"LINUX ADMINISTRATION" PRACTICAL MANUAL

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

Prepared By : 1. Prof. Sweta Chheda - N.M.College
2. Prof. Jagdish Sanas

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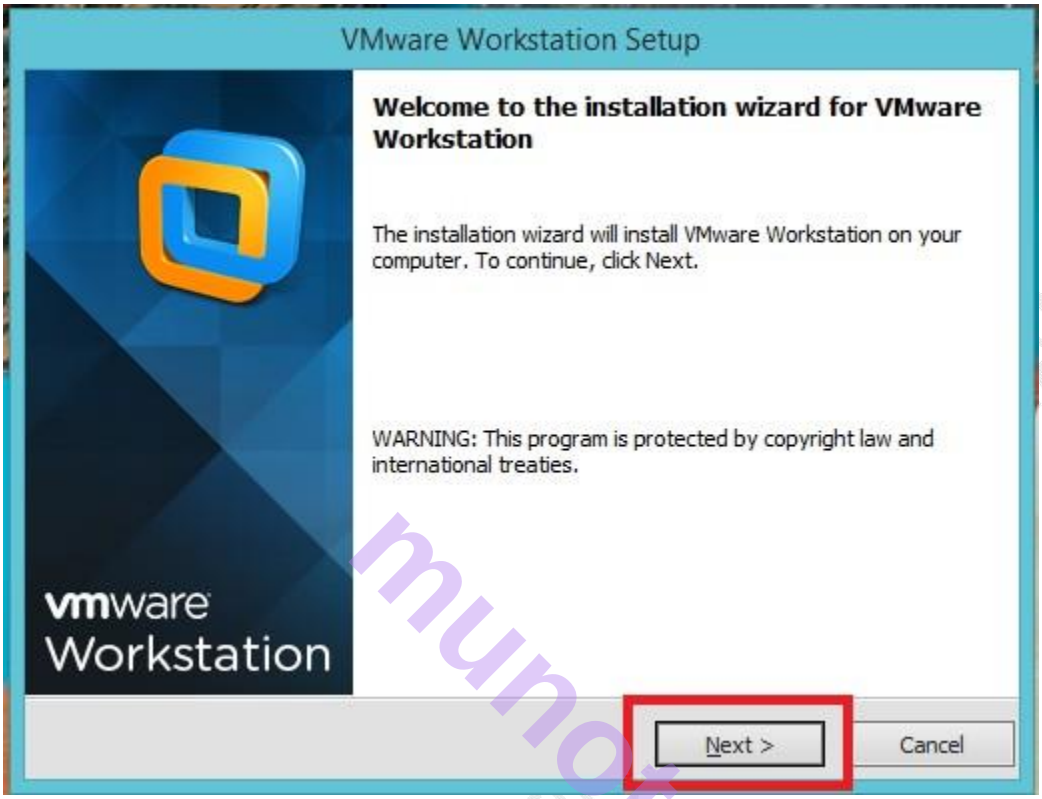
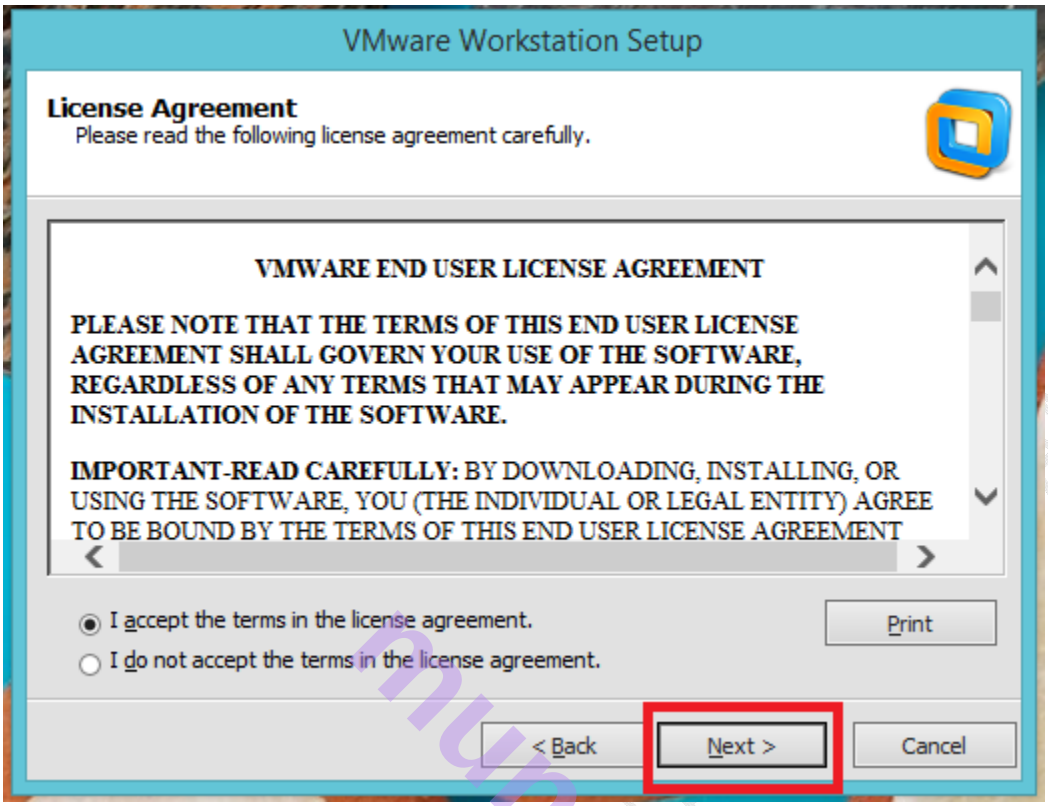
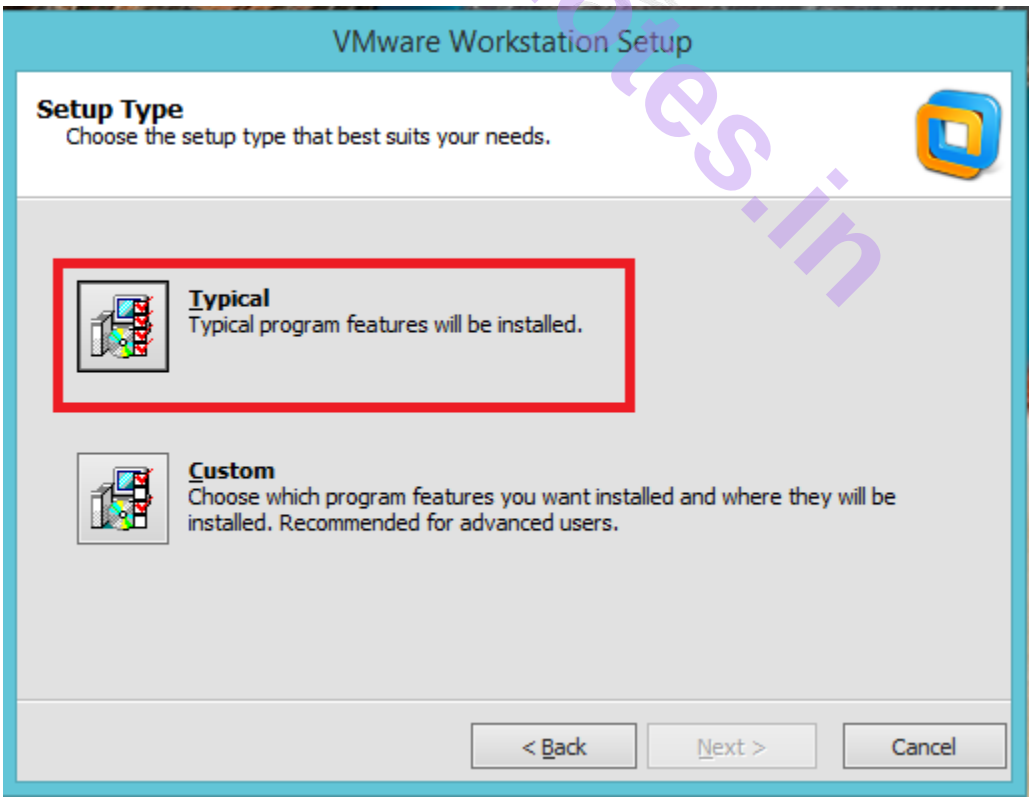
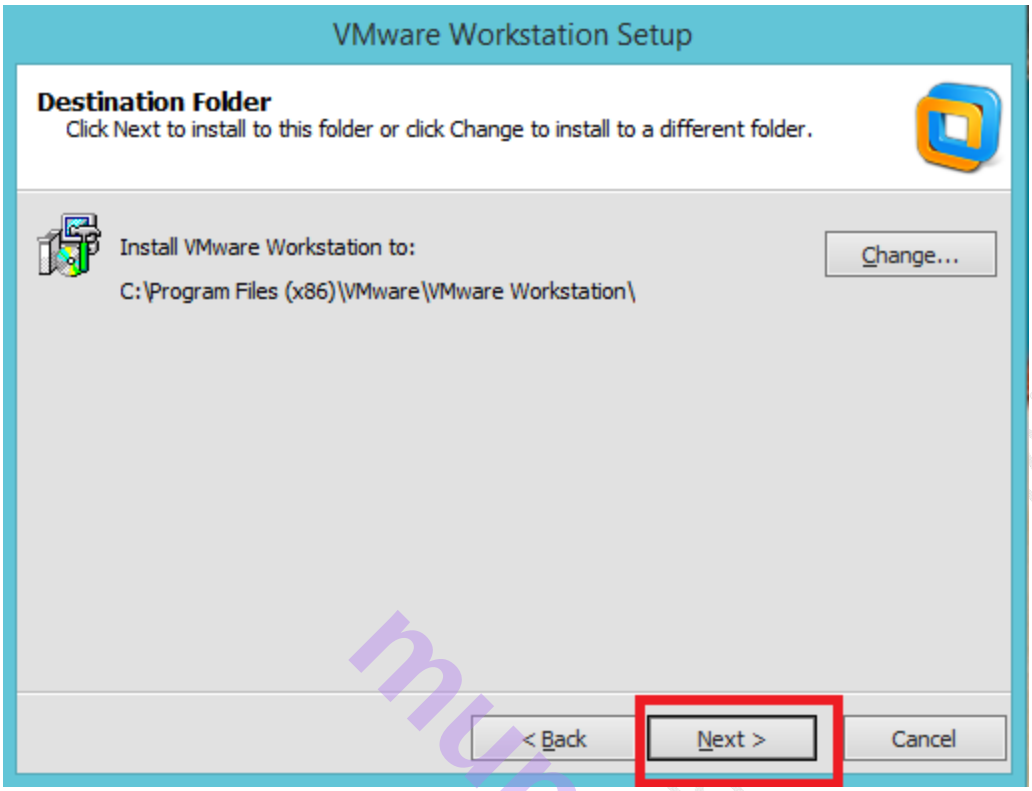
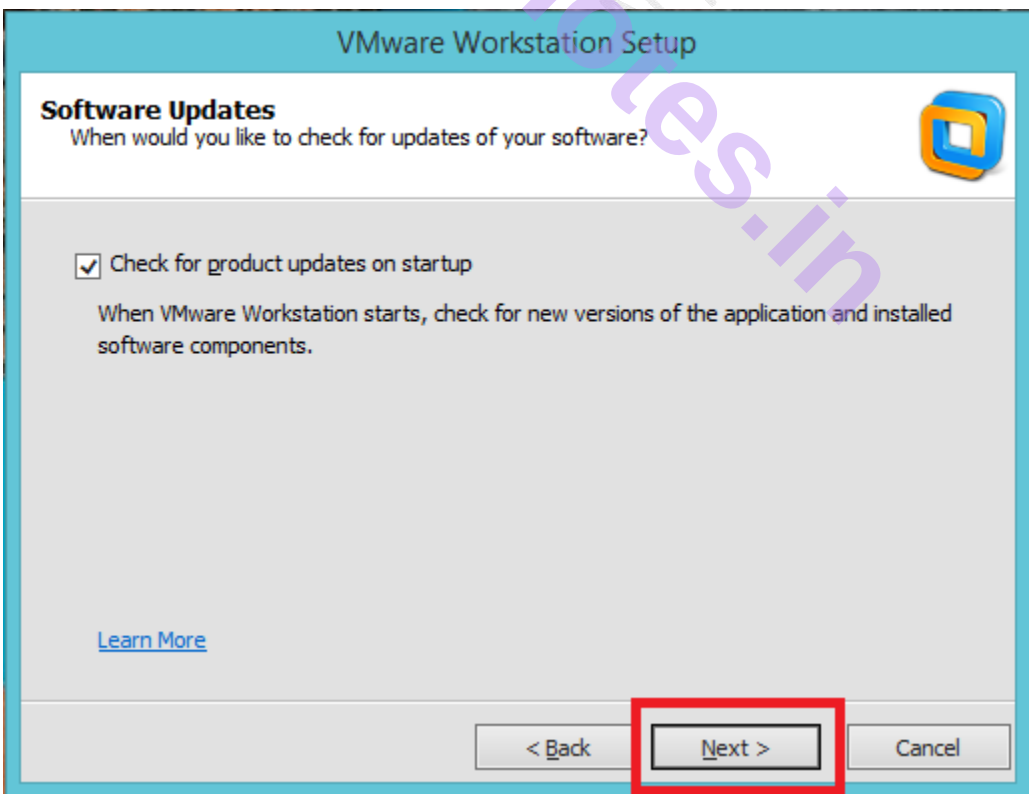
Practical no 1: Installation of Red HAT Linux operating system.

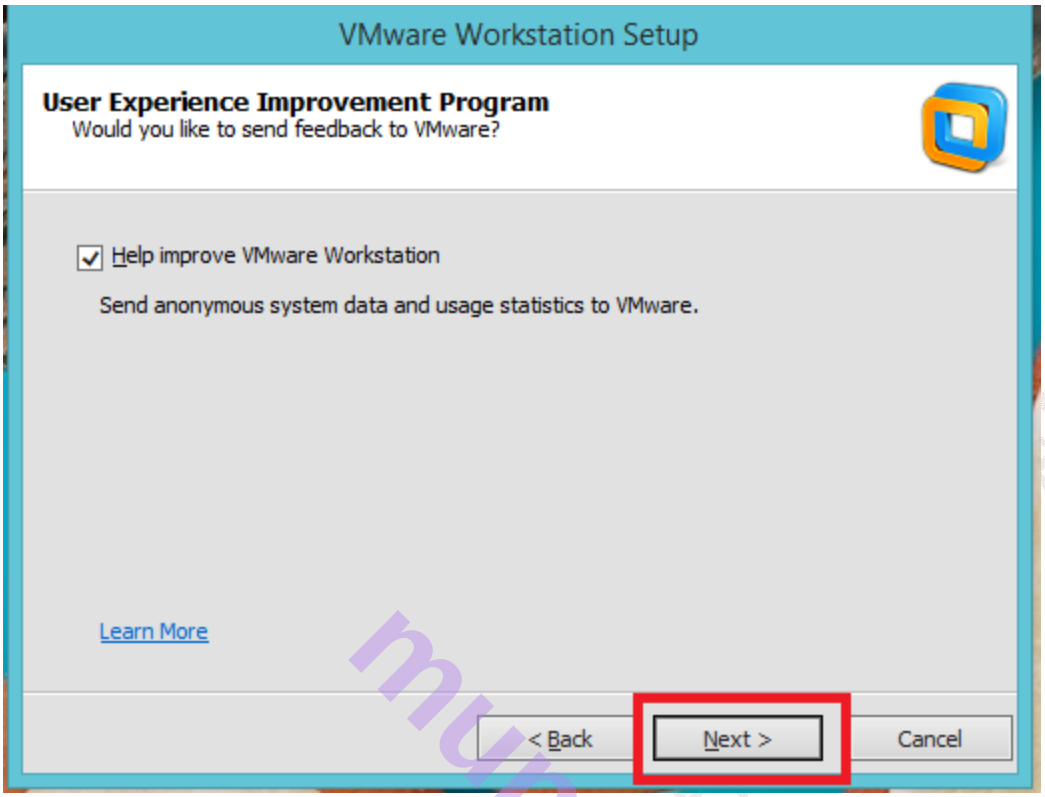


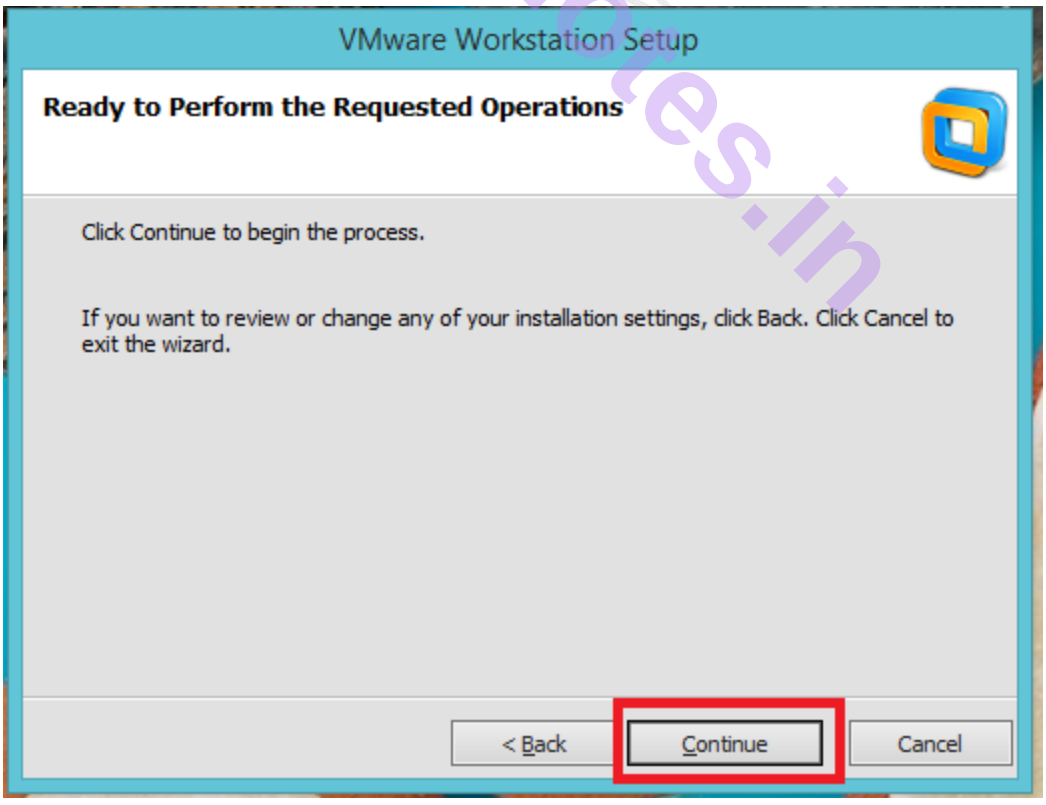

VMware Workstation Setup
License Agreement
Please read the following license agreement carefully.
VMWARE END USER LICENSE AGREEMENT
PLEASE NOTE THAT THE TERMS OF THIS END USER LICENSE AGREEMENT SHALL GOVERN YOUR USE OF THE SOFTWARE, REGARDLESS OF ANY TERMS THAT MAY APPEAR DURING THE INSTALLATION OF THE SOFTWARE.
IMPORTANT-READ CAREFULLY: BY DOWNLOADING, INSTALLING, OR USING THE SOFTWARE, YOU (THE INDIVIDUAL OR LEGAL ENTITY) AGREE TO BE BOUND BY THE TERMS OF THIS END USER LICENSE AGREEMENT
I accept the terms in the license agreement.
I do not accept the terms in the license agreement.
Print
< Back
Next >
Cancel

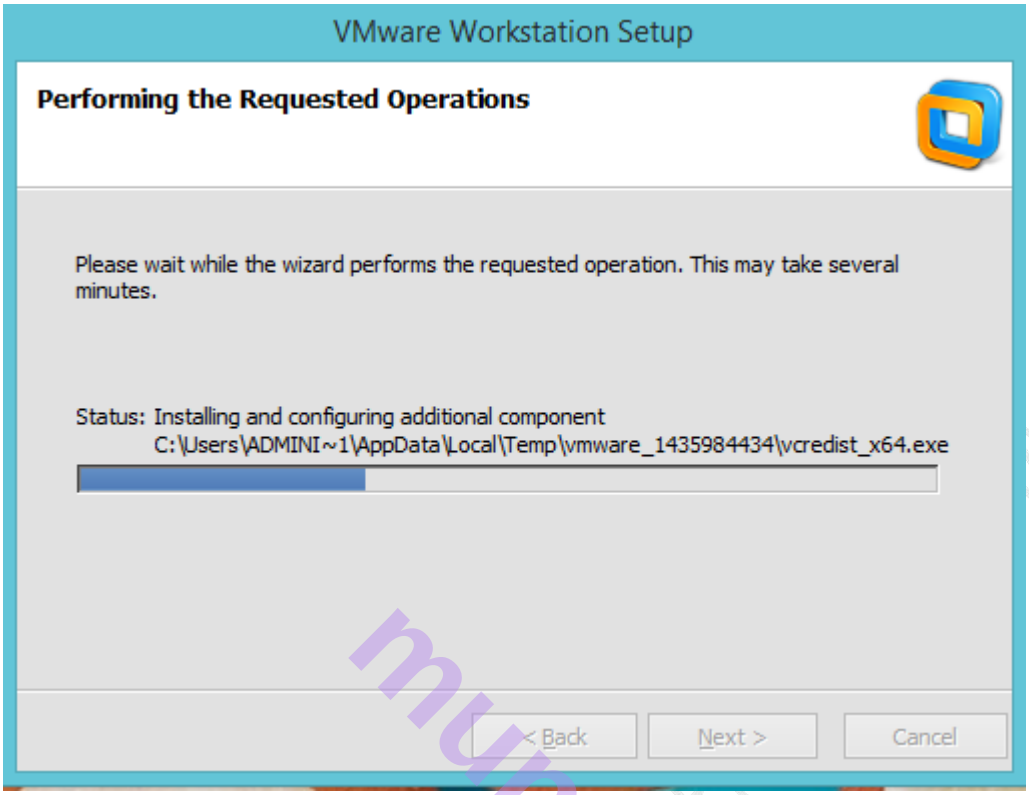

VMware Workstation Setup
Setup Type
Choose the setup type that best suits your needs.
Typical
Typical program features will be installed.
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
< Back
Next >
Cancel


VMware Workstation Setup
Destination Folder
Click Next to install to this folder or click Change to install to a different folder.
Install VMware Workstation to:
C:\Program Files (x86)\VMware\VMware Workstation\
Change...
< Back
Next >
Cancel

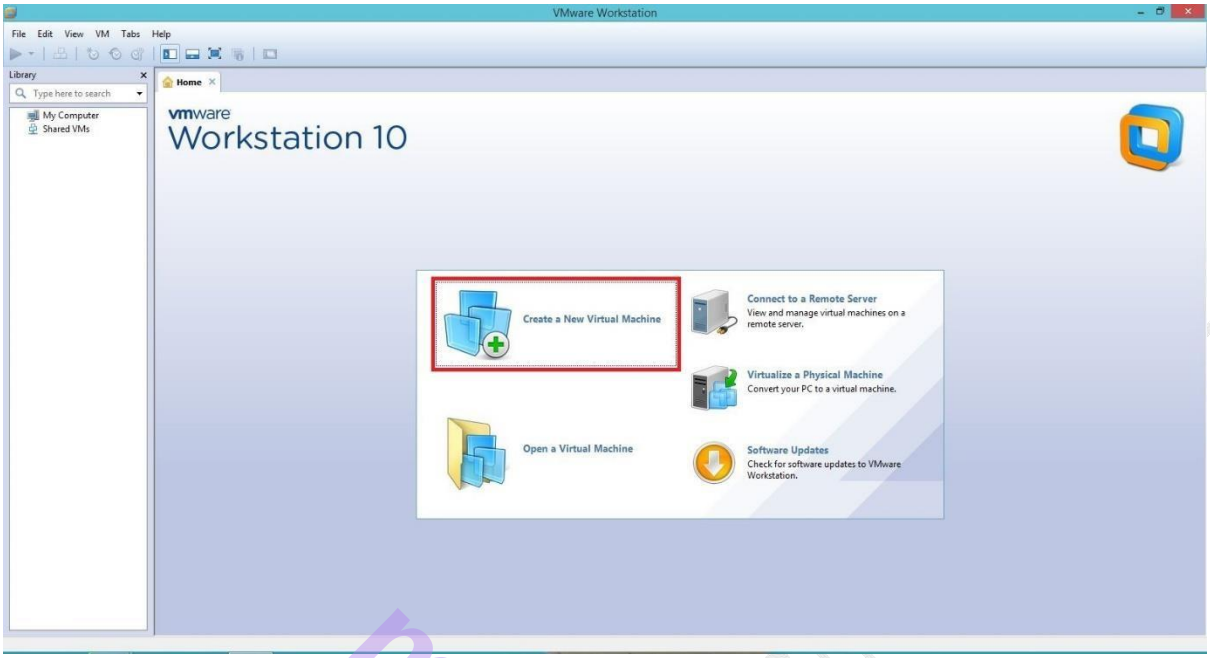

VMware Workstation Setup
Software Updates
When would you like to check for updates of your software?
Check for product updates on startup
When VMware Workstation starts, check for new versions of the application and installed software components.
Learn More
< Back
Next >
Cancel


VMware Workstation Setup
User Experience Improvement Program
Would you like to send feedback to VMware?
Help improve VMware Workstation
Send anonymous system data and usage statistics to VMware.
Learn More
< Back
Next >
Cancel

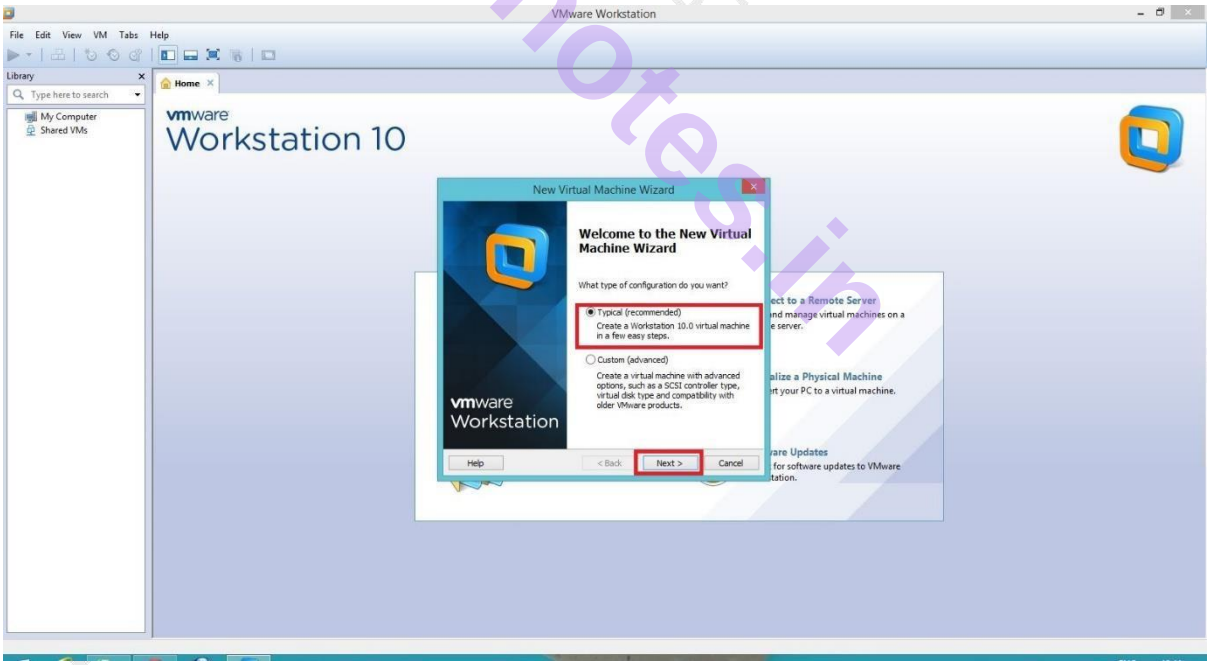

VMware Workstation Setup
Ready to Perform the Requested Operations
Click Continue to begin the process.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
< Back
Continue
Cancel



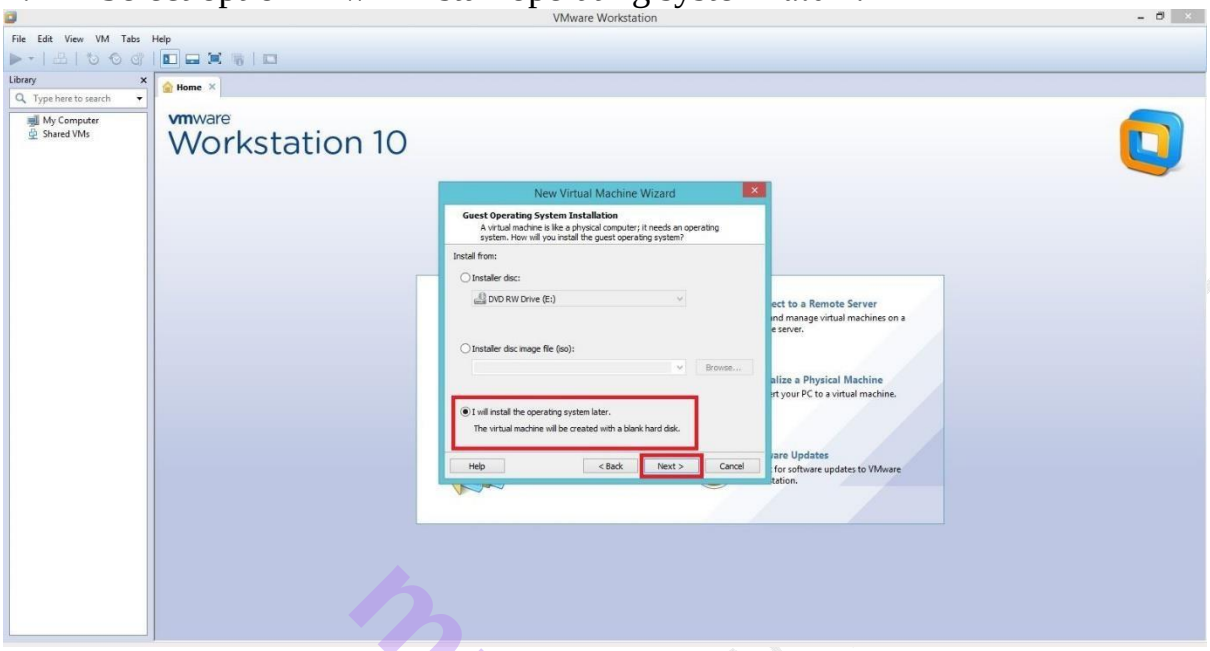
1. Double click on VM VirtualBox icon and Oracle VM VirtualBox Manager will open.
2. Click on New button in the toolbar to create a new virtual machine



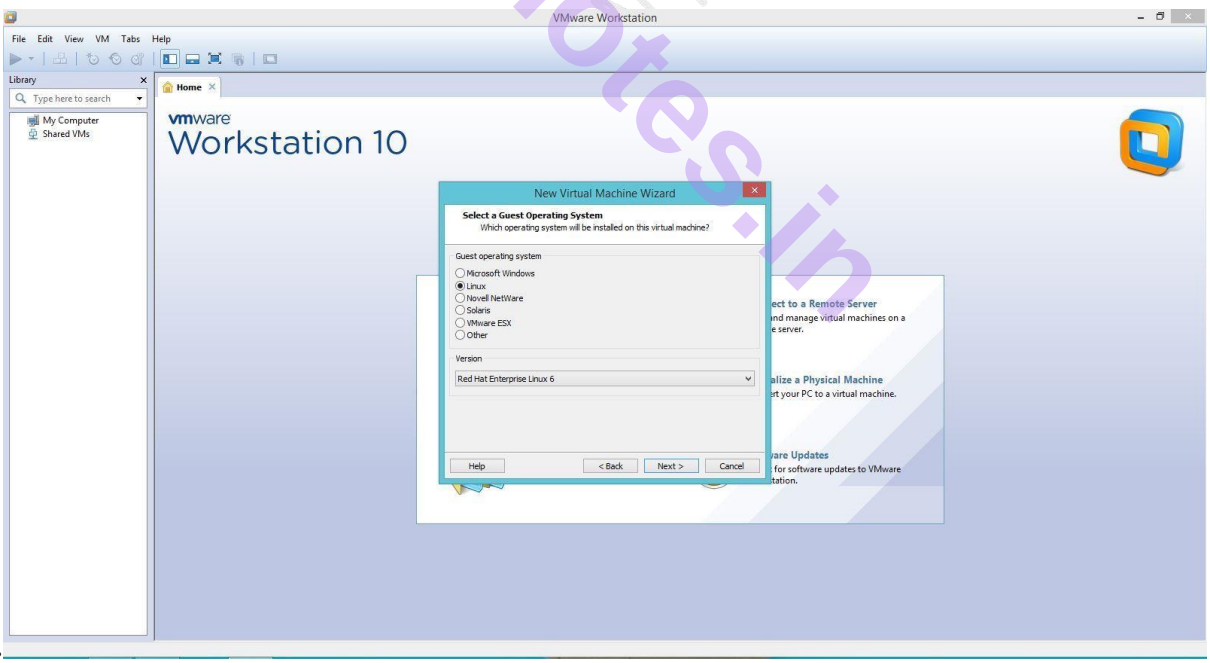
3. Create Virtual Machine Dialog box will open



4. Select option "I will install operating system later".

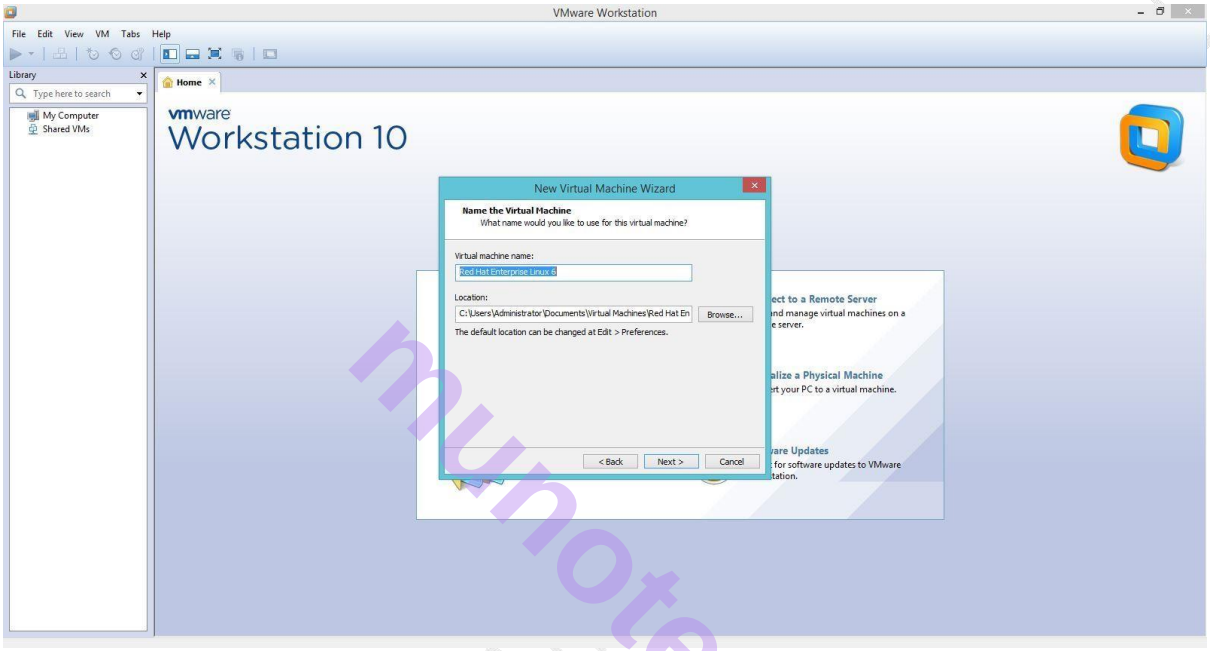


5. Select the operating system as RedHat the Type will automatically get selected as Linux and Version as Red hat

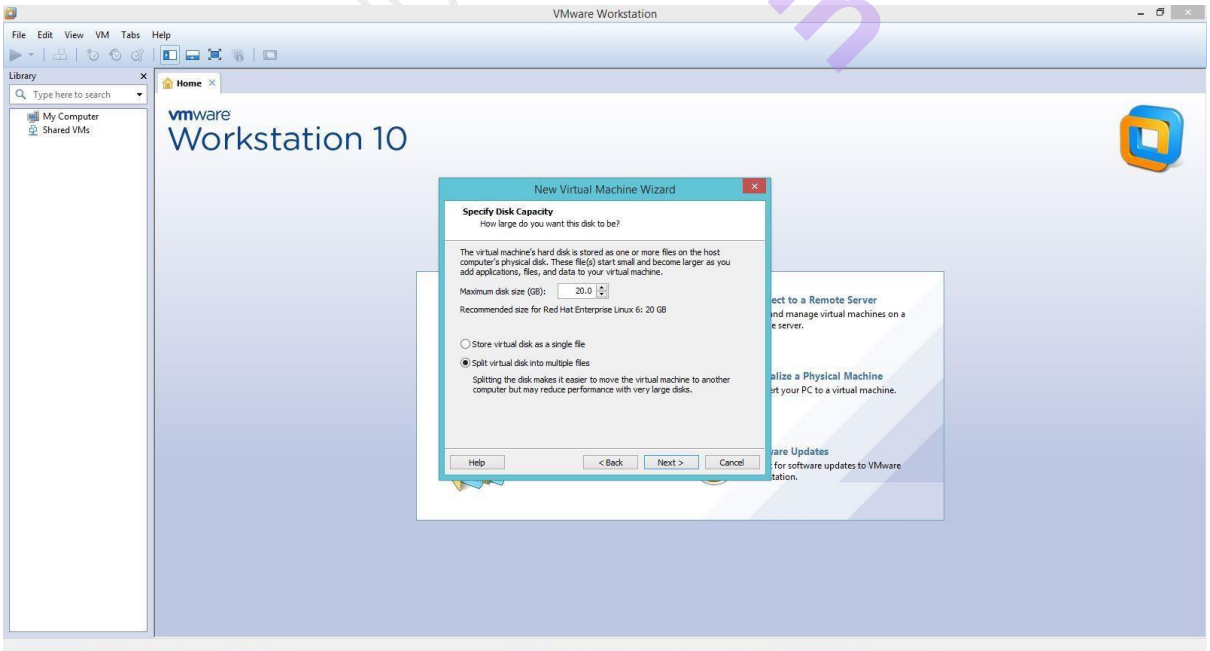


(Virtual Box support no of operating system which you can select from, Type drop down menu)

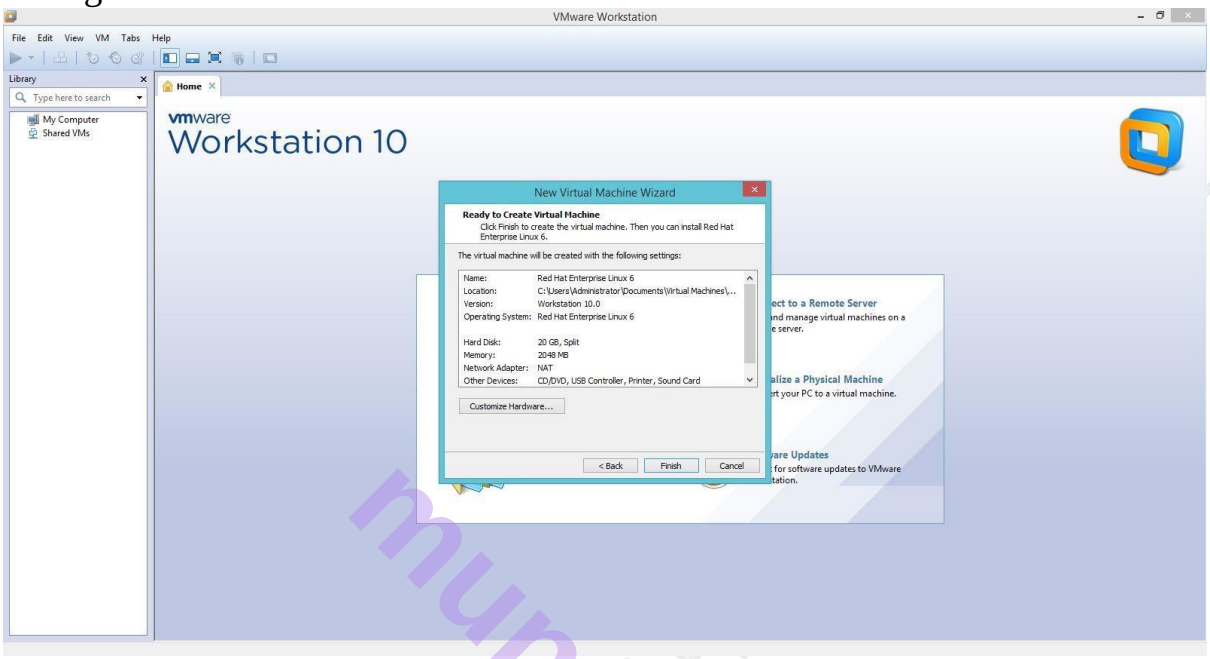
6. Now write the virtual machine name as you want or set it by default "Red Hat Enterprise Linux 6".



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



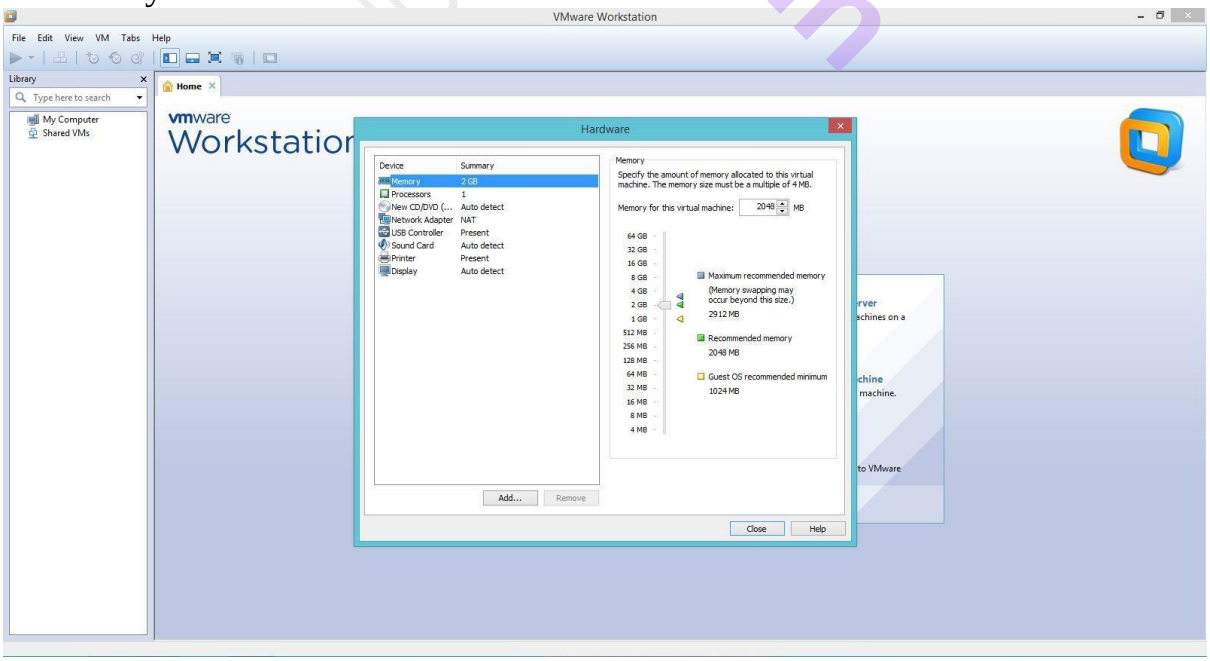
8. Now you get the option that virtual machine is created with the following settings

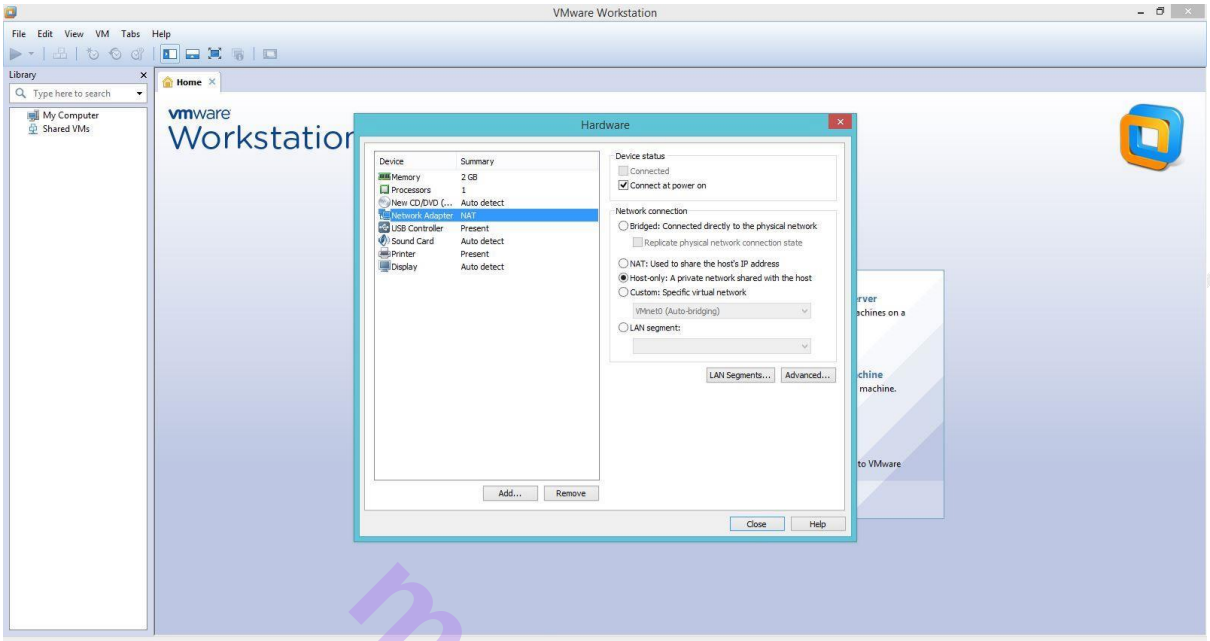


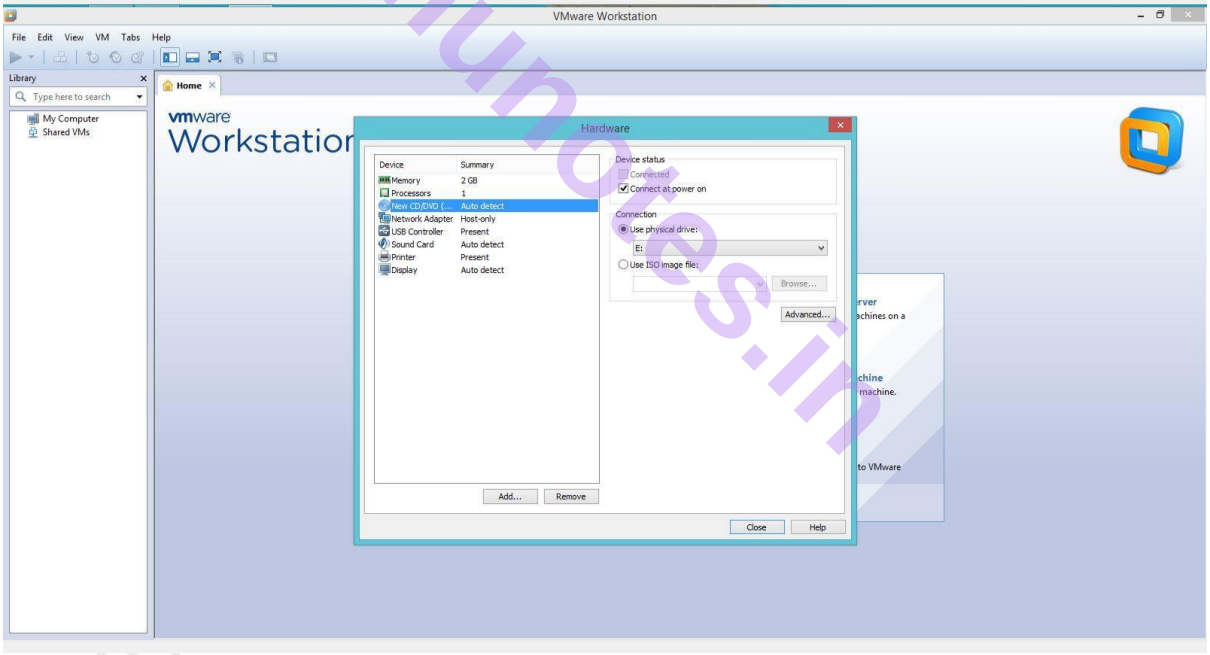
9. Click on "customize Hardware" Select the memory size that is RAM you want to allocate for RedHat virtual machine (1 GB) click Next button.

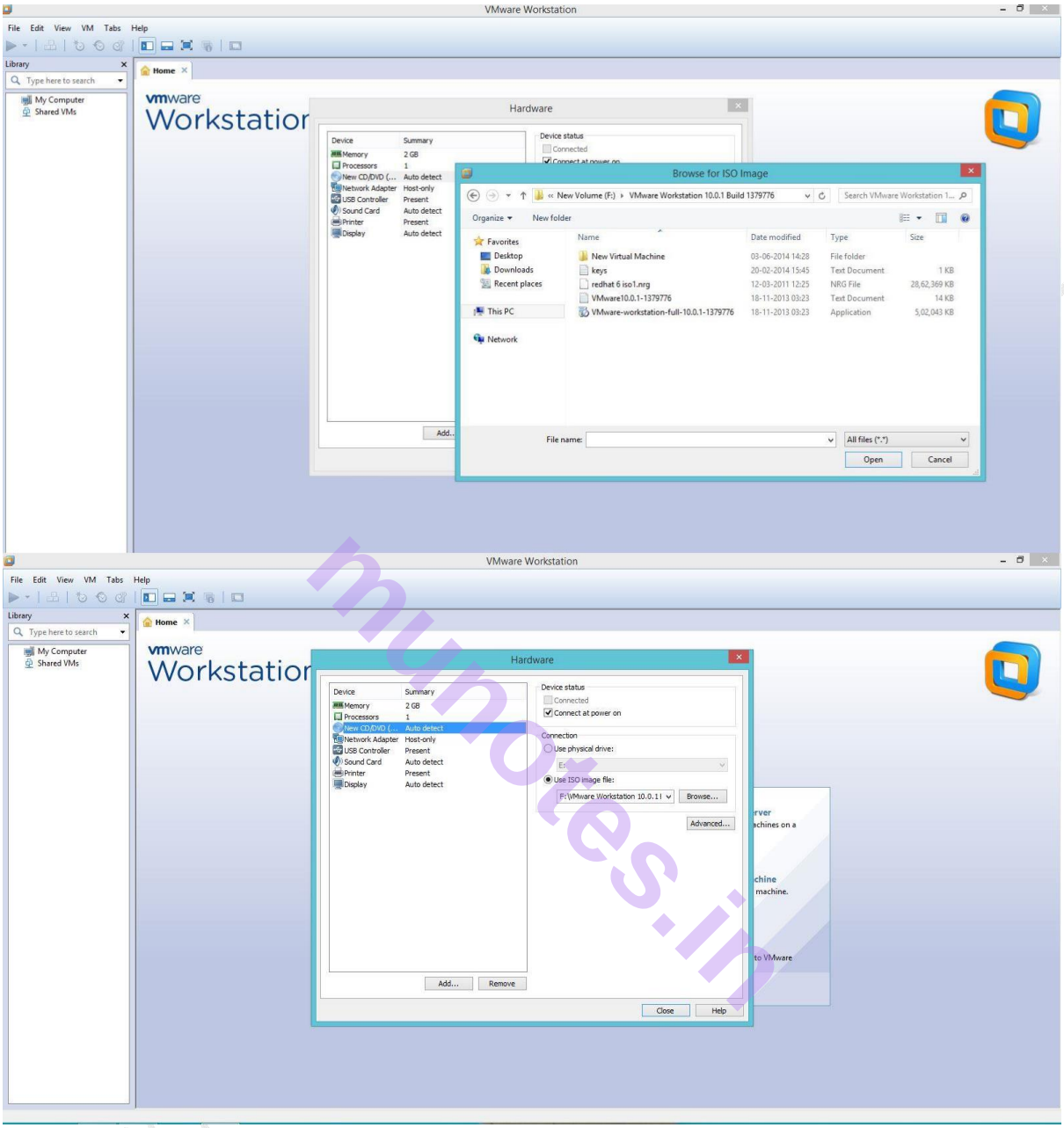
10. Now select create a virtual hard drive to the new machine click create button.

