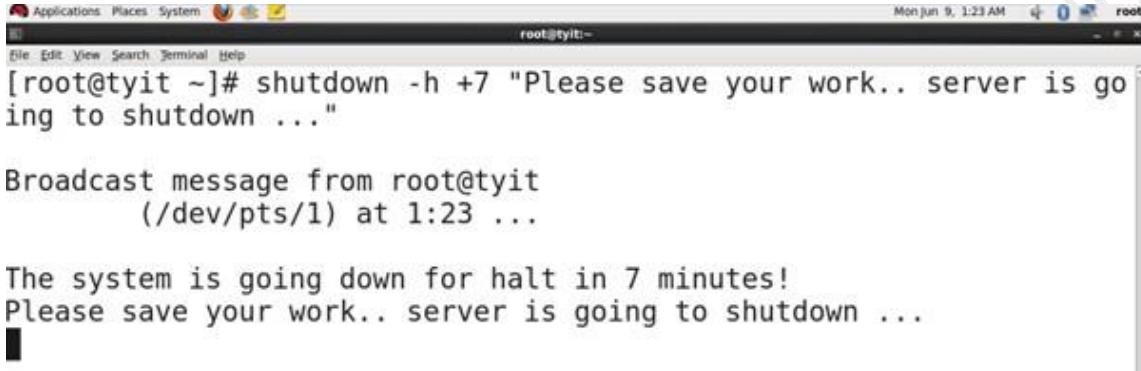
## (7) Shutdown command:

- (i) To shutdown after 5 mins:



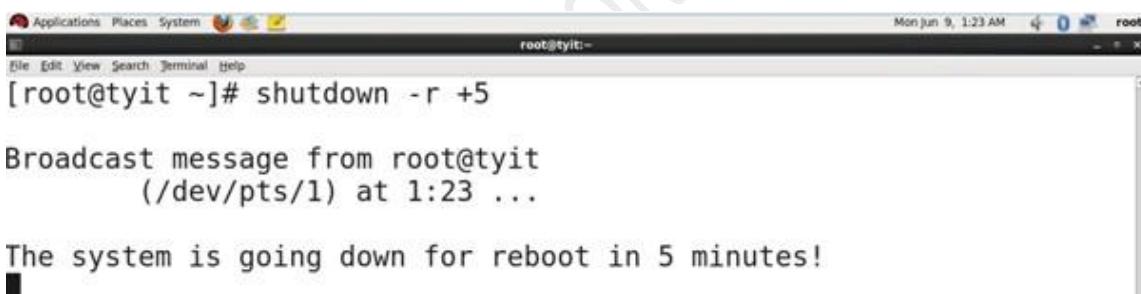
```
[root@tyit ~]# shutdown -h +5
Broadcast message from root@tyit
  (/dev/pts/1) at 1:22 ...
The system is going down for halt in 5 minutes!
```

(ii) To shutdown with a particular broadcast message:



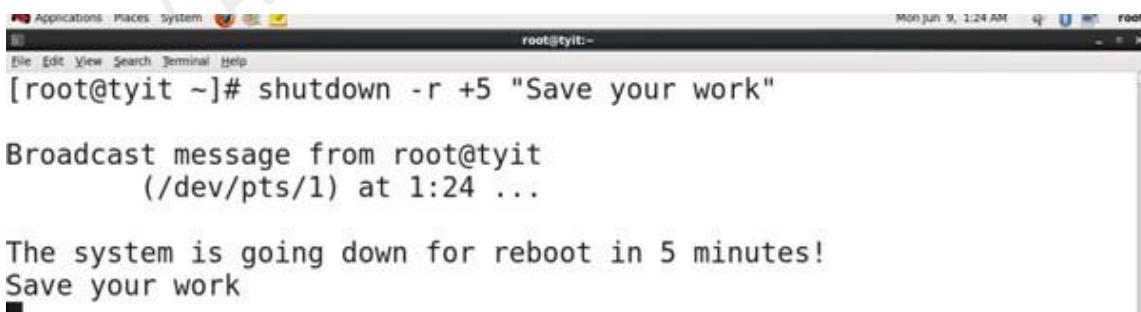
```
[root@tyit ~]# shutdown -h +7 "Please save your work.. server is going to shutdown ..."
Broadcast message from root@tyit
  (/dev/pts/1) at 1:23 ...
The system is going down for halt in 7 minutes!
Please save your work.. server is going to shutdown ...
```