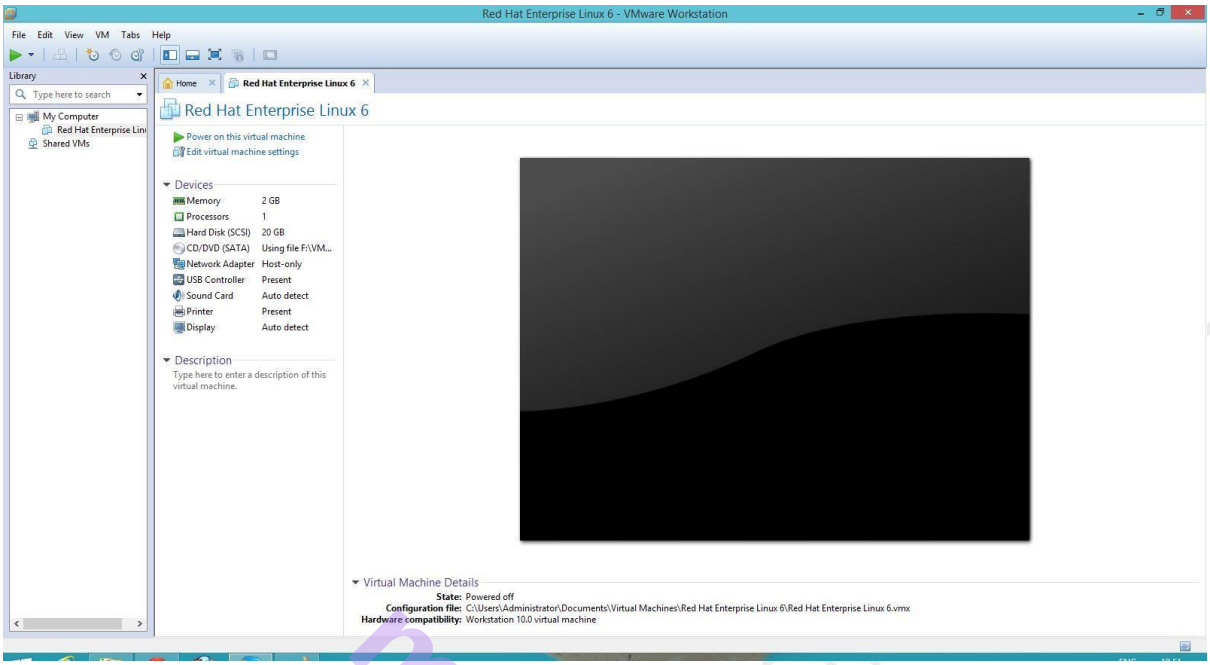
11. Your RedHat Virtual Box operating system drive is created. Now start the RedHat by double-click on it or use Start tab on menu bar.



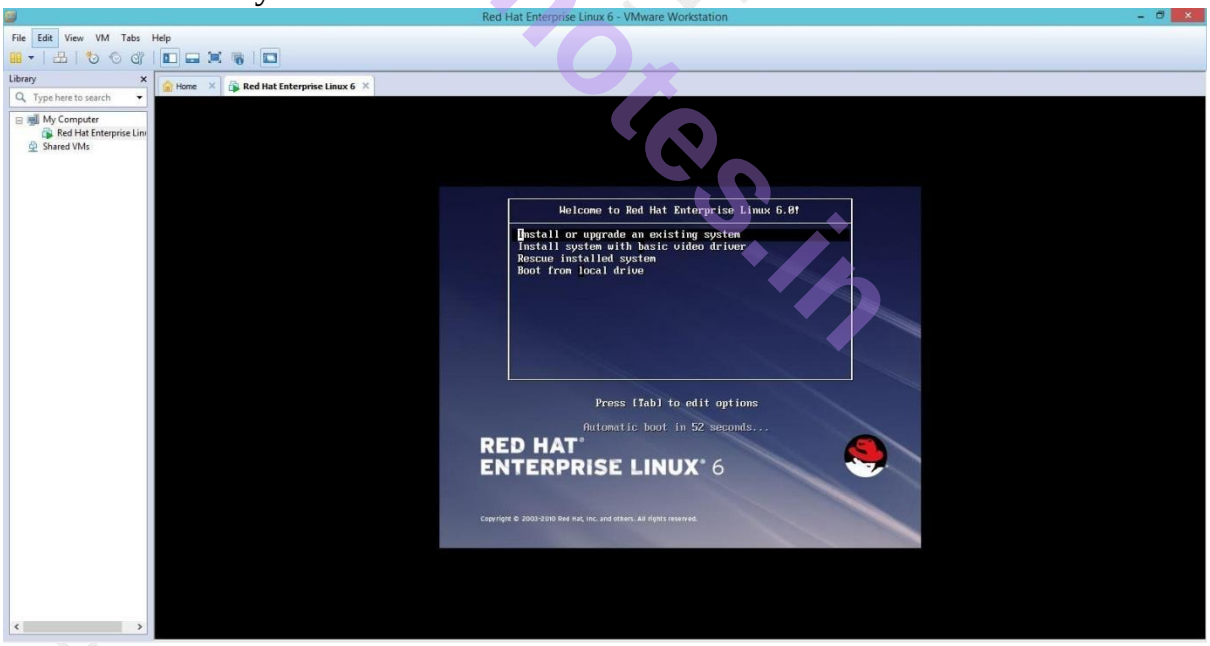

VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Shared VMs
Home
vmware
Workstation
Hardware
Device Summary
Memory 2 GB
Processors 1
New CD/DVD (... Auto detect
Network Adapter NAT
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Add... Remove
Device status
Connected
Connect at power on
Network connection
Bridged: Connected directly to the physical network
Replicate physical network connection state
NAT: Used to share the host's IP address
Host-only: A private network shared with the host
Custom: Specific virtual network
VMnet0 (Auto-bridging)
LAN segment:
LAN Segments... Advanced...
Close Help


VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Shared VMs
Home
vmware
Workstation
Hardware
Device Summary
Memory 2 GB
Processors 1
New CD/DVD (... Auto detect
Network Adapter Host-only
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Add... Remove
Device status
Connected
Connect at power on
Connection
Use physical drive:
E:
Use ISO image file:
Browse...
Advanced...
Close Help

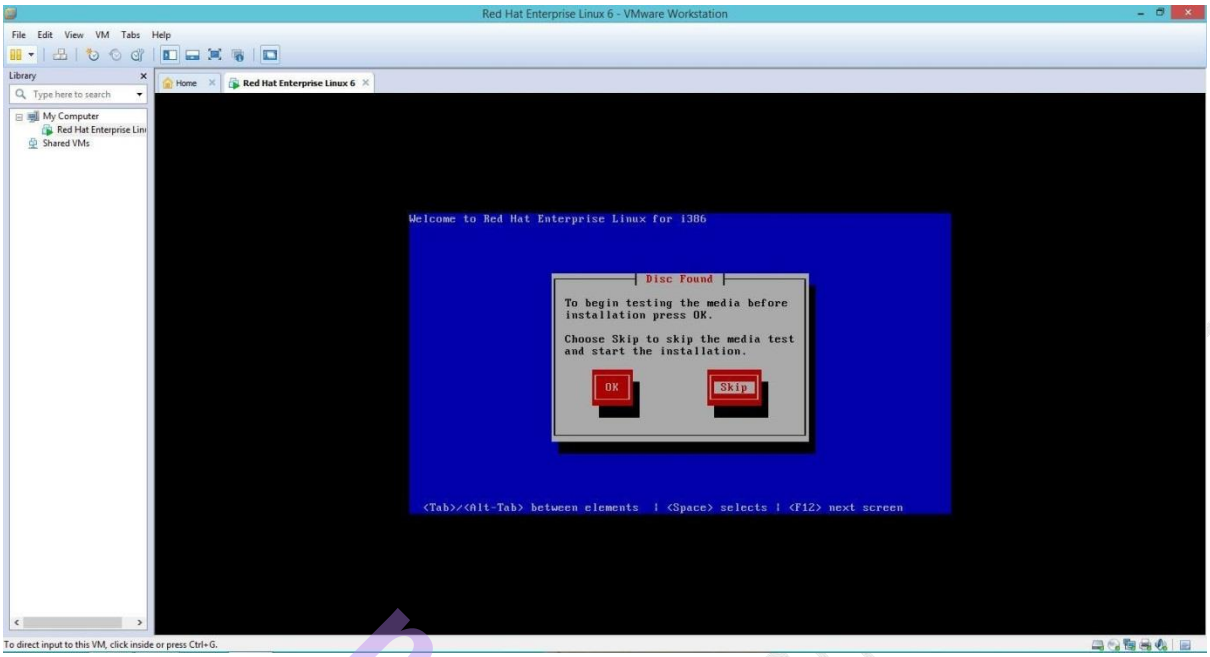

VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Shared VMs
Home
vmware Workstation
Hardware
Device Summary
Memory 2 GB
Processors 1
New CD/DVD (... Auto detect
Network Adapter Host-only
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Device status
Connected
Connect at power on
Browse for ISO Image
« New Volume (F:) ▸ VMware Workstation 10.0.1 Build 1379776
Search VMware Workstation 1...
Organize
New folder
Favorites
Desktop
Downloads
Recent places
This PC
Network
Name
Date modified
Type
Size
New Virtual Machine 03-06-2014 14:28 File folder
keys 20-02-2014 15:45 Text Document 1 KB
redhat 6 iso1.nrg 12-03-2011 12:25 NRG File 28,62,369 KB
VMware10.0.1-1379776 18-11-2013 03:23 Text Document 14 KB
VMware-workstation-full-10.0.1-1379776 18-11-2013 03:23 Application 5,02,043 KB
File name:
All files (*.*)
Open
Cancel
Add...
VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Shared VMs
Home
vmware Workstation
Hardware
Device Summary
Memory 2 GB
Processors 1
New CD/DVD (... Auto detect
Network Adapter Host-only
USB Controller Present
Sound Card Auto detect
Printer Present
Display Auto detect
Device status
Connected
Connect at power on
Connection
Use physical drive:
Use ISO image file:
F:\VMware Workstation 10.0.1 I
Browse...
Advanced...
Add...
Remove
Close
Help



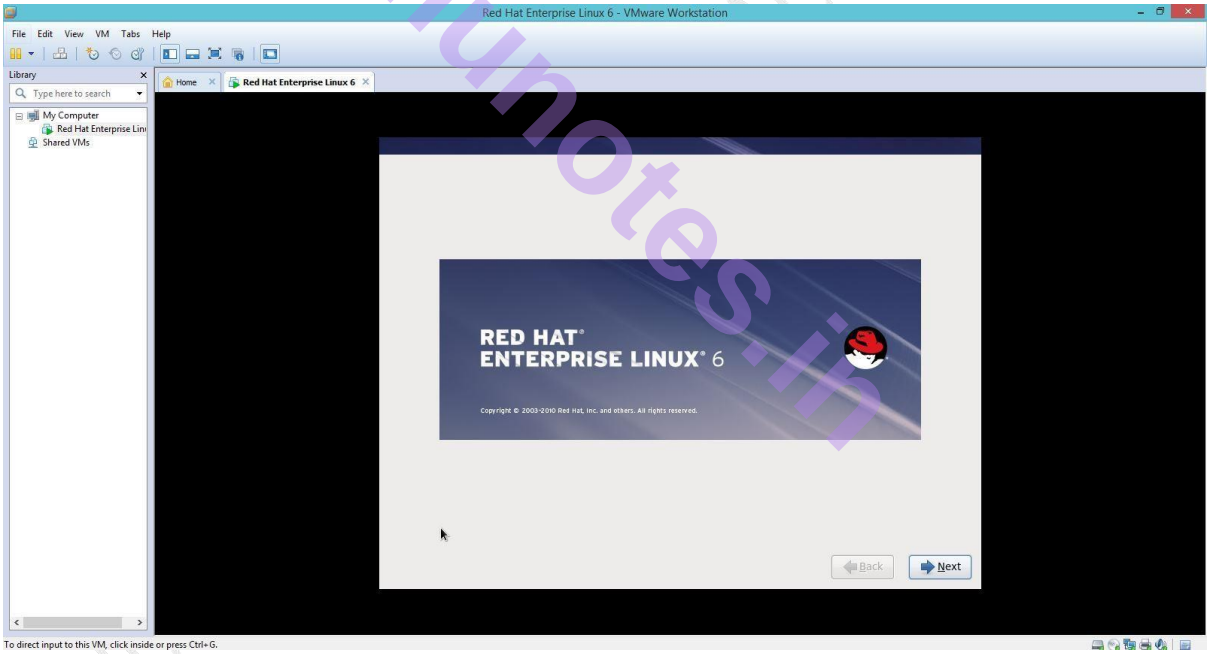
12. Red hat installation starts from here. select " Install or upgrade an existing system " option and press enter. It is a by default graphical installation option or it will automatically start in a while.



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

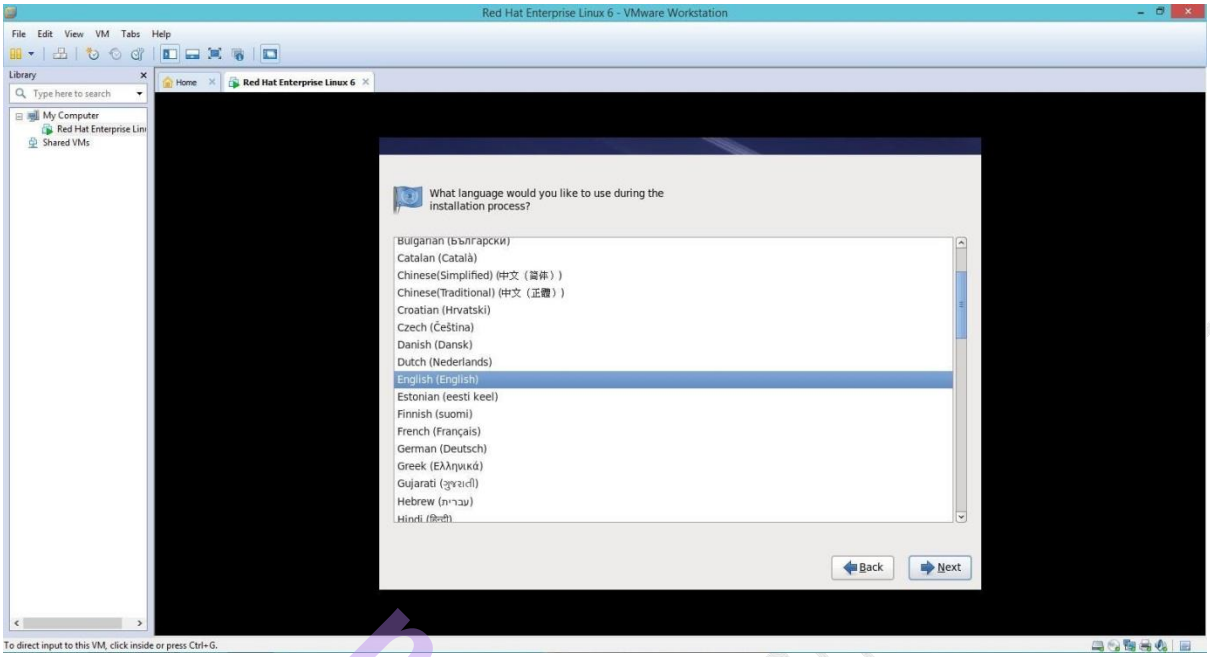


14. Select “Next”



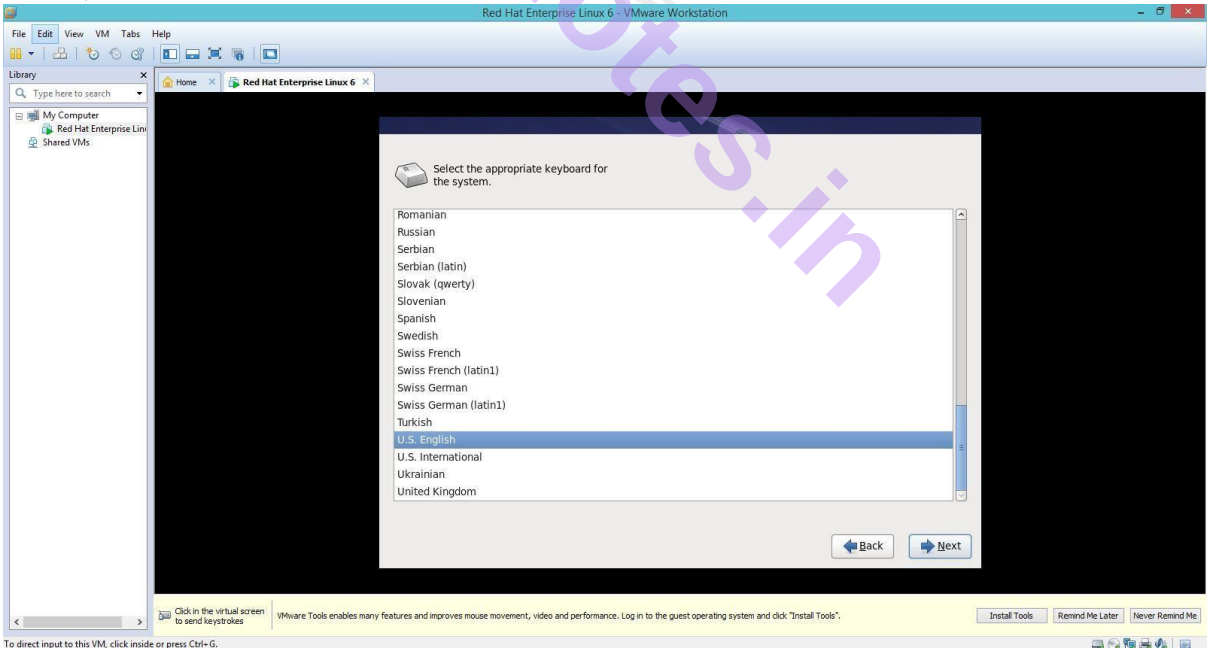
15. Language Selection :--

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



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.

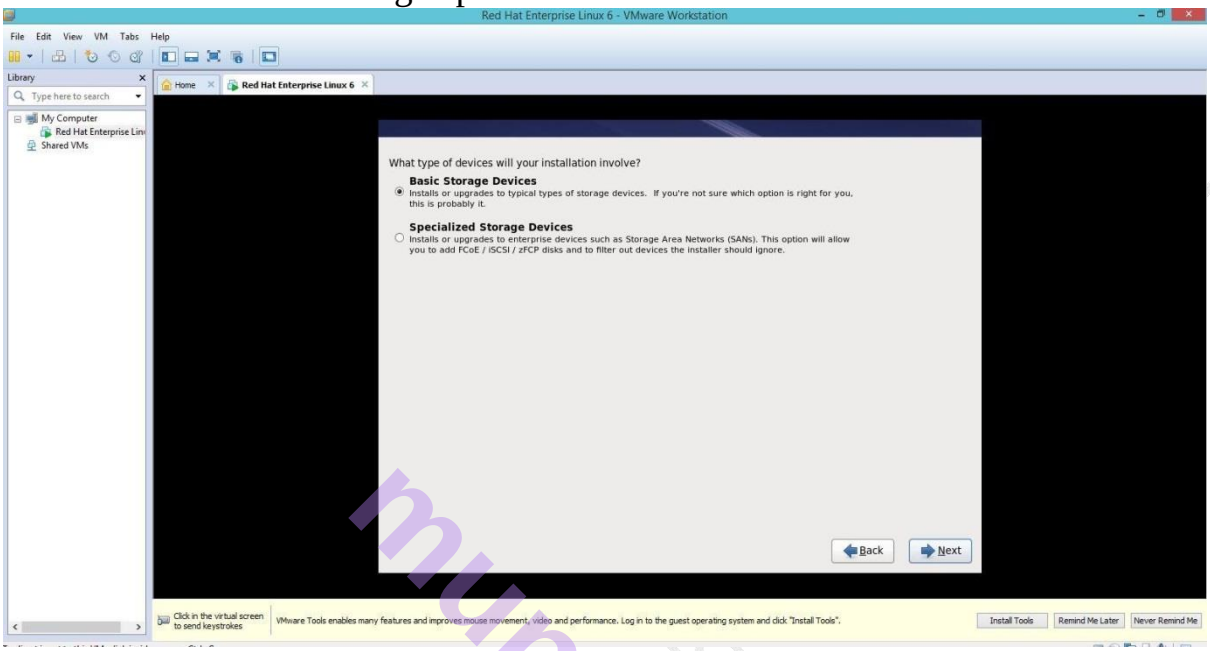


17. Enter the installation number:-

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.

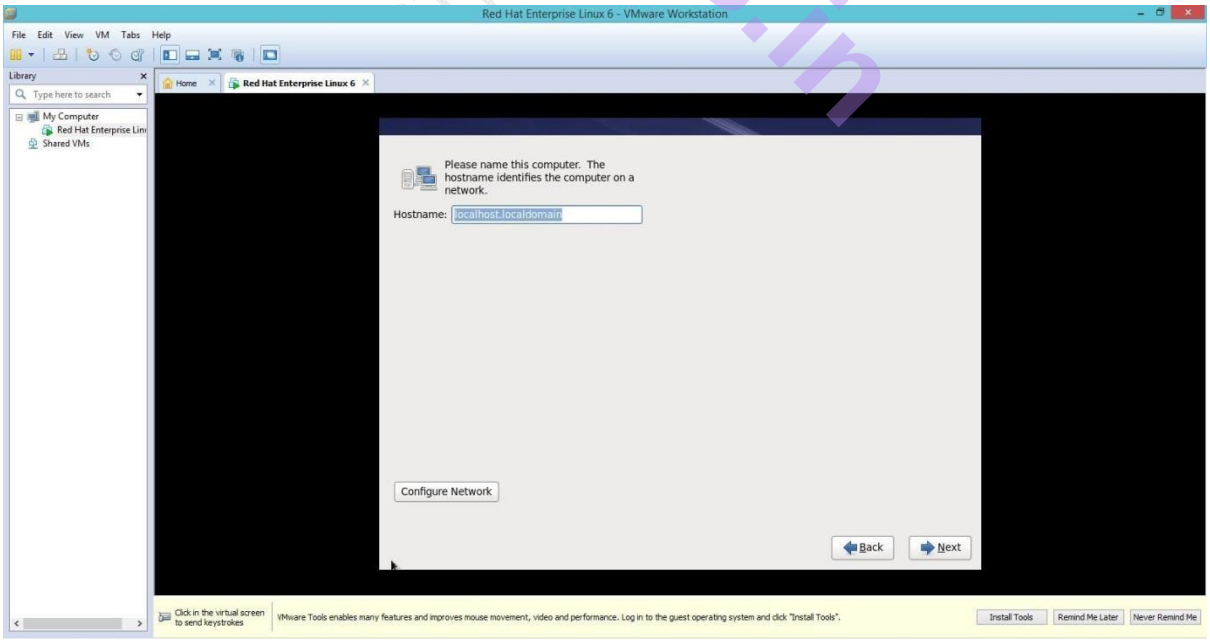
Click on “Skip entering installation number. Then Ok -. Skip-> Yes and then done.

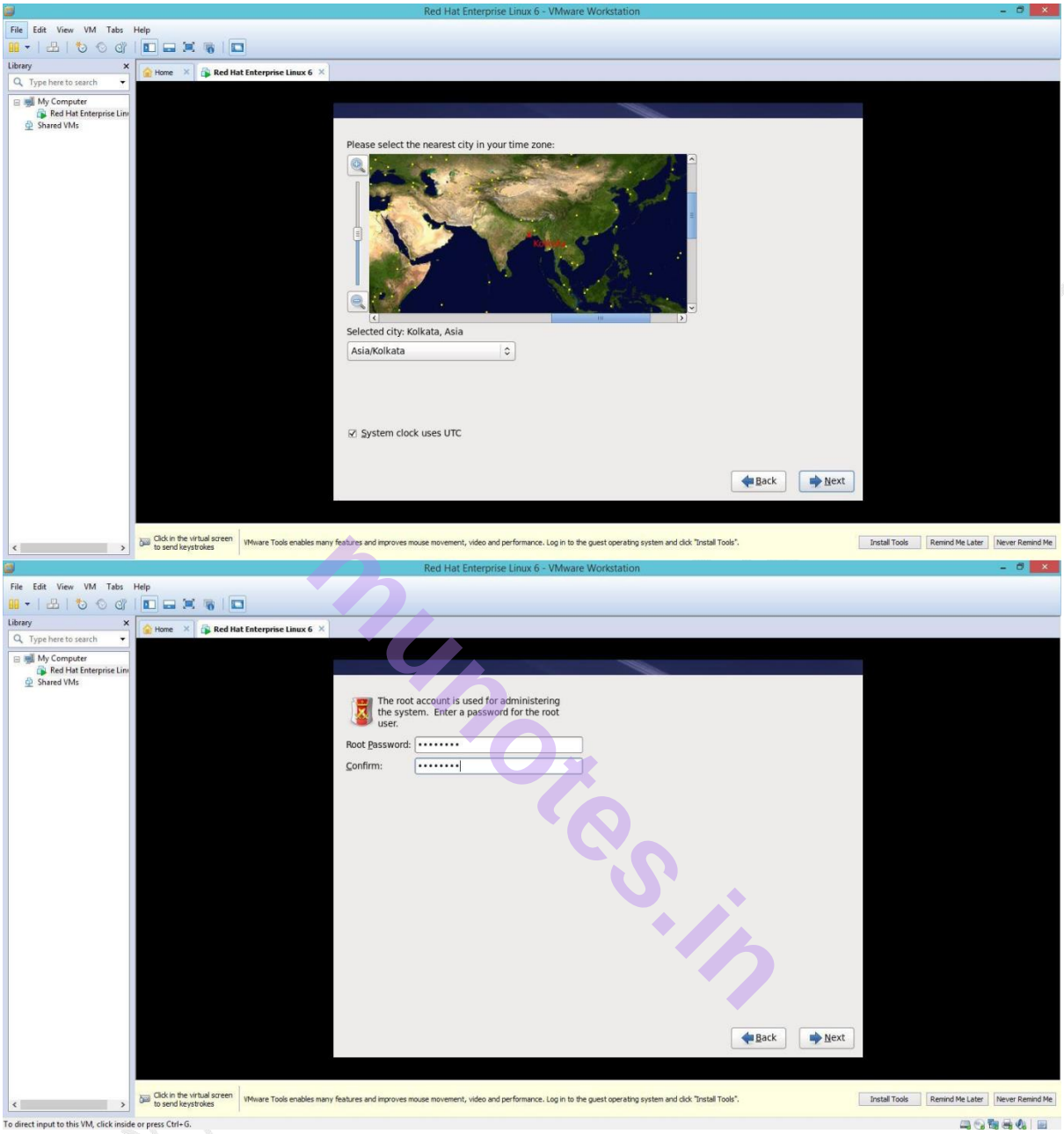
19. Now select basic storage option



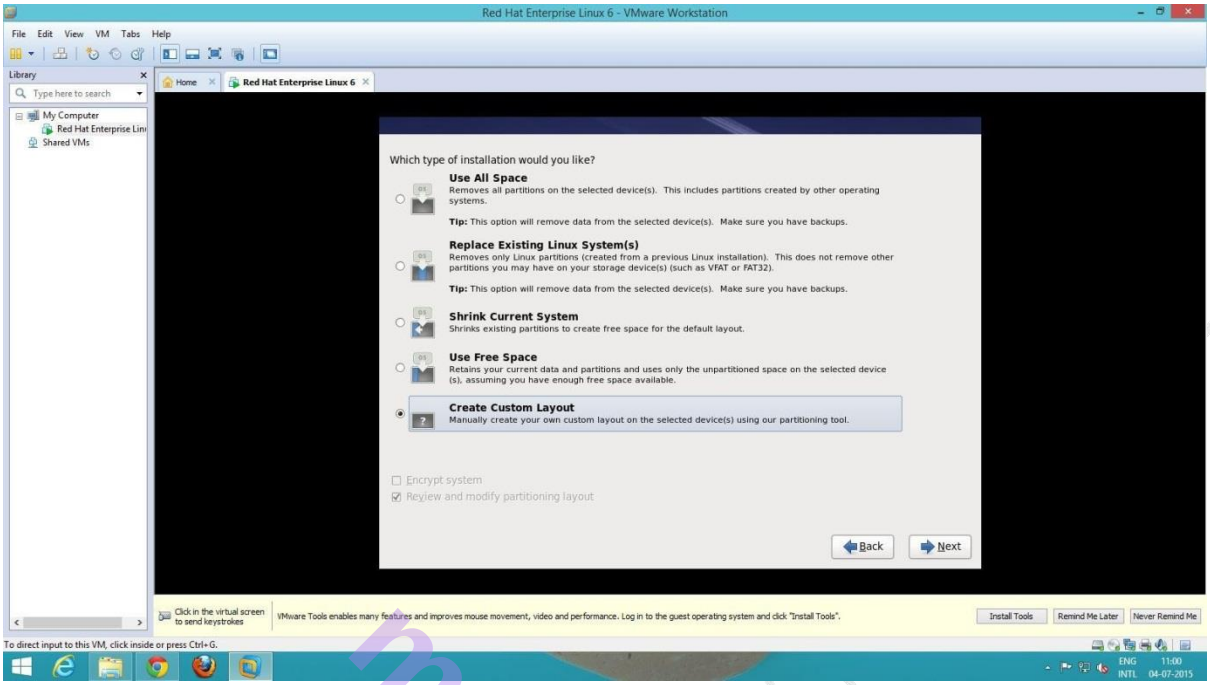
20. Now the system will find the hard disk space and need to re-initialize for creating directories. Select “re-initialize” all option.

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



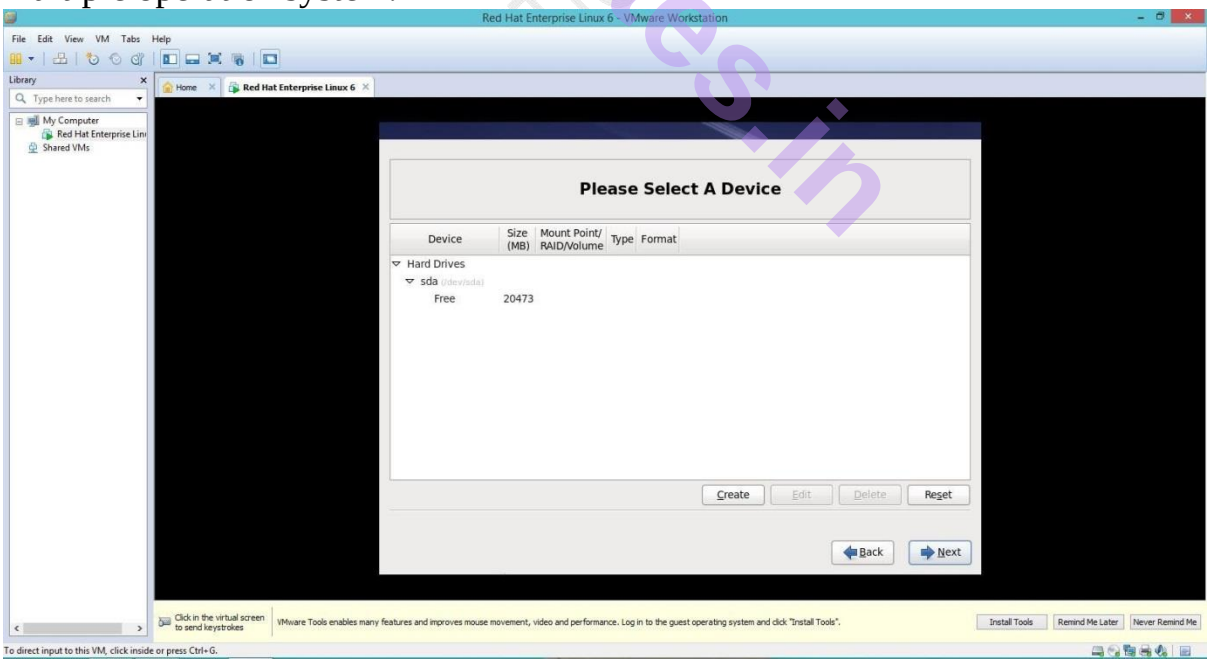


22.. Now select “Create Custom Layout” for manually creating Partitions



23. Disk Partitioning Setup :-

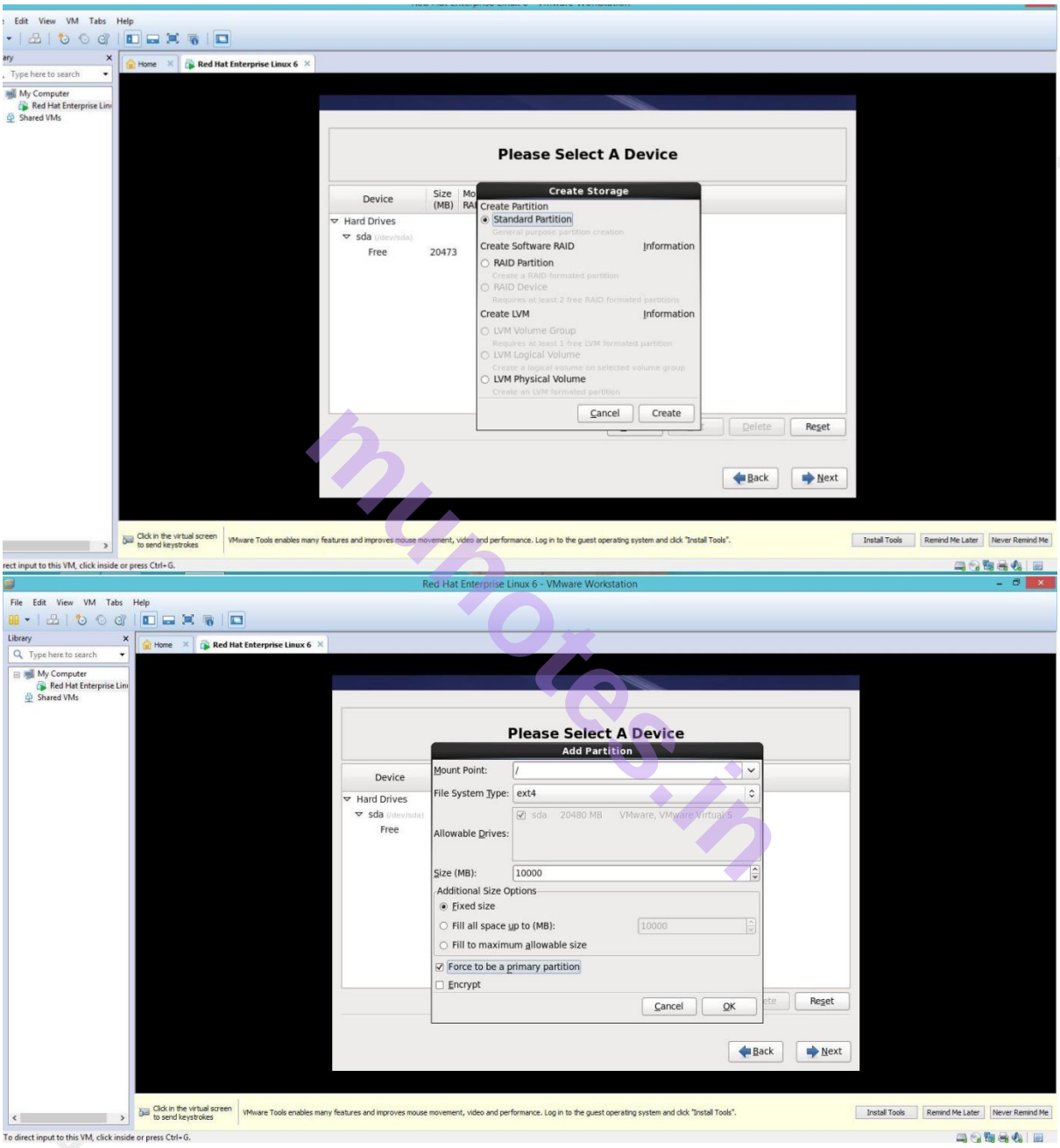
Partitioning allow to divide the hard drive into installed sections where each section behaves as its own hard drive partitioning is particularly useful if we run multiple operation system.

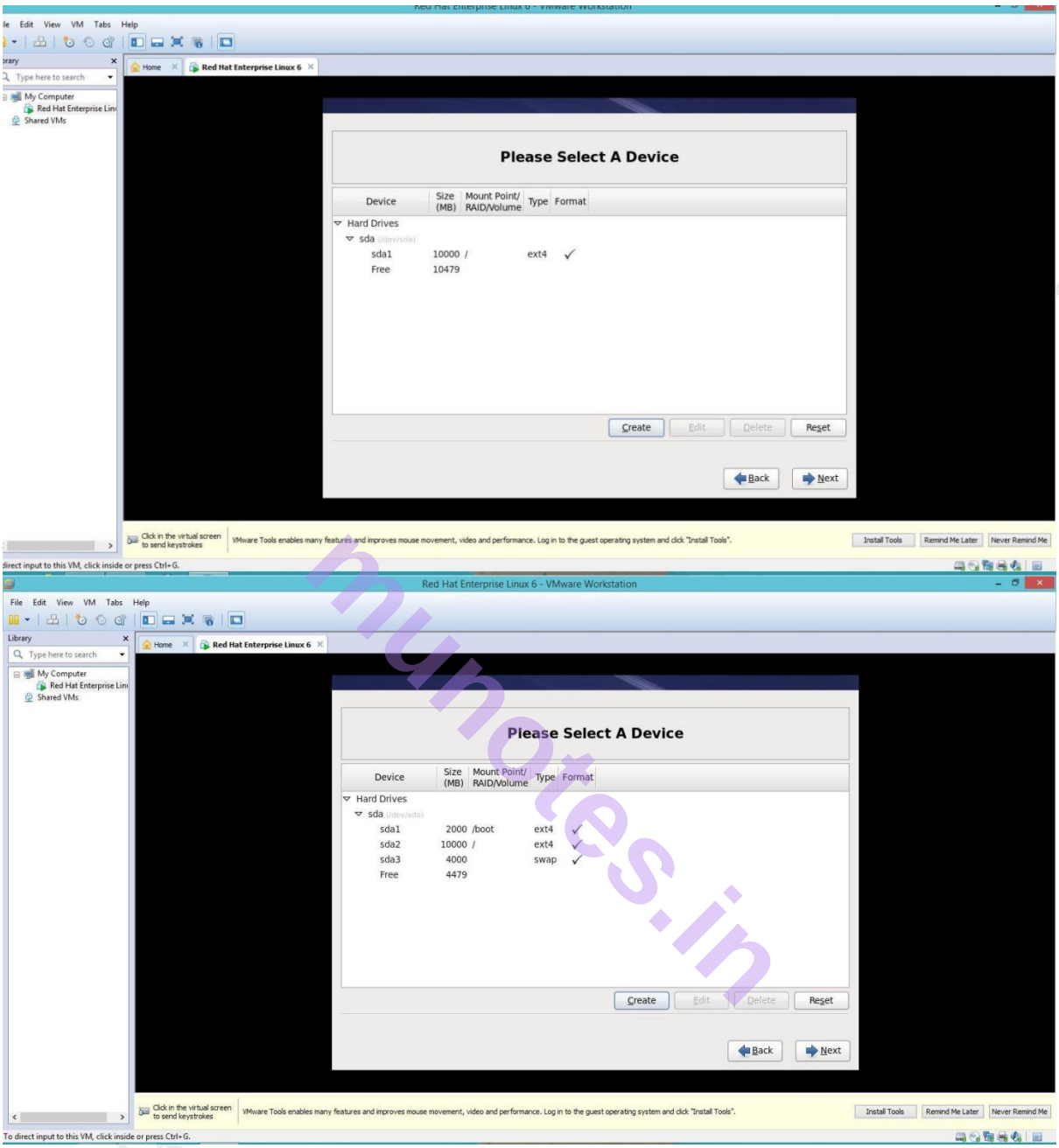


For Root :-

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

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





For Swap :-

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

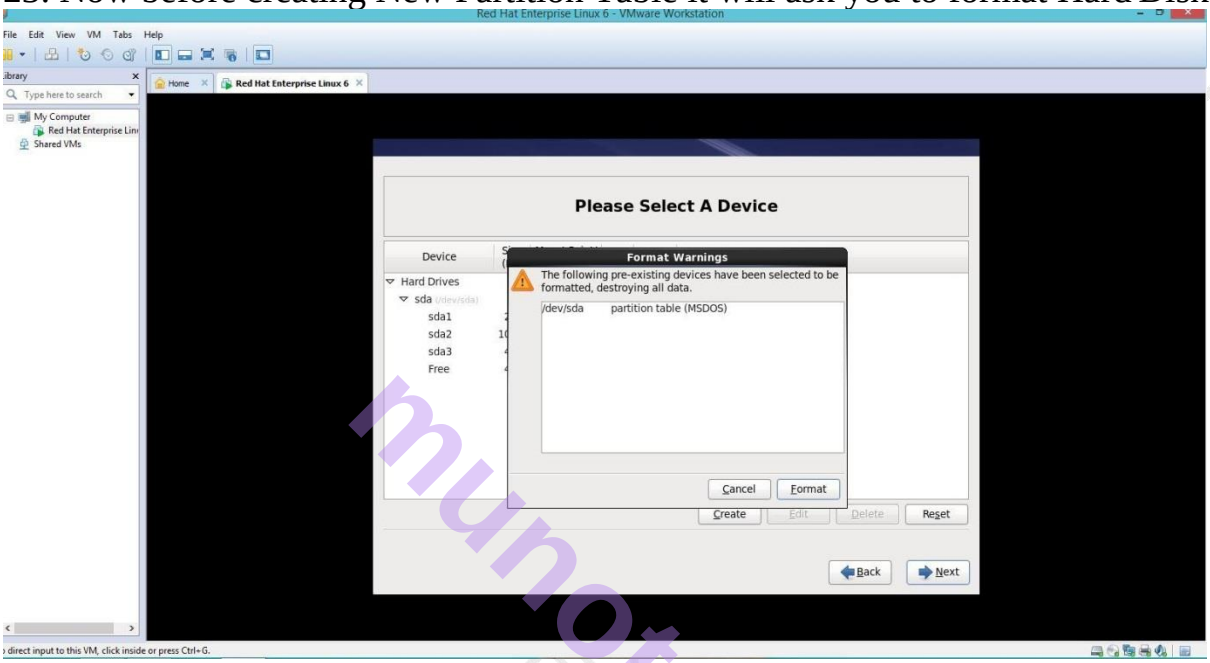
Now partitioning is complete. Click on "next".

The following is tabular presentation of Disk Partition.

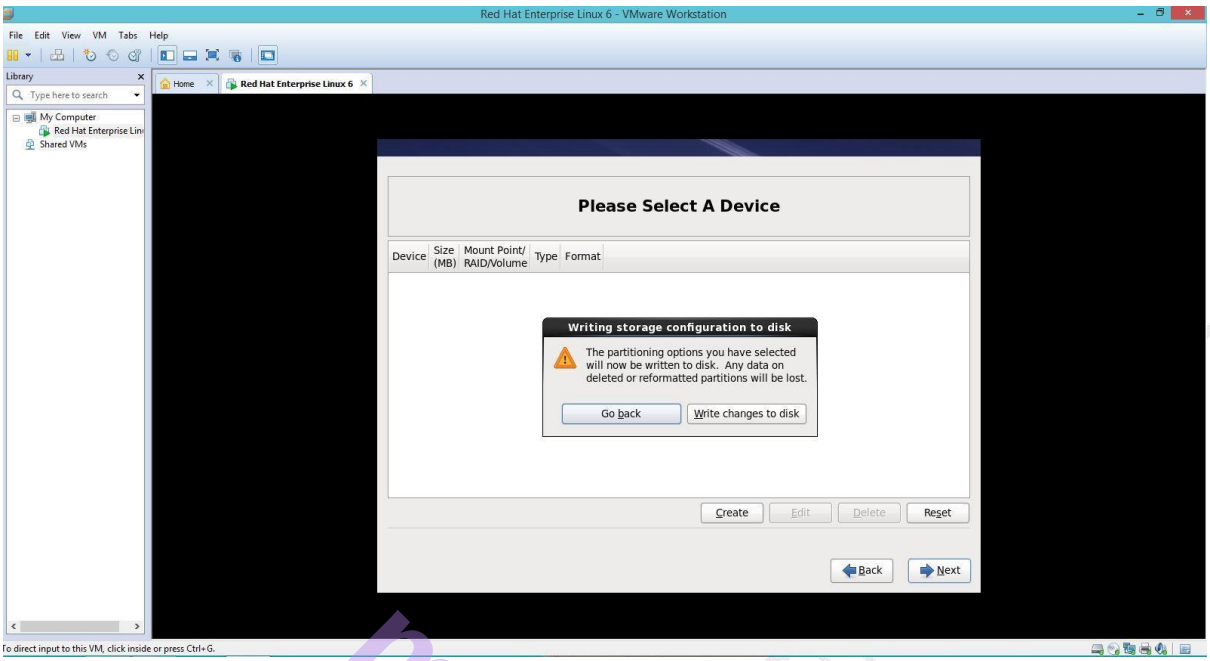
Sr. No Mount Point File system type Size (MB)

1	/(root)	Ext3/Ext4	10000 MB
2	-	/swap	4000 MB
3	/boot	Ext3/Ext4	2000 MB

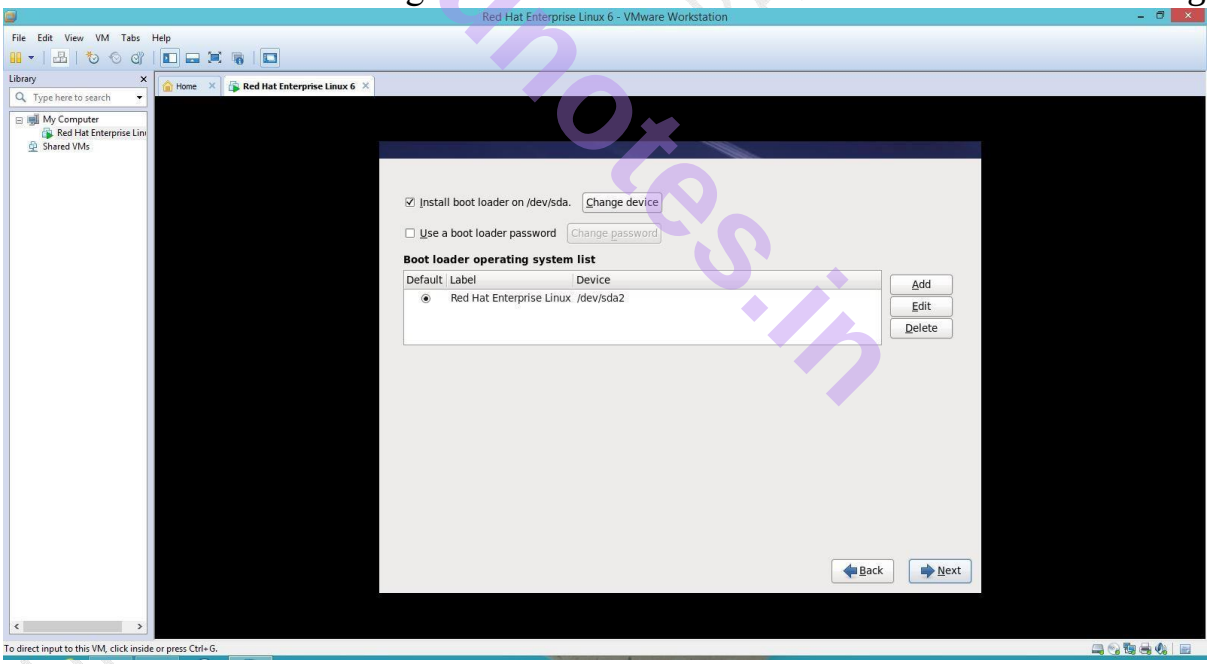
23. Now before creating New Partition Table it will ask you to format Hard Disk.



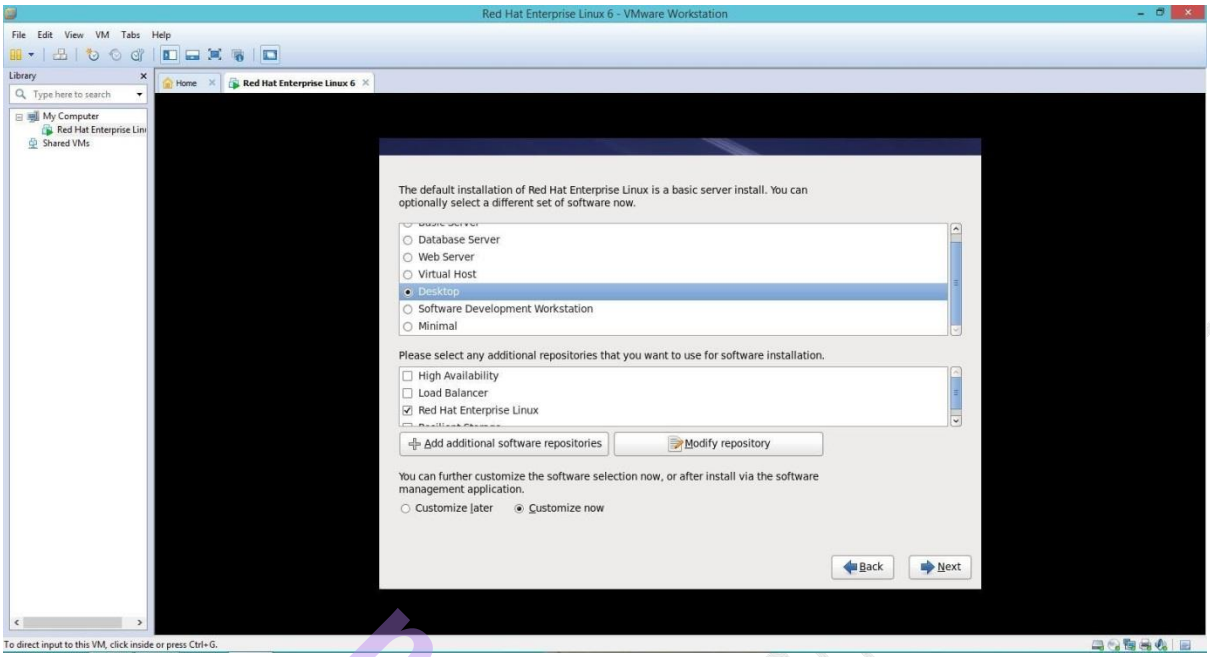
Now it will ask for format and write changes to disk, click on "Write changes to disk"



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

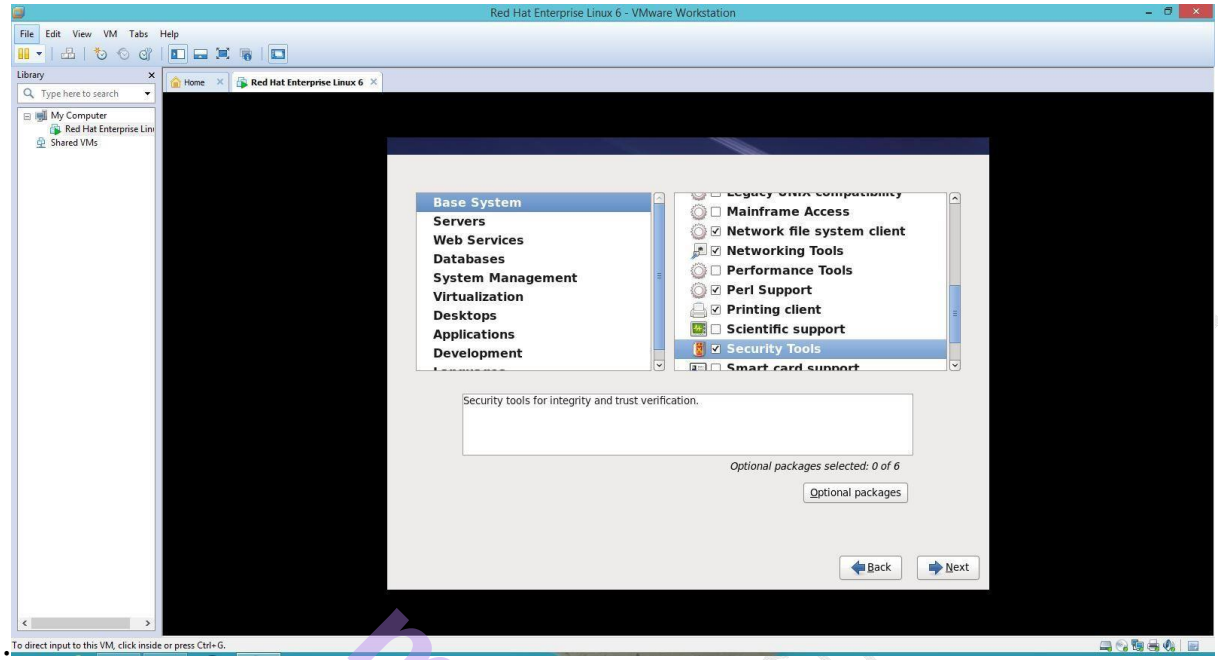
This option provides the necessary tools to compile software on your Red Hat Enterprise Linux
system.