(iii) To reboot after 5 mins:



```
[root@tyit ~]# shutdown -r +5
Broadcast message from root@tyit
  (/dev/pts/1) at 1:23 ...
The system is going down for reboot in 5 minutes!
```

(iv) To with specific broadcast message:



```
[root@tyit ~]# shutdown -r +5 "Save your work"
Broadcast message from root@tyit
  (/dev/pts/1) at 1:24 ...
The system is going down for reboot in 5 minutes!
Save your work
```

## (D) Administrative Files:

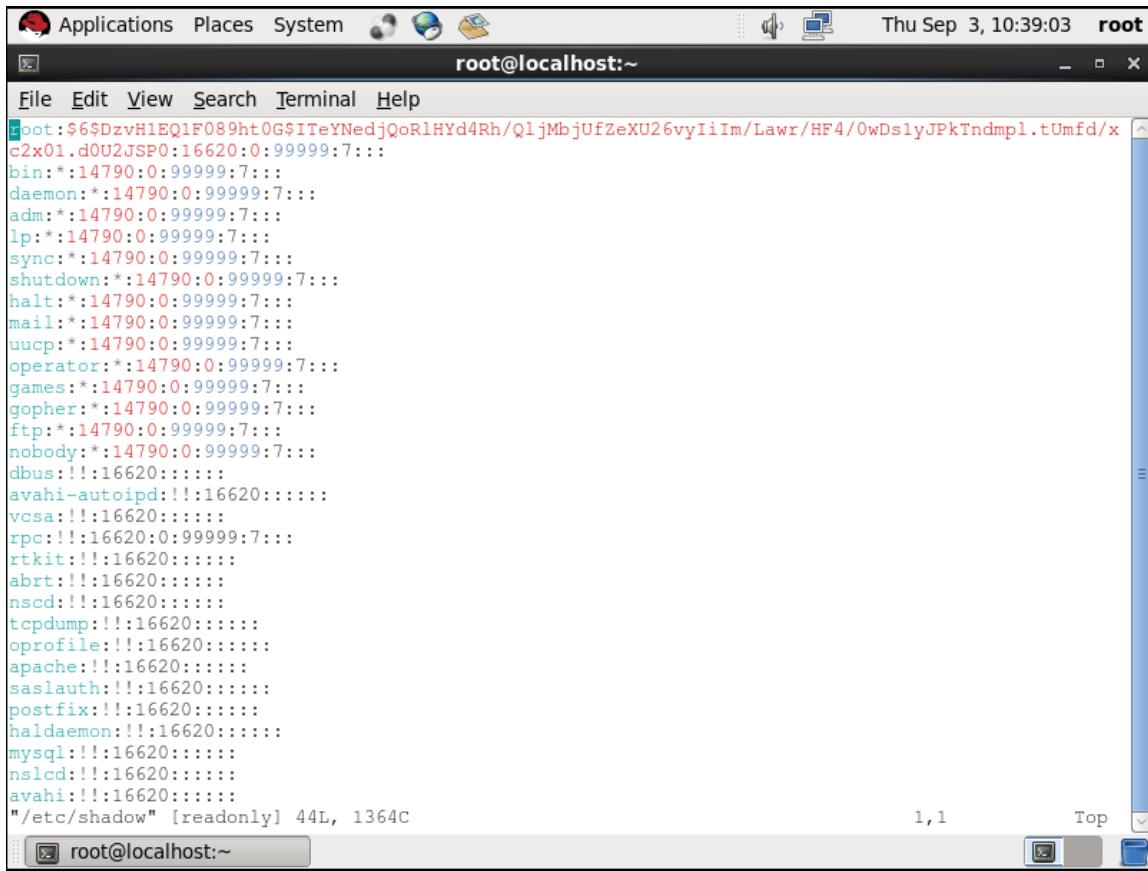
(1) /etc/aliases (will be done in sendmail)

(2) /etc/passwd

A screenshot of a terminal window titled "root@localhost:~". The window shows the contents of the /etc/passwd file. The file lists various system users and their details. The root user is at the top, followed by bin, daemon, adm, lp, sync, shutdown, halt, mail, uucp, operator, games, gopher, ftp, nobody, dbus, avahi-autoipd, vcsa, rpc, rtkit, abrt, nscd, tcpdump, oprofile, apache, saslauth, postfix, haldaemon, mysql, nsldc, avahi, and ntp. The root user has a password of "root". Other users have entries like "nologin" or specific paths for their shells.

```
root:x:0:0:root:/bin/bash
bin:x:1:1:bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/bin/shutdown
halt:x:7:0:halt:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
uucp:x:10:14:uucp:/var/spool/uucp:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
games:x:12:100:games:/usr/games:/sbin/nologin
gopher:x:13:30:gopher:/var/gopher:/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/sbin/nologin
nobody:x:99:99:Nobody:/sbin/nologin
dbus:x:81:81:System message bus:/sbin/nologin
avahi-autoipd:x:170:170:Avahi IPv4LL Stack:/var/lib/avahi-autoipd:/sbin/nologin
vcsa:x:69:69:virtual console memory owner:/dev:/sbin/nologin
rpc:x:32:32:Rpcbind Daemon:/var/cache/rpcbind:/sbin/nologin
rtkit:x:499:499:RealtimeKit:/proc:/sbin/nologin
abrt:x:498:498::/etc/abrt:/sbin/nologin
nscd:x:28:28:NSCD Daemon:/sbin/nologin
tcpdump:x:72:72::/sbin/nologin
oprofile:x:16:16:Special user account to be used by OProfile:/home/oprofile:/sbin/nologin
apache:x:48:48:Apache:/var/www:/sbin/nologin
saslauth:x:497:494:"Saslauthd user":/var/empty/saslauth:/sbin/nologin
postfix:x:89:89::/var/spool/postfix:/sbin/nologin
haldaemon:x:68:68:HAL daemon:/sbin/nologin
mysql:x:27:27:MySQL Server:/var/lib/mysql:/bin/bash
nsldc:x:65:55:LDAP Client User:/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
ntp:x:0:20:ntp:/sbin/nologin
"/etc/" root@localhost:~ 9C
```

(3) /etc/shadow



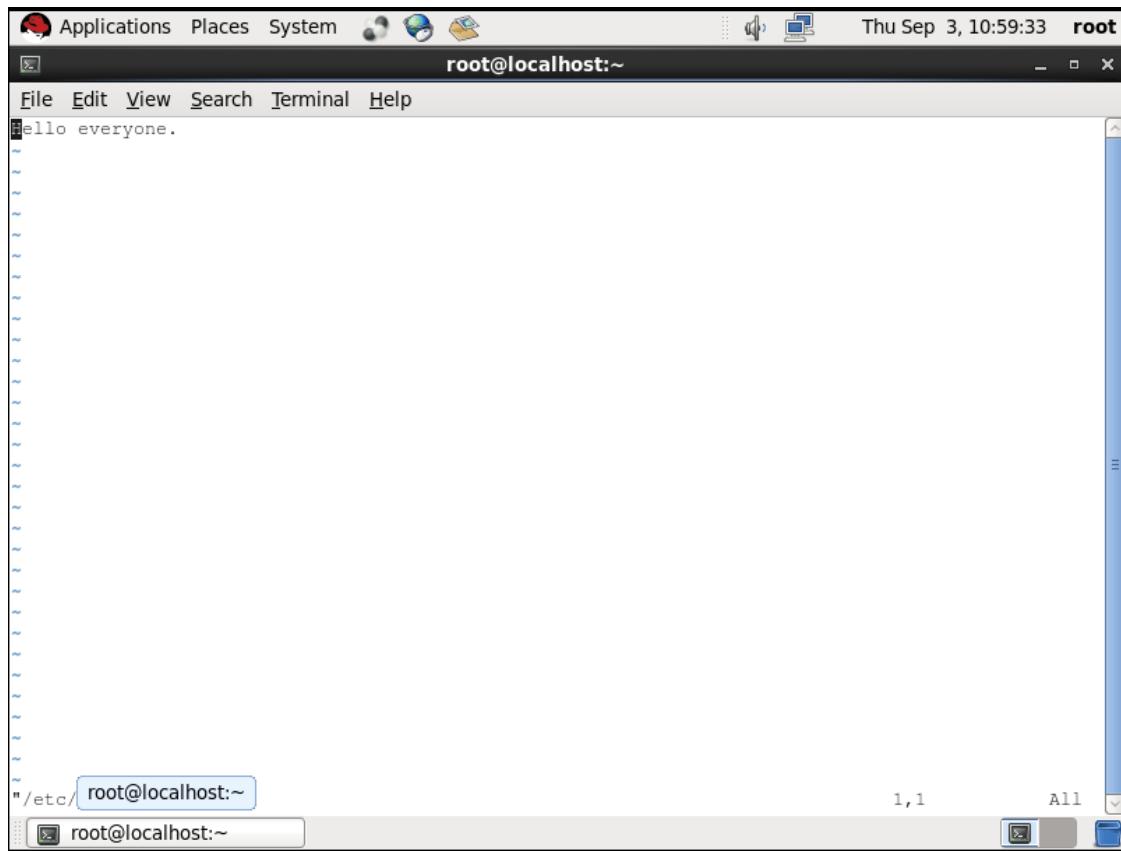
A screenshot of a Linux terminal window titled "root@localhost:~". The window shows the contents of the "/etc/shadow" file. The file contains a list of user accounts with their encrypted passwords. The password field is heavily redacted. The terminal window has a standard Xfce-style interface with icons in the top bar and a scroll bar on the right.

```
File Edit View Search Terminal Help
root:$6$DzvH1EQ1F089ht0G$ITeYNedjQoRlHYd4Rh/Q1jMbJUfZeXU26vyIiIm/Lawr/HF4/OwDslyJPkTndmpl.tUmfd/x
c2x01_d0U2JSPO:16620:0:99999:7:::
bin:*:14790:0:99999:7:::
daemon:*:14790:0:99999:7:::
adm:*:14790:0:99999:7:::
lp:*:14790:0:99999:7:::
sync:*:14790:0:99999:7:::
shutdown:*:14790:0:99999:7:::
halt:*:14790:0:99999:7:::
mail:*:14790:0:99999:7:::
uucp:*:14790:0:99999:7:::
operator:*:14790:0:99999:7:::
games:*:14790:0:99999:7:::
gopher:*:14790:0:99999:7:::
ftp:*:14790:0:99999:7:::
nobody:*:14790:0:99999:7:::
dbus:!:16620:::::
avahi-autoipd:!:16620:::::
vcxsrv:!:16620:::::
rpc:!:16620:0:99999:7:::
rtkit:!:16620:::::
abrt:!:16620:::::
nsqd:!:16620:::::
tcpdump:!:16620:::::
oprofile:!:16620:::::
apache:!:16620:::::
saslauth:!:16620:::::
postfix:!:16620:::::
haldaemon:!:16620:::::
mysql:!:16620:::::
nsLCD:!:16620:::::
avahi:!:16620:::::
"/etc/shadow" [readonly] 44L, 1364C
```