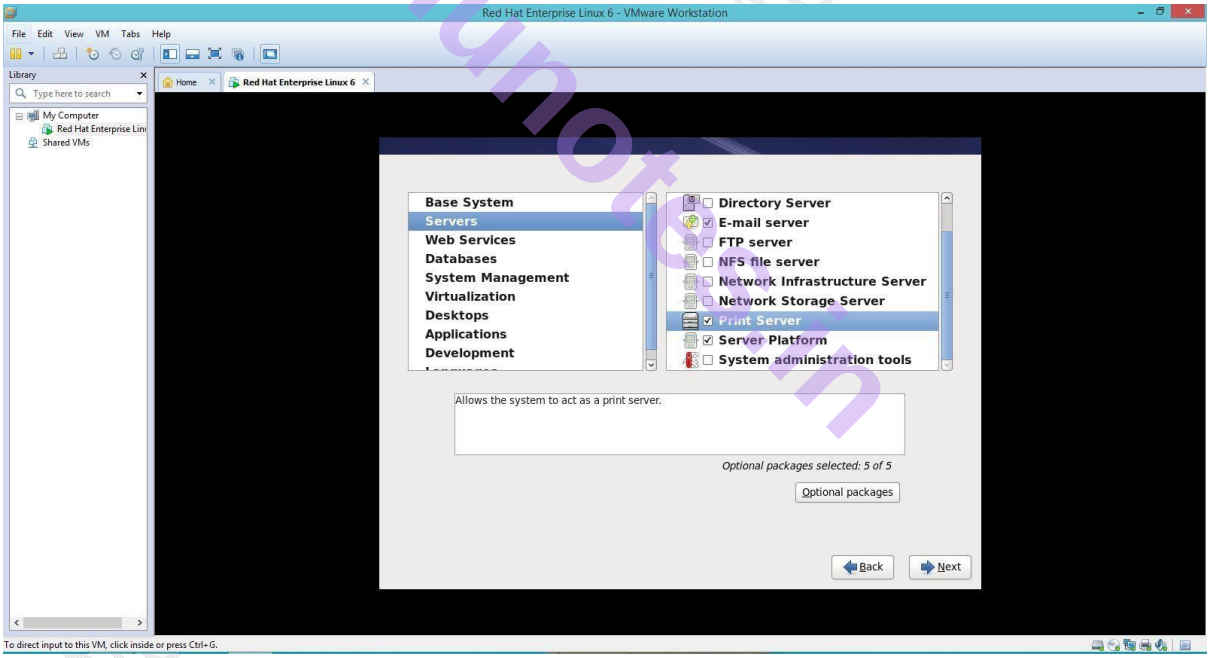
This option provides only the packages essential to run Red Hat Enterprise Linux. A minimal
installation provides the basis for a single-purpose server or desktop appliance and maximizes
performance and security on such an installation.

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


Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Red Hat Enterprise Linux
Shared VMs
Home
Red Hat Enterprise Linux 6
Base System
Servers
Web Services
Databases
System Management
Virtualization
Desktops
Applications
Development
Mainframe Access
Network file system client
Networking Tools
Performance Tools
Perl Support
Printing client
Scientific support
Security Tools
Security tools for integrity and trust verification.
Optional packages selected: 0 of 6
Optional packages
Back
Next
To direct input to this VM, click inside or press Ctrl+G.


Red Hat Enterprise Linux 6 - VMware Workstation
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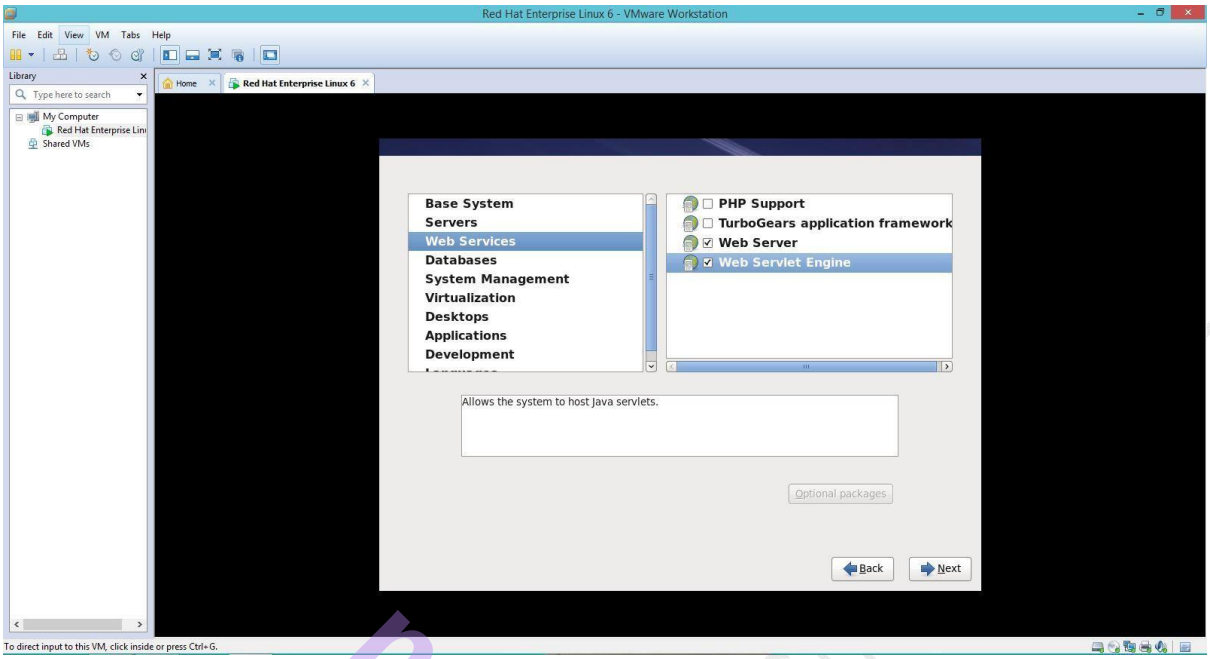
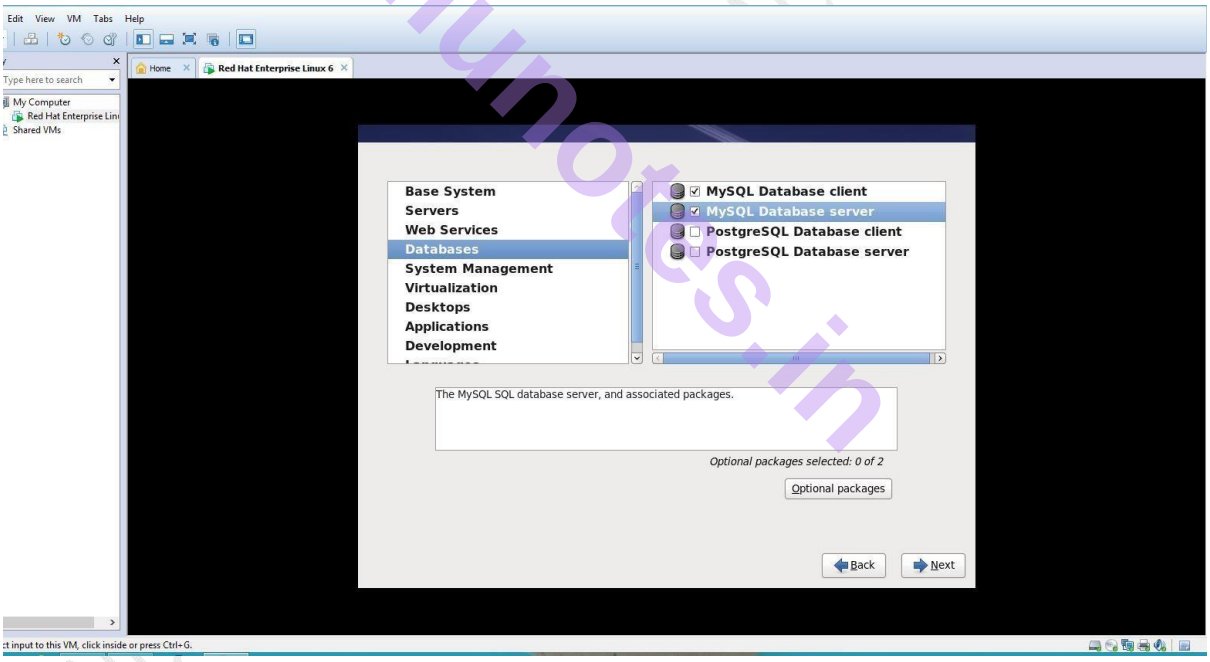
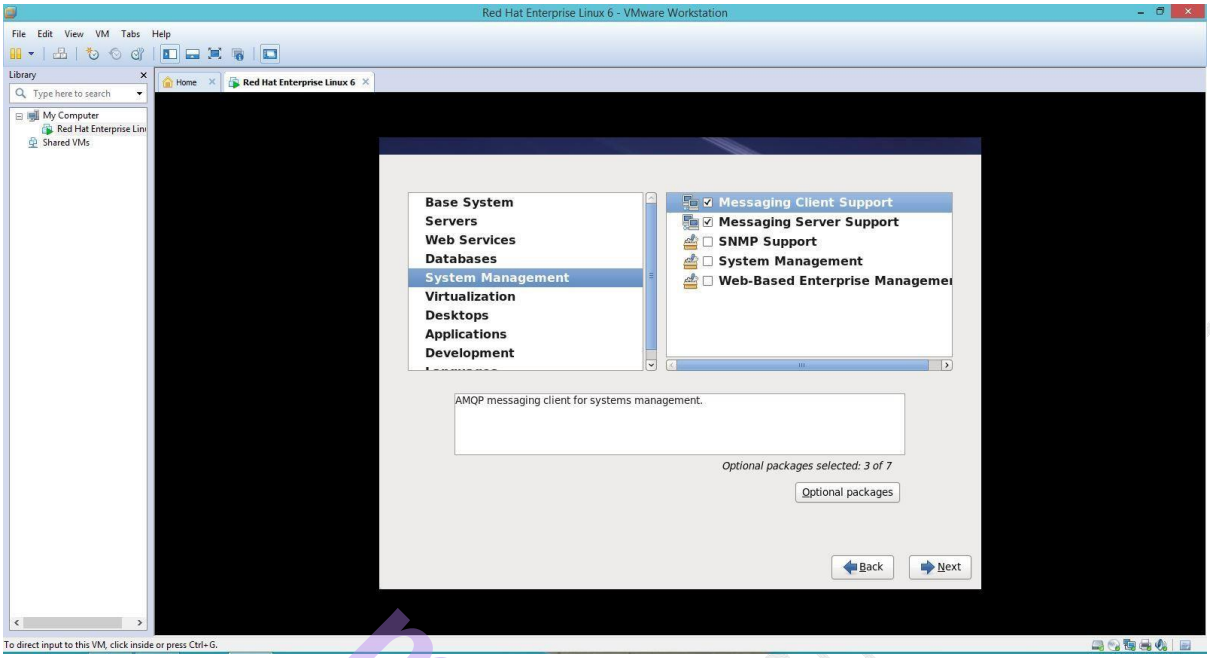
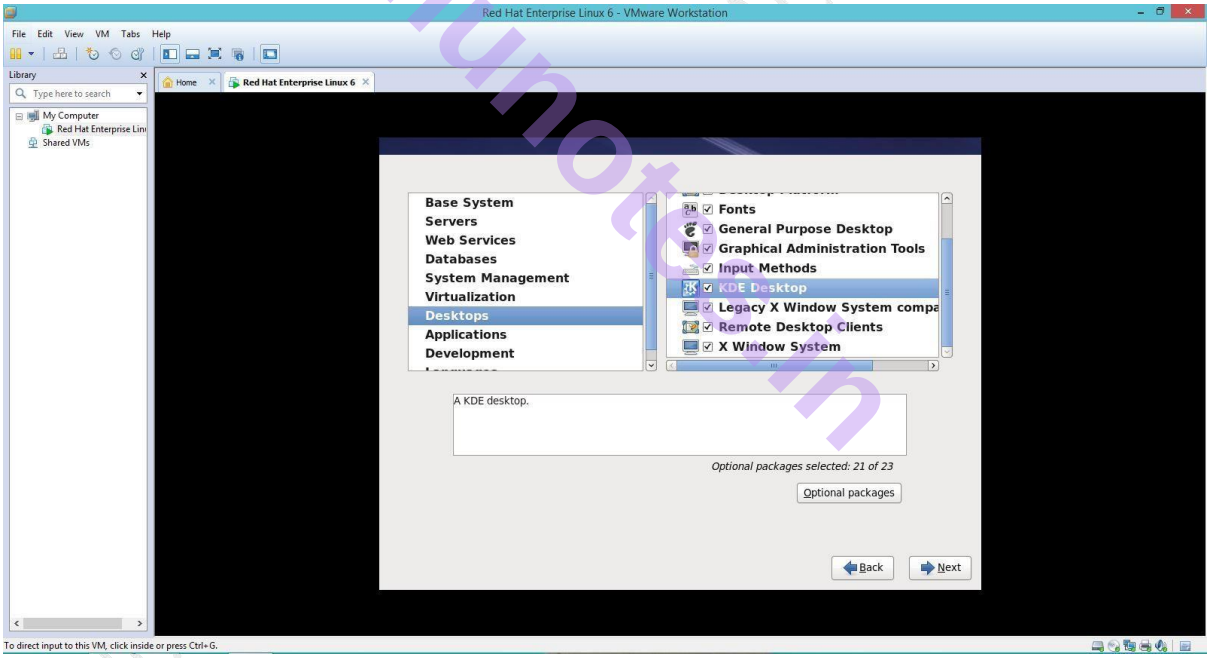
Library
Type here to search
My Computer
Red Hat Enterprise Linux
Shared VMs
Home
Red Hat Enterprise Linux 6
Base System
Servers
Web Services
Databases
System Management
Virtualization
Desktops
Applications
Development
Directory Server
E-mail server
FTP server
NFS file server
Network Infrastructure Server
Network Storage Server
Print Server
Server Platform
System administration tools
Allows the system to act as a print server.
Optional packages selected: 5 of 5
Optional packages
Back
Next
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 Linux
Shared VMs
Home
Red Hat Enterprise Linux 6
Base System
Servers
Web Services
Databases
System Management
Virtualization
Desktops
Applications
Development
PHP Support
TurboGears application framework
Web Server
Web Servlet Engine
Allows the system to host Java servlets.
Optional packages
Back
Next
To direct input to this VM, click inside or press Ctrl+G.

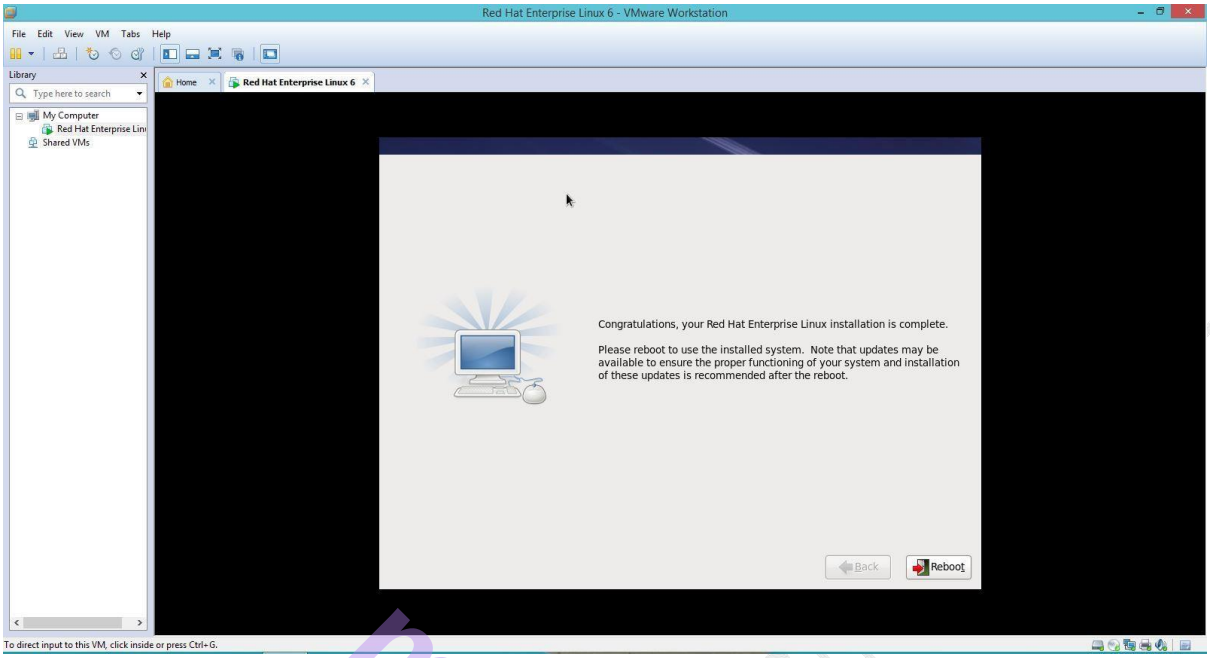

Edit View VM Tabs Help
Type here to search
My Computer
Red Hat Enterprise Linux
Shared VMs
Home
Red Hat Enterprise Linux 6
Base System
Servers
Web Services
Databases
System Management
Virtualization
Desktops
Applications
Development
MySQL Database client
MySQL Database server
PostgreSQL Database client
PostgreSQL Database server
The MySQL SQL database server, and associated packages.
Optional packages selected: 0 of 2
Optional packages
Back
Next



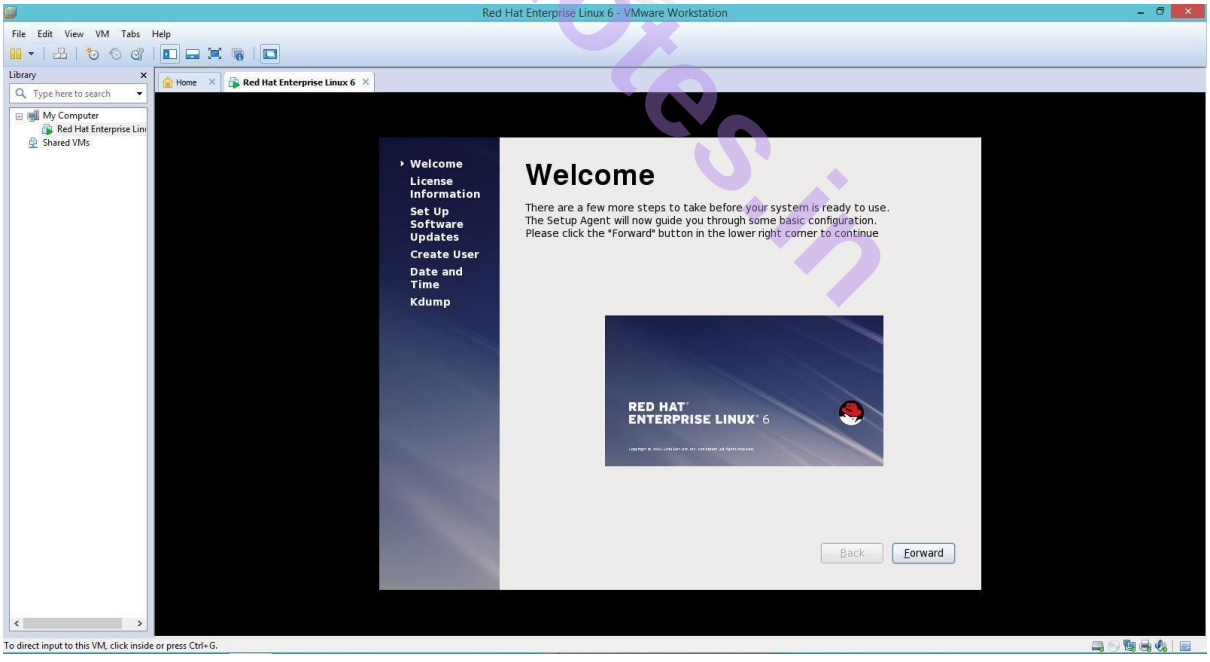


27. Now the next windows showing that it is “Transferring the install image to hard drive” it copy all files to hard drive so installation process get faster

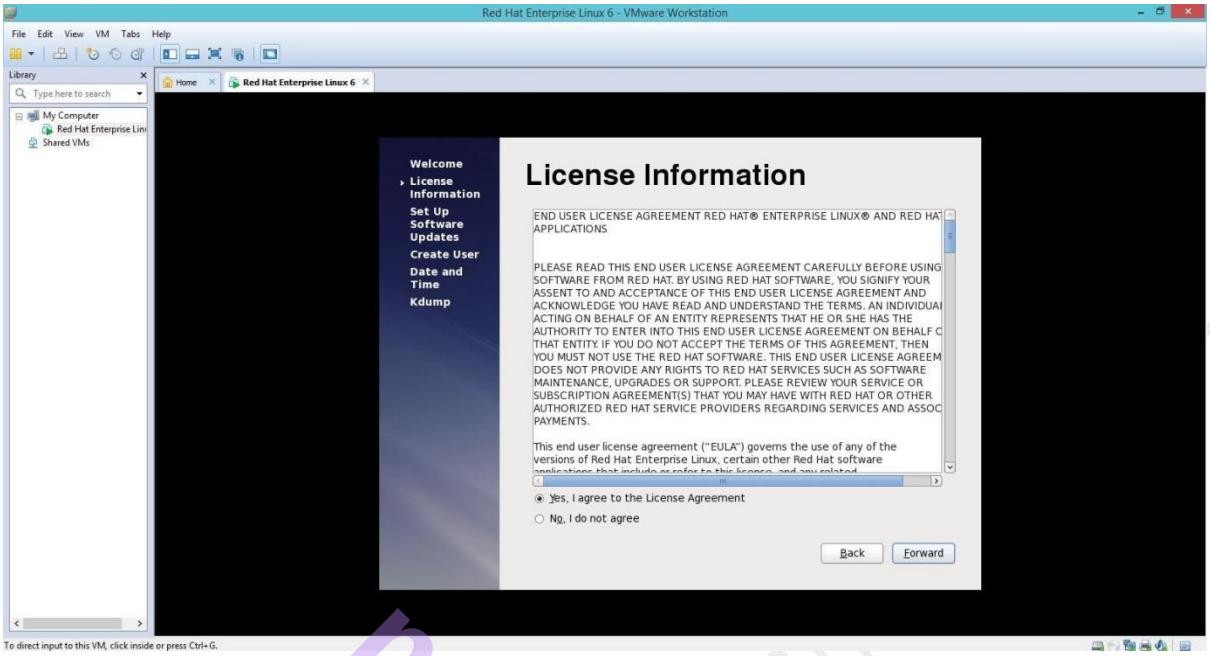
28. Now the installation start from the hard disk files.
29. Installation of Red hat is completed and ask for the reboot. Click on “Reboot”.



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



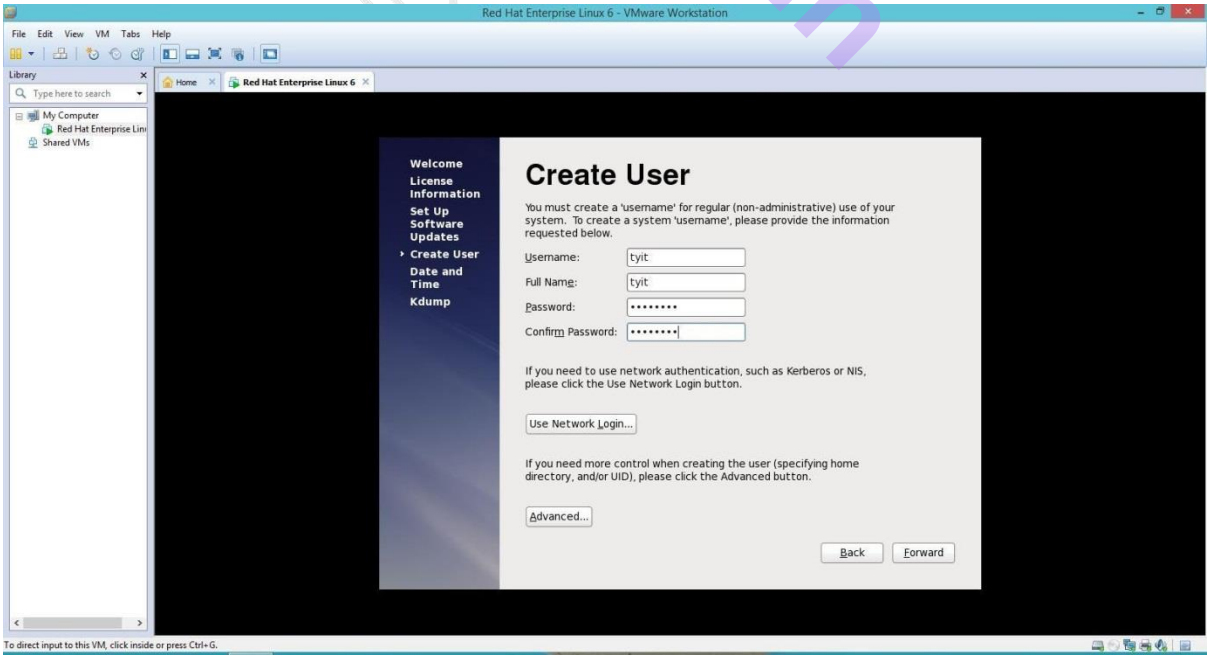
31. Here select "I agree to the license agreement" to proceed and click "Forward".



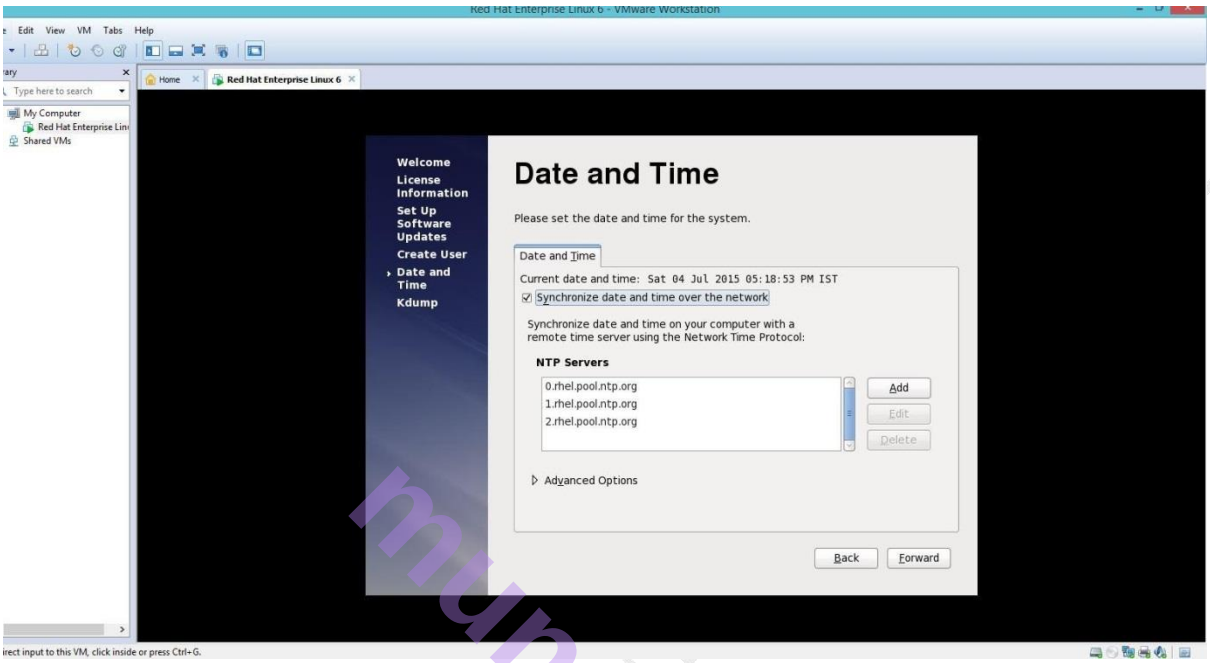
32. Now it asks for software update as we don't have the RHN No. Click "Forward" .

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.



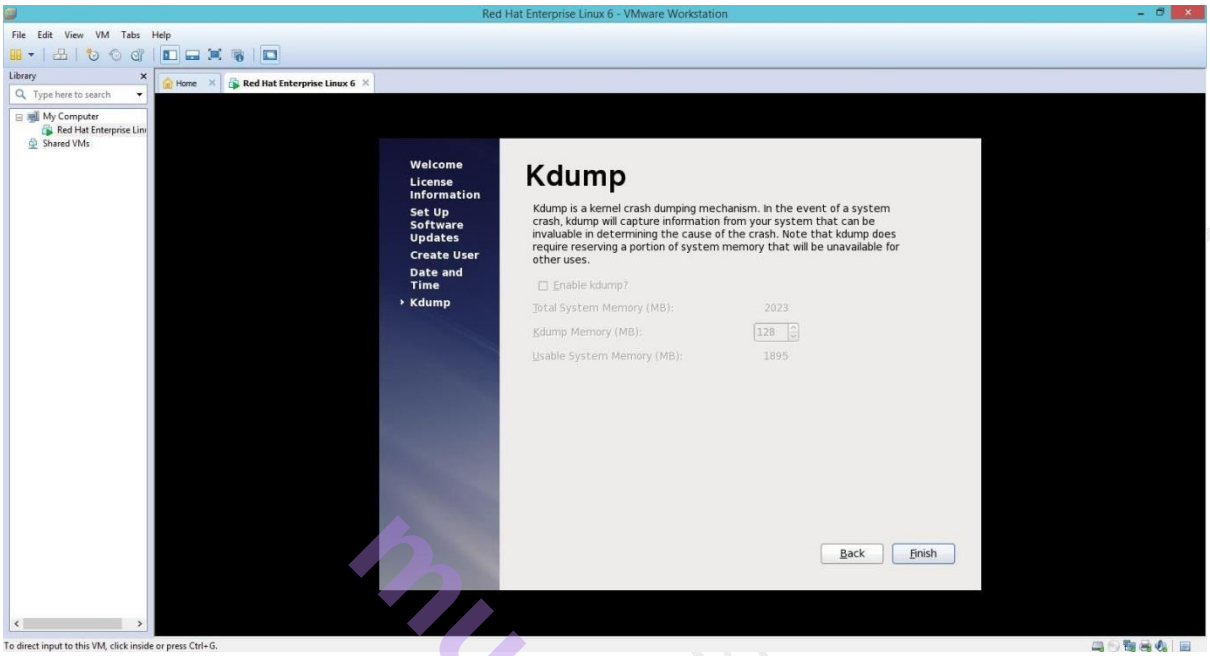
35.Date and Time Zone Configuration
Now select the System date for the window,

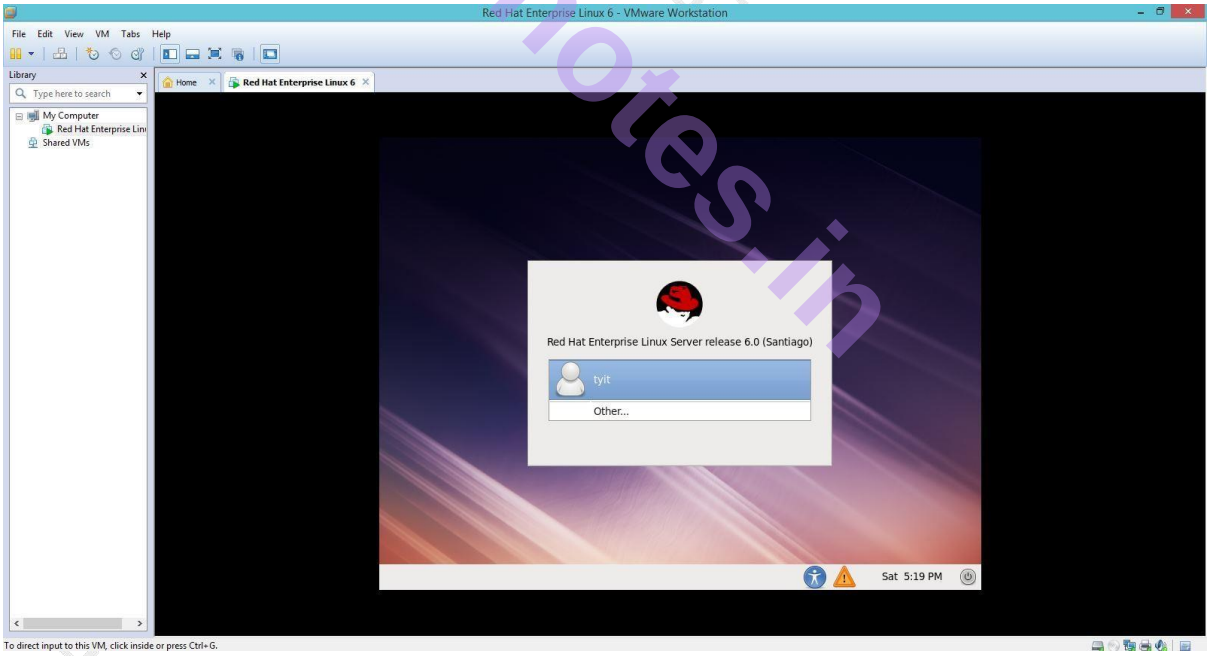


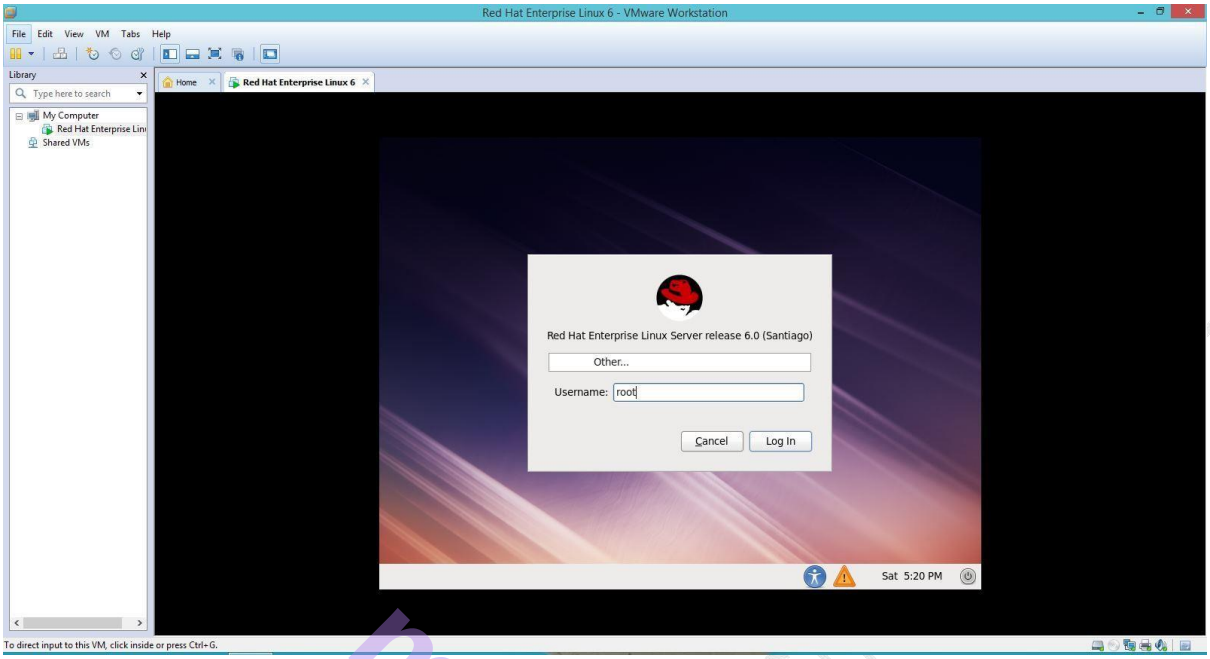
Set your time zone by selecting the city closest to your computer's physical location. Click on the map to
zoom in to a particular geographical region of the world.
From here there are two ways for you to select your time zone:
Using your mouse, click on the interactive map to select a specific city (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.

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]

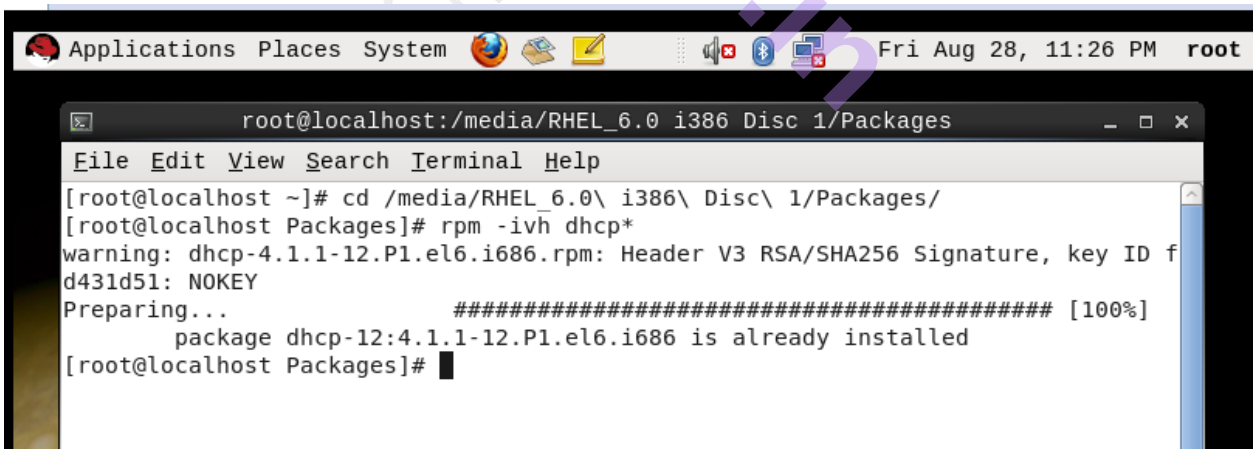
- **Following are rpm installation options:**

  -i : To install the package

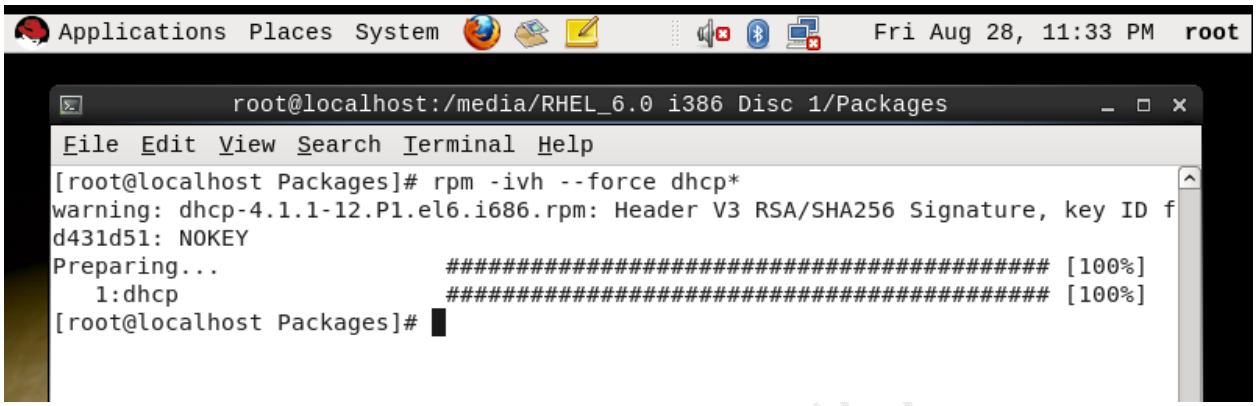
  -v : verbose it is to enable verbose and shows useful messages during installation.

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

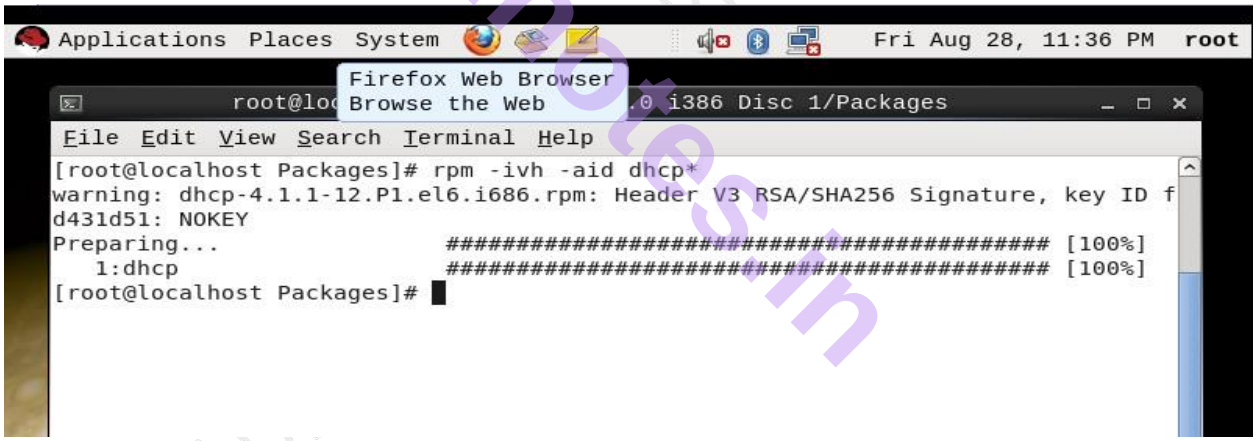
  Example : rpm –ivh dhcp*



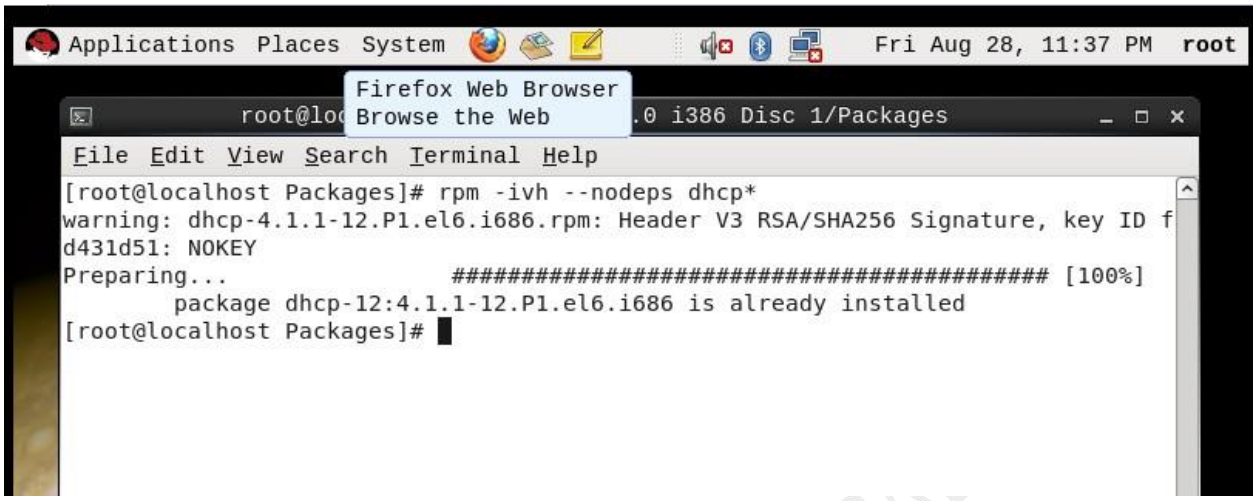
--force : installs package forcefully or replaces if already exists.



--aid : To install package along with dependencies

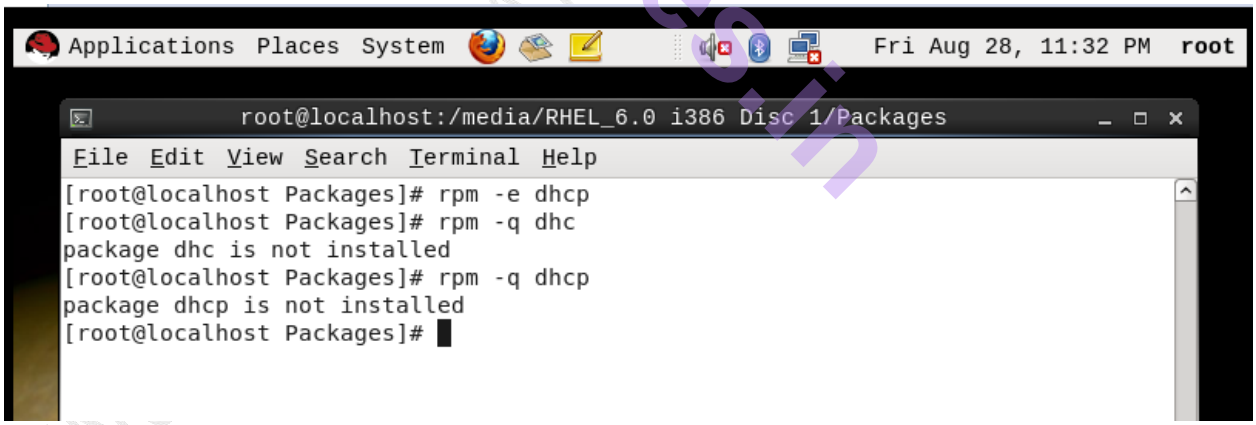


--nodeps : it performs no dependency check.



2) Remove Installation Packages:

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

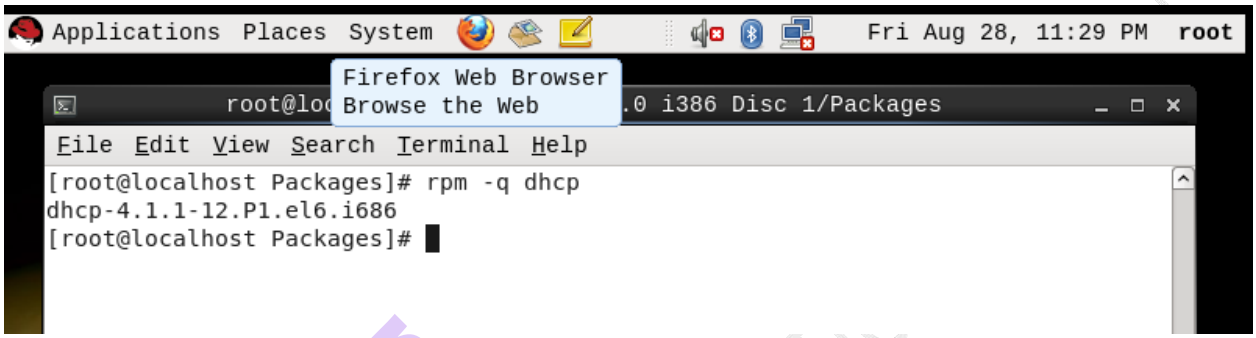


3. Upgrade the Package:

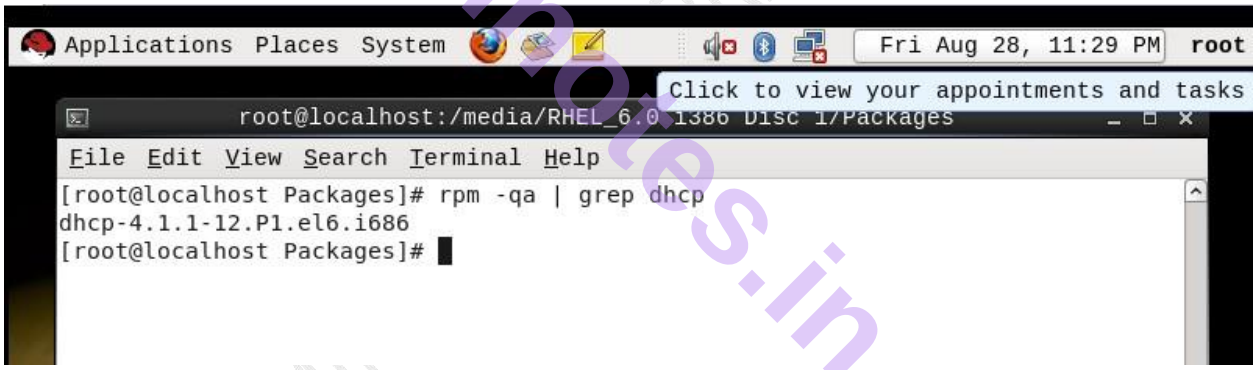
-u : to upgrade the existing package.