## (4) /etc/motd

# Linux Administration Practical Manual

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```
Red Hat Enterprise Linux Server release 6.0 (Santiago)
Kernel 2.6.32-71.el6.i686 on an i686

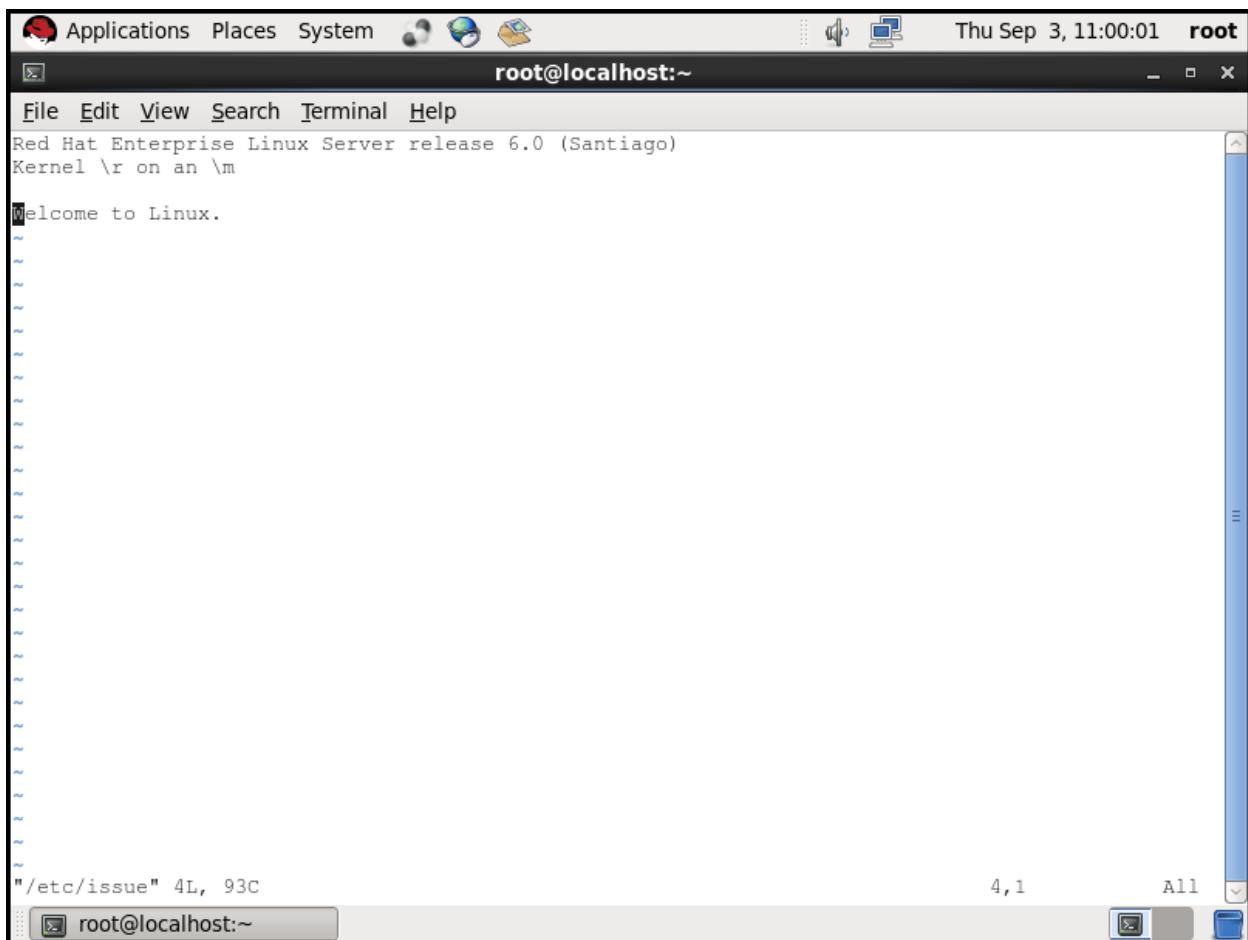
localhost login: root
Password:
Hello everyone.
[root@localhost ~]# _
```

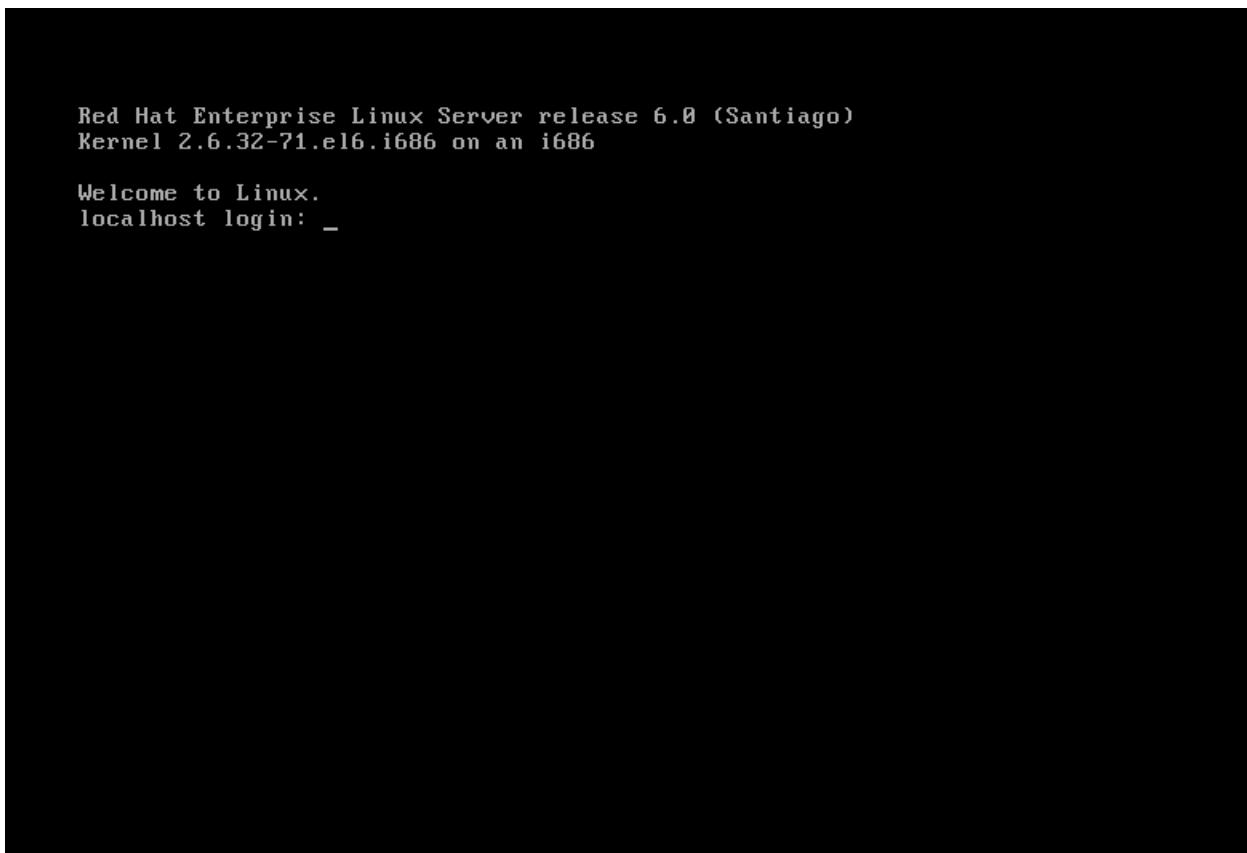
## (5) /etc/issue

LINUX ADMINISTRATION

# Linux Administration Practical Manual

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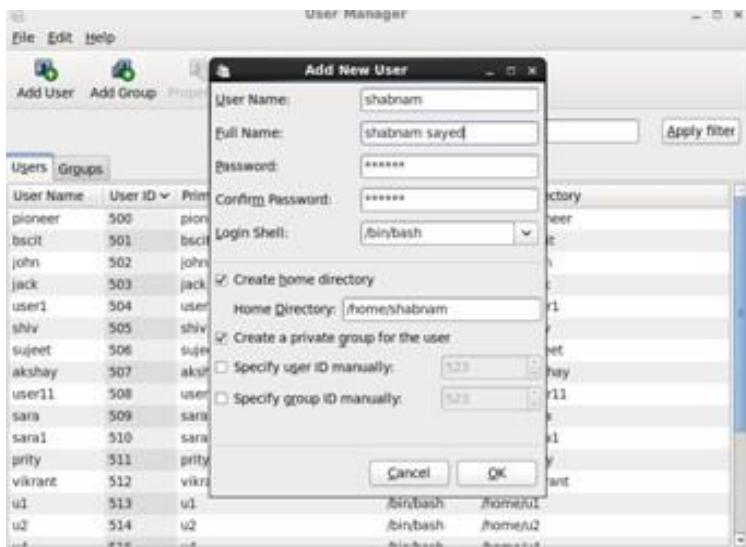


## (E) Graphical Tools:

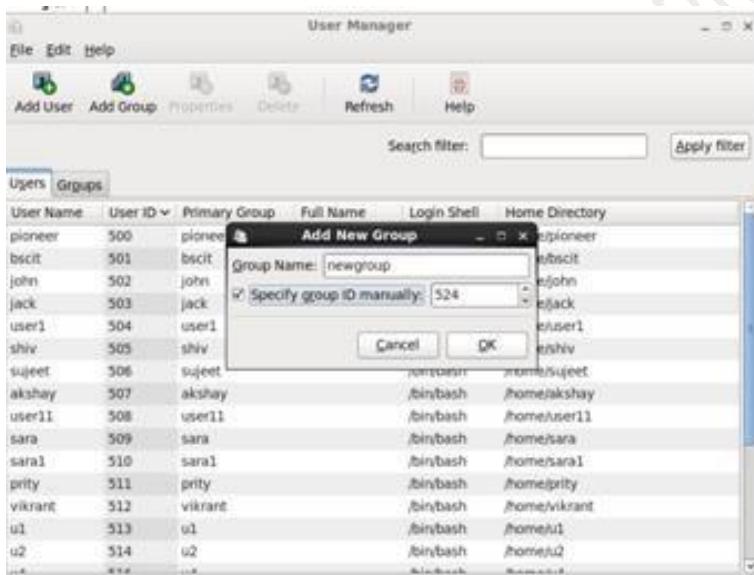
- (1) To add user graphically:



Useradd dialog box comes. Write username, full name, password, shell name, home dir and click OK.



- (2) To add a group graphically, system->Administration->user.  
Click add group and provide the group name. Click OK.