4. Query the Installed Package:

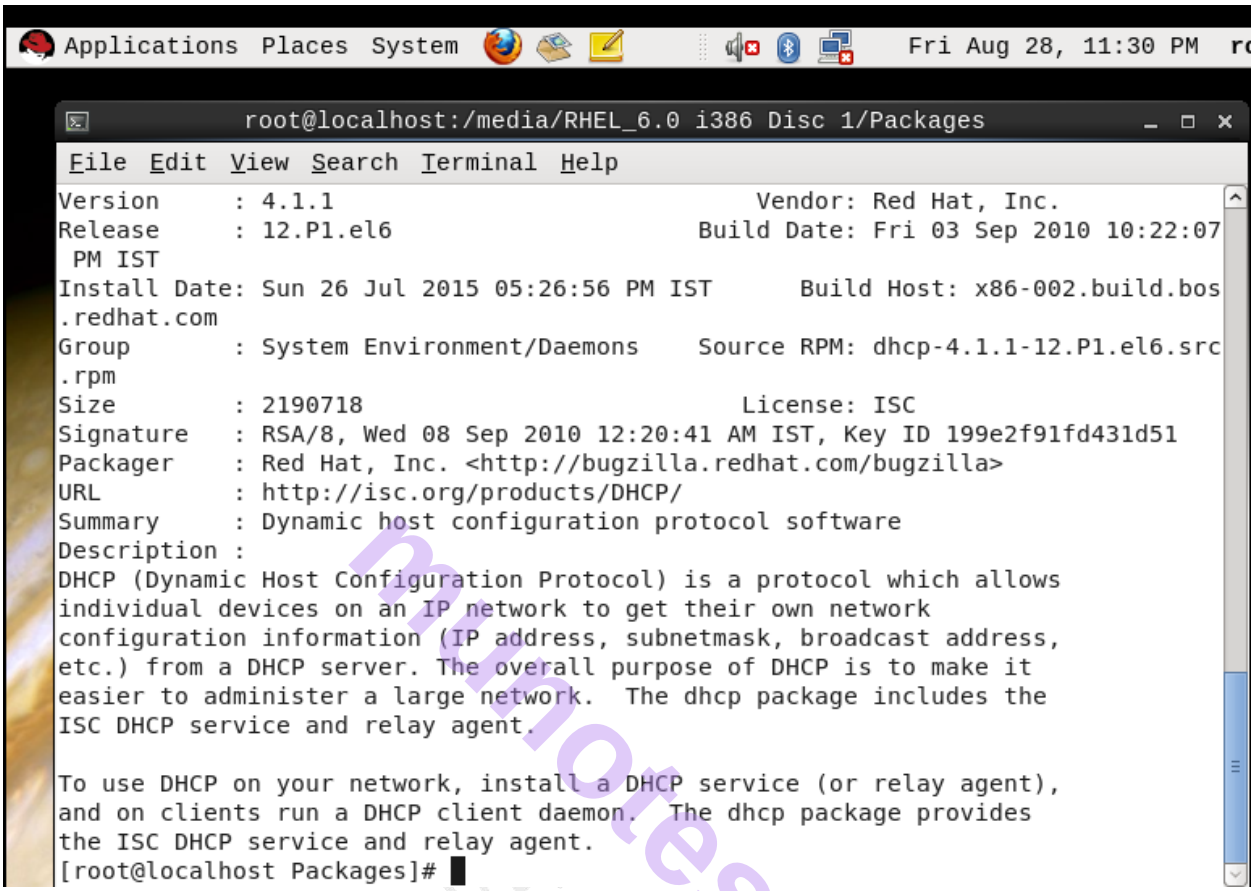
-q: to query any installed packages



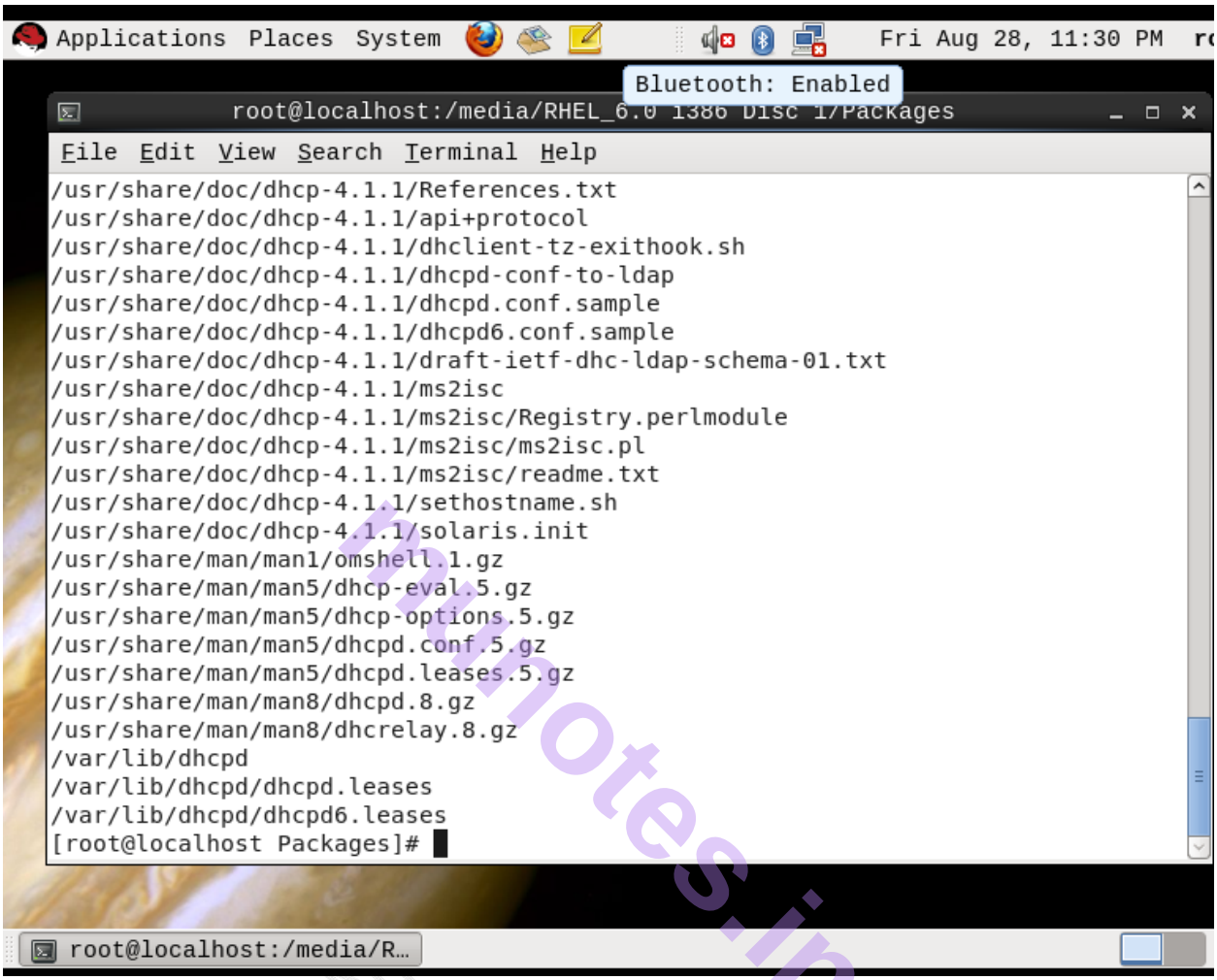
-qa : to query all installed packages



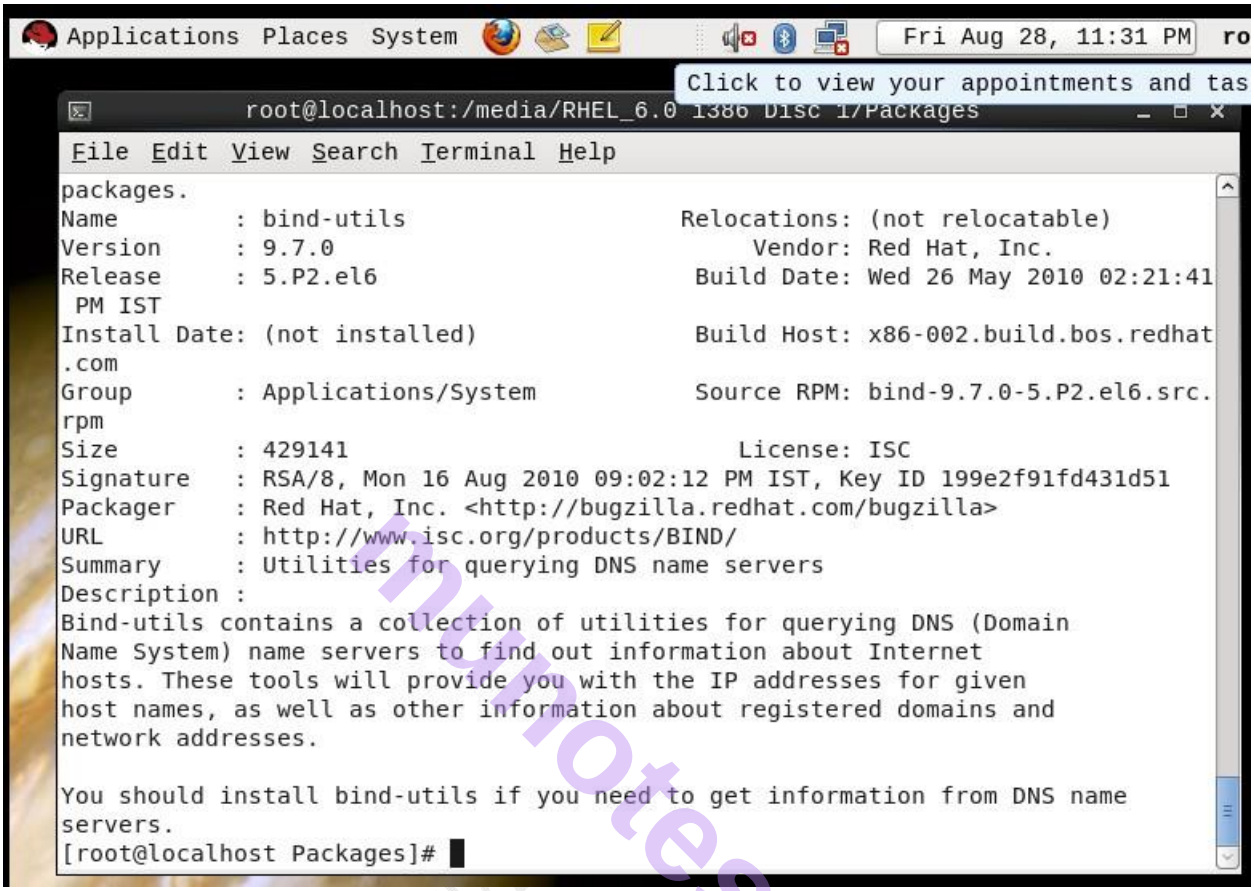
-qi : to show general information about the package searched for.



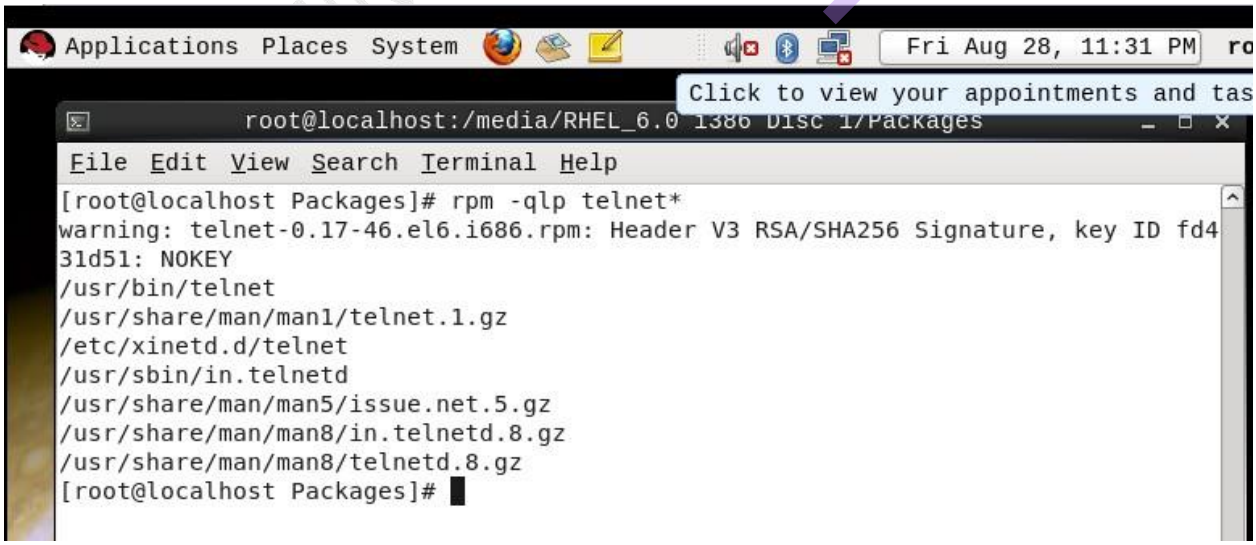
-ql : to show list of package files installed



-qip : to show general information of uninstalled packages



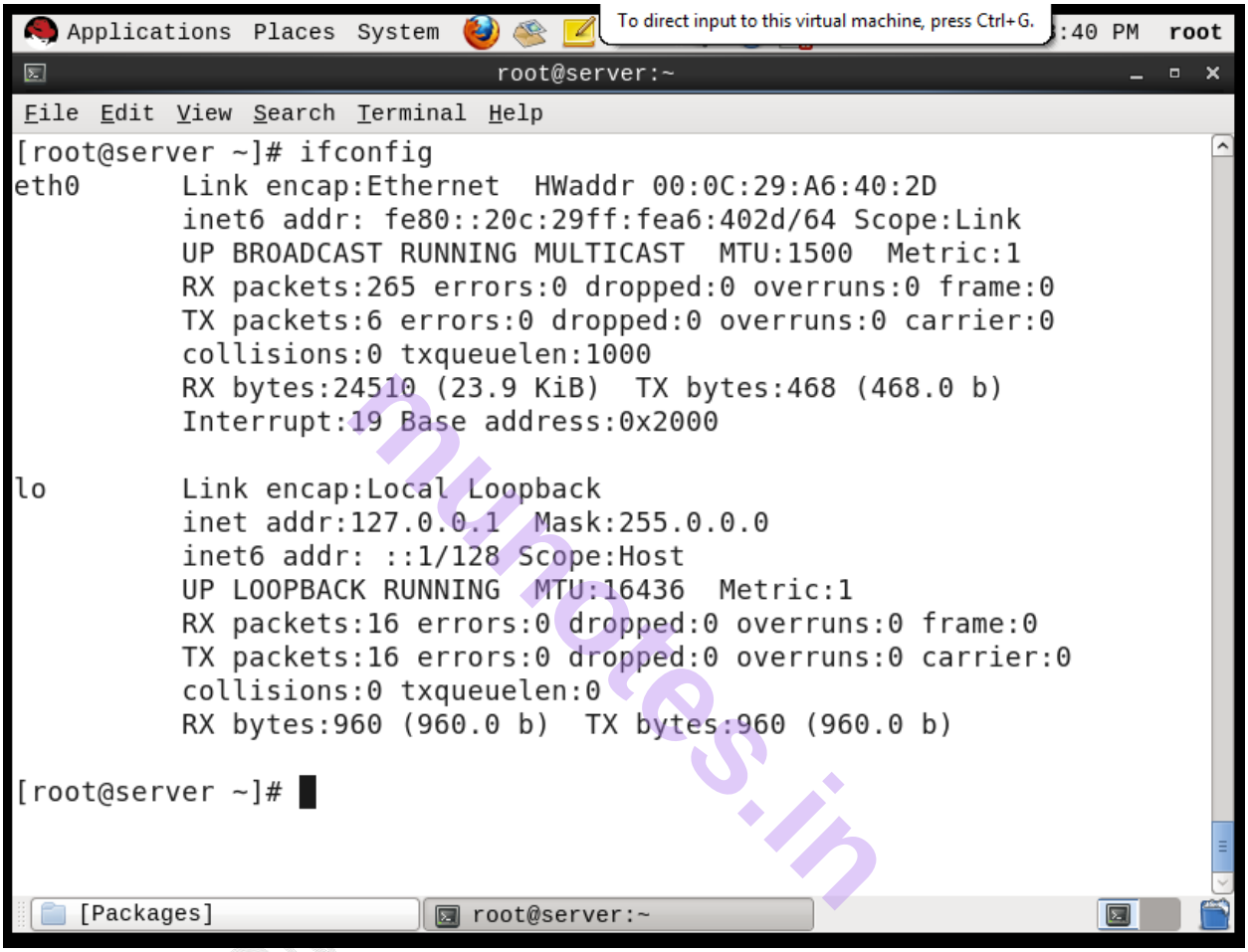
-qlp : to show list of package files of uninstalled package.



Practical no 3: Basic Commands

ifconfig :-

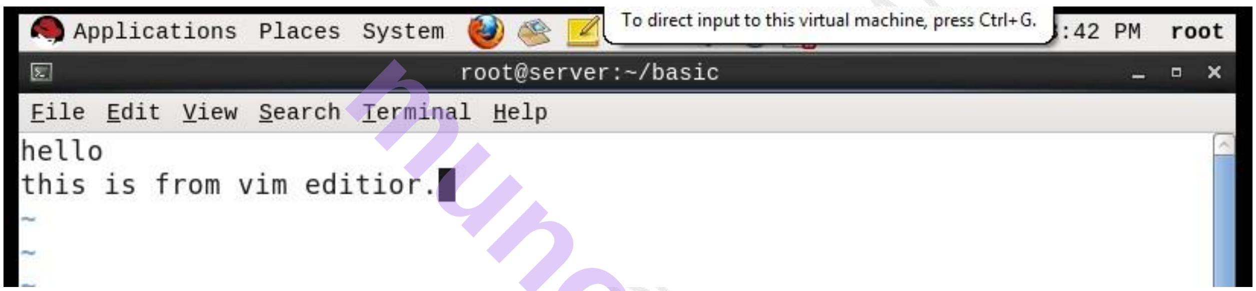
The ifconfig command is used to set an IP address

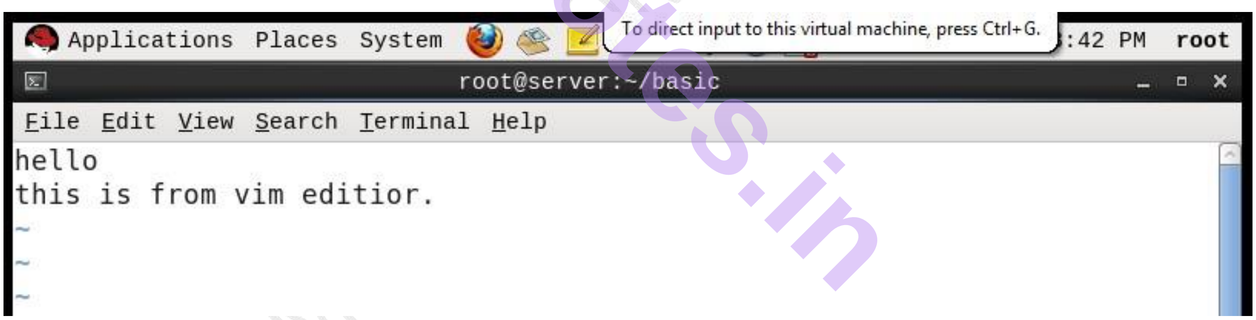


vim/ vi :-

vi stands for visual editor.

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



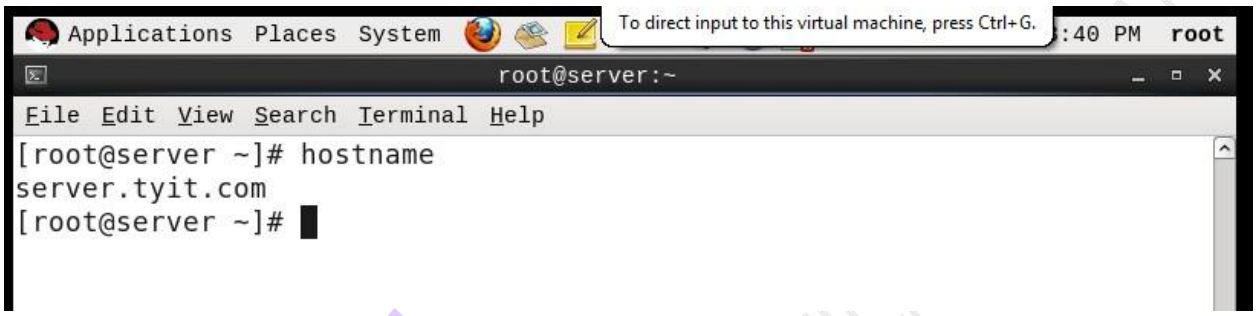


Hostname:-

The #hostname command is used to change the hostname

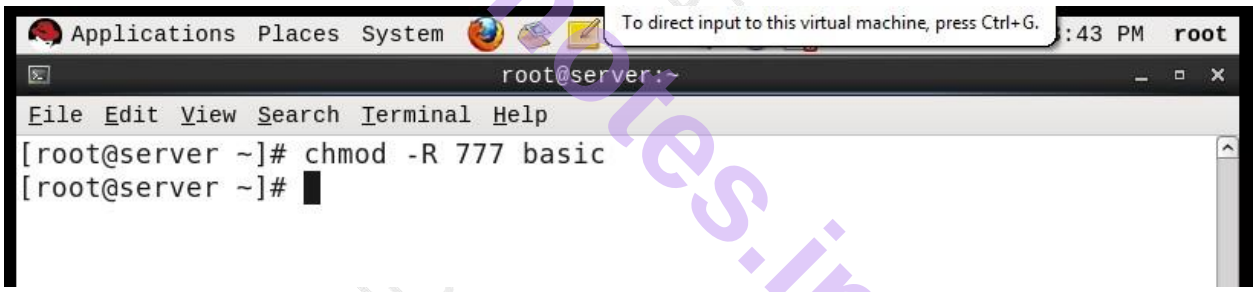
Syntax:

#hostname <>



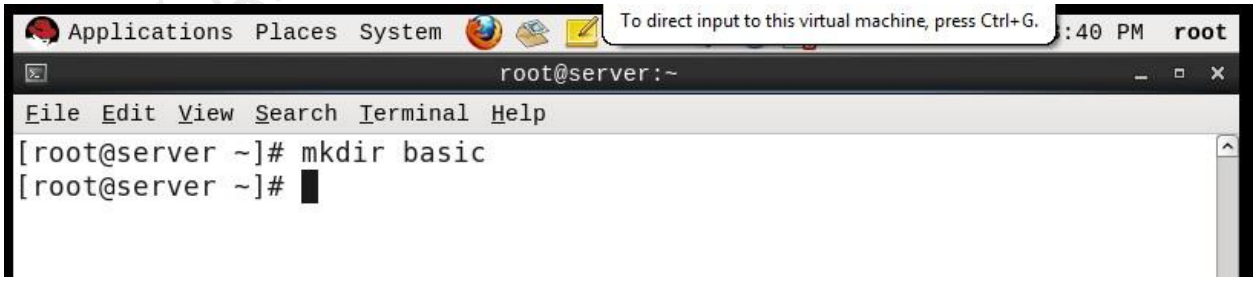
chmod:-

#chmod is used to give permission for a particular directory



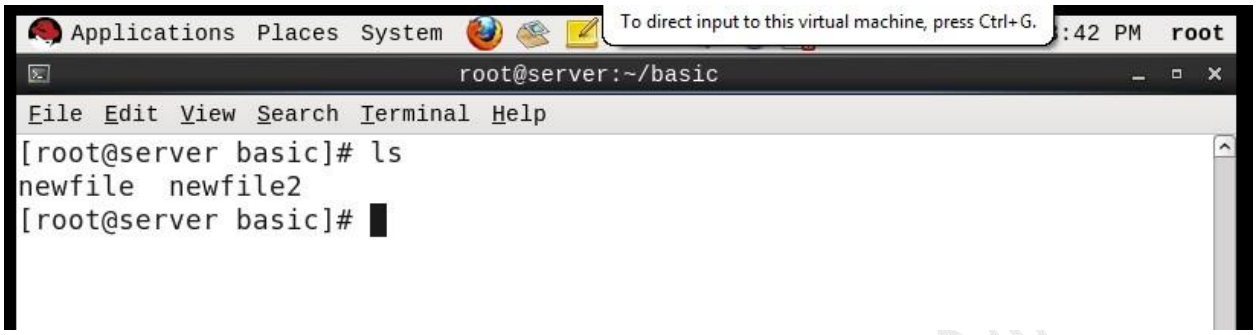
mkdir :-

The mkdir is used to create a new directory



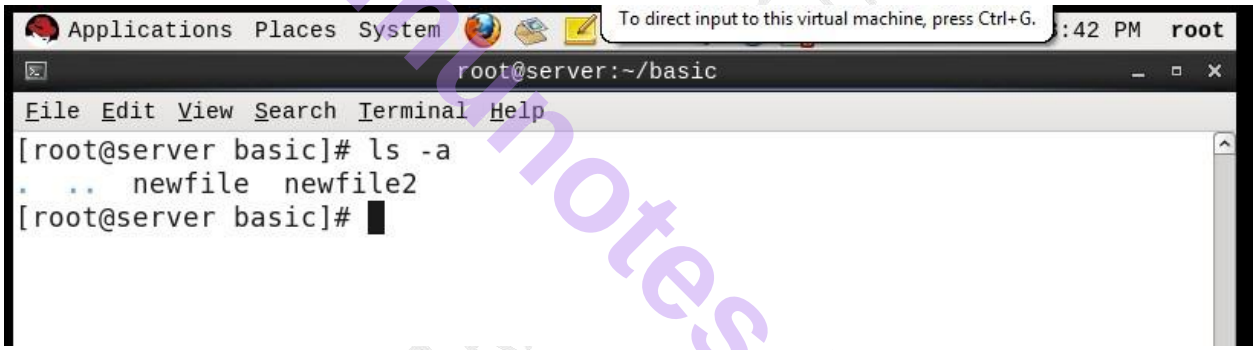
ls :-

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



ls-a :-

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



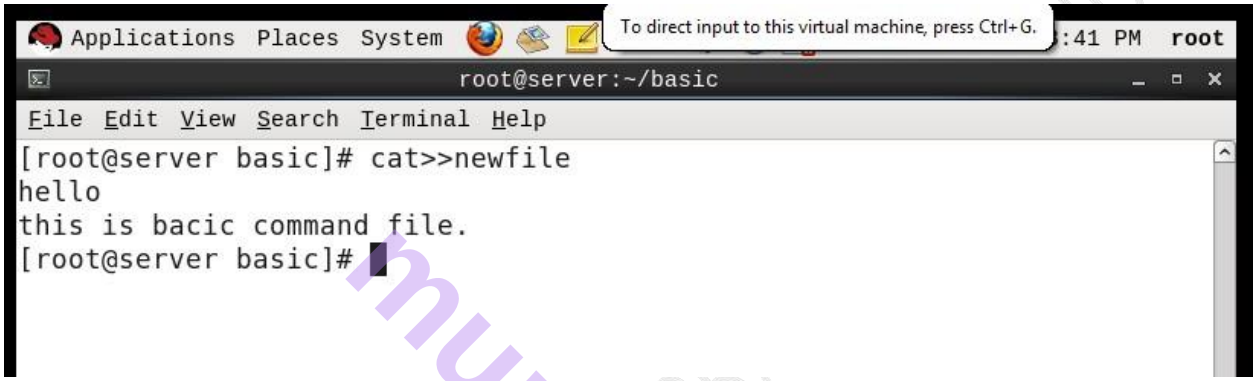
cat :-

The cat command is used to create a new file.

Syntax:

cat>>[filename]

To save a file ctrl+d



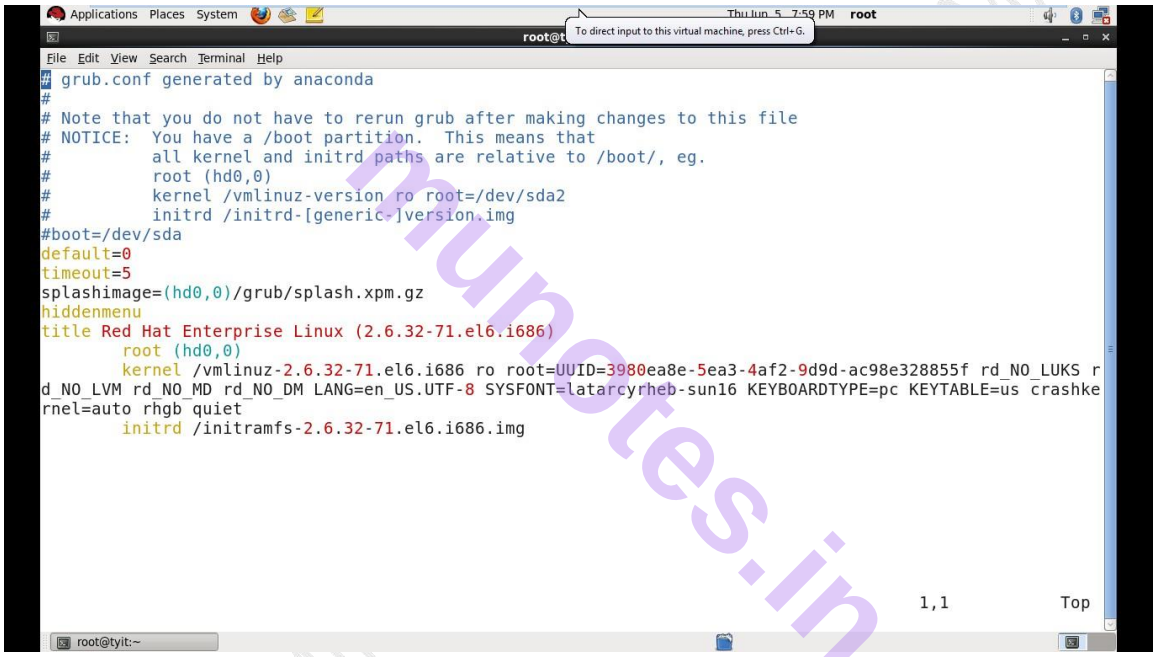
Practical no 4: Introduction to Grub.conf

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:

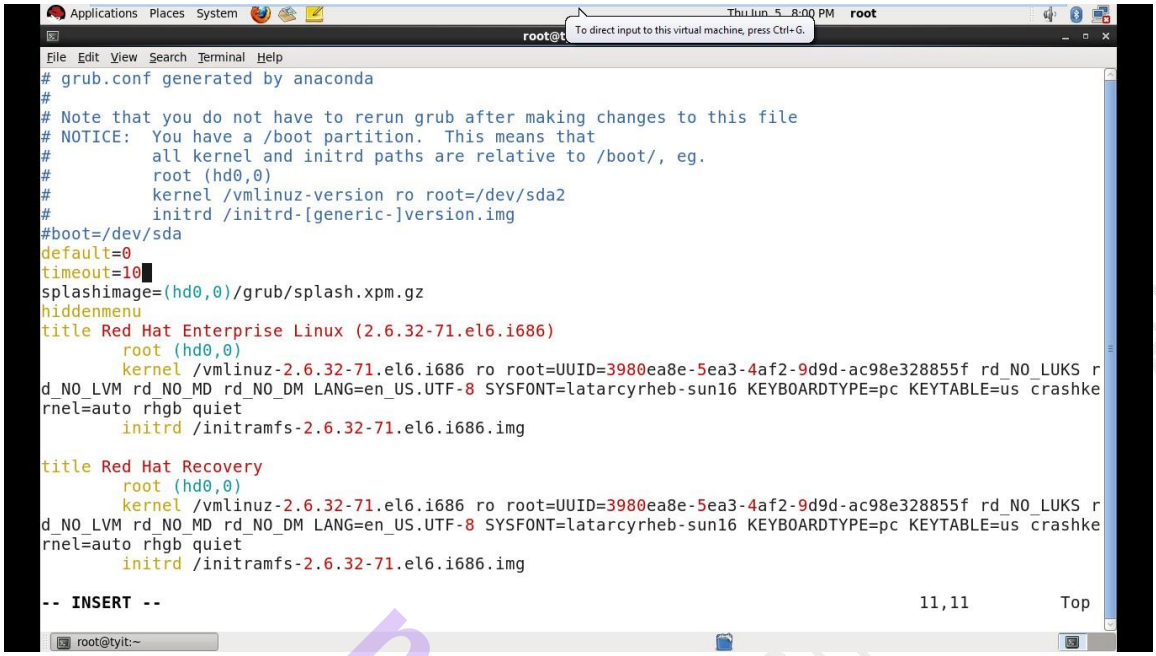
[root@tyit ~]#vim /boot/grub/grub.conf



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

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

- **(a)** The new entry should have the title "Red Hat Recovery".
- **(b)** The new entry should not be the default.
- **(c)** Change the timeout of the boot selection to 10 seconds.



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 gub to identity 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.

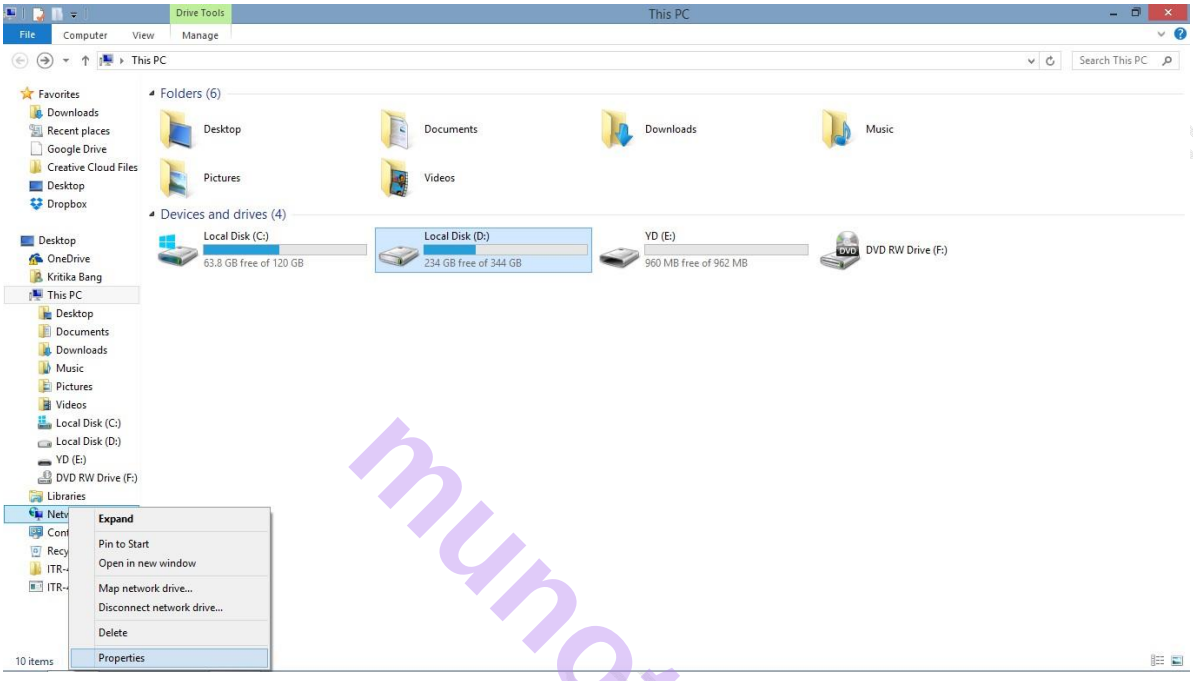
• **initrd /initrd-2.6.18-8.el5.img -** This line tells the GRUB location of the initial ramdisk image that is used to load special drivers for the system during boot process.

Practical no 5: Setting up Samba Server

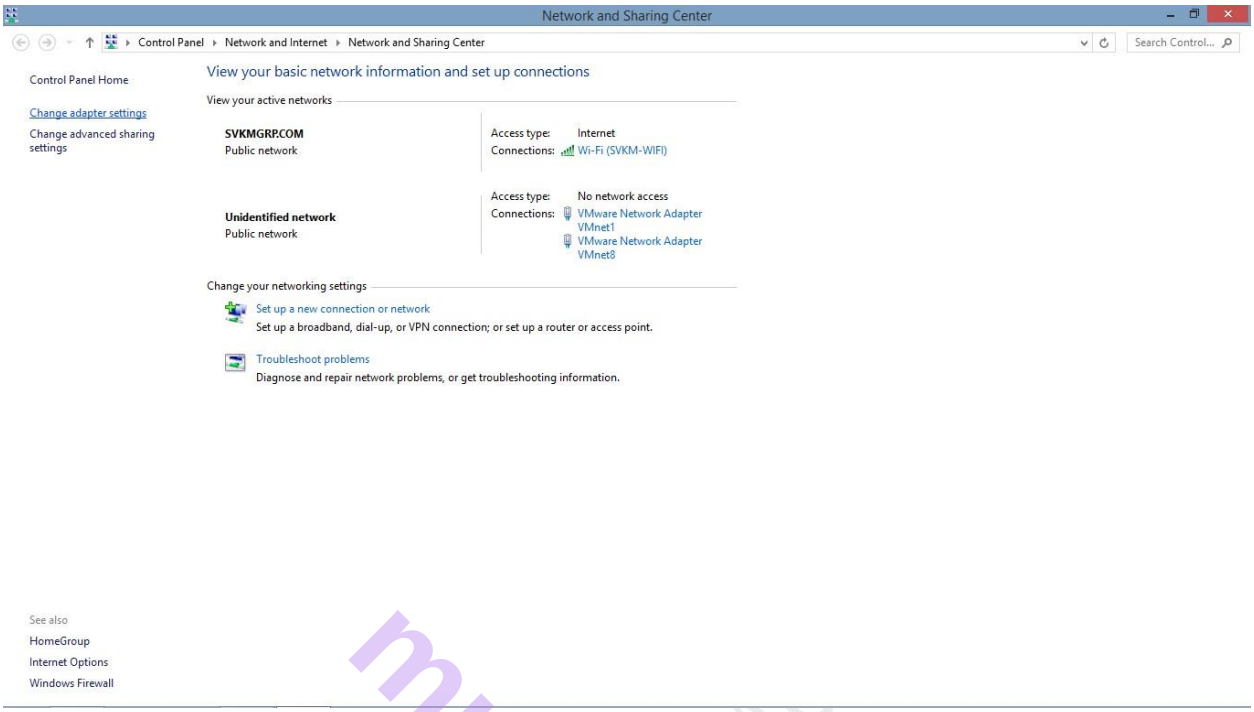
- Samba is basically used for establishing connection among linux to windows, with help of samba file sharing can be done using Windows file-sharing protocol and connect your Red Hat Enterprise network to a windows network to share files and printers.
- Windows use a protocol called Server Message Block (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

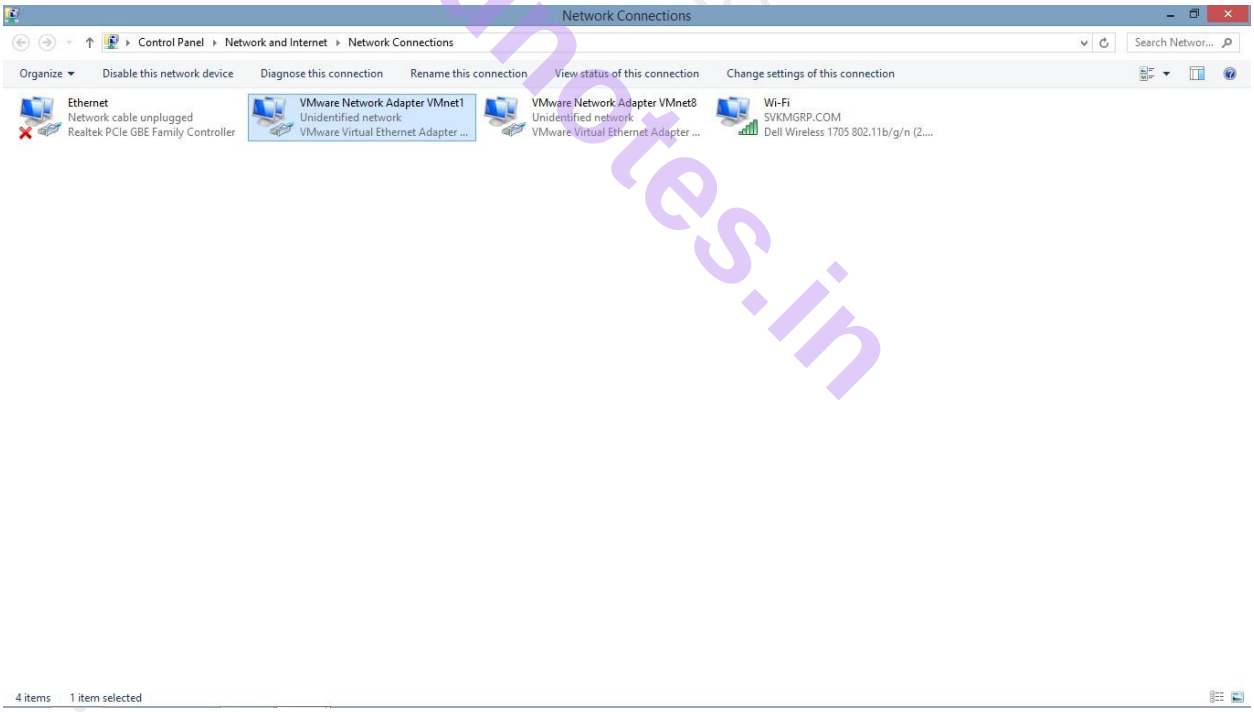
Settings to be done in Windows

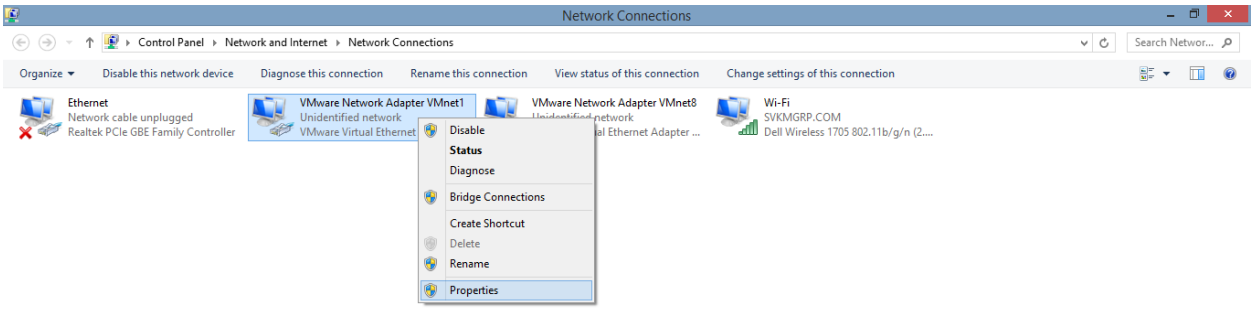
Go to “My Computer” -> “Network” -> Right Click on “Properties”

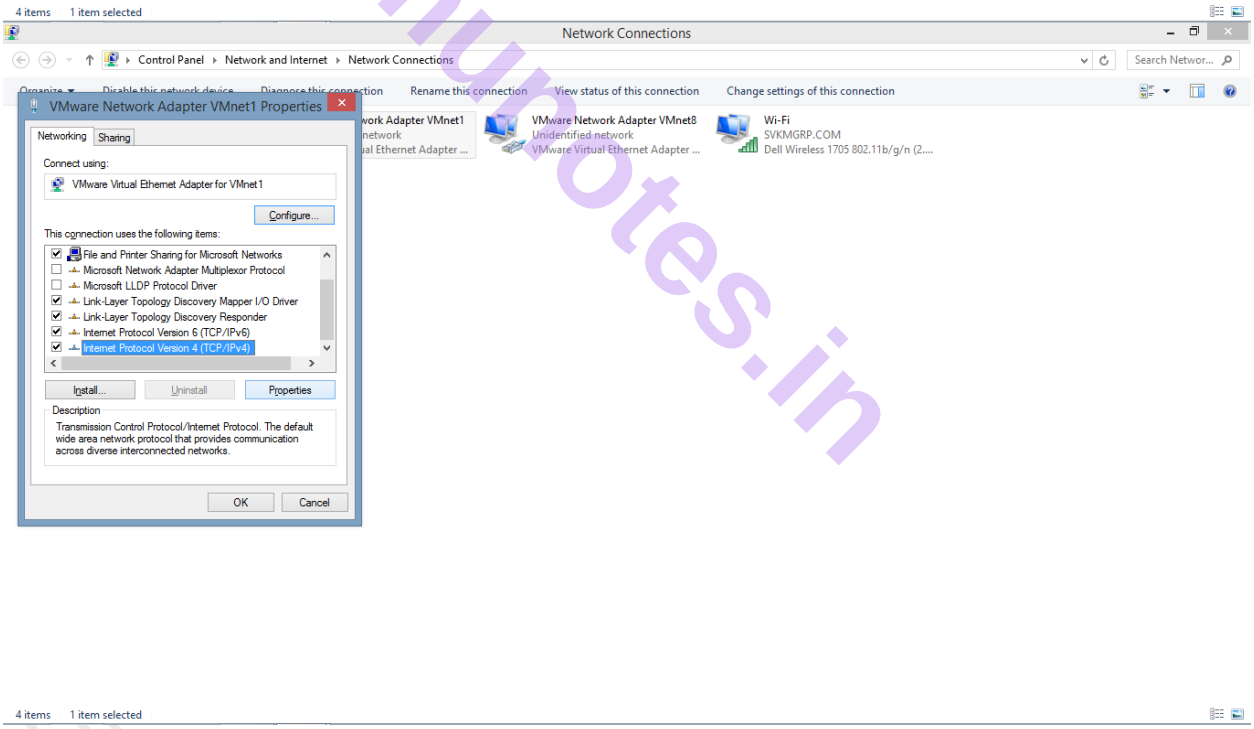


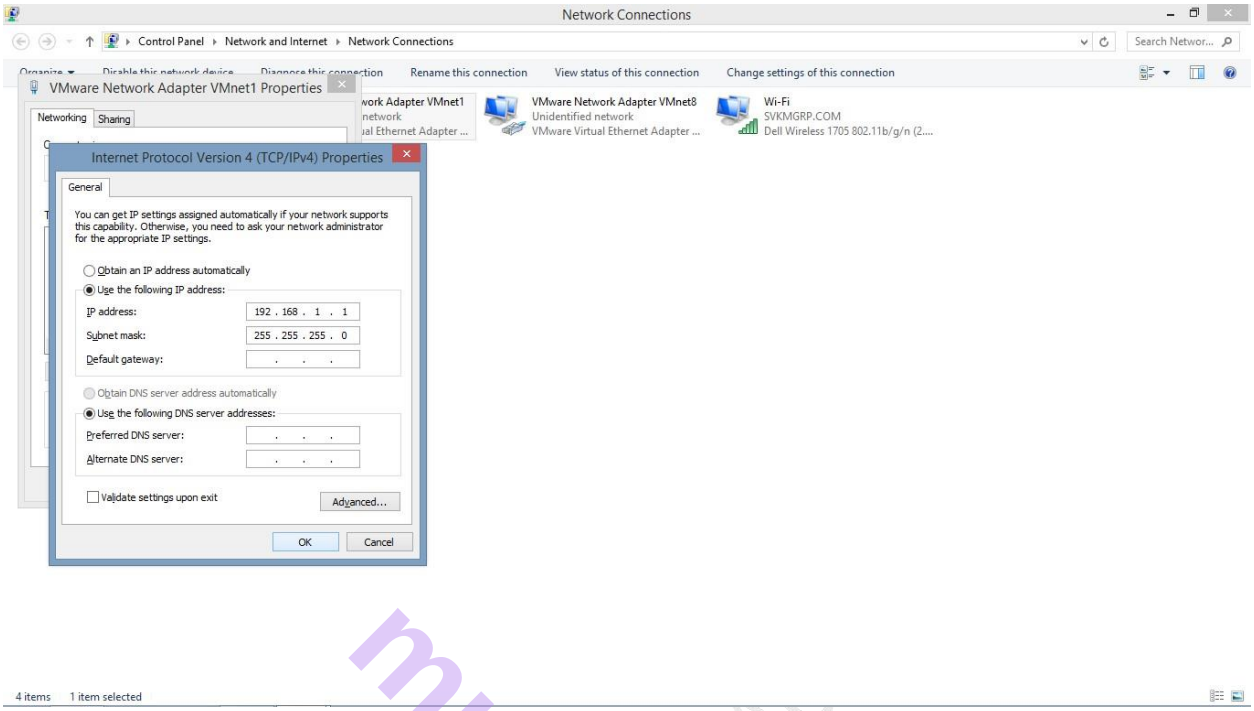
Go to the option “Change adapter settings” -> Right click on “VMWare Network Adapter VMnet1” -> Click “IPV4” - > Click on “Properties” button -> Set IP Address Example : 192.168.1.1 -> Click “OK” -> Click “Close”.


Network and Sharing Center
Control Panel ▸ Network and Internet ▸ Network and Sharing Center
Search Control...
Control Panel Home
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
View your active networks
SVKMGRP.COM
Public network
Access type: Internet
Connections: Wi-Fi (SVKM-WIFI)
Unidentified network
Public network
Access type: No network access
Connections: VMware Network Adapter VMnet1
VMware Network Adapter VMnet8
Change your networking settings
Set up a new connection or network
Set up a broadband, dial-up, or VPN connection; or set up a router or access point.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.
See also
HomeGroup
Internet Options
Windows Firewall

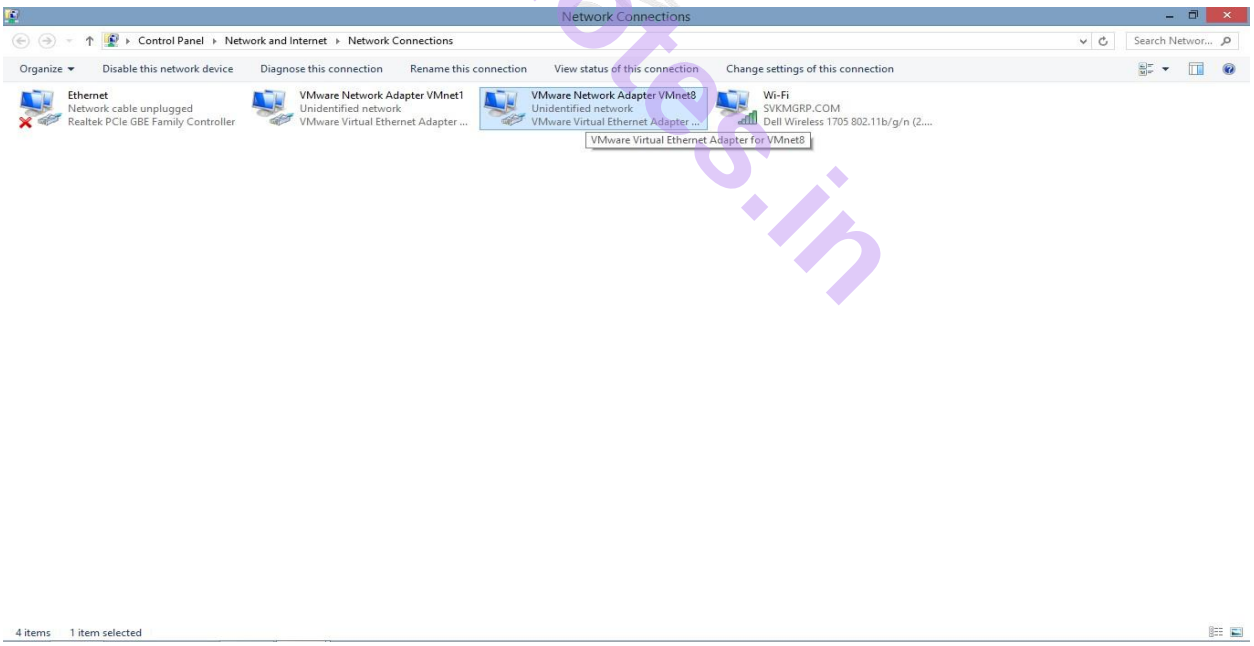

Network Connections
Control Panel ▸ Network and Internet ▸ Network Connections
Search Networ...
Organize
Disable this network device
Diagnose this connection
Rename this connection
View status of this connection
Change settings of this connection
Ethernet
Network cable unplugged
Realtek PCIe GBE Family Controller
VMware Network Adapter VMnet1
Unidentified network
VMware Virtual Ethernet Adapter ...
VMware Network Adapter VMnet8
Unidentified network
VMware Virtual Ethernet Adapter ...
Wi-Fi
SVKMGRP.COM
Dell Wireless 1705 802.11b/g/n (2....
4 items
1 item selected

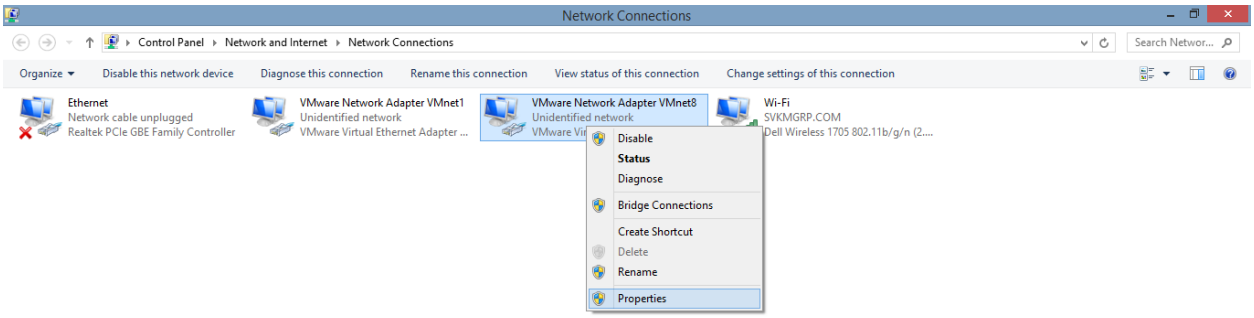

Network Connections
Control Panel ▸ Network and Internet ▸ Network Connections
Search Networ...
Organize
Disable this network device
Diagnose this connection
Rename this connection
View status of this connection
Change settings of this connection
Ethernet
Network cable unplugged
Realtek PCIe GBE Family Controller
VMware Network Adapter VMnet1
Unidentified network
VMware Virtual Ethernet
VMware Network Adapter VMnet8
Wi-Fi
SVKMGRP.COM
Dell Wireless 1705 802.11b/g/n (2....
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

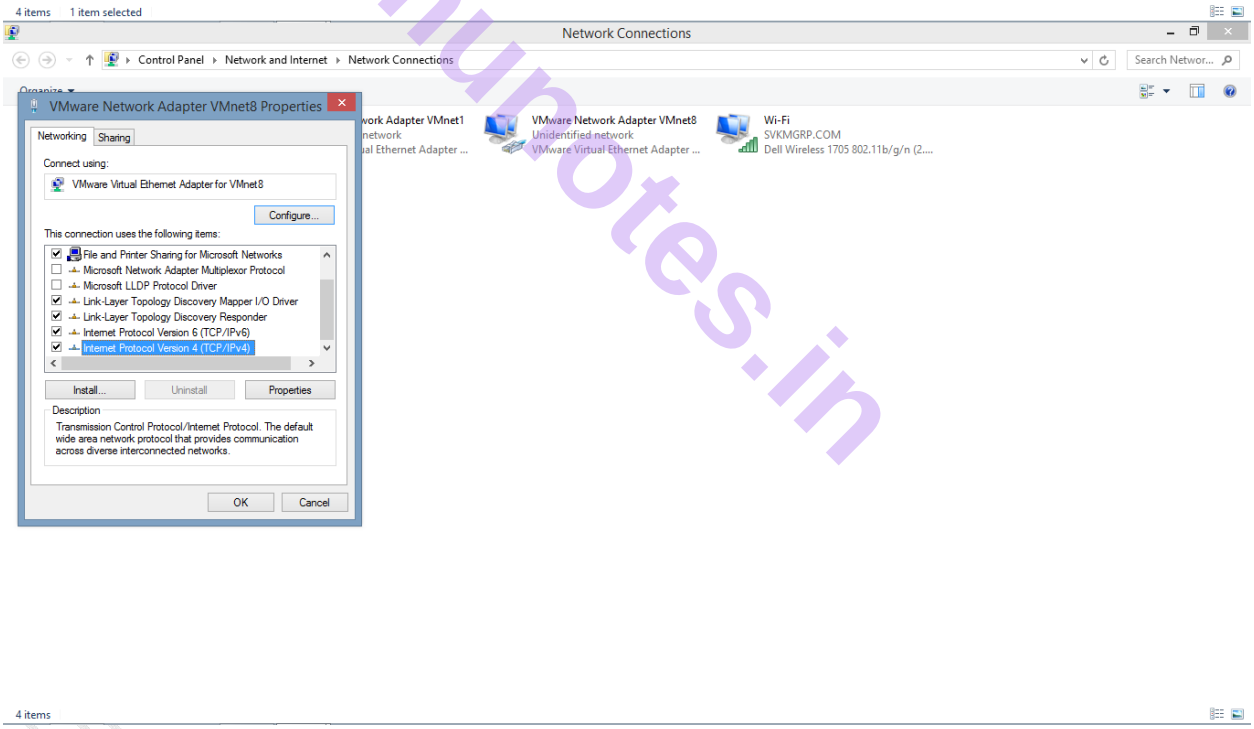

4 items
1 item selected
Network Connections
Control Panel ▸ Network and Internet ▸ Network Connections
Search Networ...
Rename this connection
View status of this connection
Change settings of this connection
VMware Network Adapter VMnet8
Unidentified network
VMware Virtual Ethernet Adapter ...
Wi-Fi
SVKMGRP.COM
Dell Wireless 1705 802.11b/g/n (2....
VMware Network Adapter VMnet1 Properties
Networking
Sharing
Connect using:
VMware Virtual Ethernet Adapter for VMnet1
Configure...
This connection uses the following items:
File and Printer Sharing for Microsoft Networks
Microsoft Network Adapter Multiplexor Protocol
Microsoft LLDP Protocol Driver
Link-Layer Topology Discovery Mapper I/O Driver
Link-Layer Topology Discovery Responder
Internet Protocol Version 6 (TCP/IPv6)
Internet Protocol Version 4 (TCP/IPv4)
Install...
Uninstall
Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
OK
Cancel
4 items
1 item selected

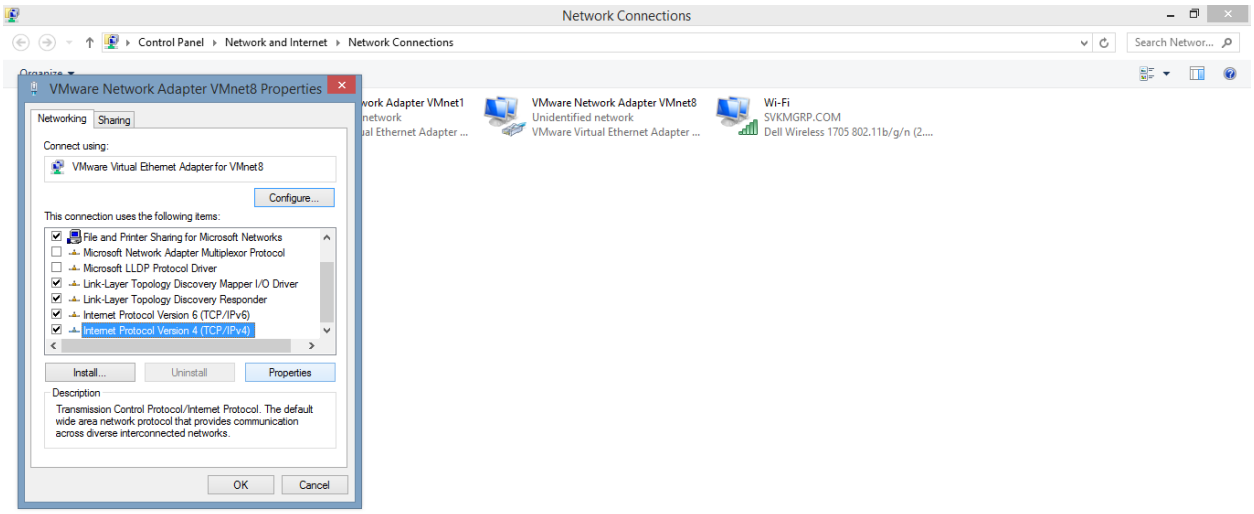


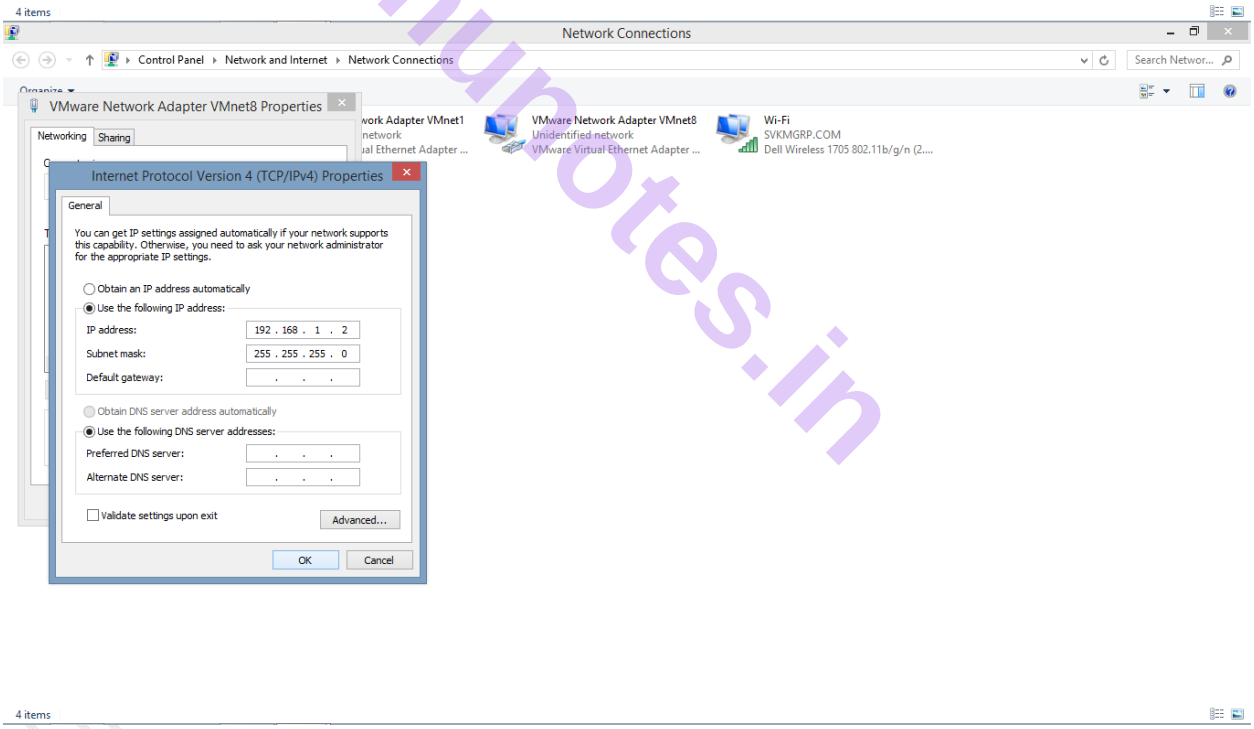
Right click on “VMWare Network Adapter VMnet8” -> Click “IPV4” - > Click on “Properties” button -> Set IP Address Example : 192.168.1.2 -> Click “OK” -> Click “Close”.




Network Connections
Control Panel ▸ Network and Internet ▸ Network Connections
Search Networ...
Organize
Disable this network device
Diagnose this connection
Rename this connection
View status of this connection
Change settings of this connection
Ethernet
Network cable unplugged
Realtek PCIe GBE Family Controller
VMware Network Adapter VMnet1
Unidentified network
VMware Virtual Ethernet Adapter ...
VMware Network Adapter VMnet8
Unidentified network
Wi-Fi
SVKMGRP.COM
Dell Wireless 1705 802.11b/g/n (2....
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties


4 items
1 item selected
Network Connections
Control Panel ▸ Network and Internet ▸ Network Connections
Search Networ...
VMware Network Adapter VMnet8 Properties
Networking
Sharing
Connect using:
VMware Virtual Ethernet Adapter for VMnet8
Configure...
This connection uses the following items:
File and Printer Sharing for Microsoft Networks
Microsoft Network Adapter Multiplexor Protocol
Microsoft LLDP Protocol Driver
Link-Layer Topology Discovery Mapper I/O Driver
Link-Layer Topology Discovery Responder
Internet Protocol Version 6 (TCP/IPv6)
Internet Protocol Version 4 (TCP/IPv4)
Install...
Uninstall
Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
OK
Cancel
VMware Network Adapter VMnet8
Unidentified network
VMware Virtual Ethernet Adapter ...
Wi-Fi
SVKMGRP.COM
Dell Wireless 1705 802.11b/g/n (2....
4 items



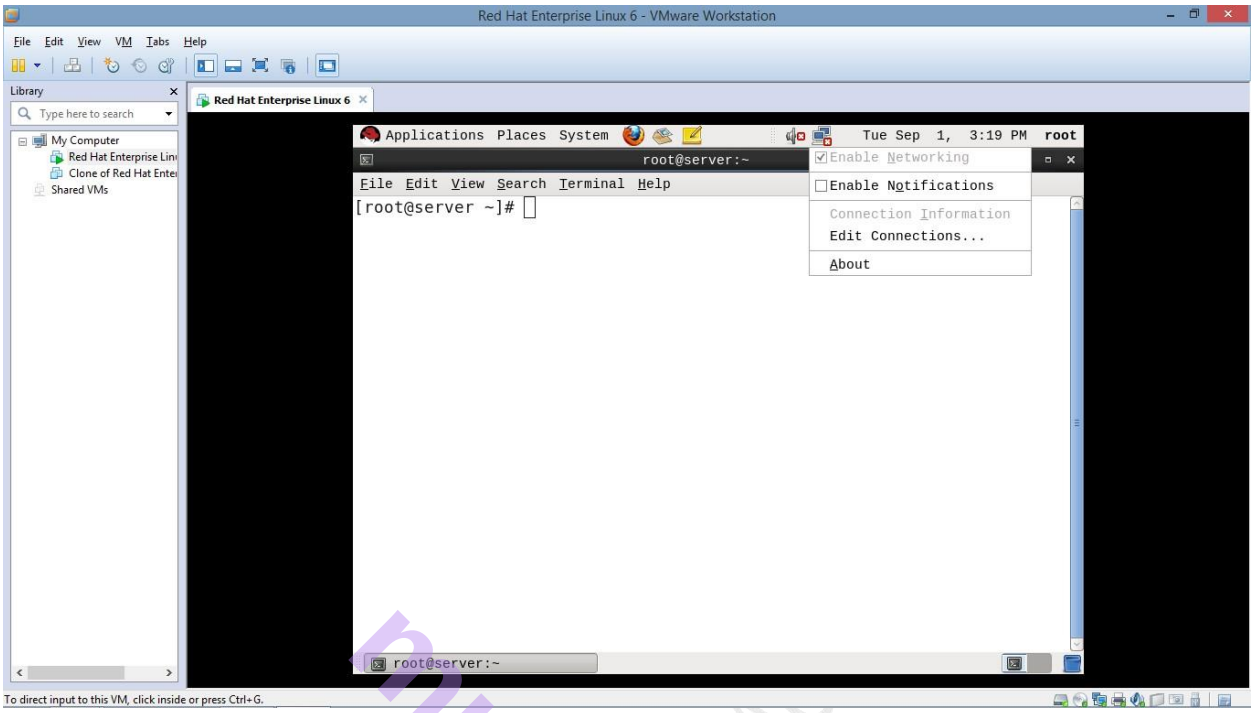


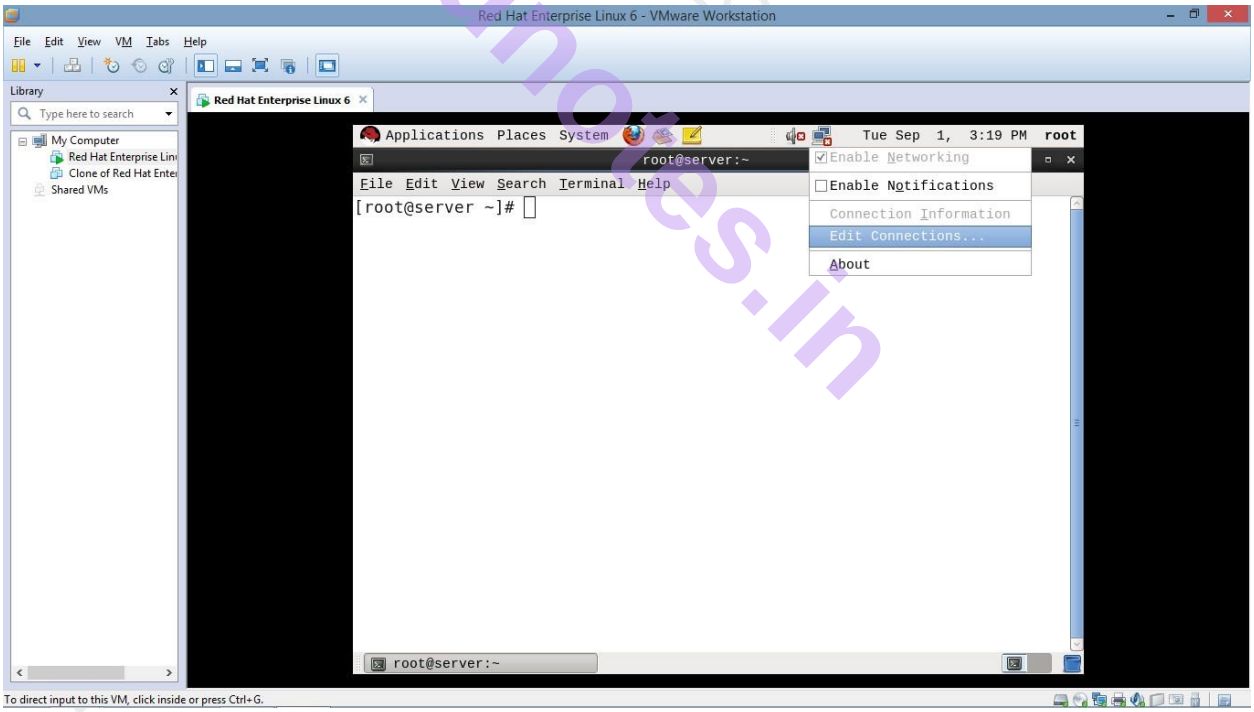
Now Open "VMWare"– Linux Virtual machine

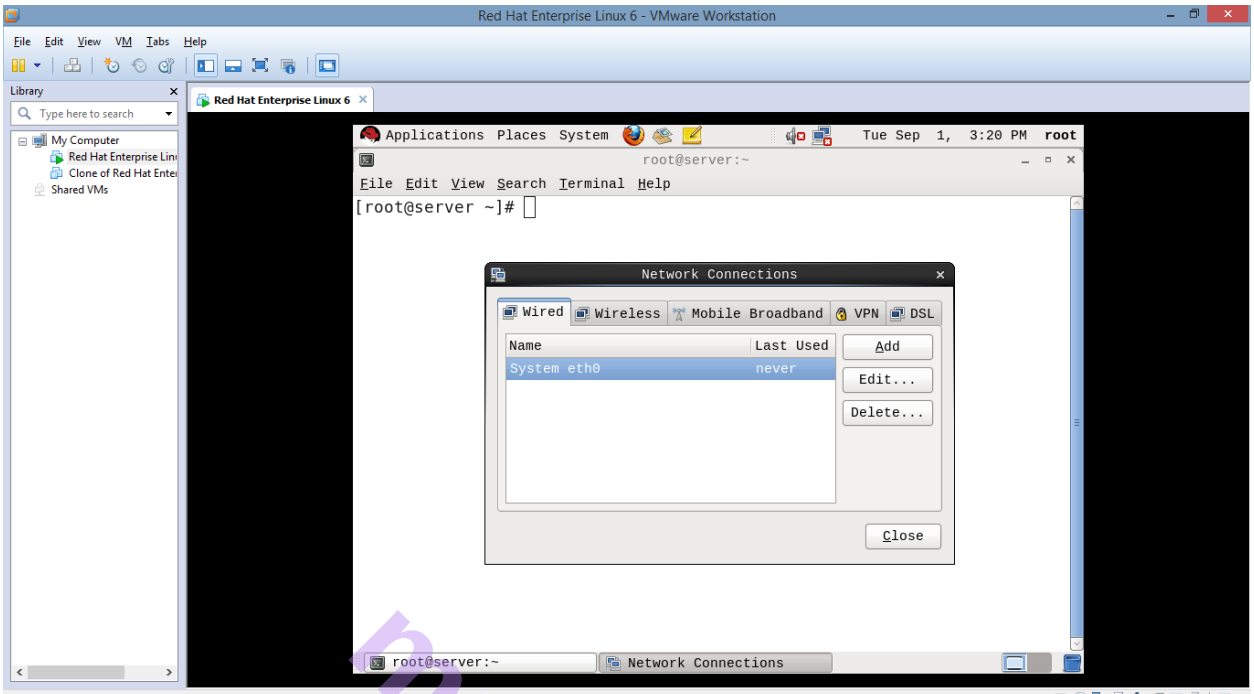
Set the IP Address to 192.168.1.3

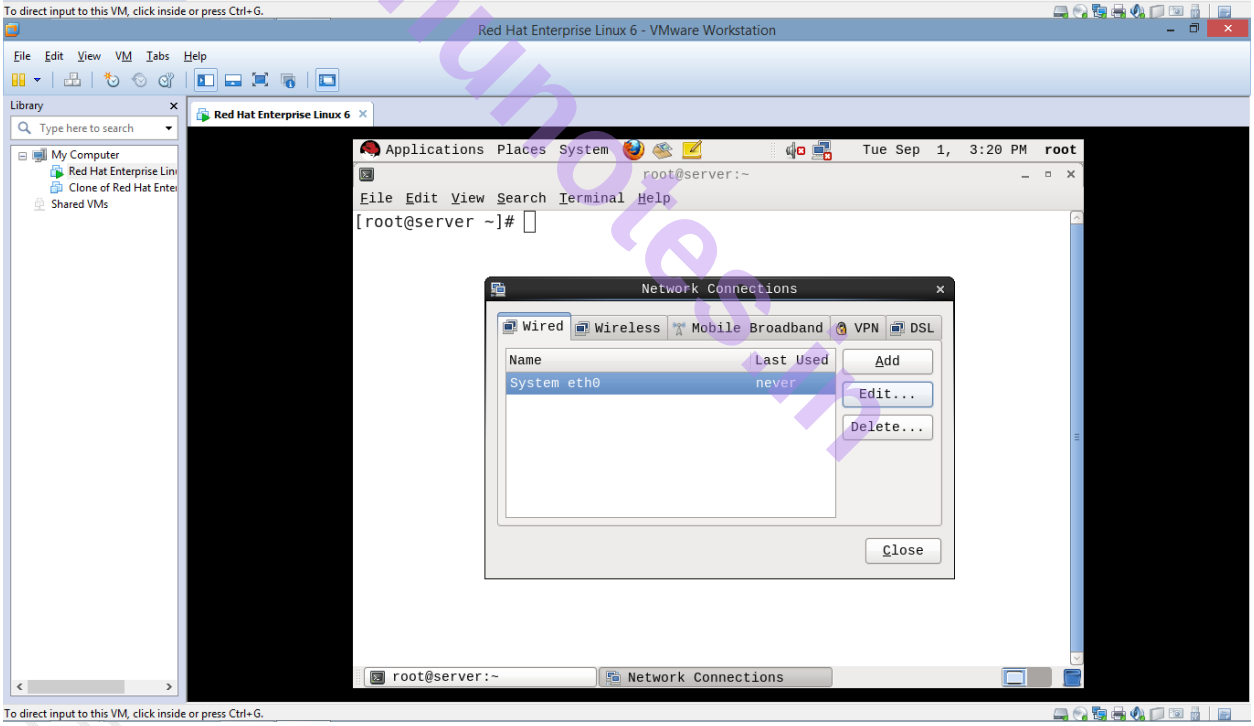
To do so follow the steps :

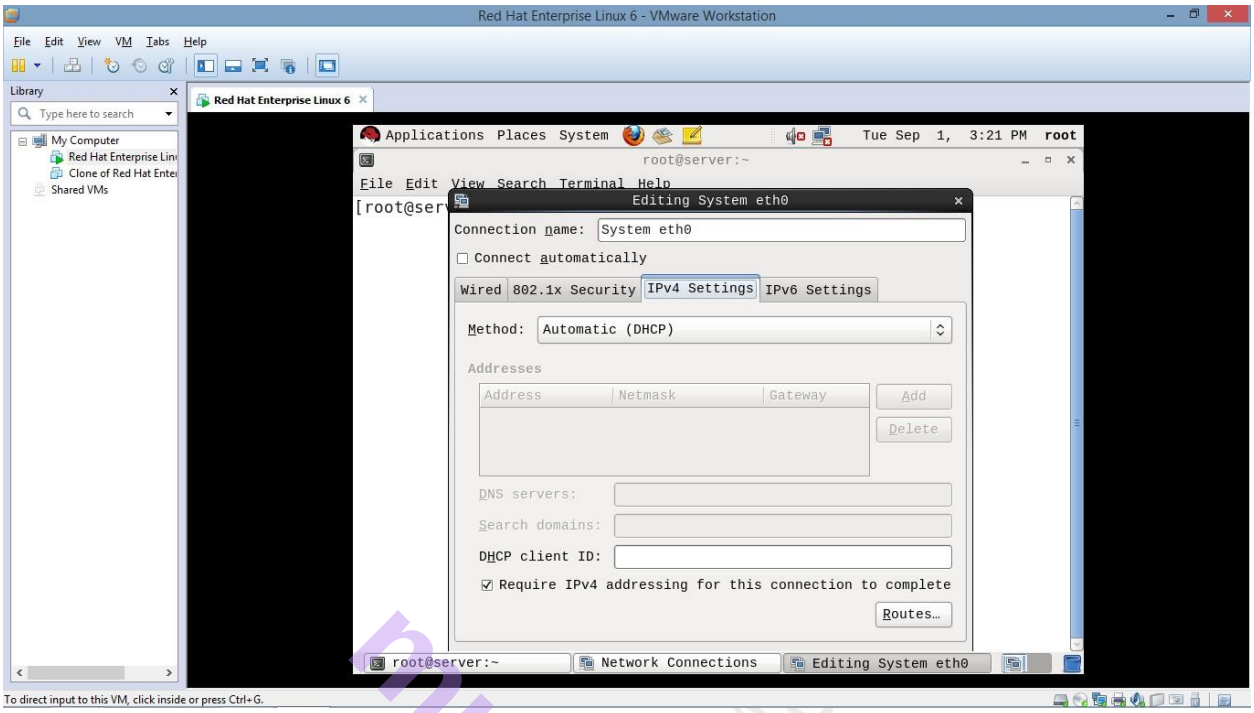
Right click on top of "Network symbol" -> Go to "Edit Connections" ->Select "eth0" ->Click on "Edit" button -> Select IPV4 - >Select "Manual" .

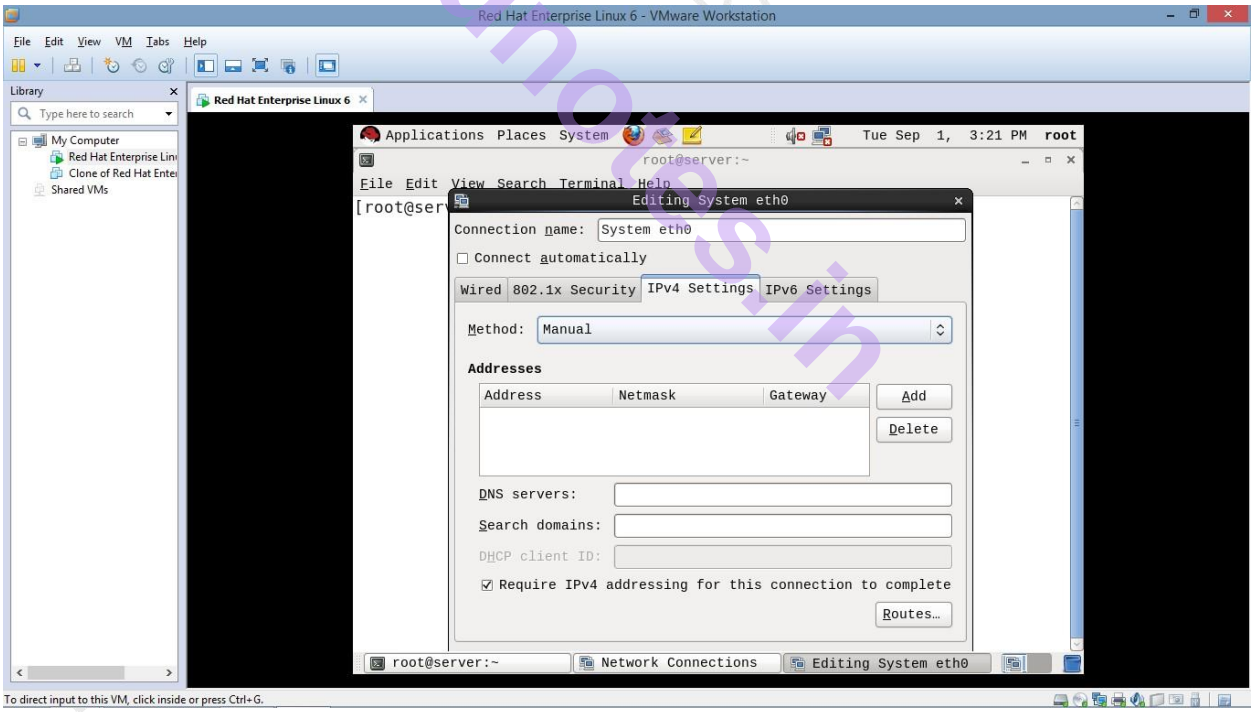

Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Red Hat Enterprise Linux 6
Clone of Red Hat Enterprise Linux 6
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System
Tue Sep 1, 3:19 PM root
root@server:~
File Edit View Search Terminal Help
[root@server ~]#
Enable Networking
Enable Notifications
Connection Information
Edit Connections...
About
root@server:~
To direct input to this VM, click inside or press Ctrl+G.

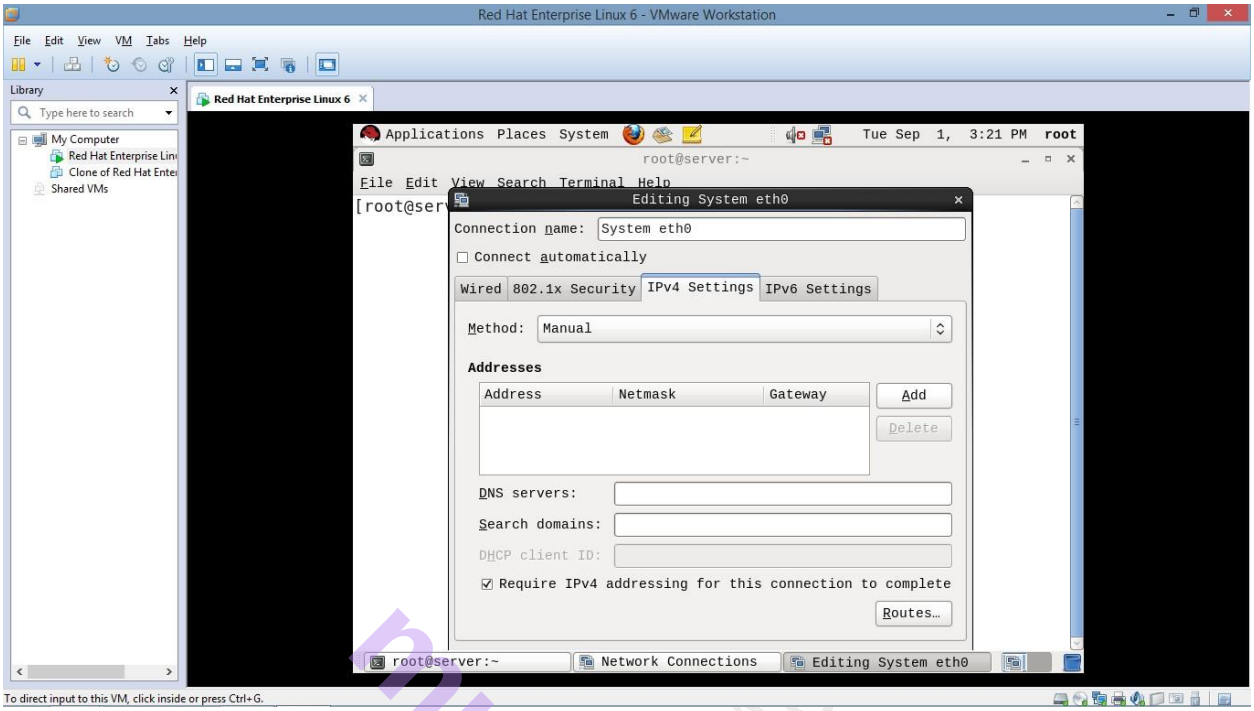

Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Red Hat Enterprise Linux 6
Clone of Red Hat Enterprise Linux 6
Shared VMs
Red Hat Enterprise Linux 6
Applications Places System
Tue Sep 1, 3:19 PM root
root@server:~
File Edit View Search Terminal Help
[root@server ~]#
Enable Networking
Enable Notifications
Connection Information
Edit Connections...
About
root@server:~
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 Linux 6
Clone of Red Hat Enterprise Linux 6
Shared VMs
Applications Places System
Tue Sep 1, 3:20 PM root
root@server:~
File Edit View Search Terminal Help
[root@server ~]#
Network Connections
Wired
Wireless
Mobile Broadband
VPN
DSL
Name
Last Used
System eth0
never
Add
Edit...
Delete...
Close
root@server:~
Network Connections
To direct input to this VM, click inside or press Ctrl+G.

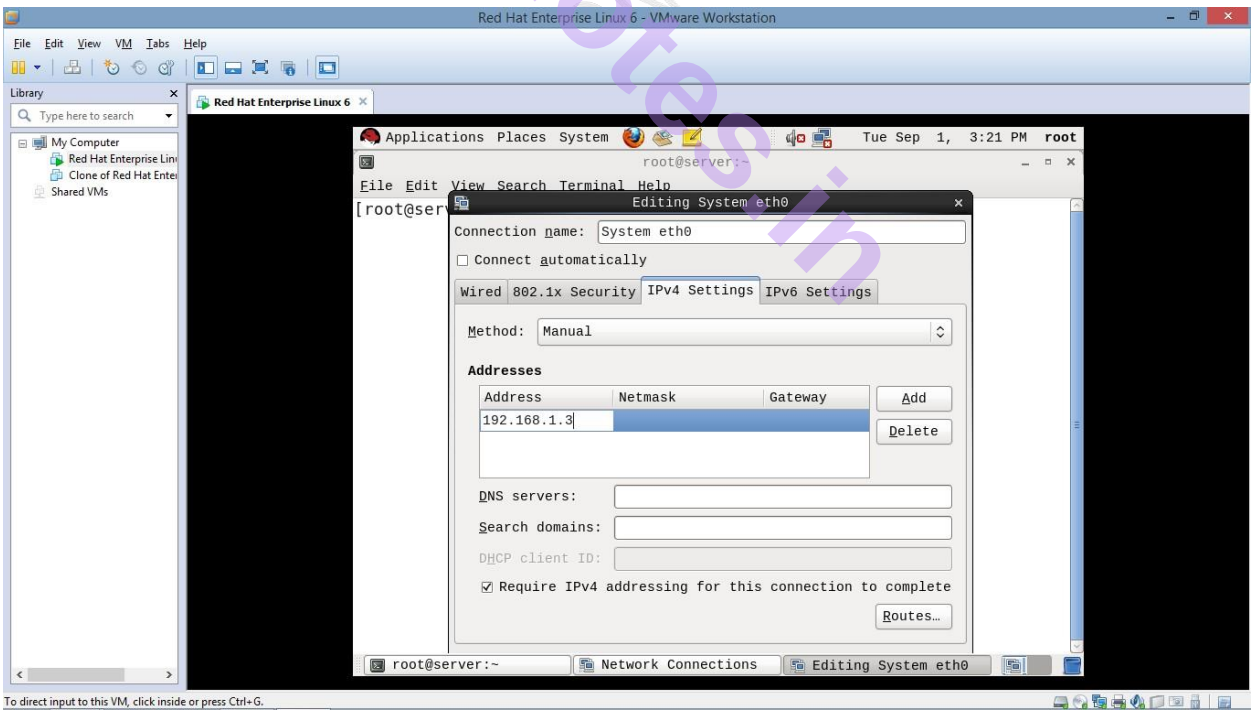

Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Red Hat Enterprise Linux 6
Clone of Red Hat Enterprise Linux 6
Shared VMs
Applications Places System
Tue Sep 1, 3:20 PM root
root@server:~
File Edit View Search Terminal Help
[root@server ~]#
Network Connections
Wired
Wireless
Mobile Broadband
VPN
DSL
Name
Last Used
System eth0
never
Add
Edit...
Delete...
Close
root@server:~
Network Connections
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 Linux 6
Clone of Red Hat Enterprise Linux 6
Shared VMs
Applications Places System
Tue Sep 1, 3:21 PM root
root@server:~
File Edit View Search Terminal Help
Editing System eth0
Connection name: System eth0
Connect automatically
Wired 802.1x Security IPv4 Settings IPv6 Settings
Method: Automatic (DHCP)
Addresses
Address Netmask Gateway
Add
Delete
DNS servers:
Search domains:
DHCP client ID:
Require IPv4 addressing for this connection to complete
Routes...
root@server:~
Network Connections
Editing System eth0
To direct input to this VM, click inside or press Ctrl+G.

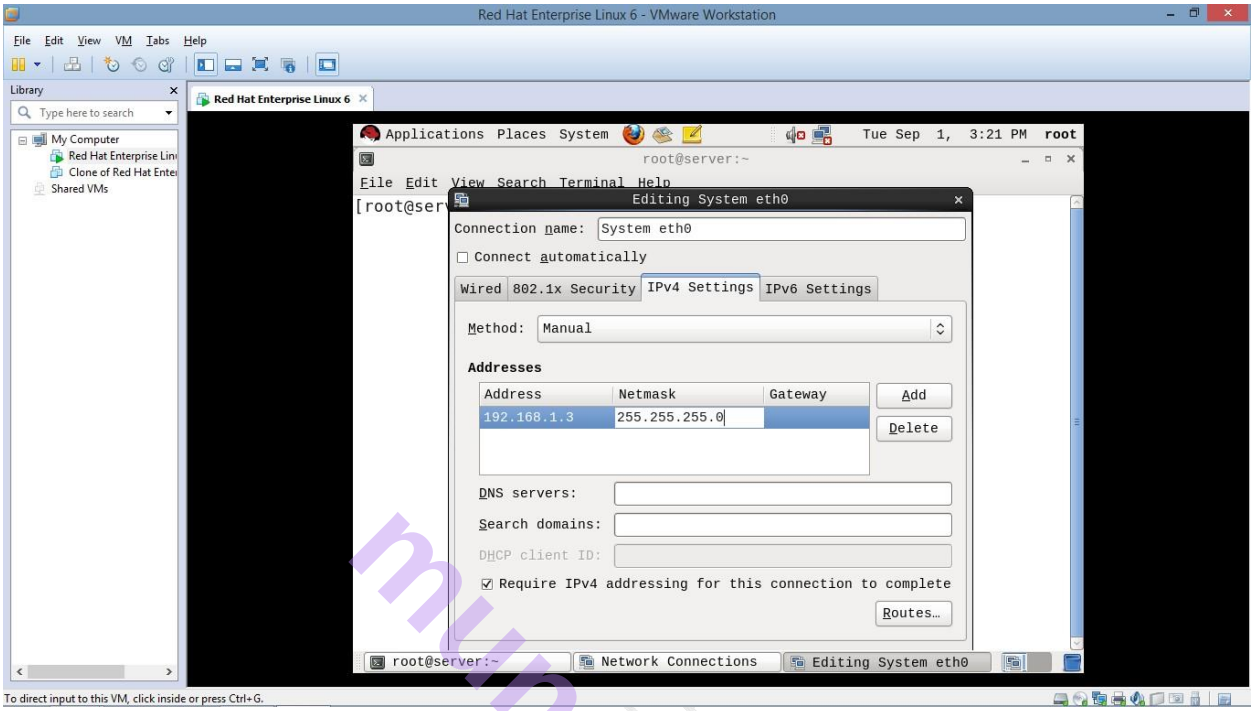

Red Hat Enterprise Linux 6 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Red Hat Enterprise Linux 6
Clone of Red Hat Enterprise Linux 6
Shared VMs
Applications Places System
Tue Sep 1, 3:21 PM root
root@server:~
File Edit View Search Terminal Help
Editing System eth0
Connection name: System eth0
Connect automatically
Wired 802.1x Security IPv4 Settings IPv6 Settings
Method: Manual
Addresses
Address Netmask Gateway
Add
Delete
DNS servers:
Search domains:
DHCP client ID:
Require IPv4 addressing for this connection to complete
Routes...
root@server:~
Network Connections
Editing System eth0
To direct input to this VM, click inside or press Ctrl+G.



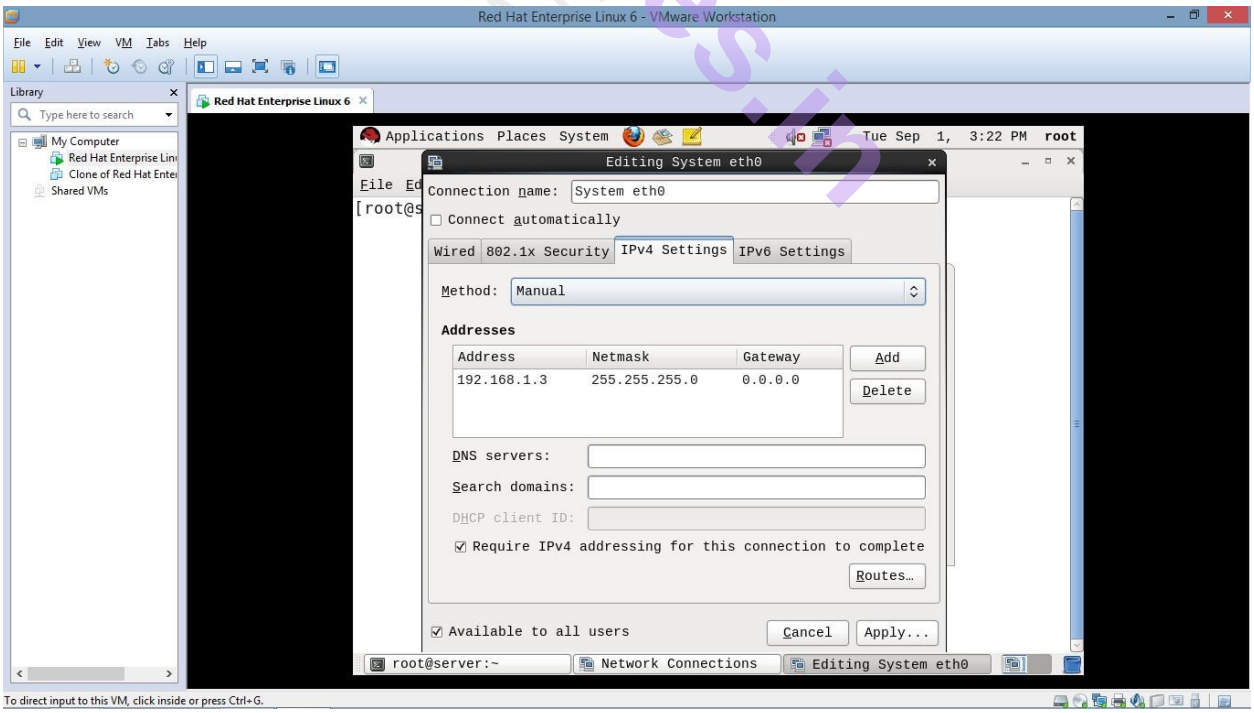
Now set IP Address to 192.168.1.3



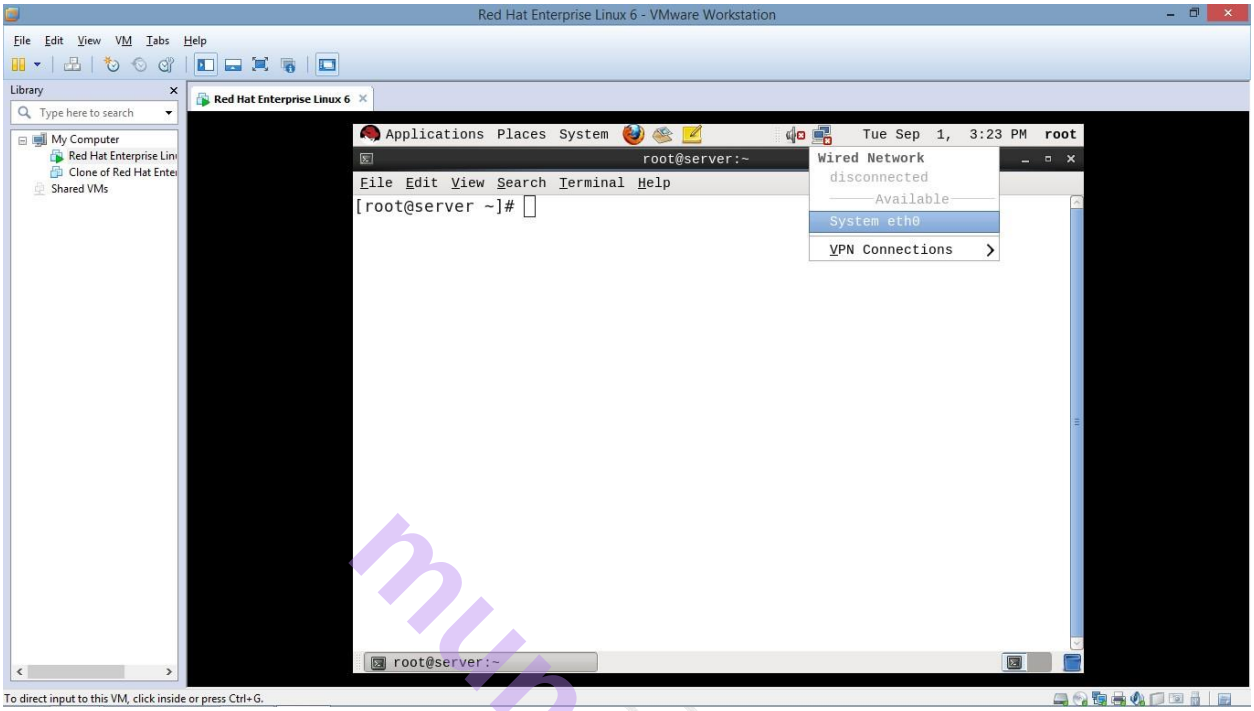
Set the Netmask as 255.255.255.0

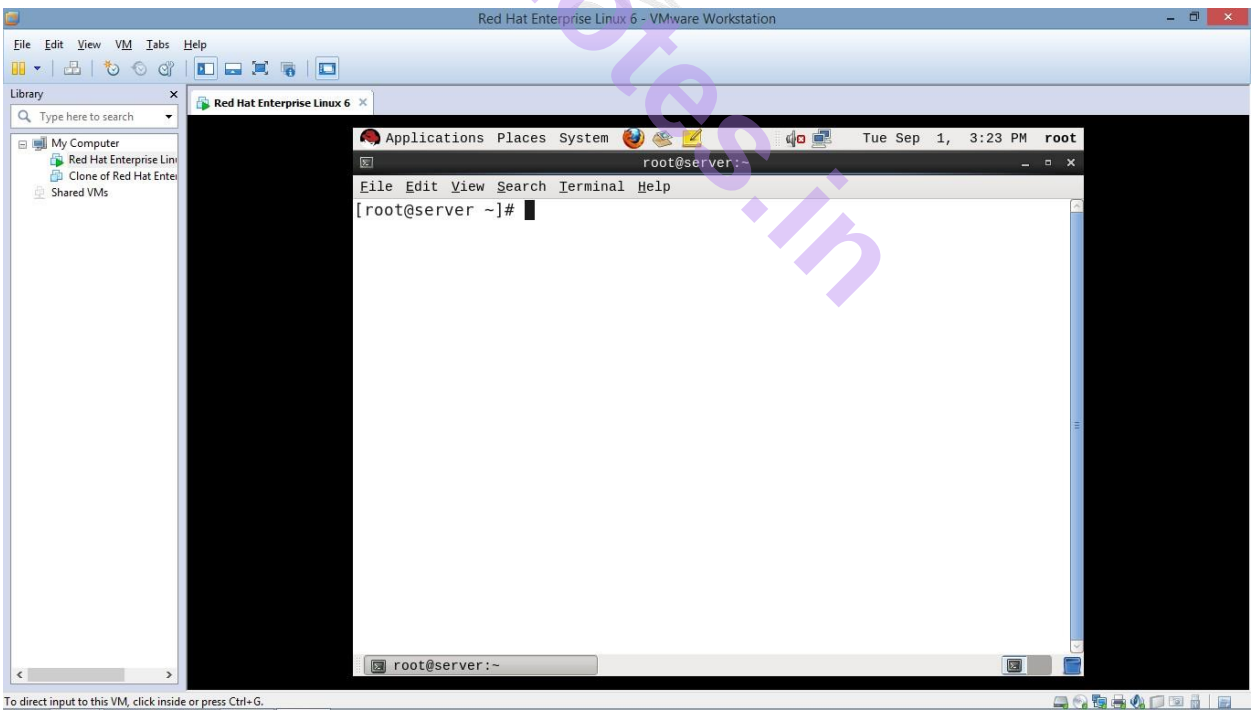


Click on “Apply” button -> Click on “Close” button.



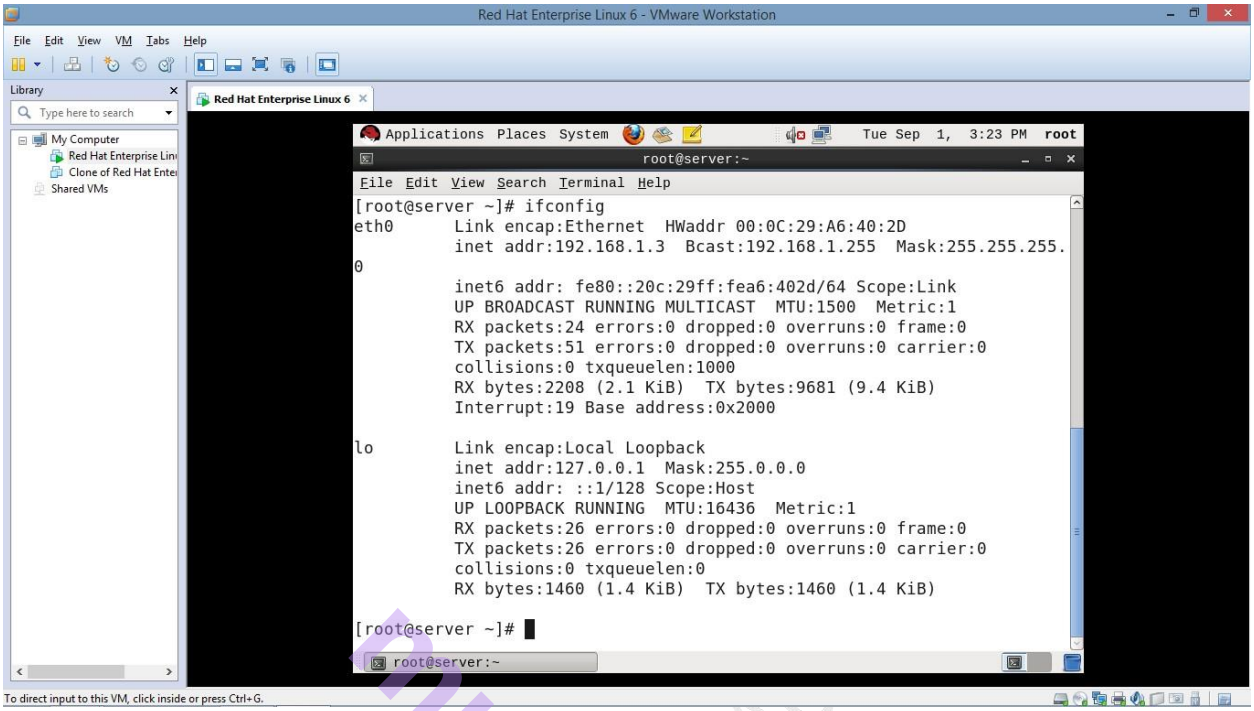
Now connect your network - > To do so double click on Network icon.