## Practical no 16: Using javac compiler

### (I) Sample JAVA program and demonstration of javac compiler:

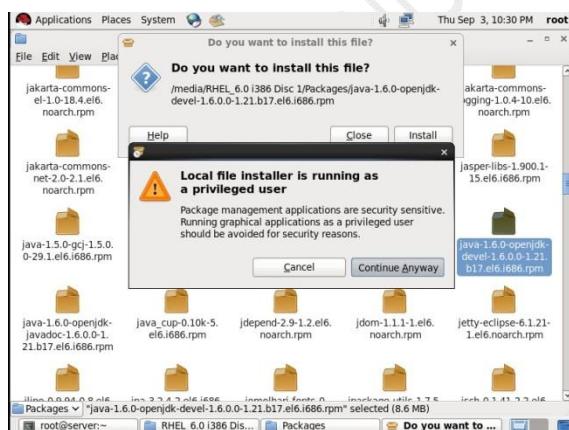
#### 1) Java package installation :=

We graphically install java-1.6 . go to CD/ Package directory.

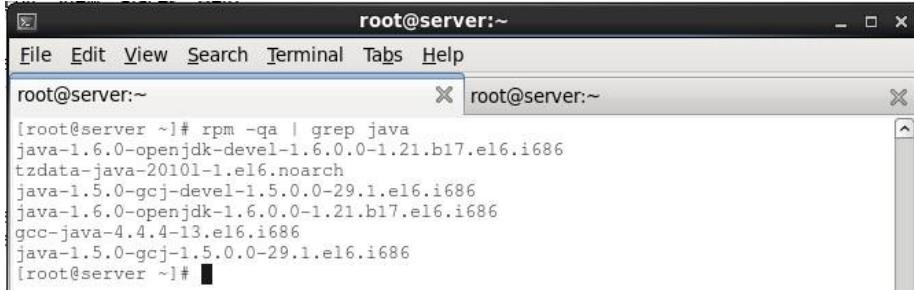


Find java 1.6.0-openjdk-devel. Double click the package.

Click on install.



#### 2) Now query package and check whether it is properly install or not.