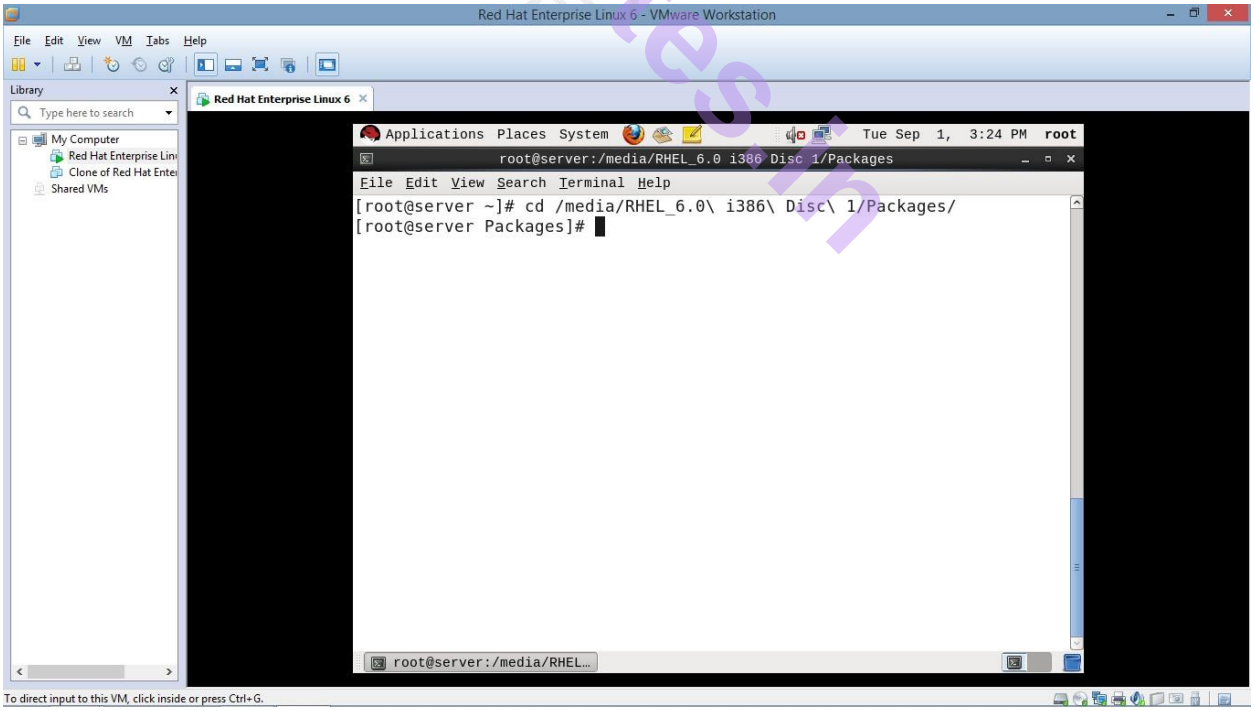
To check whether IP Address is set :

 # ifconfig

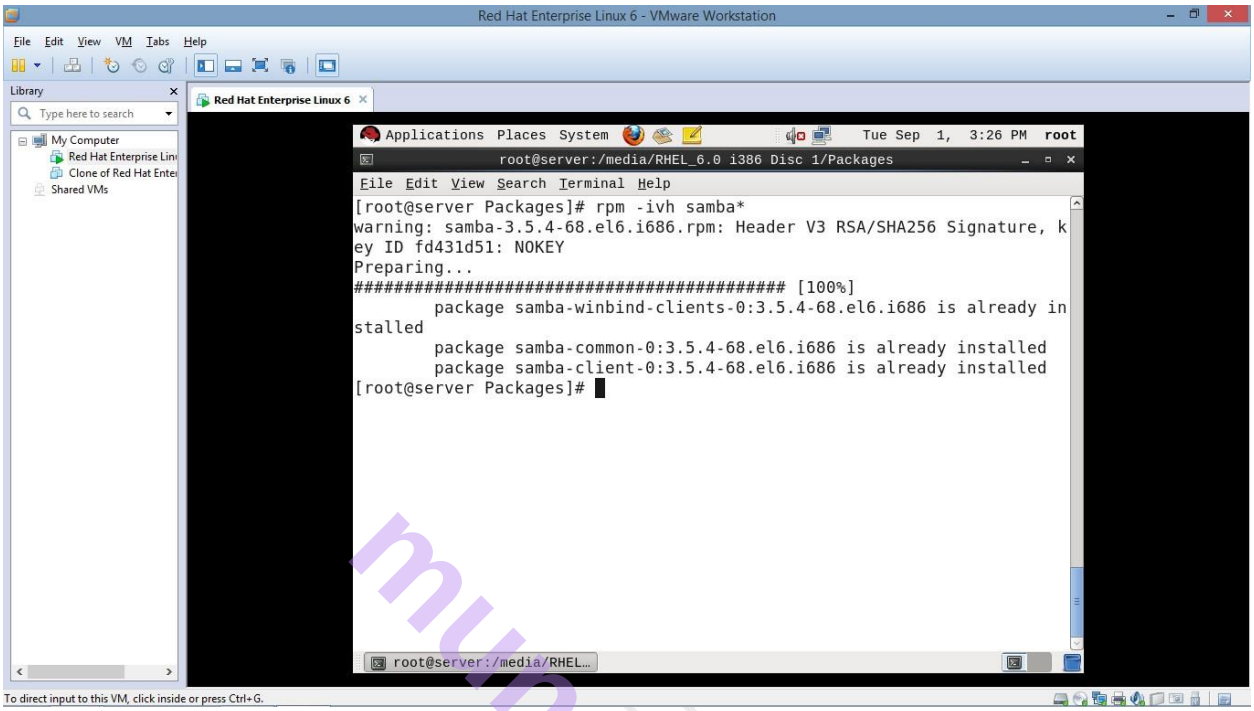


To install the samba package :

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



Packages] # **rpm –ivh samba***

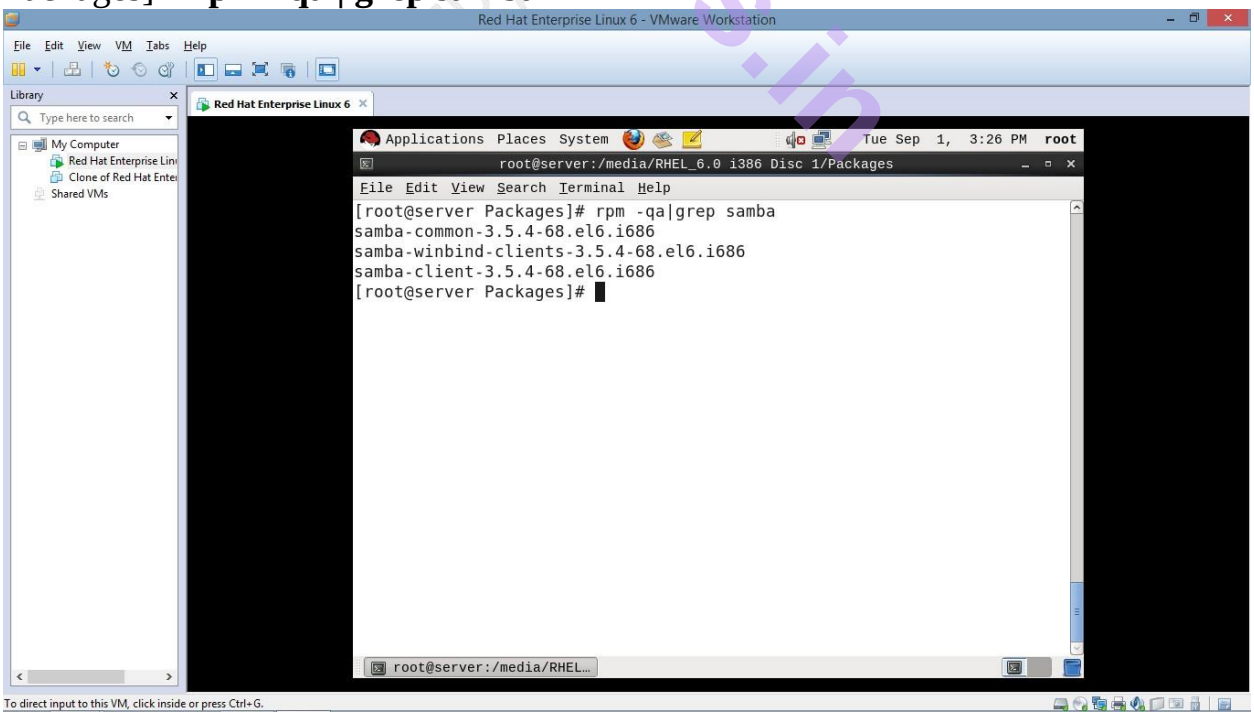


To verify service package of samba

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

OR

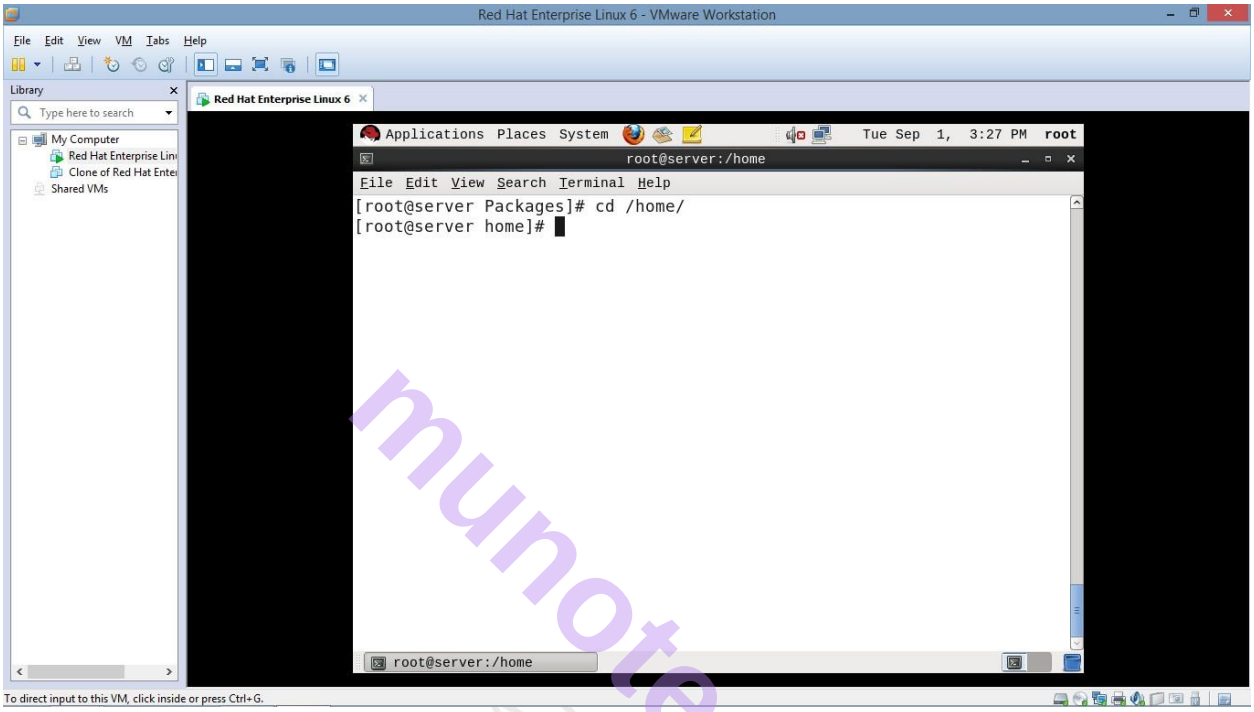
Packages] # **rpm –qa | grep samba**



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



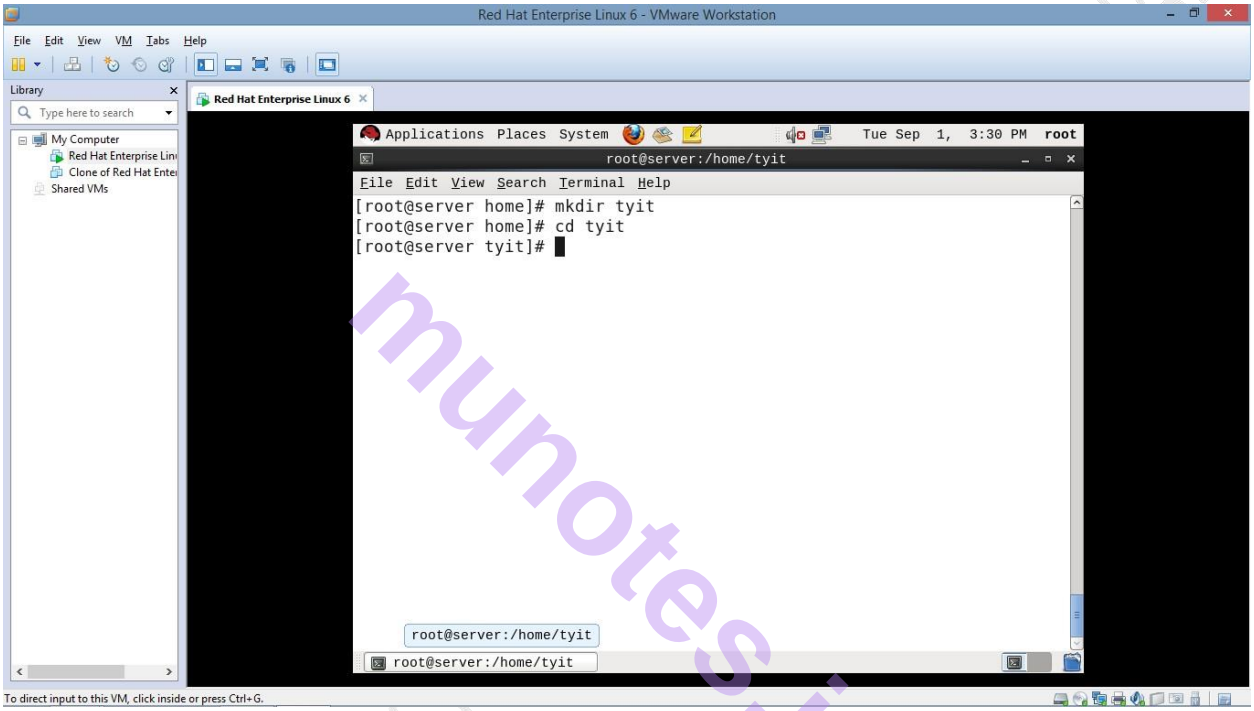
Now create a directory and create few files into it. You can also write the contents in the file.

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)

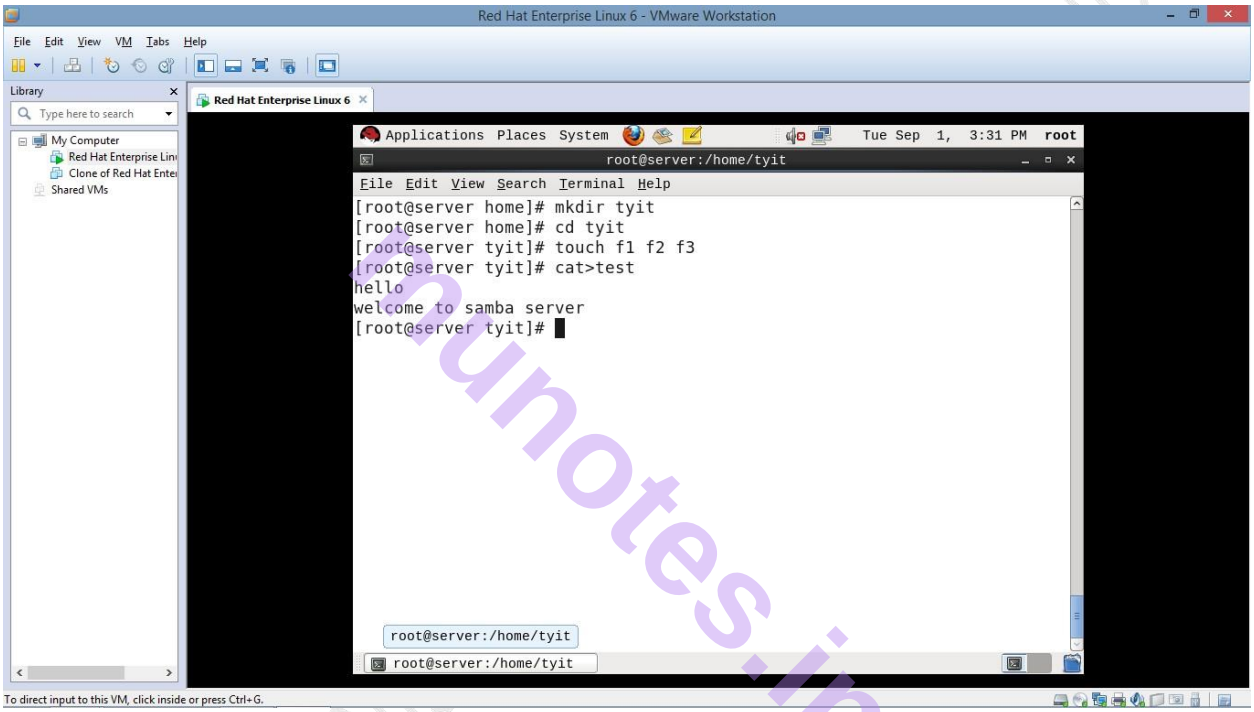
Creating a file named as 'test' with cat command

cat > test

// Write the contents

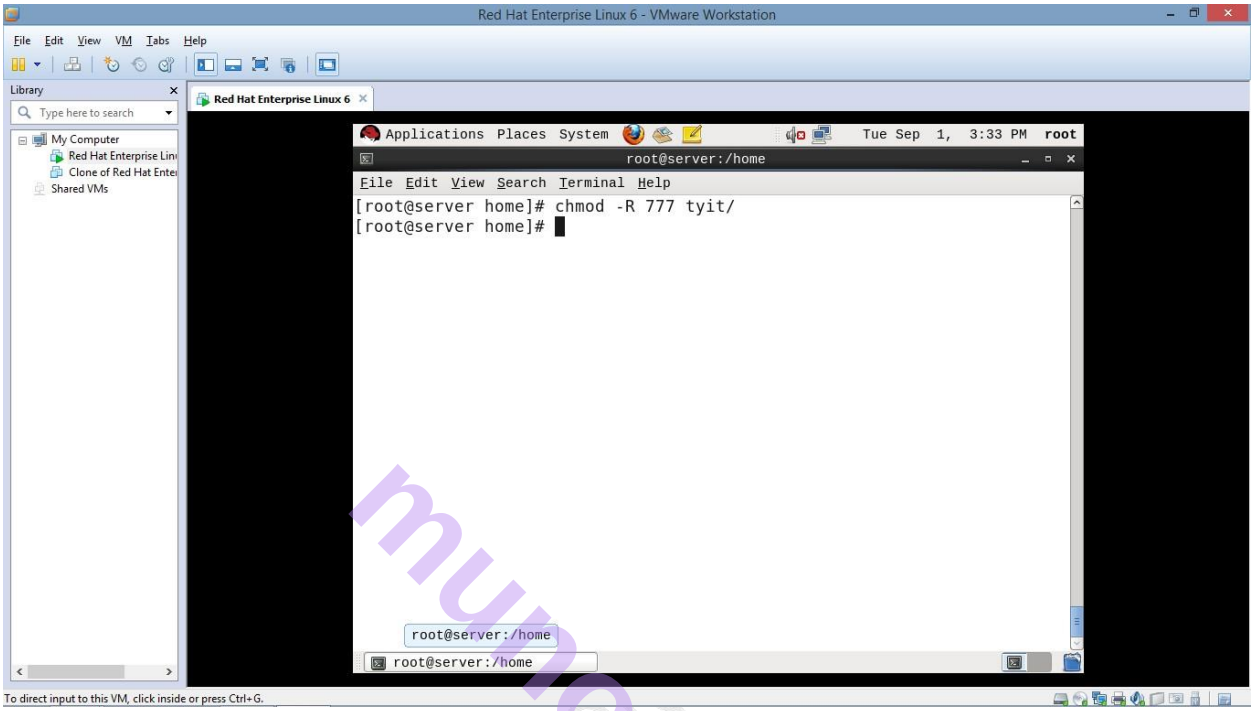
Hello my First Samba file to be shared

Press <ctrl+d> to save the file.



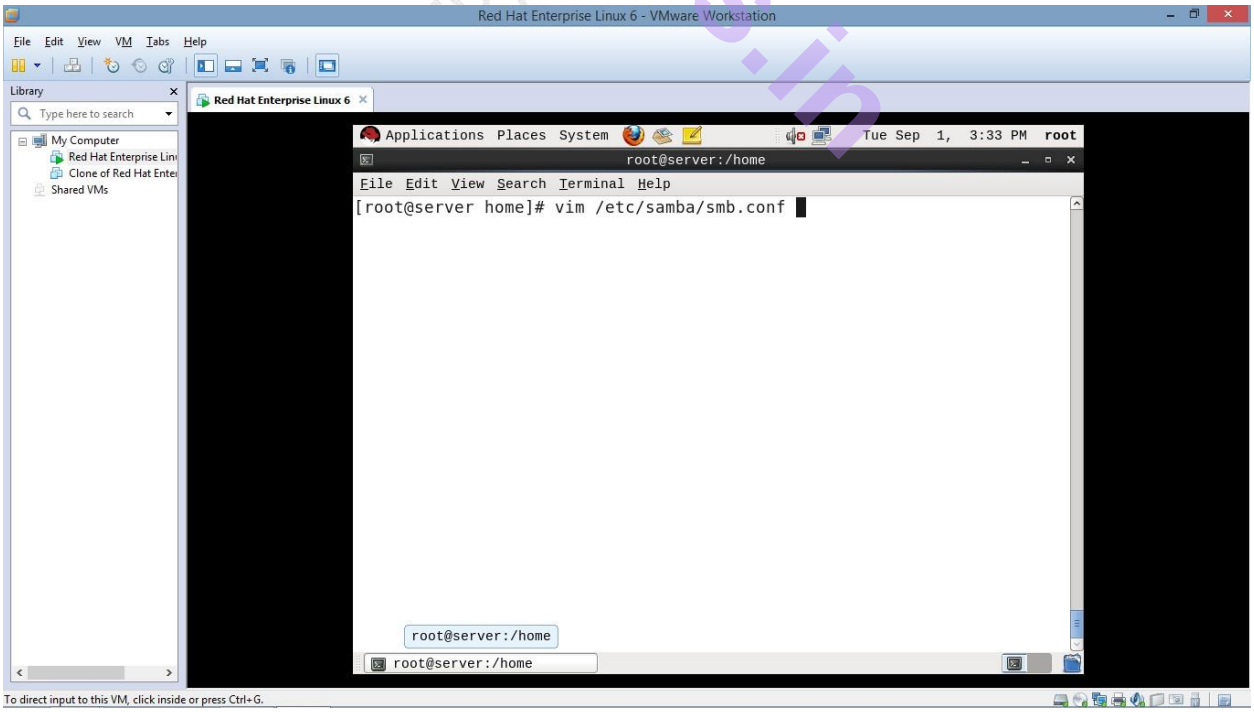
Also give this directory full permission.

chmod –R 777 /tyit/

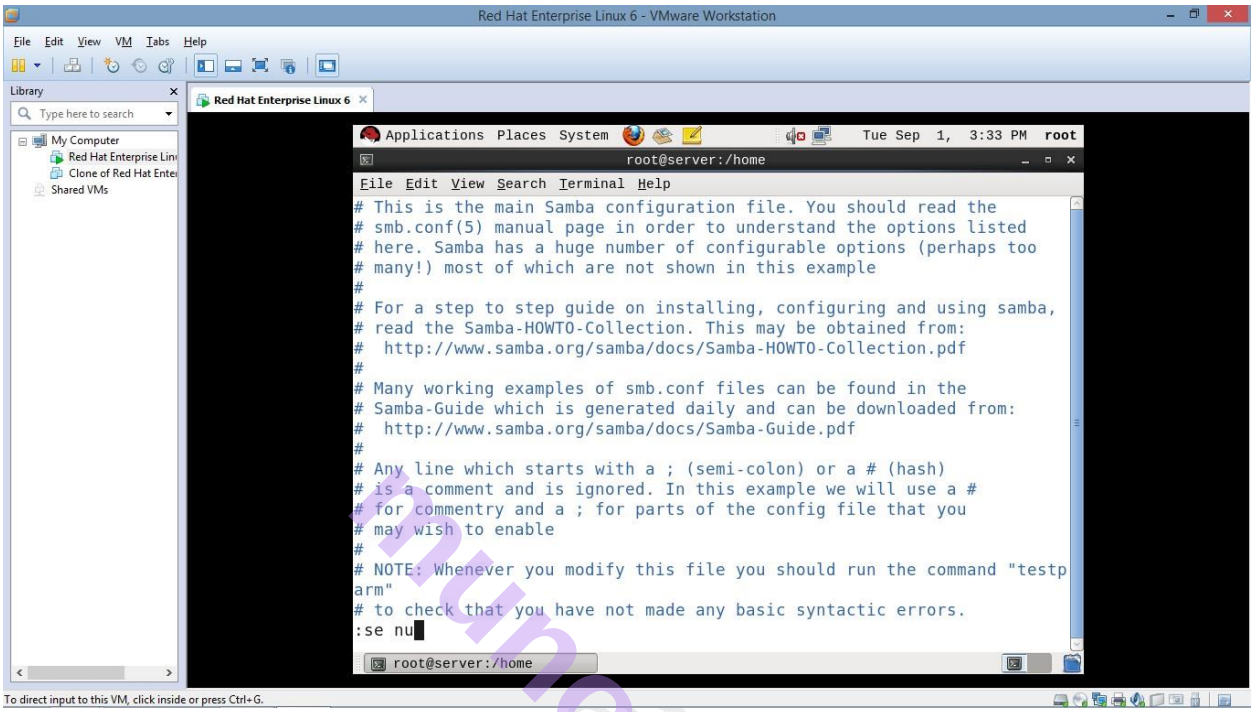


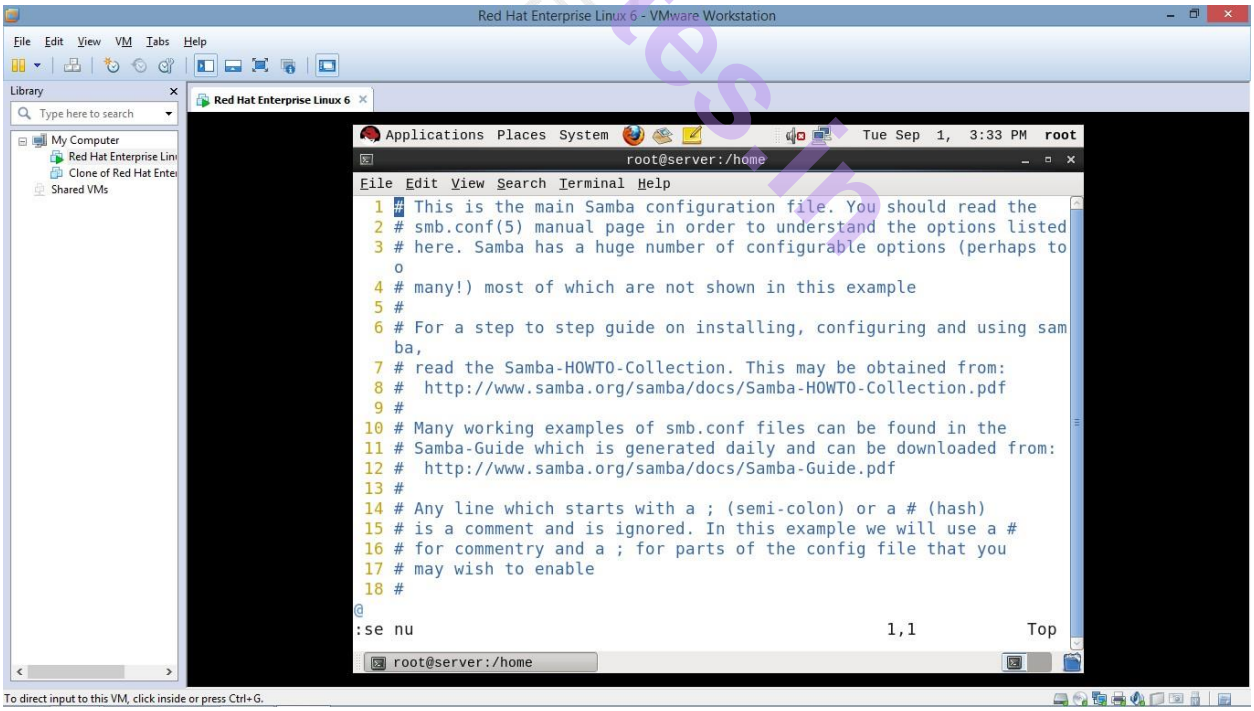
Open the samba configuration file :

 # vi /etc/samba/smb.conf

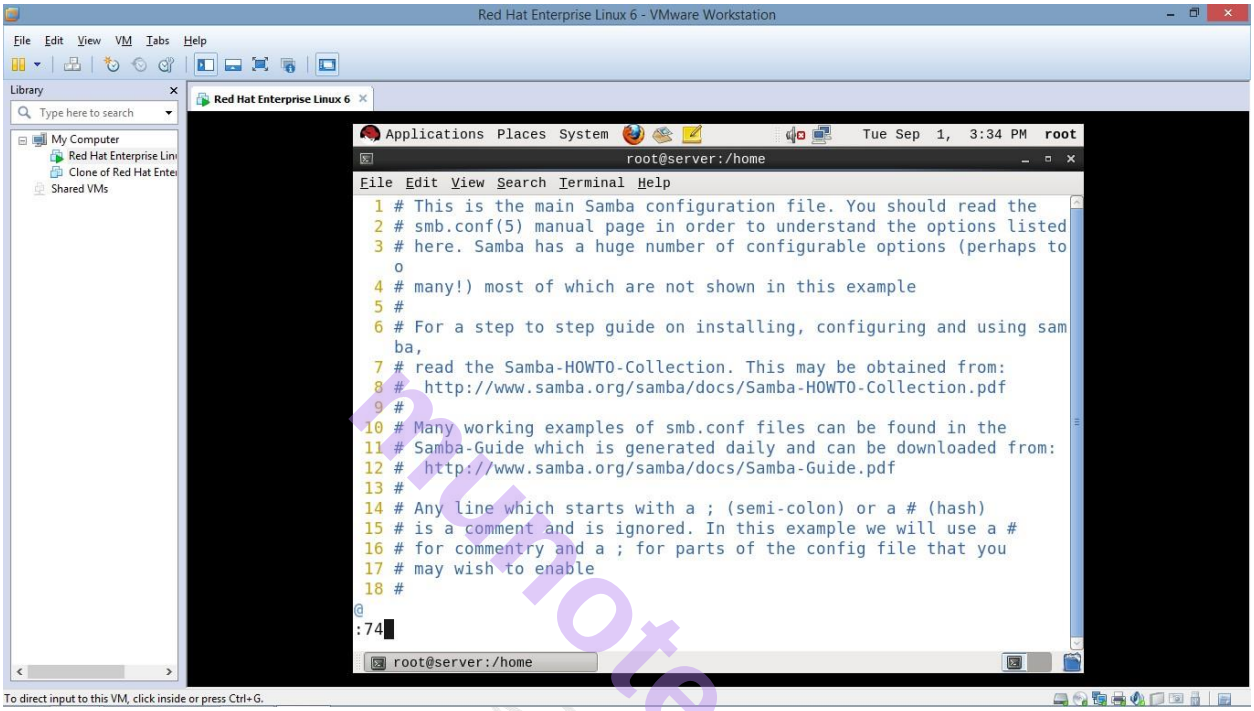


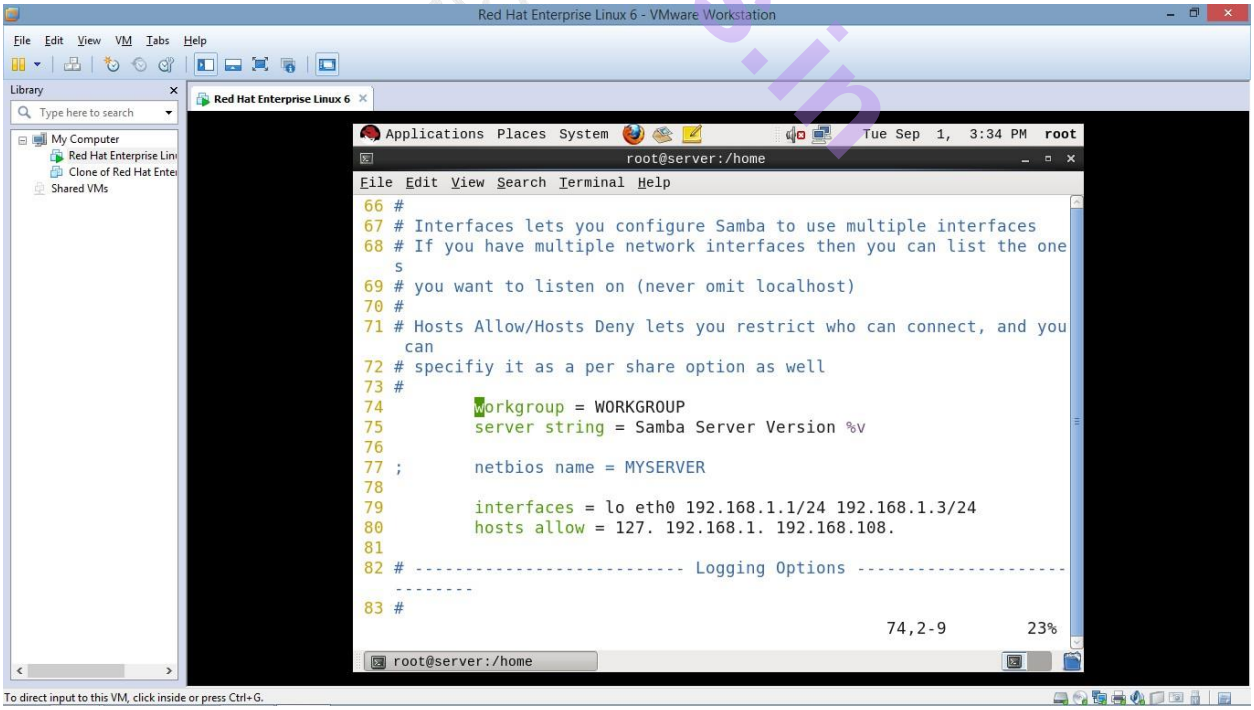
Make the following changes:
To set the line numbers - :se nu



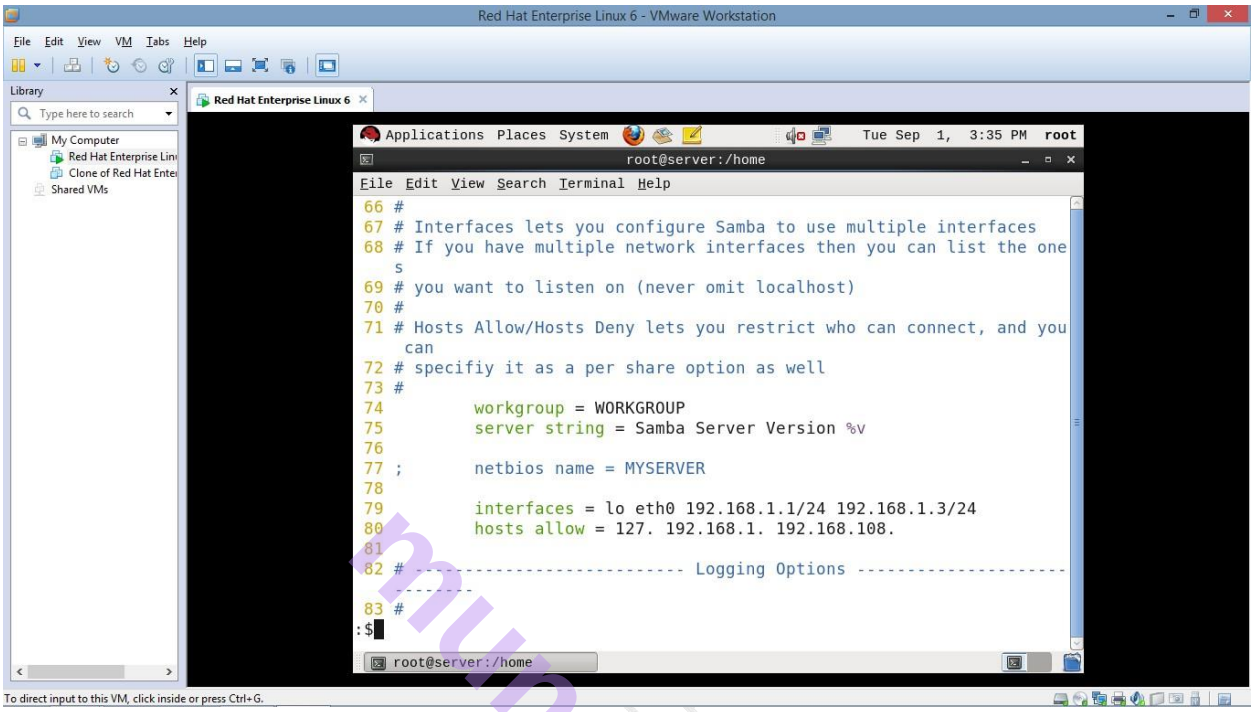


a) Line no 74: workgroup=MYGROUP To workgroup= WORKGROUP(windows workgroup)
b) Line no 79: eth0 192.168.1.1/24 192.168.1.3/24
c) Line no 80: 127. 192.168.1. 192.168.108.



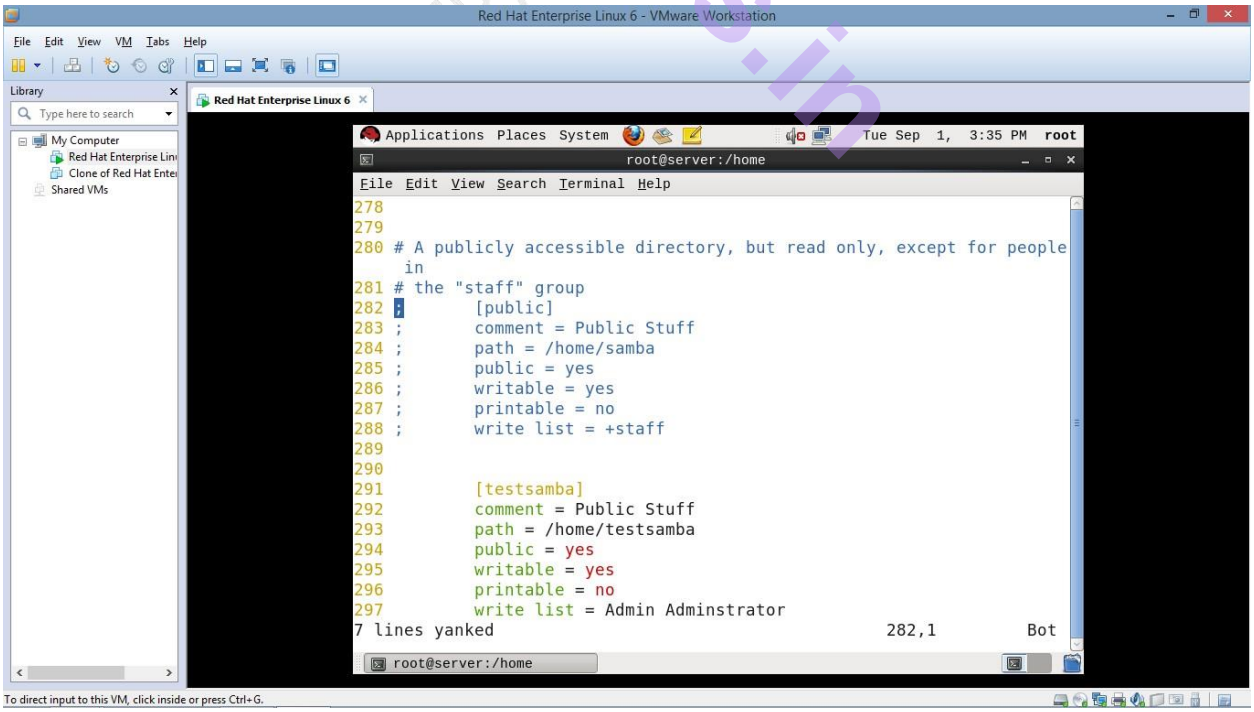


Now go to end of the file - > Press Esc -> :$

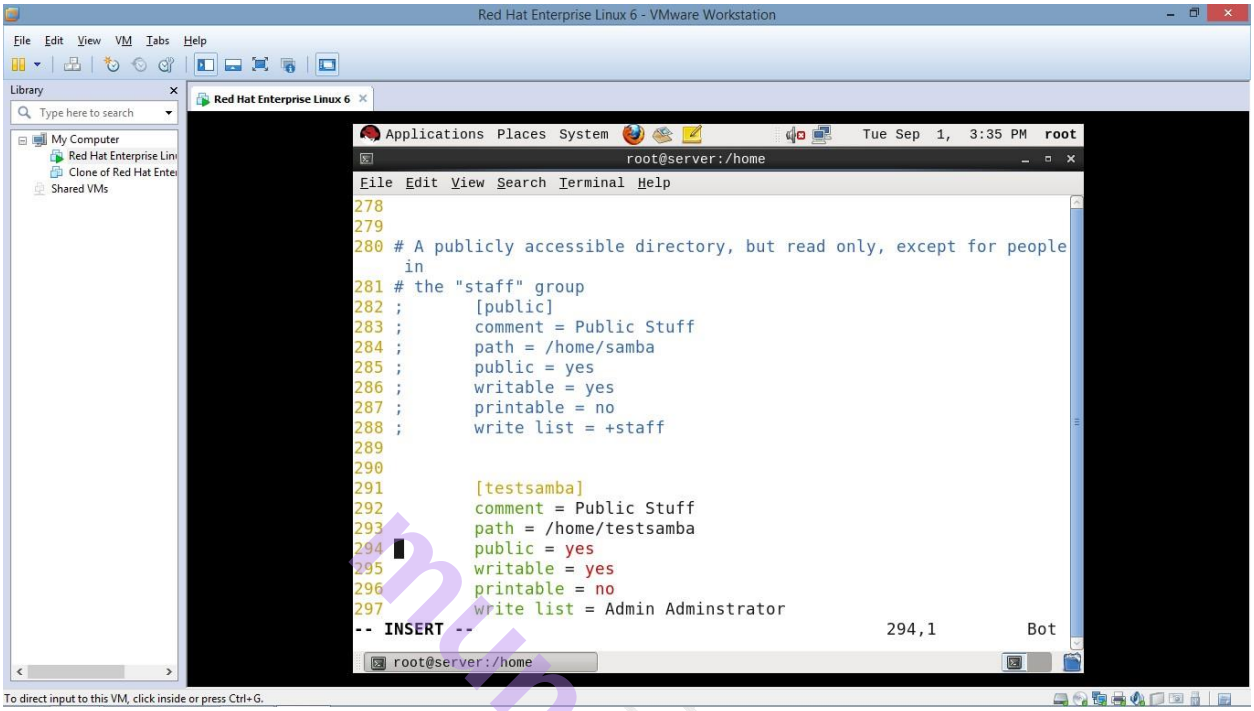


d) At the end of the file copy 7 lines and paste it.

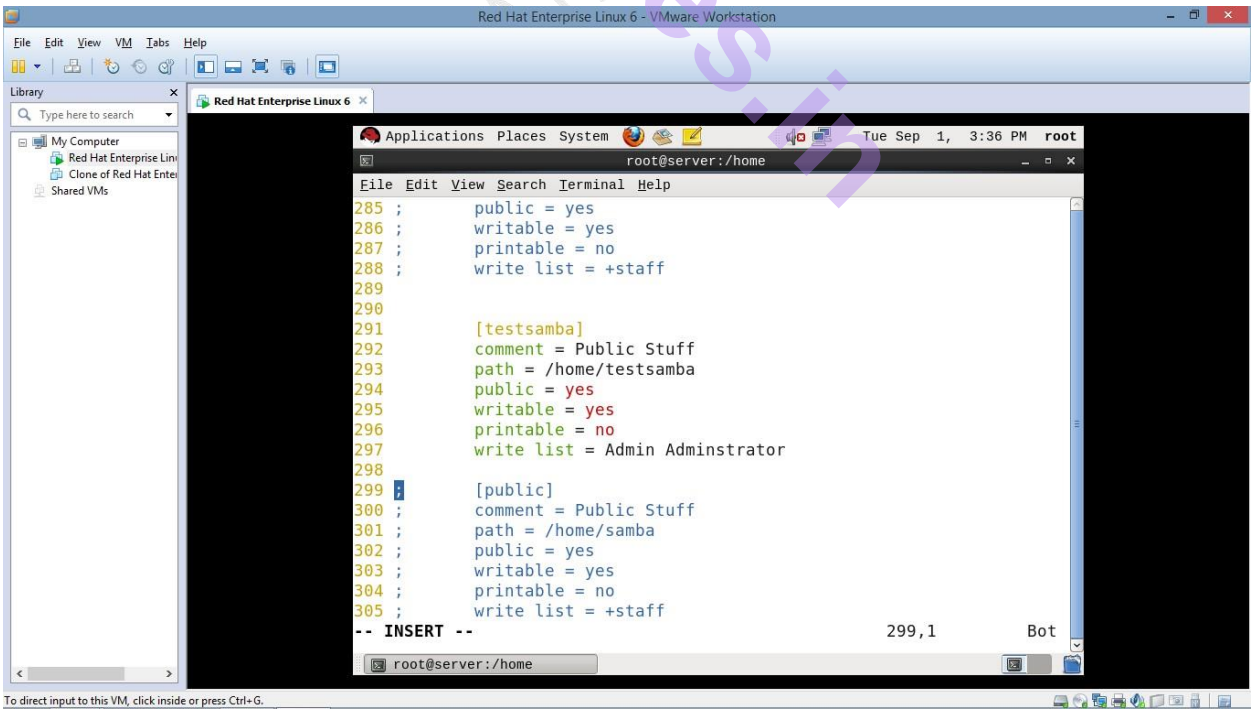
e) To copy 7 lines - type 7yy



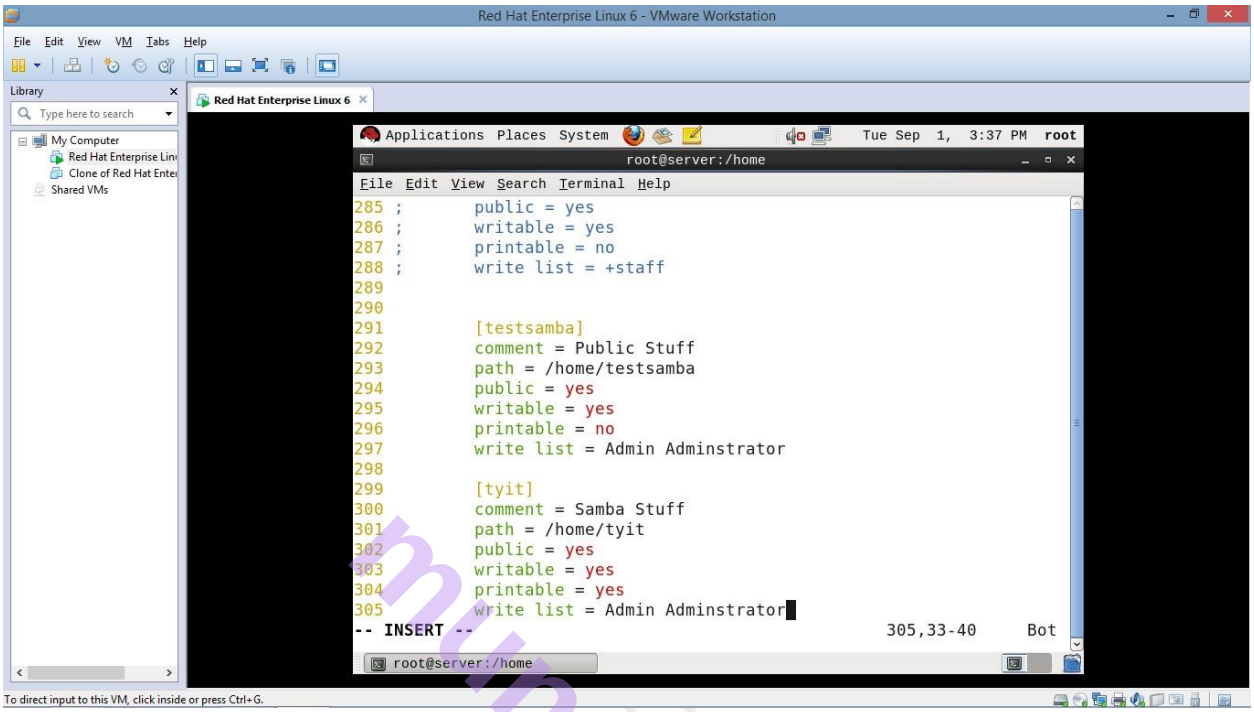
Go to Insert mode -> press ‘ i ’ -> press Enter and now paste it at the end



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

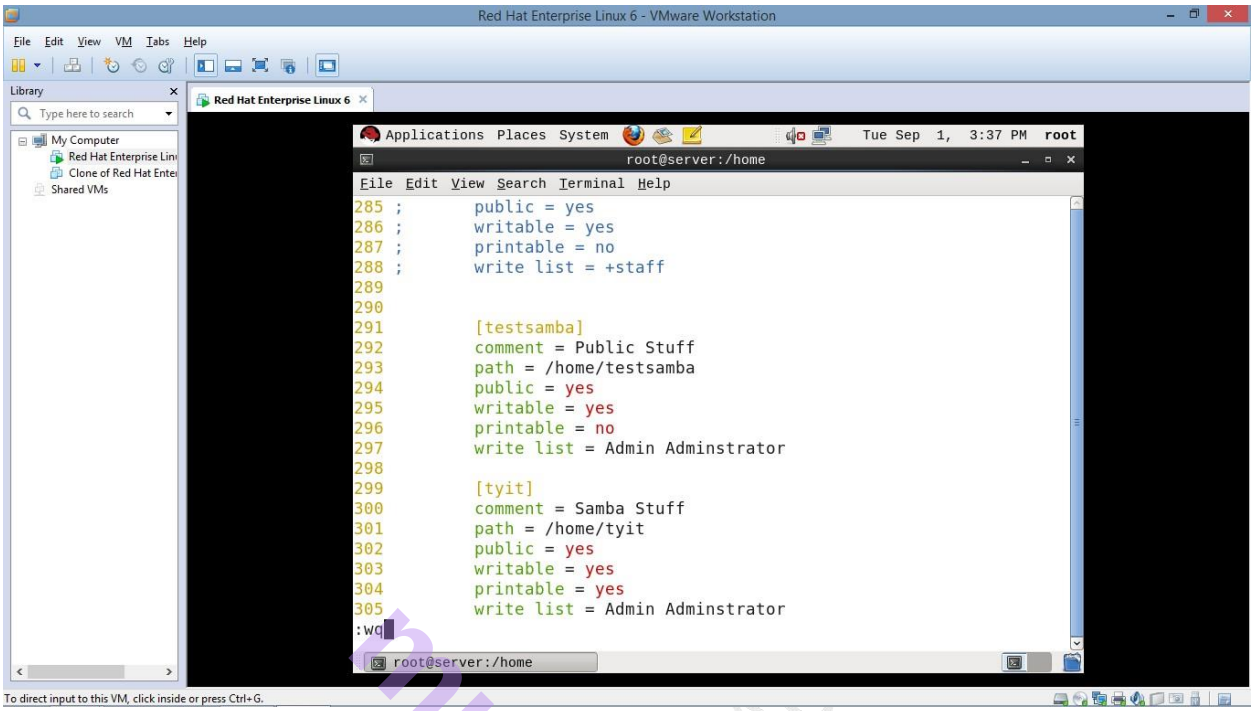


Uncomment all the 7 lines and make the following changes.



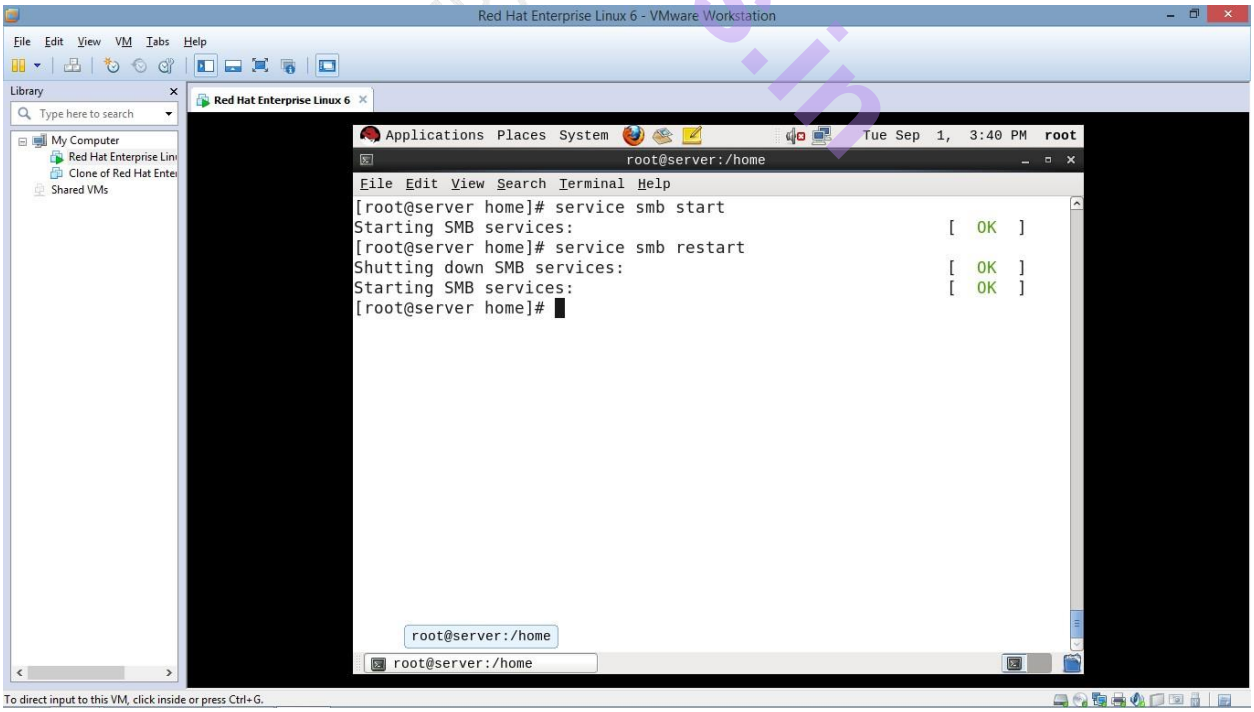
After changes line should look as follows:
[tyit]
comment = samba stuff
path = /tyit
public=yes
writable =yes
;printable =yes
write list = Admin Administrator

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

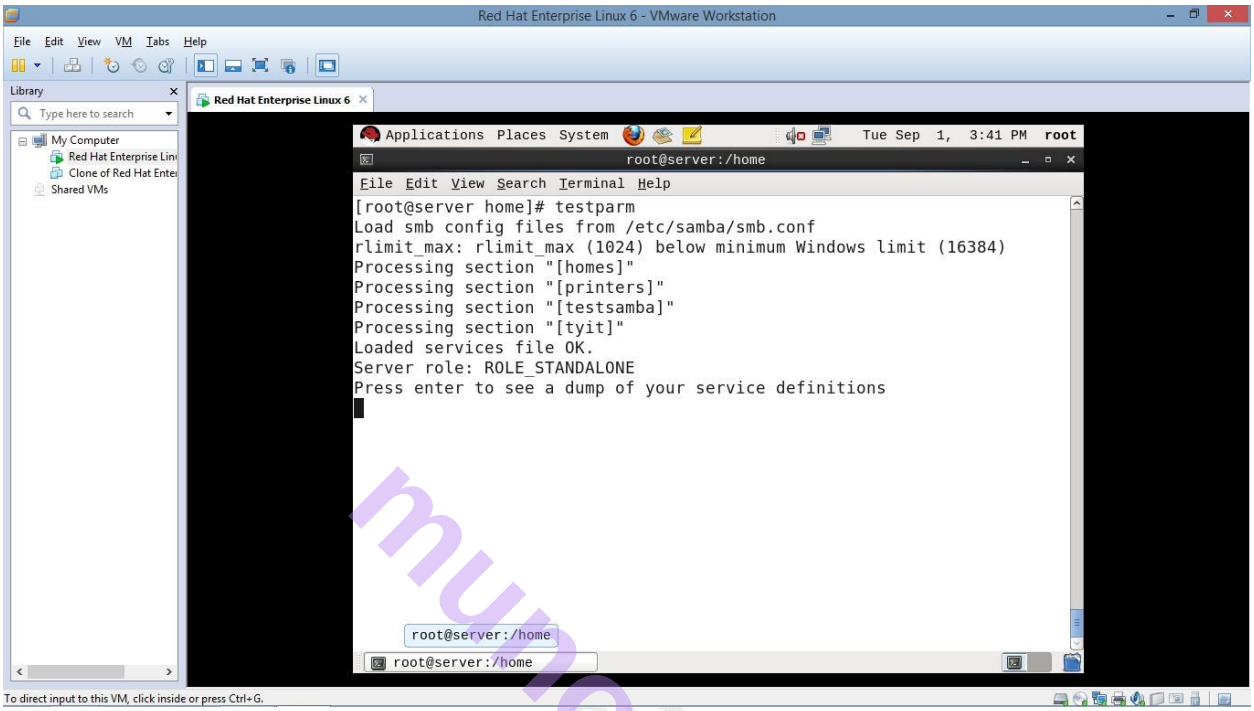


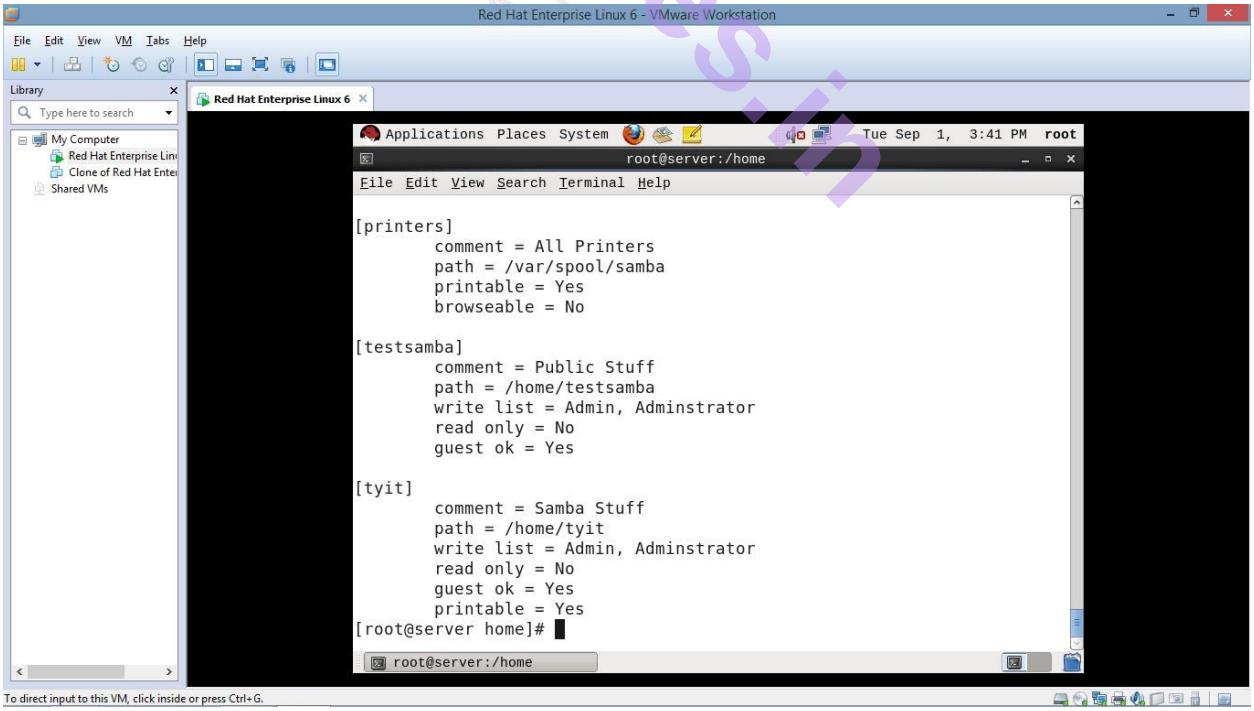
Now start the smb service

#] **service smb start**
#] **service smb restart**



Execute the command testparm to test the parameters



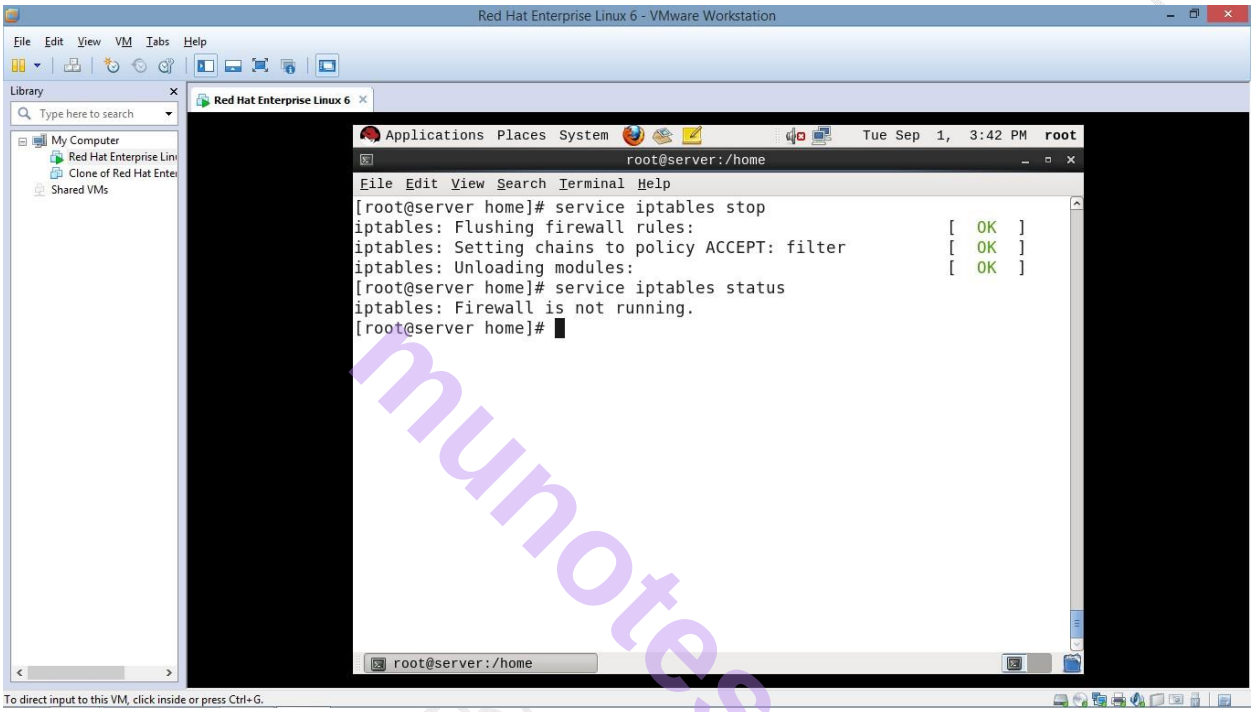


Stop Firewalls

 # service iptables stop

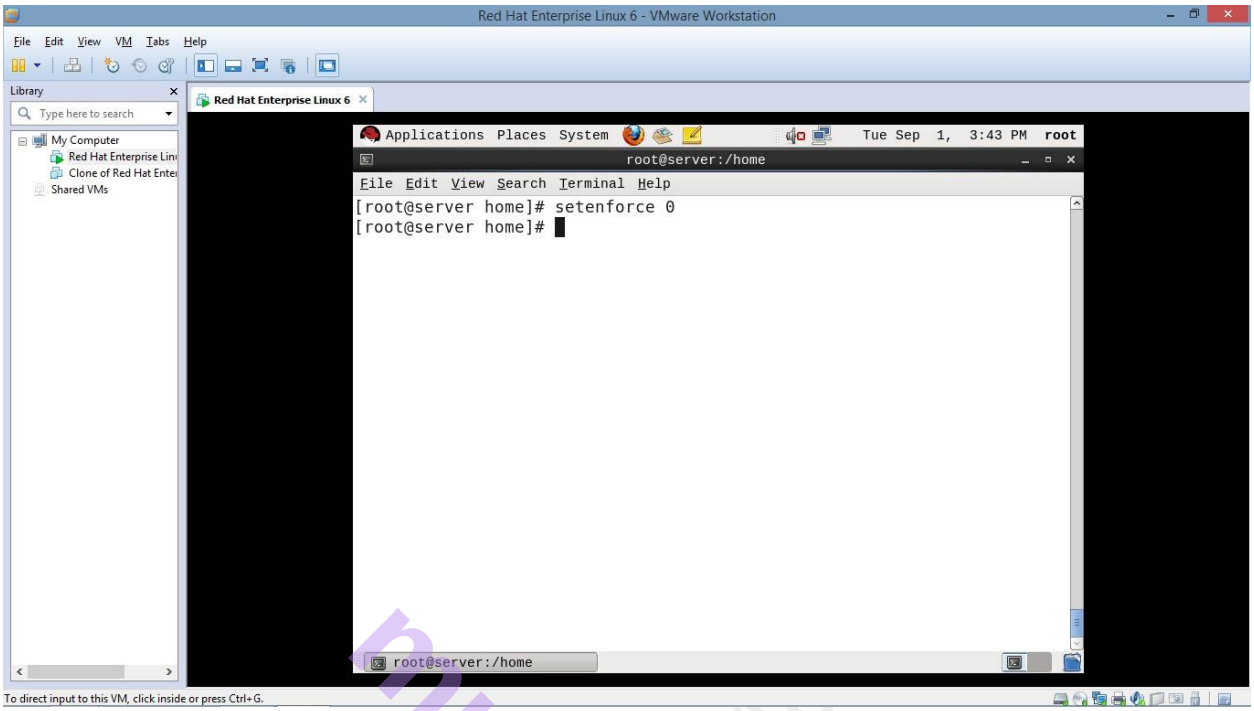
To check whether firewalls are stopped

 # service iptables status

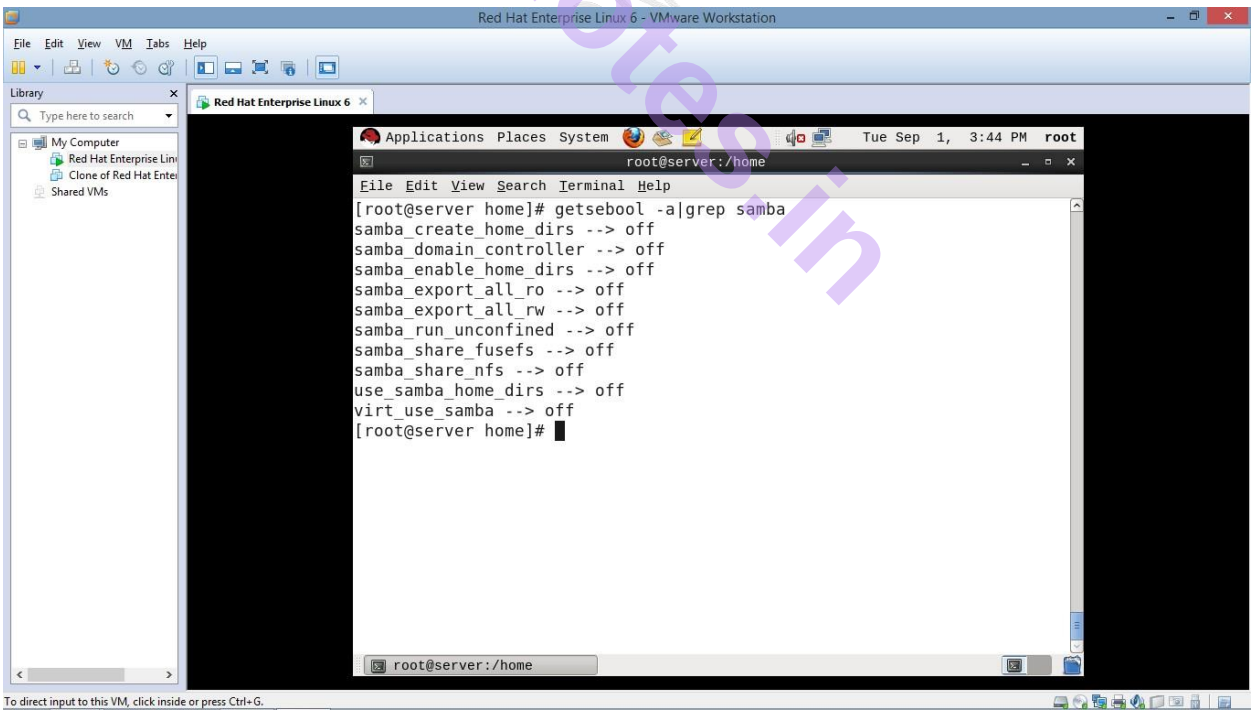


To give temporary read only permissions

 # setenforce 0



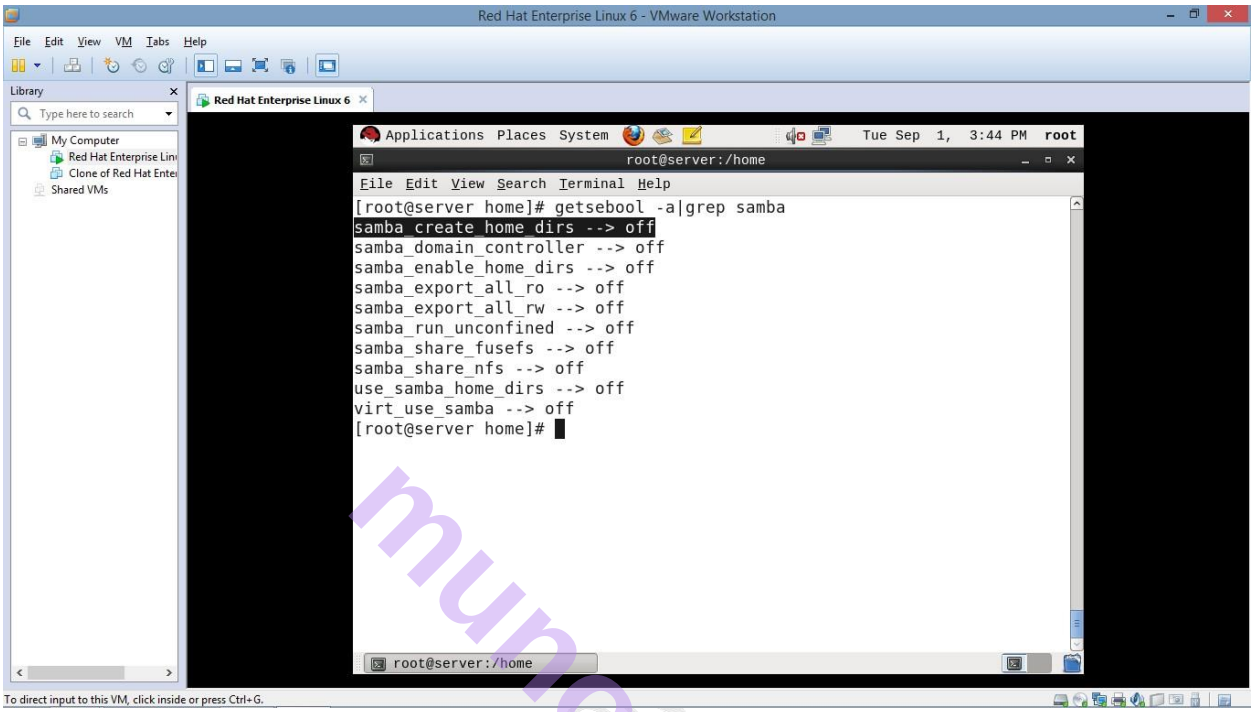
 # getsebool –a | grep samba

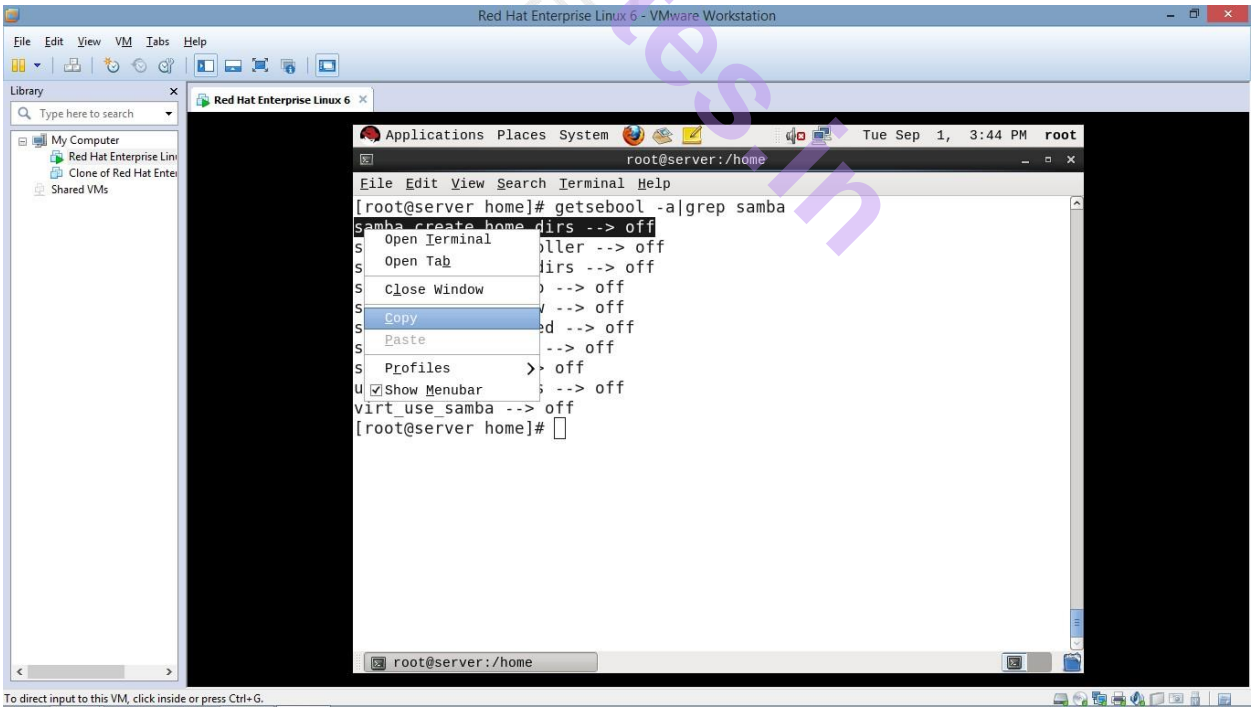


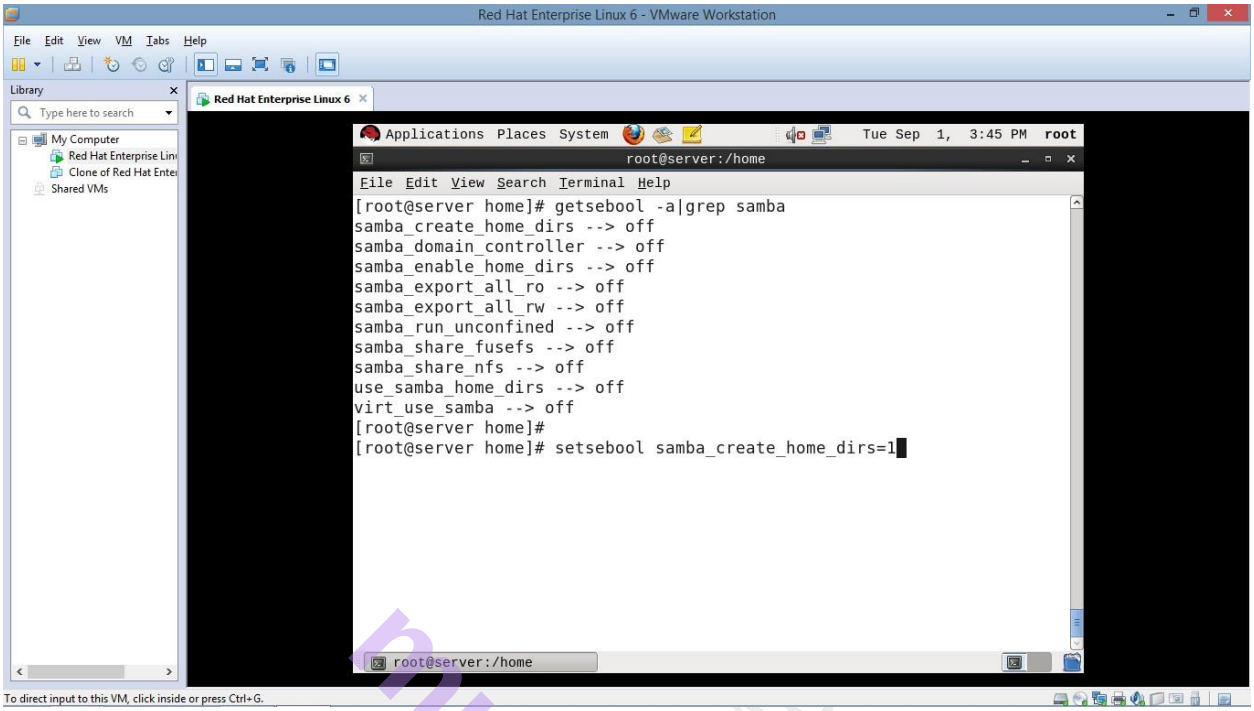
In this file home directory is off

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

#setsebool samba_enable_home_dirs=1

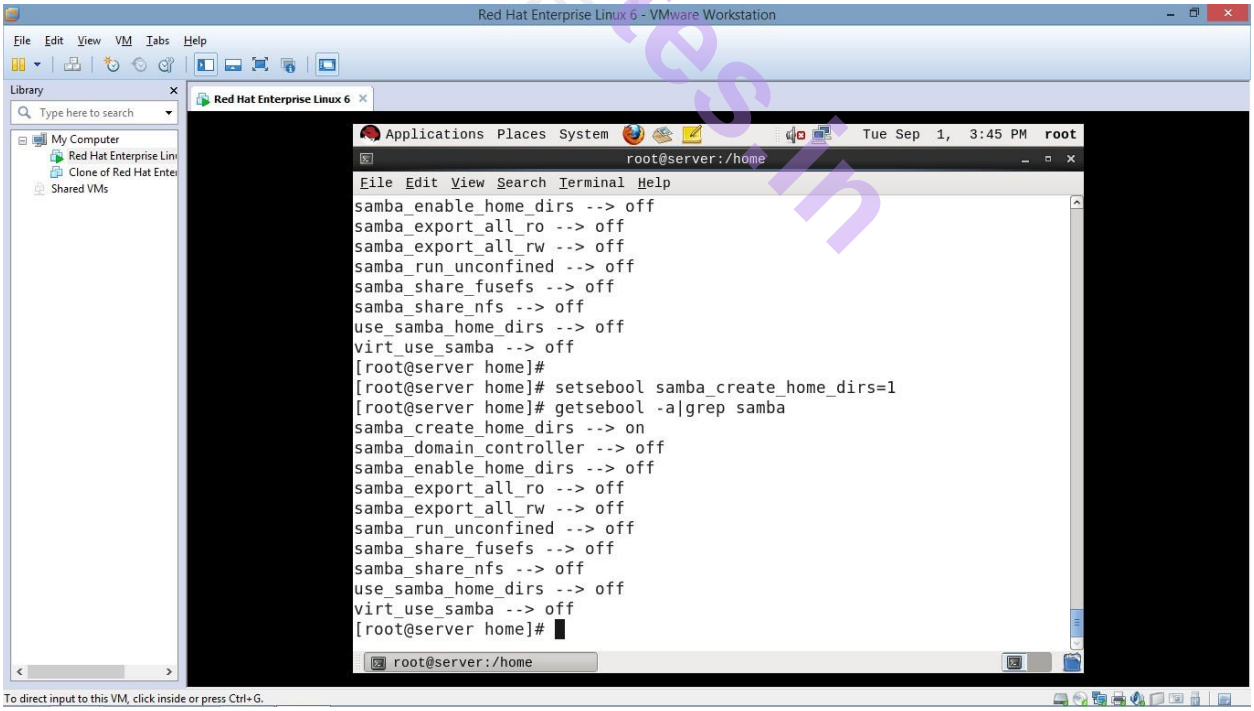






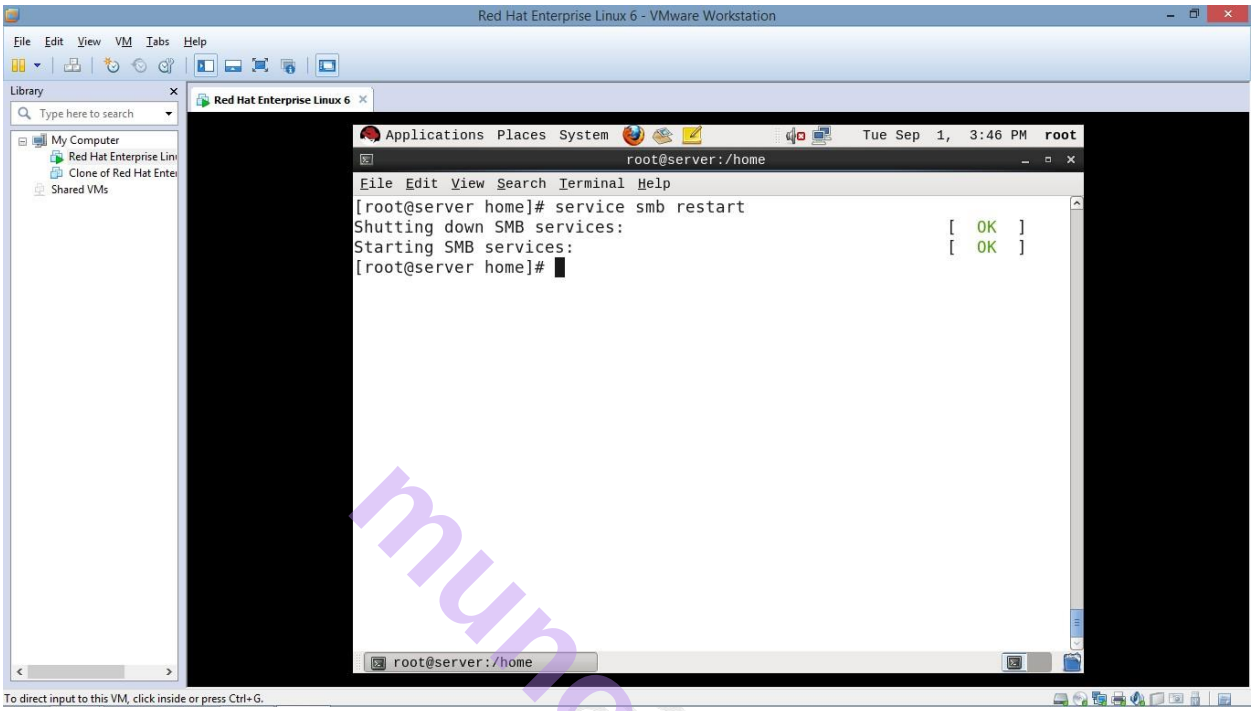
Now to check whether home directory is enabled:

 # getsebool –a | grep samba



Restart the samba service

 # service smb restart

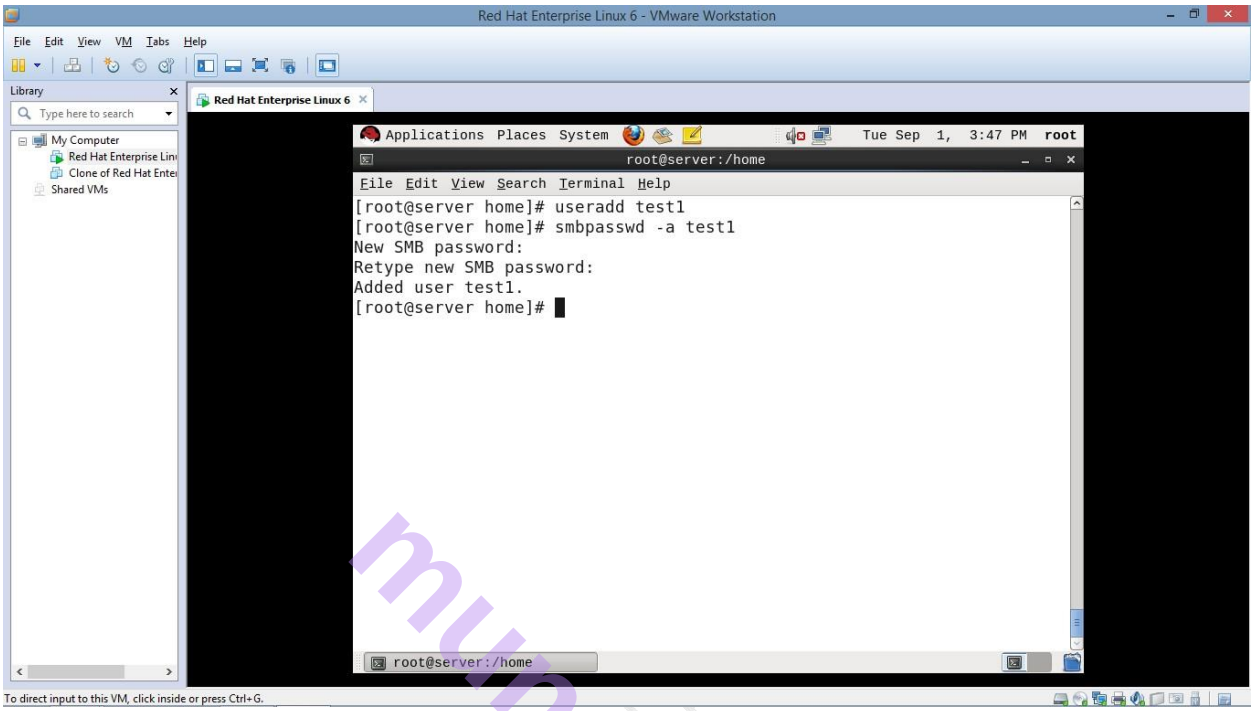


Create a samba user and assign password

 # useradd test1

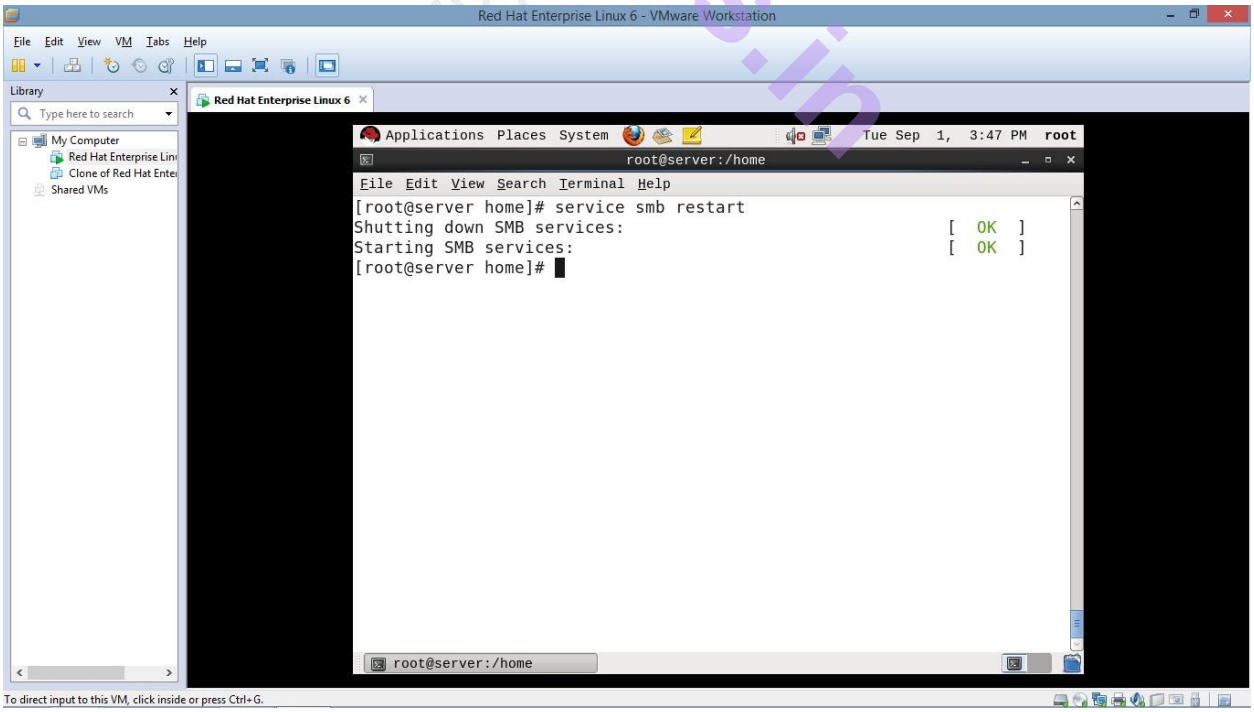
 # smbpasswd –a test1

Enter the password and confirm password



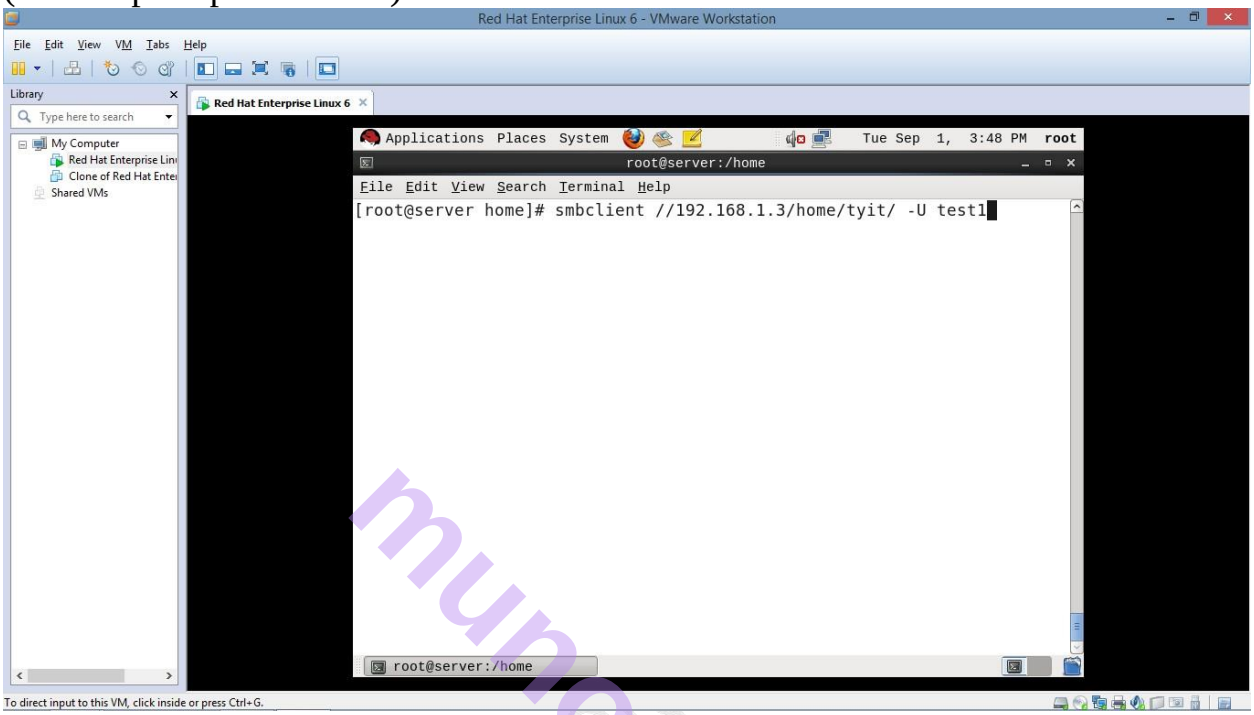
Restart the service

 # service smb restart

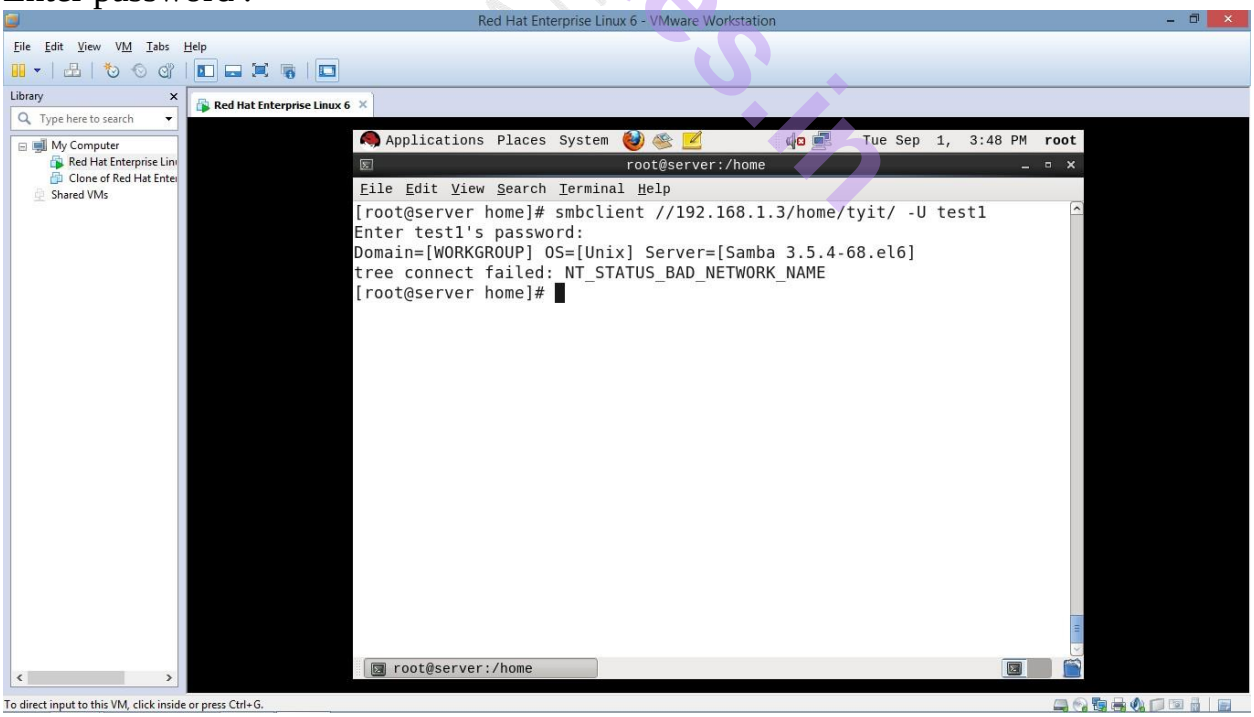


#smbclient //192.168.1.3/home/tyit/ -U test1

(-U will prompt username)

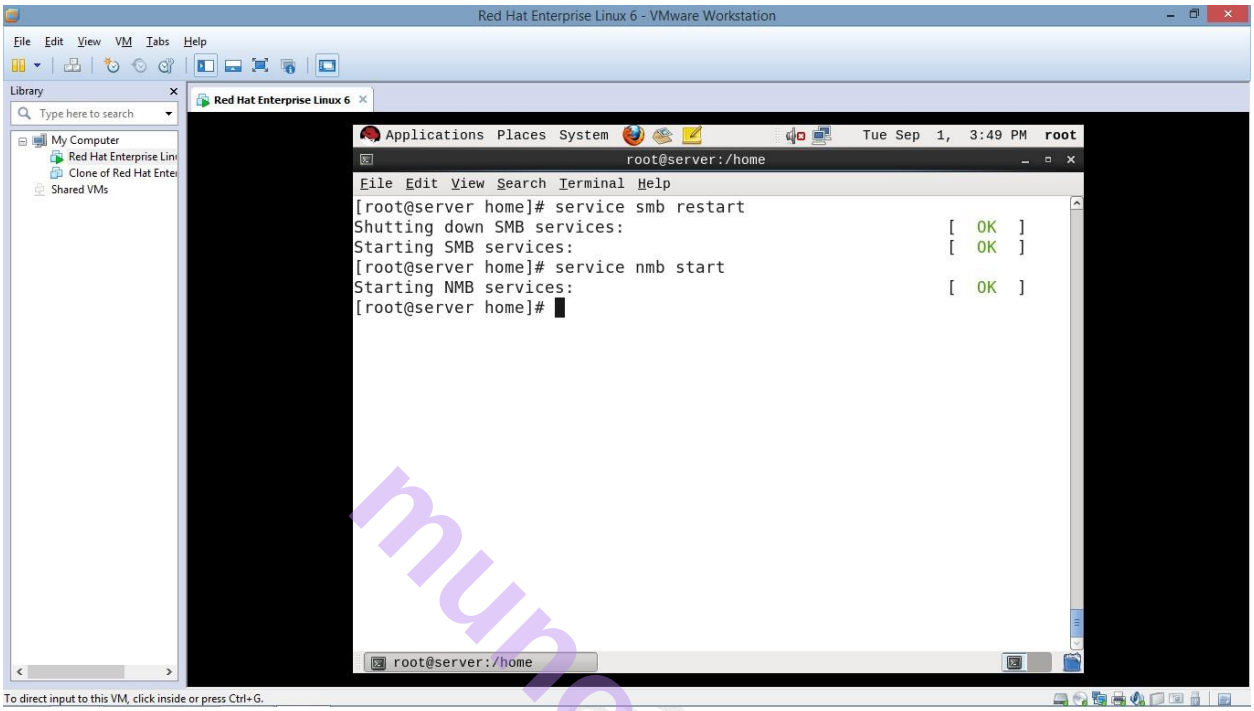


Enter password :



 # service smb restart

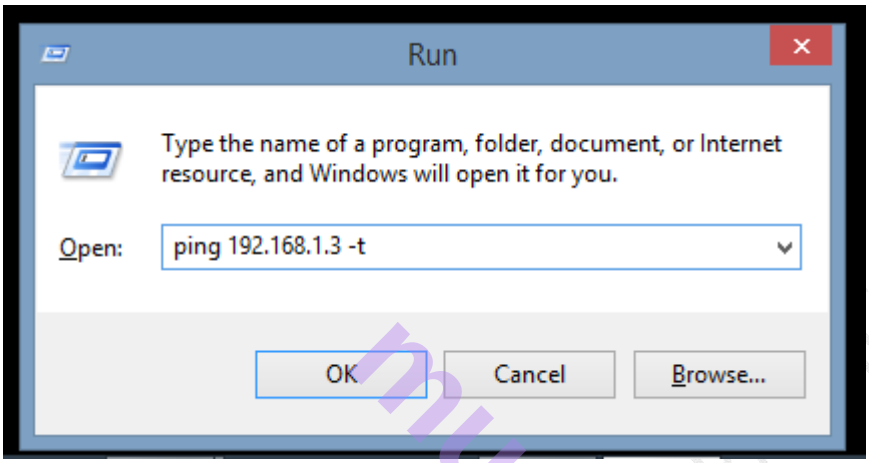
 # service nmb start (//start network services)



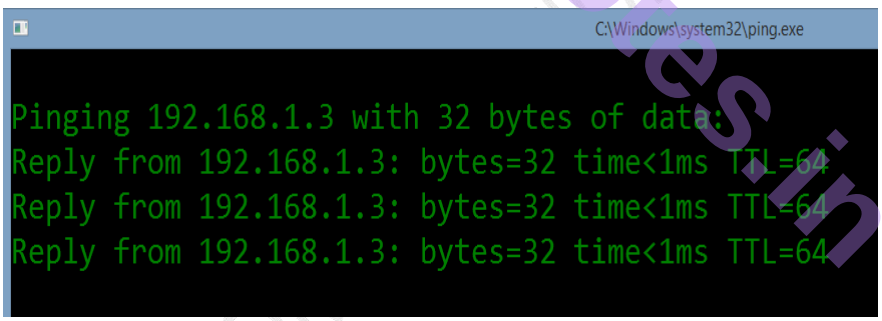
Go to Windows

Run Command

Type **ping 192.168.1.3 -t**



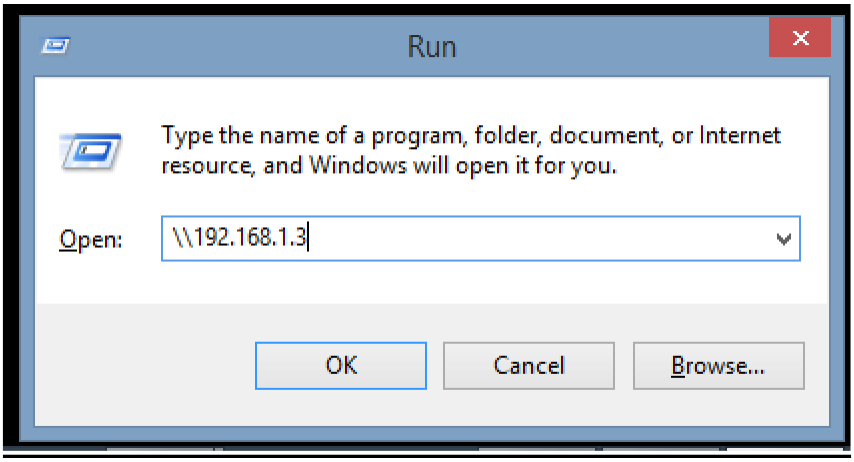
Check whether reply and response is working fine.



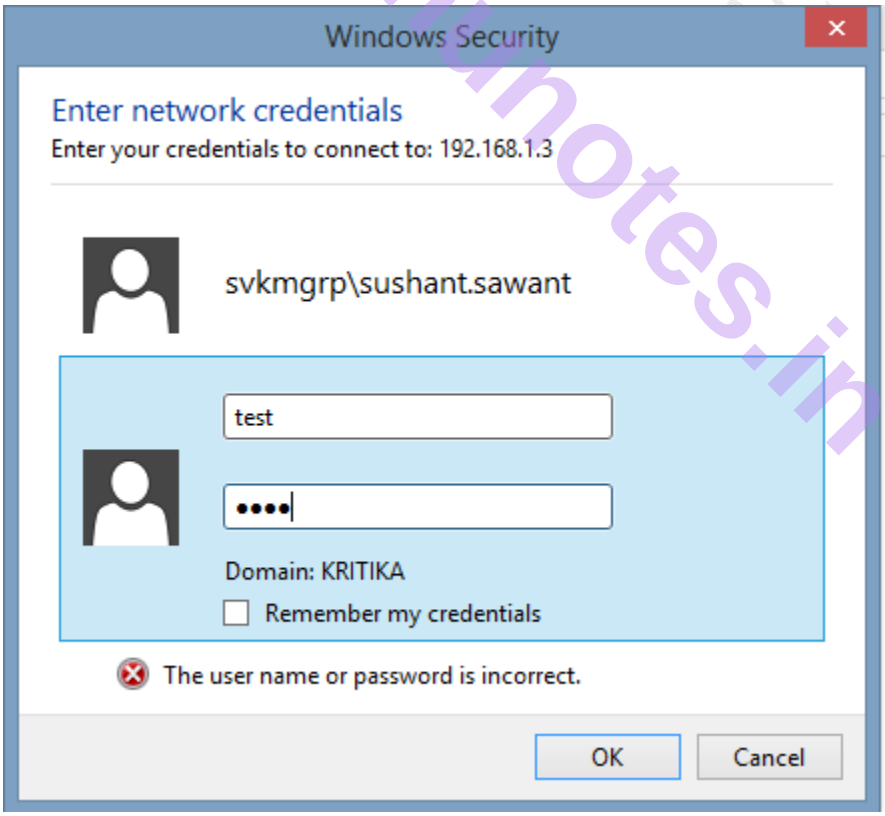
Close

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

Run - > **\\192.168.1.3**



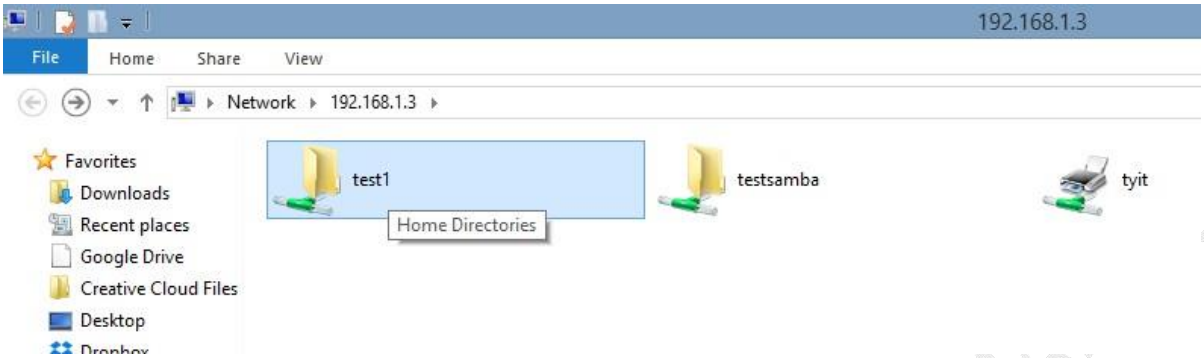
It will prompt one dialog box asking for username and password
Enter Username – test1
Enter Password - **********

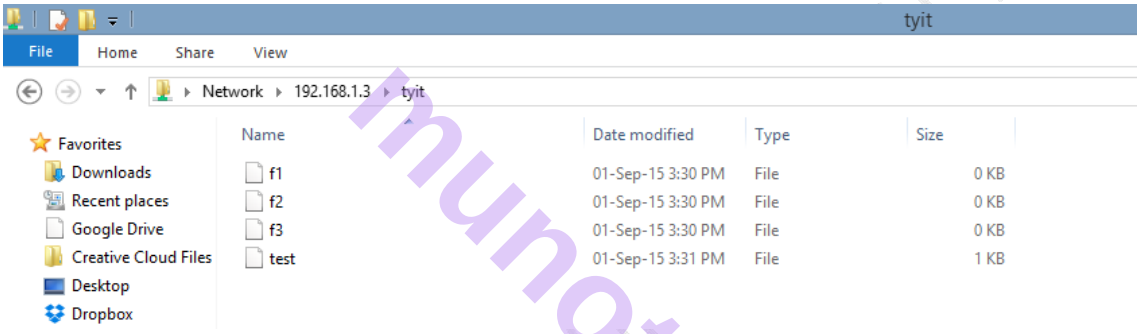


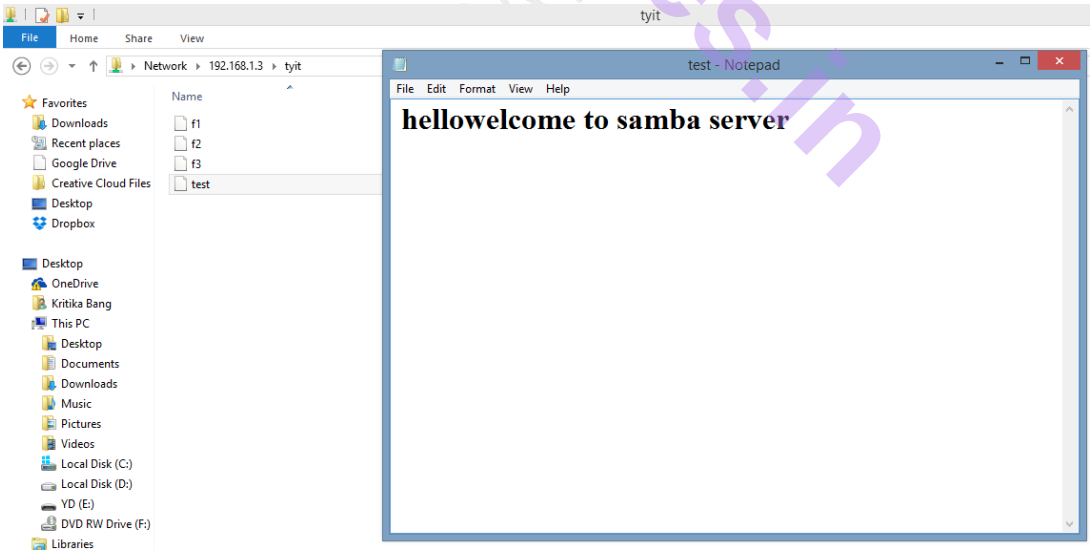
Now you will be able to see that files are transferred.