```
root@server:~# rpm -qa | grep java
java-1.6.0-openjdk-devel-1.6.0.0-1.21.b17.el6.i686
tzdata-java-2010l-1.el6.noarch
java-1.5.0-gcj-devel-1.5.0.0-29.1.el6.i686
java-1.6.0-openjdk-1.6.0.0-1.21.b17.el6.i686
gcc-java-4.4.4-13.el6.i686
java-1.5.0-gcj-1.5.0.0-29.1.el6.i686
[root@server ~]#
```

- 3) Now create file HelloWorld.java with vi editor.

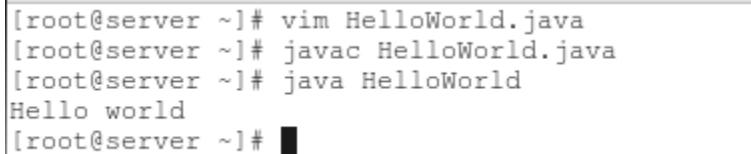
```
[root@server ~]# vim HelloWorld.java |
```

- 4) Add the following code to file and save and exit.

```
import java.io.*;
public class HelloWorld{
public static void main(String[] args) {
System.out.println("Hello world");
}
}
```

- 5) Compile the file with javac command.

- 6) Use java command to view output.



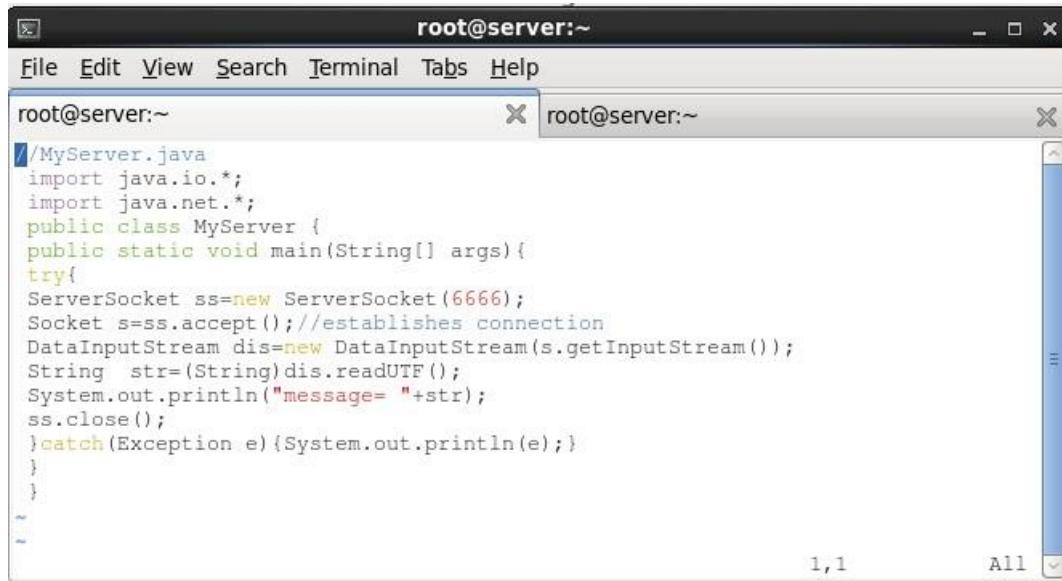
```
[root@server ~]# vim HelloWorld.java
[root@server ~]# javac HelloWorld.java
[root@server ~]# java HelloWorld
Hello world
[root@server ~]#
```

## (II) Socket Programming using Java:

- 1) Now go to server machine and create file MyServer.java with vi editor.

```
| [root@server ~]# vim MyServer.java
```

- 2) Add the following code to file and save and exit.

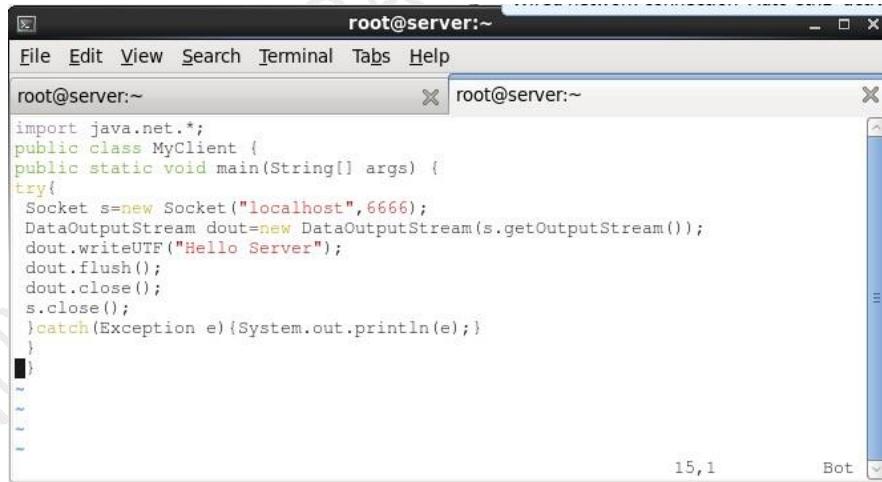


```
root@server:~          root@server:~  
File Edit View Search Terminal Tabs Help  
root@server:~          root@server:~  
/MyServer.java  
import java.io.*;  
import java.net.*;  
public class MyServer {  
public static void main(String[] args){  
try{  
ServerSocket ss=new ServerSocket(6666);  
Socket s=ss.accept(); //establishes connection  
DataInputStream dis=new DataInputStream(s.getInputStream());  
String str=(String)dis.readUTF();  
System.out.println("message= "+str);  
ss.close();  
}catch(Exception e){System.out.println(e);}  
}  
}  
~  
~  
1,1          All
```

- 3) Now go to client machine create file MyClient.java with vi editor.

```
[root@server ~]# vim MyClient.java
```

- 4) Add the following code to file and save and exit



```
root@server:~          root@server:~  
File Edit View Search Terminal Tabs Help  
root@server:~          root@server:~  
import java.net.*;  
public class MyClient {  
public static void main(String[] args) {  
try{  
Socket s=new Socket("localhost", 6666);  
DataOutputStream dout=new DataOutputStream(s.getOutputStream());  
dout.writeUTF("Hello Server");  
dout.flush();  
dout.close();  
s.close();  
}catch(Exception e){System.out.println(e);}  
}  
}  
~  
~  
~  
~  
15,1          Bot
```

- 5) Go to server machine and Compile the file with javac command. Use java MyServer command to see output.

## Linux Administration Practical Manual

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```
[root@server ~]# vim MyServer.java
[root@server ~]# javac MyServer.java
[root@server ~]# java MyServer
message= Hello Server
[root@server ~]# █
```

- 6) Go to client machine and Compile the file with javac command.

```
[root@server ~]# vim MyClient.java
[root@server ~]# javac MyClient.java
[root@server ~]# java MyClient
[root@server ~]# █
```