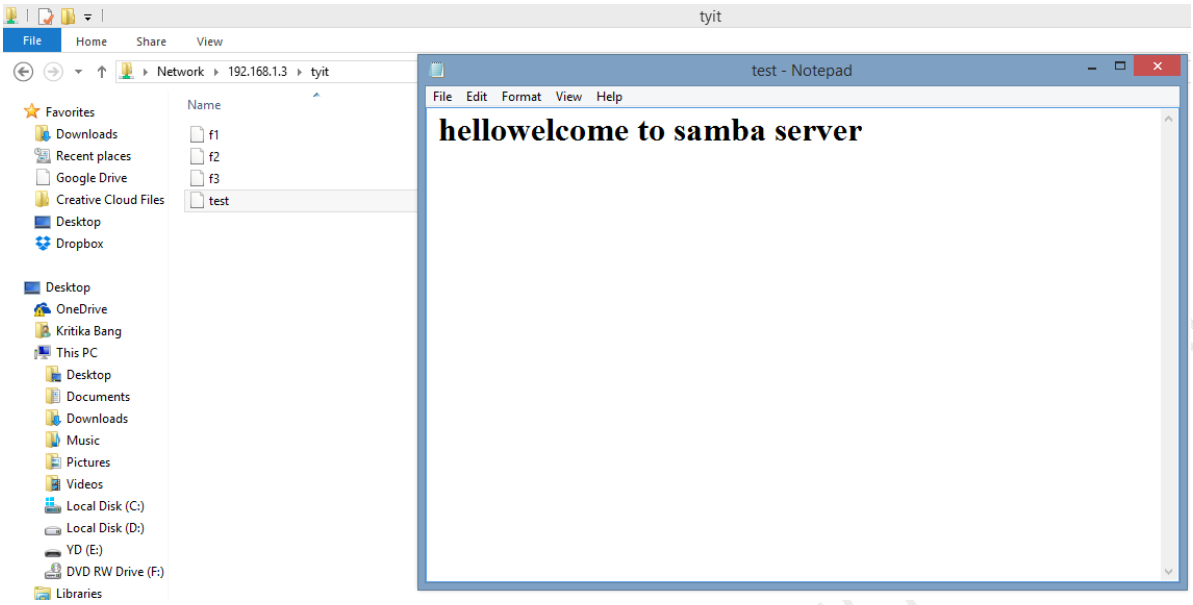
Now create a folder in Windows and check whether files from windows are

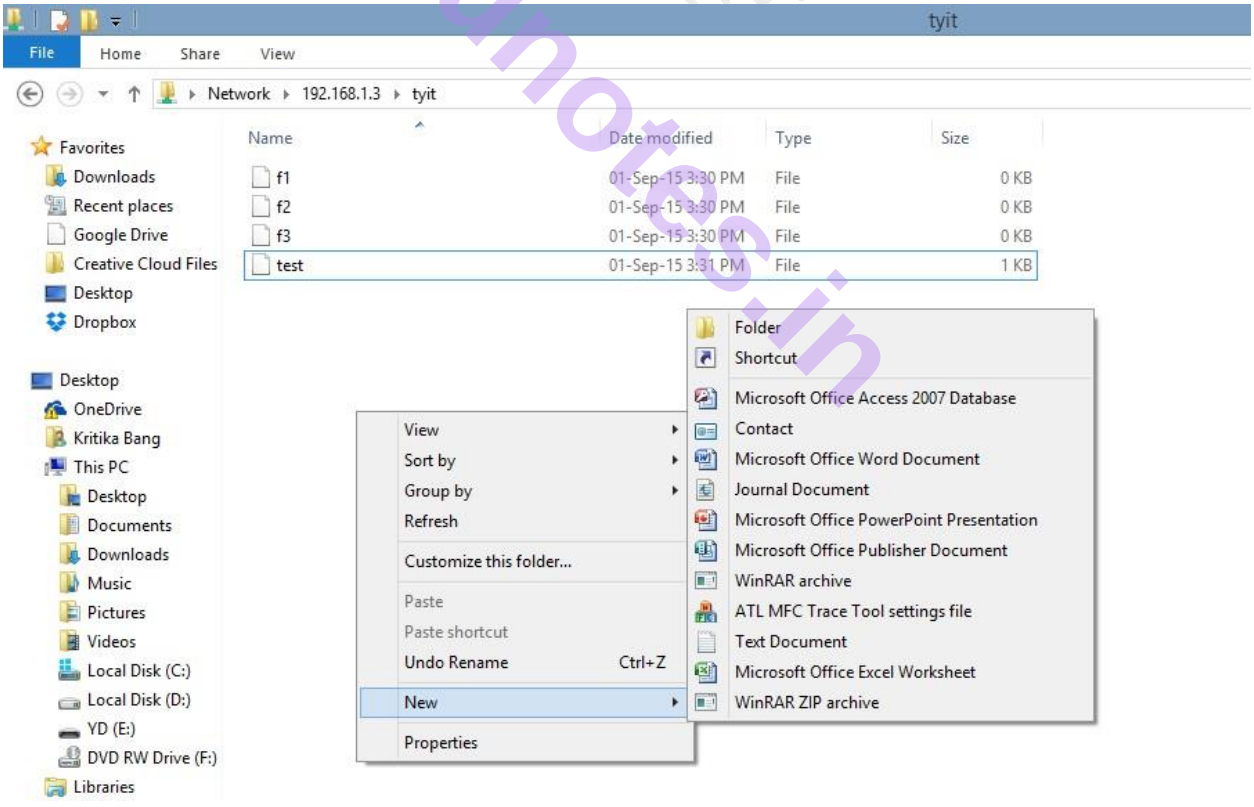
transferred to Linux

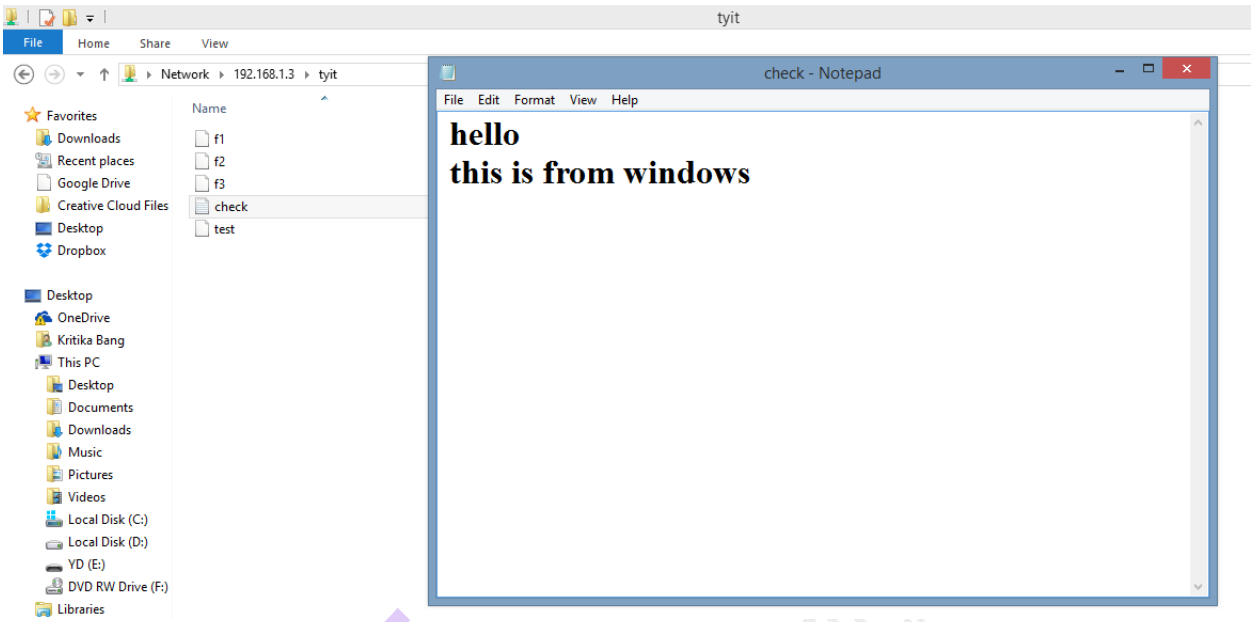




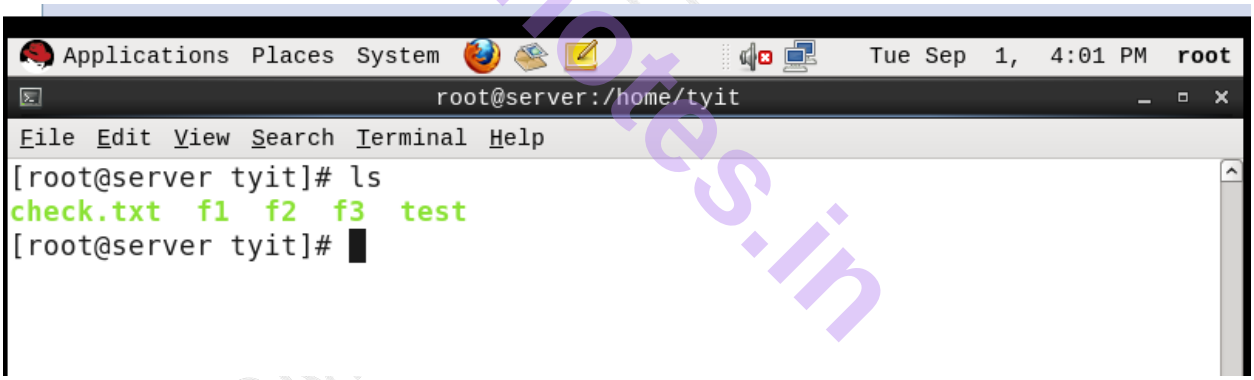



tyit
File
Home
Share
View
Network ▸ 192.168.1.3 ▸ tyit
Favorites
Downloads
Recent places
Google Drive
Creative Cloud Files
Desktop
Dropbox
Desktop
OneDrive
Kritika Bang
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Local Disk (D:)
YD (E:)
DVD RW Drive (F:)
Libraries
Name
f1
f2
f3
test
test - Notepad
File Edit Format View Help
hellowelcome to samba server


tyit
File
Home
Share
View
Network ▸ 192.168.1.3 ▸ tyit
Favorites
Downloads
Recent places
Google Drive
Creative Cloud Files
Desktop
Dropbox
Desktop
OneDrive
Kritika Bang
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Local Disk (D:)
YD (E:)
DVD RW Drive (F:)
Libraries
Name
Date modified
Type
Size
f1 01-Sep-15 3:30 PM File 0 KB
f2 01-Sep-15 3:30 PM File 0 KB
f3 01-Sep-15 3:30 PM File 0 KB
test 01-Sep-15 3:31 PM File 1 KB
View
Sort by
Group by
Refresh
Customize this folder...
Paste
Paste shortcut
Undo Rename Ctrl+Z
New
Properties
Folder
Shortcut
Microsoft Office Access 2007 Database
Contact
Microsoft Office Word Document
Journal Document
Microsoft Office PowerPoint Presentation
Microsoft Office Publisher Document
WinRAR archive
ATL MFC Trace Tool settings file
Text Document
Microsoft Office Excel Worksheet
WinRAR ZIP archive



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

#pwd

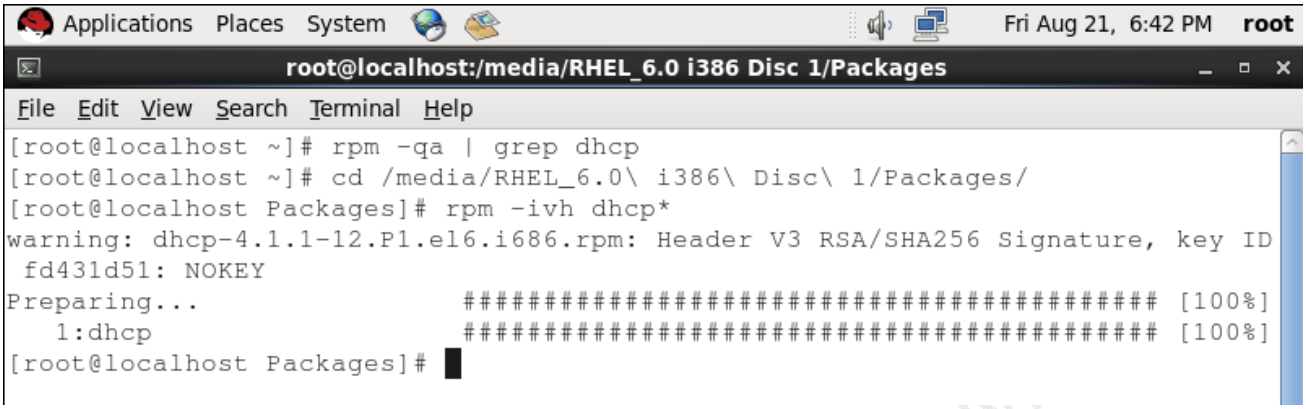
Output : -/media/RHEL/Package

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.



#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 dhcpd service in system service it should be on

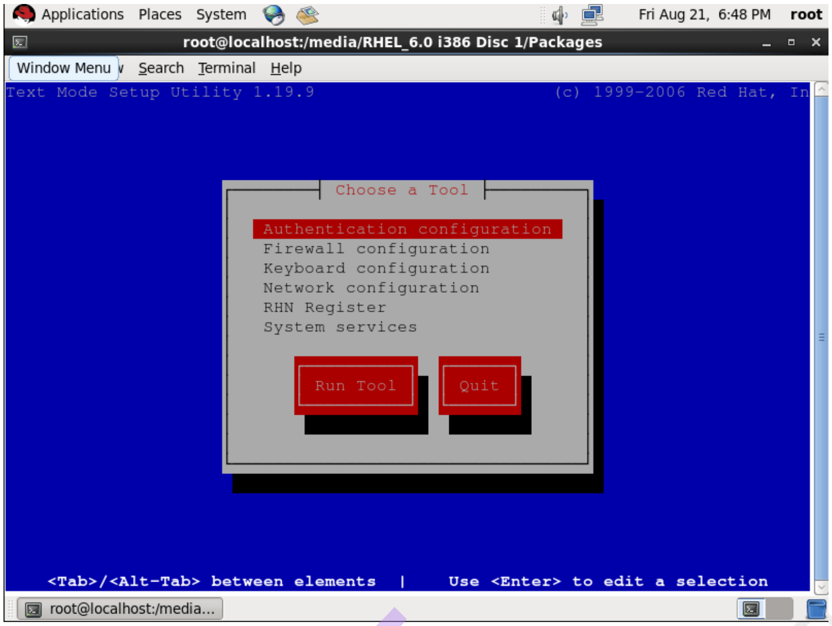
#setup

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

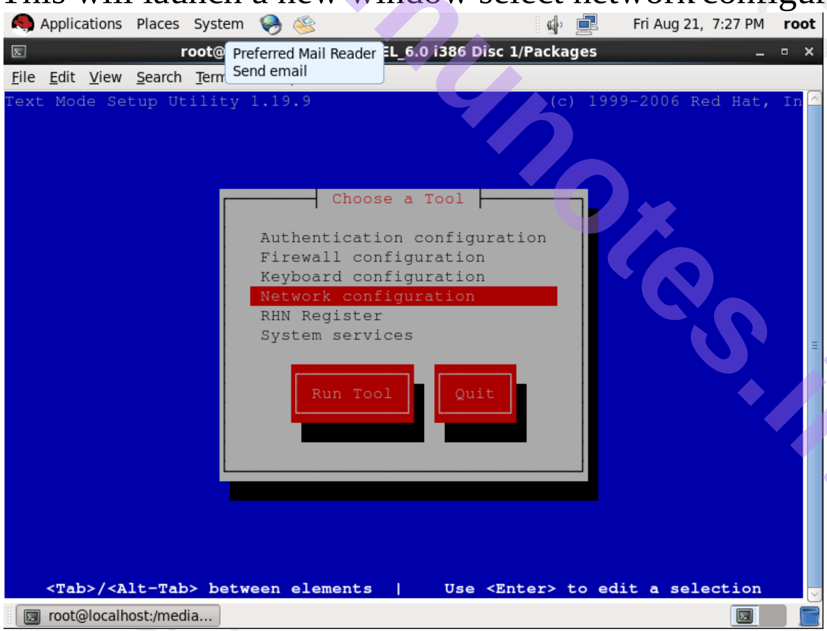
To assign IP to dhcp server

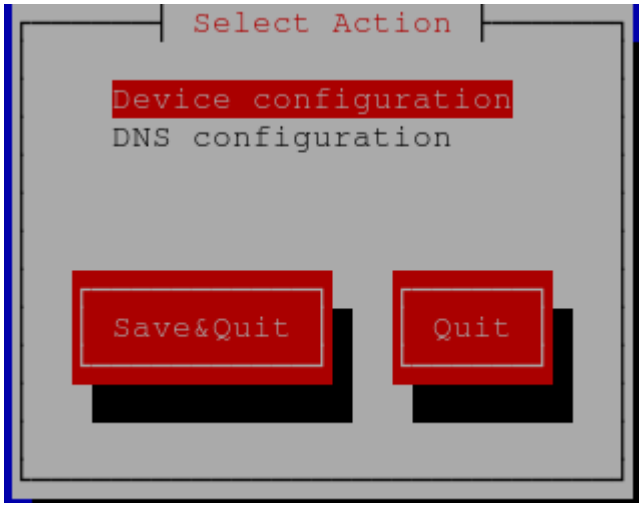
DHCP server have a static a IP address. First configure the IP address 192.168.1.3 with netmask of 255.255.255.0 on server.

Run setup command form root user

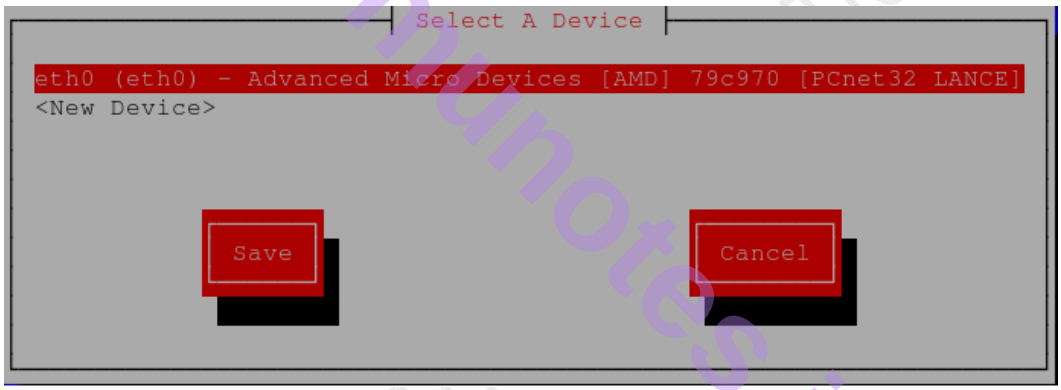


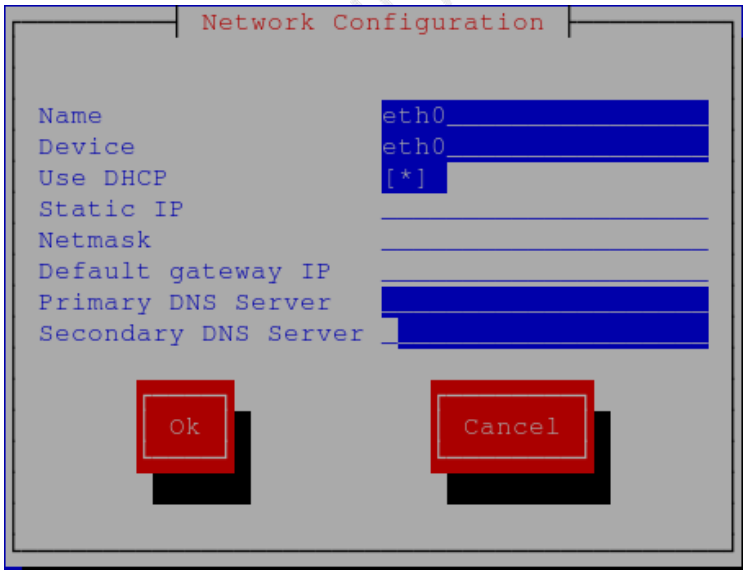
This will launch a new window select network configuration.





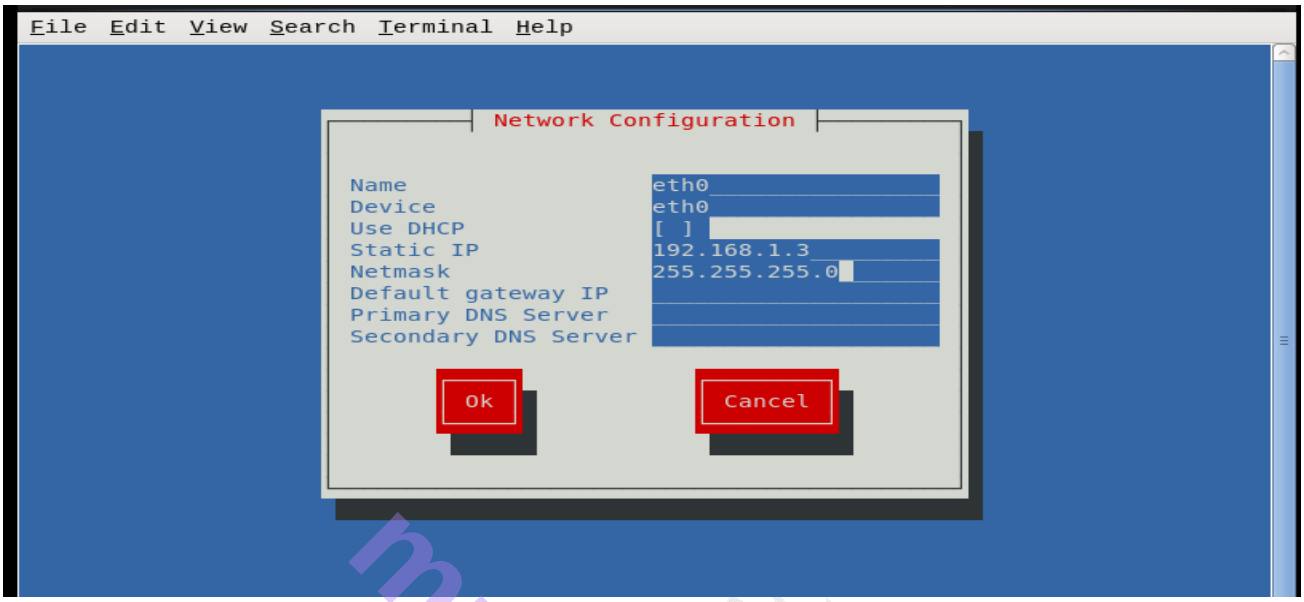
Now a new window will show you all available LAN card select your LAN card (if you don't see any LAN card here mean you don't have install driver)





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

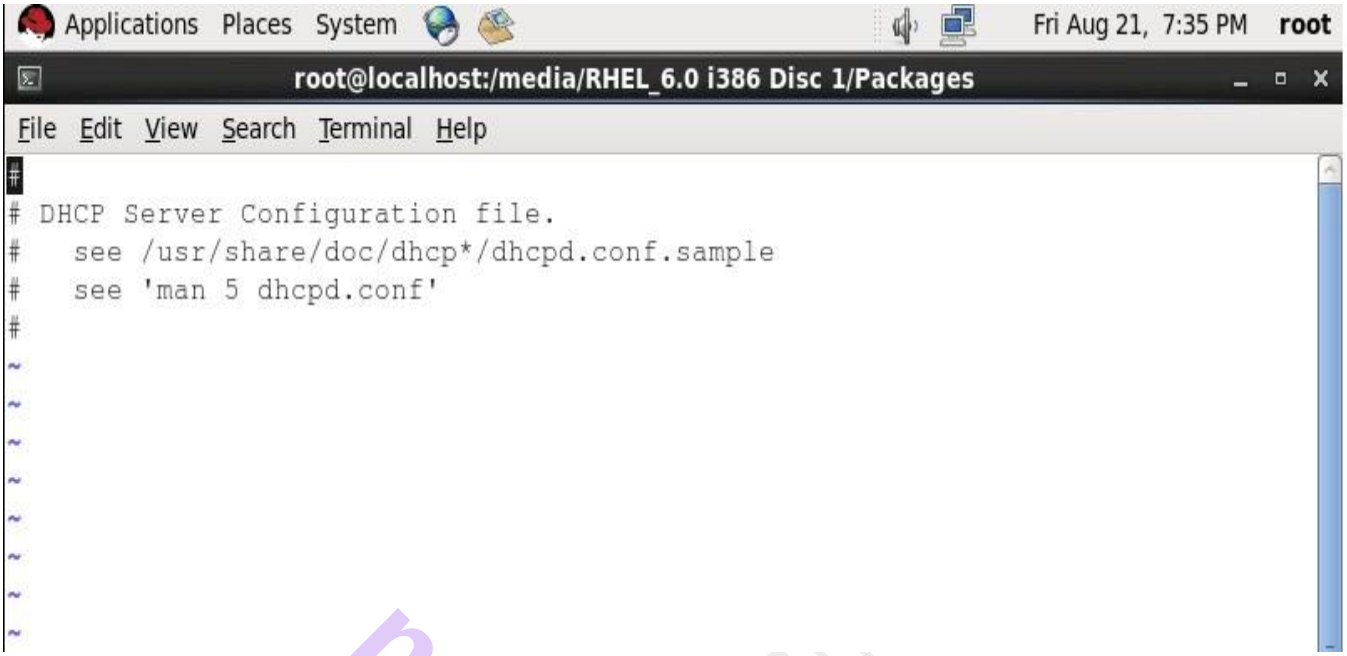
To disable network we use following command

#ifdown eth0

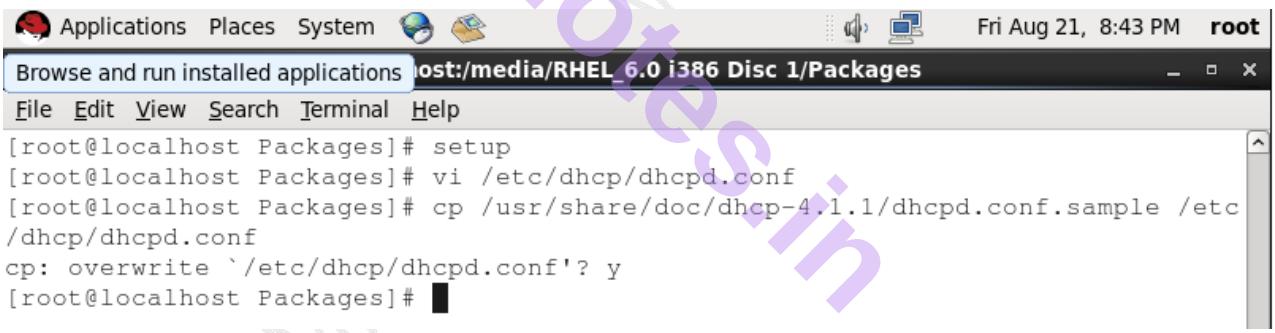
To disable network we use following command

#ifup eth0

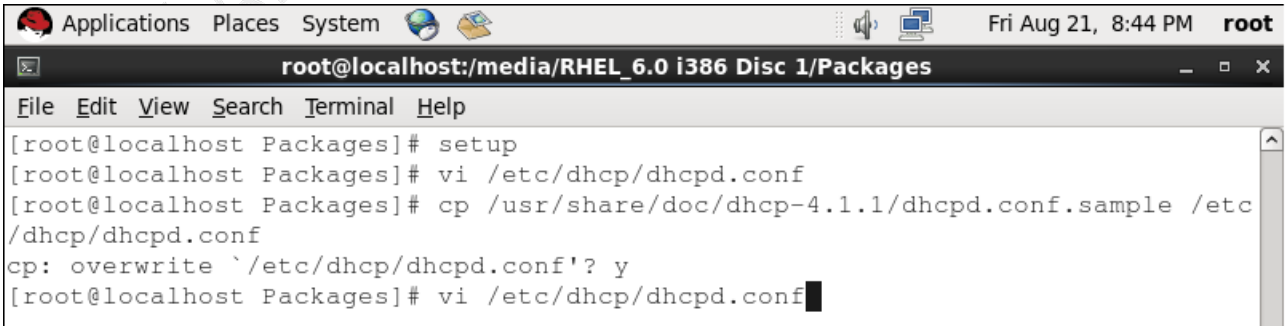
Step 6 :- main configuration file of dhcp server is dhcpd.conf. This file located on /etc directory. If this file is not present there or you have corrupted this file, then copy new file first, if ask for overwrite press "y".



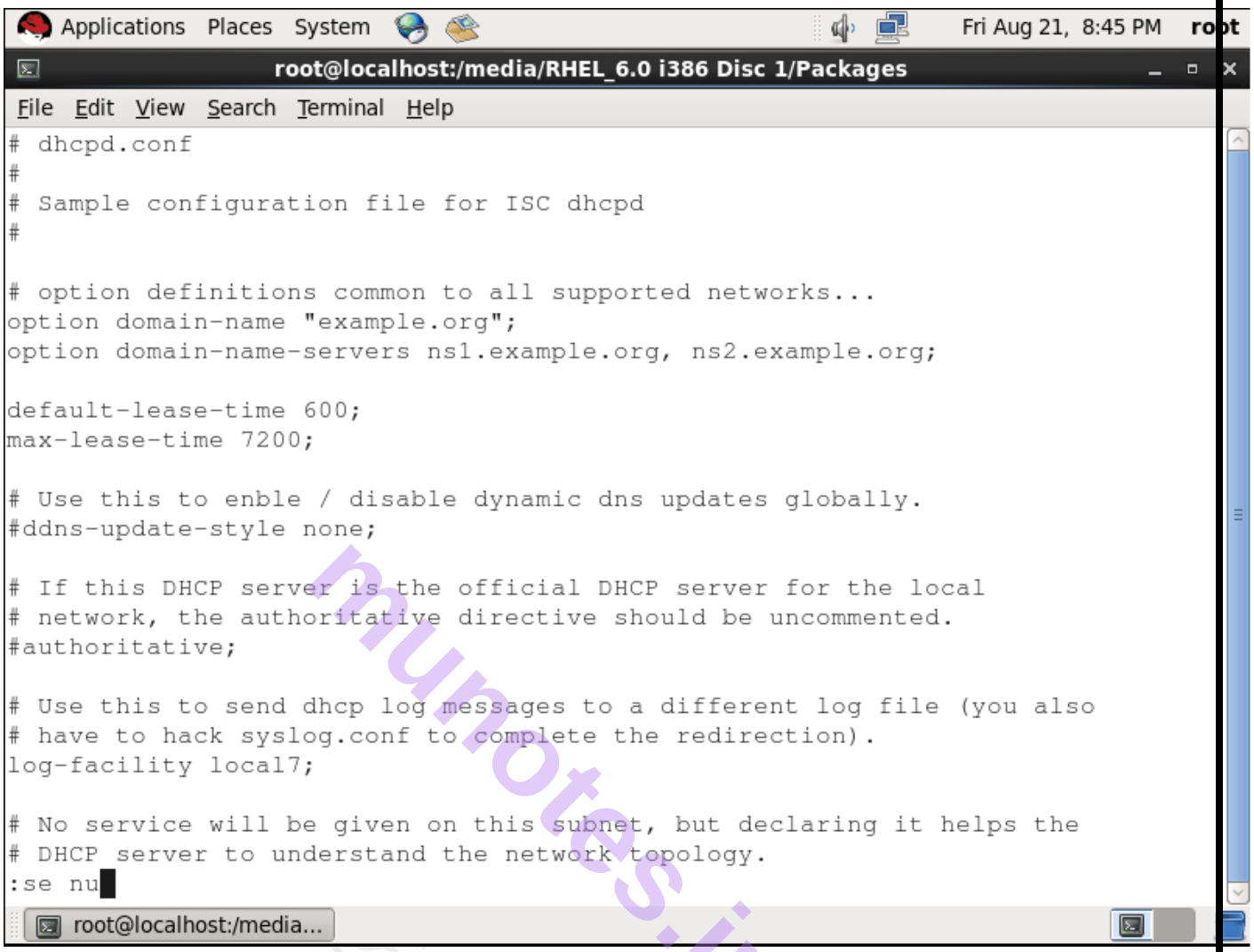
by default when you install DHCP Package it will create dhcpd.conf.sample file in /usr directory (/usr/sample/doc/dhcp-4.1.2/dhcpd.conf.sample)
now copy the file to /etc directory and replace with the old file.



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



#vi /etc/dhcp/dhcpd.conf
default entry is this file look like this.



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

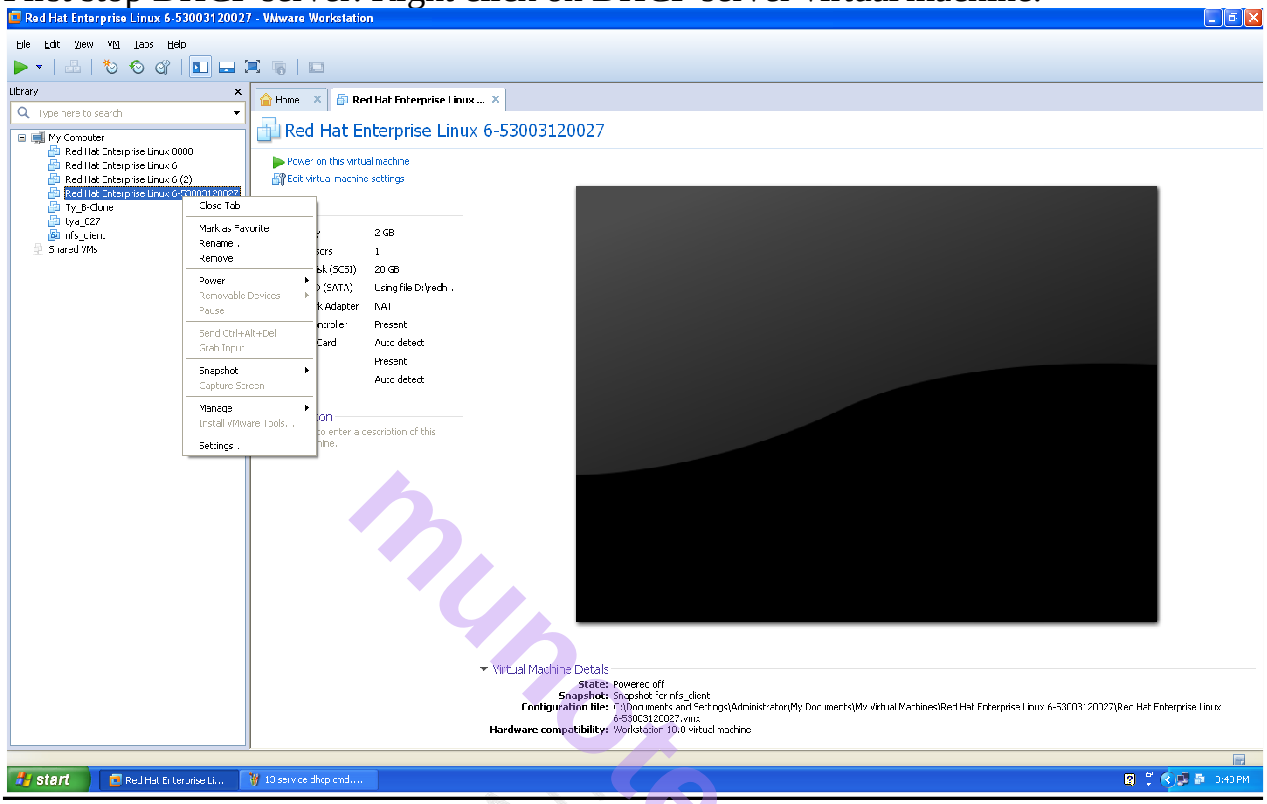
#service dhcpd start
#service dhcpd restart
#chkconfig dhcp on
#chkconfig –list dhcp
#service iptables stop
#setenforce 0

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

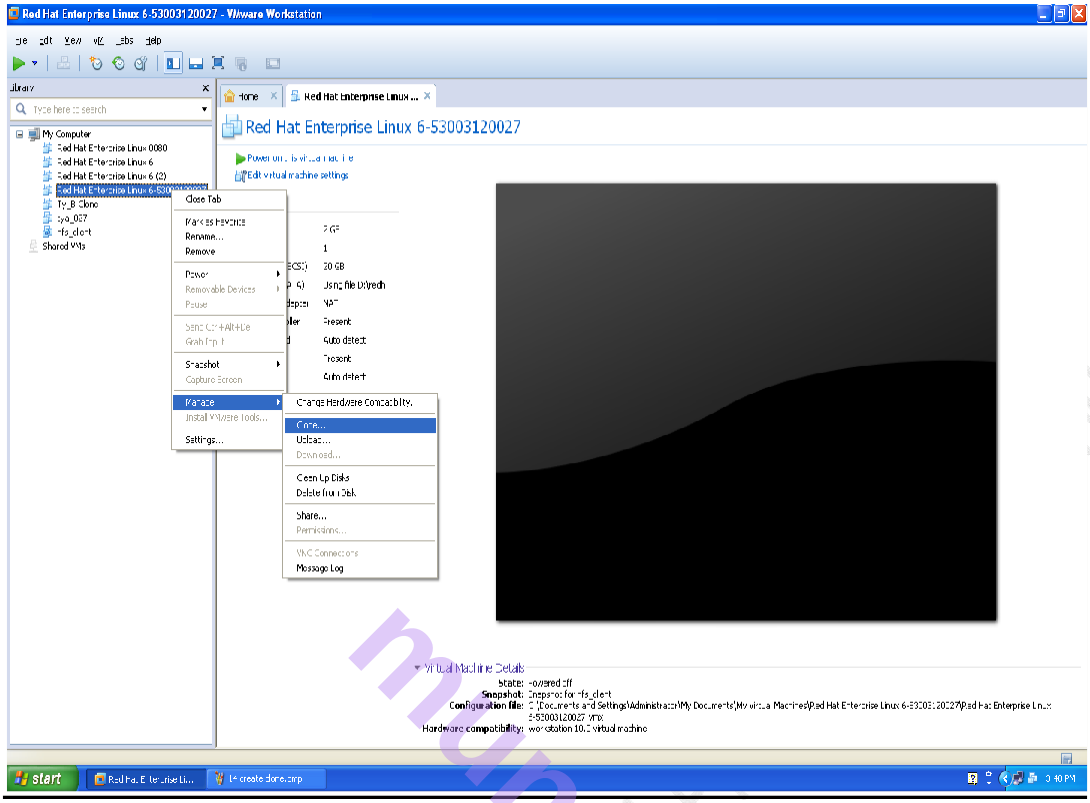
DHCP Client

How to create Clone Machine :-

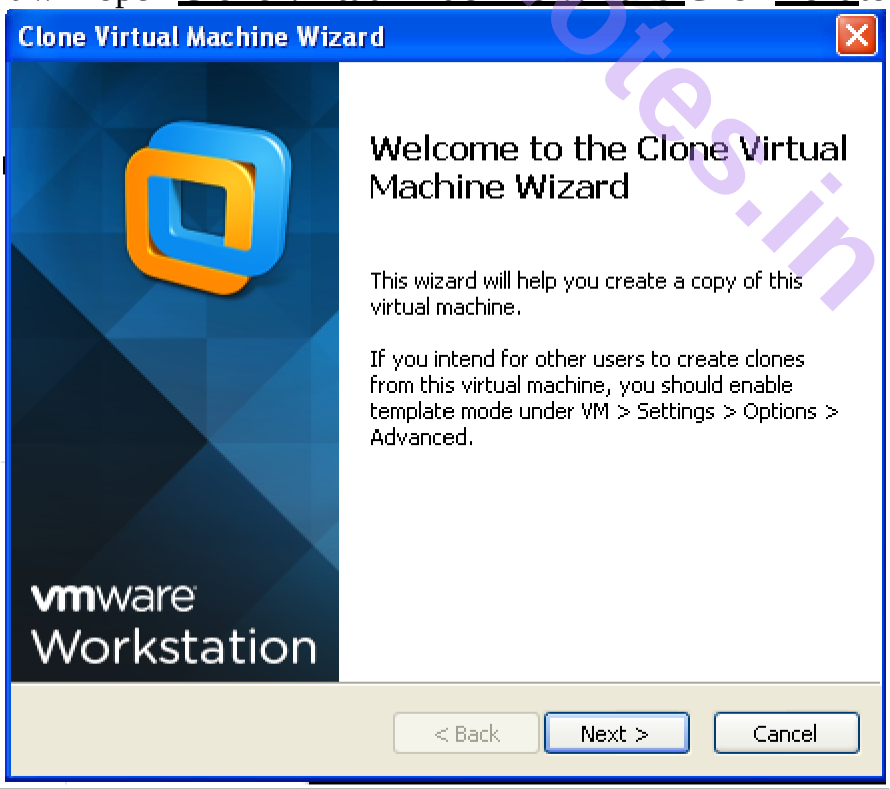
First stop DHCP server. Right click on DHCP server virtual machine.



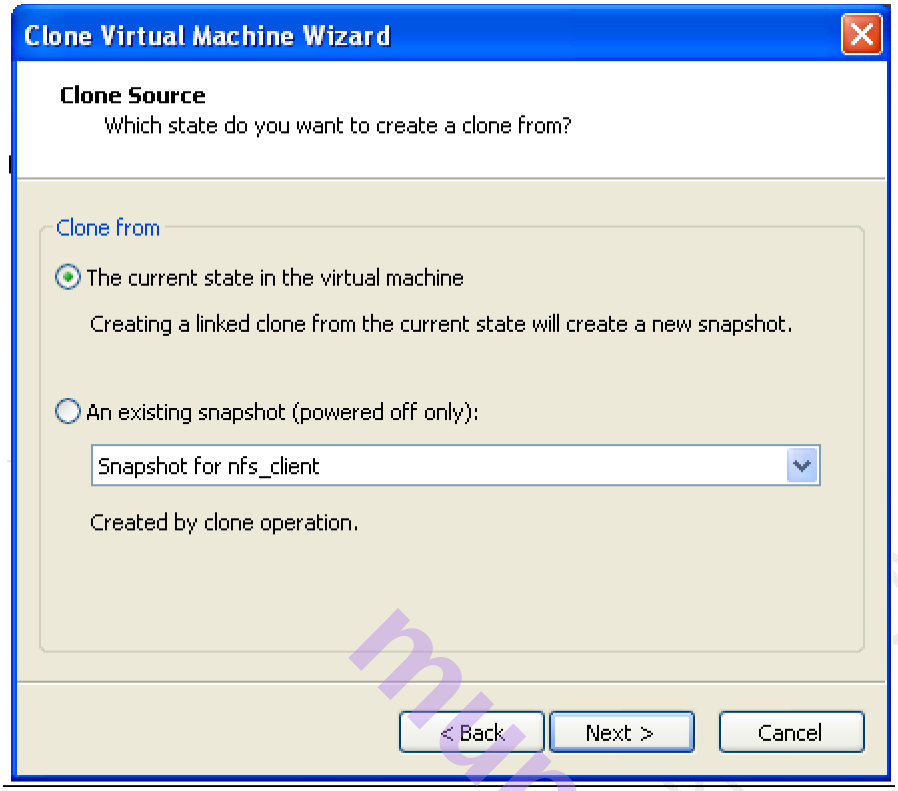
Go to manage and select clone option



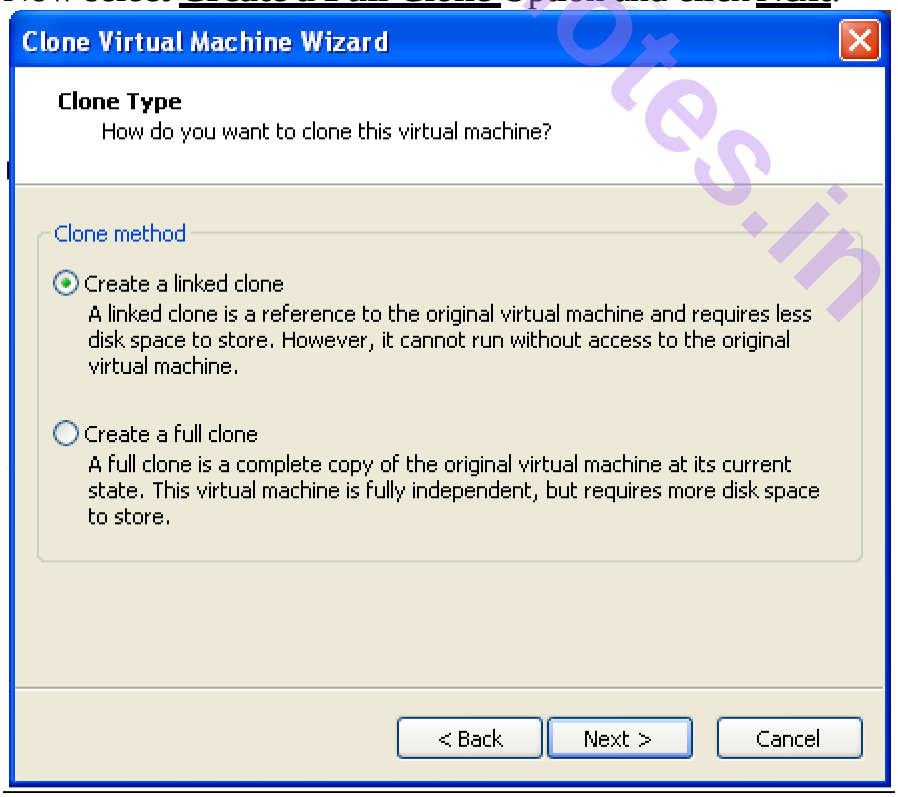
It will open **Clone Virtual Machine Wizard** Click **Next** to proceed.



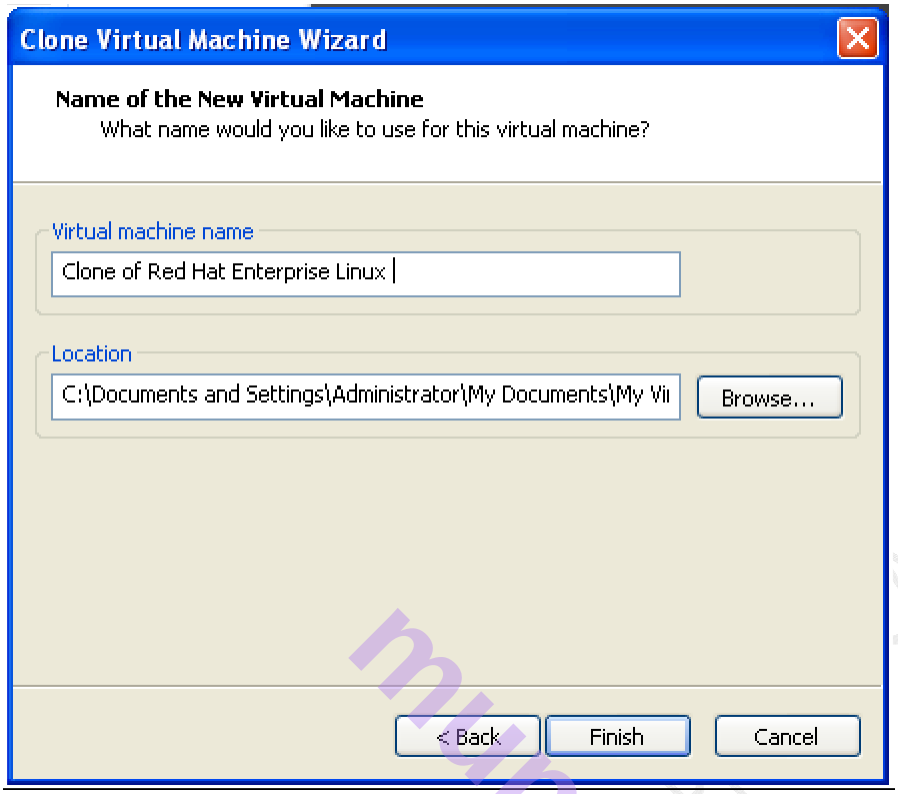
Here select the first option **The Current State in the virtual machine** and click **Next** to Proceed.



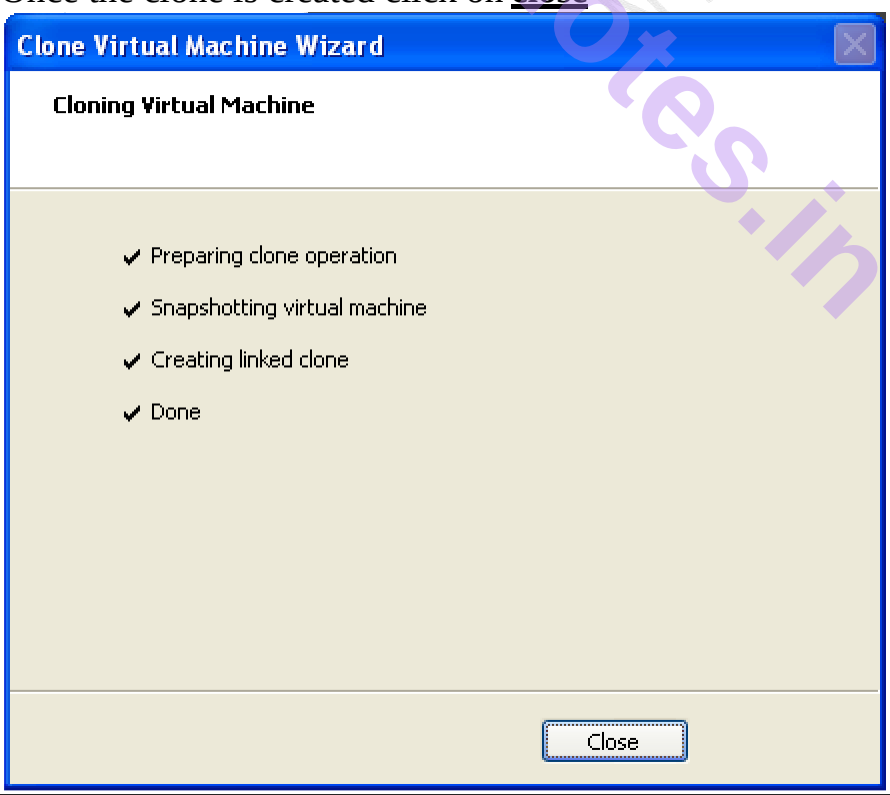
Now select **Create a Full Clone** Option and click **Next**.



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



Once the clone is created click on **close**



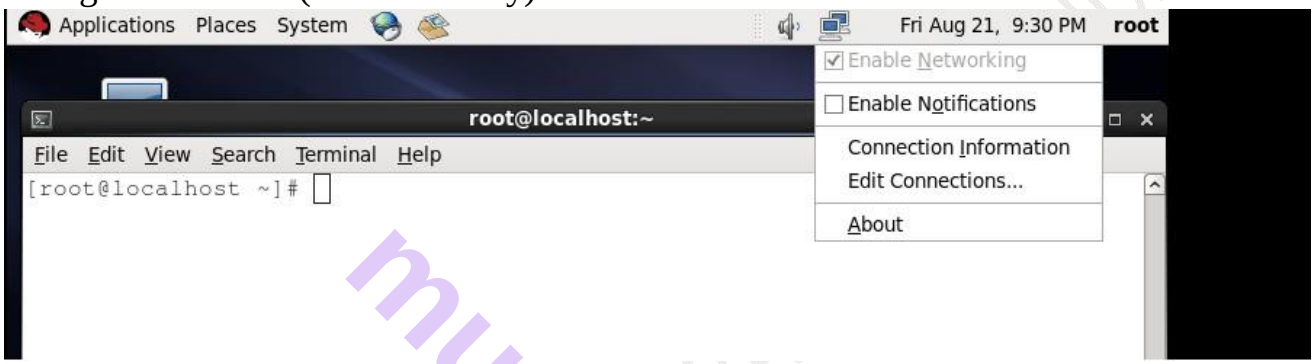
Now our clone machine is ready to use. First start DHCP Server and then start Clone/client virtual machine.

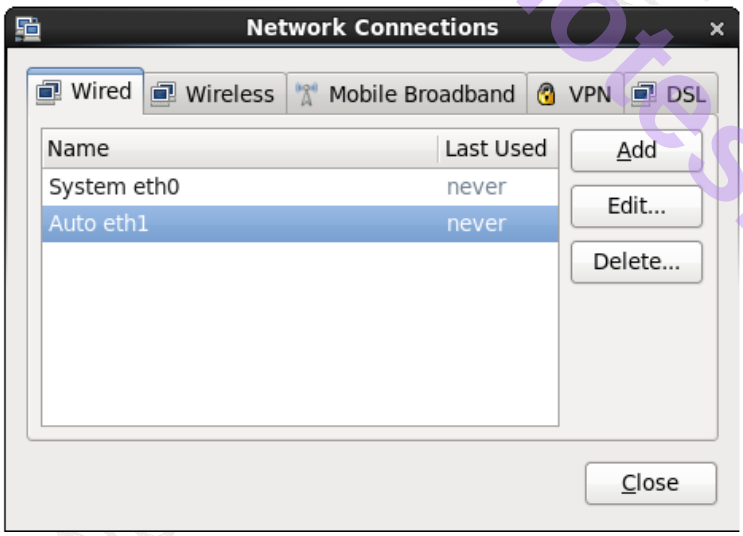
Now we are on client machine and we will check whether through dhcp, ip address can be given to our client machine or not before that we have to check currently our machine is configured manual or dhcp.

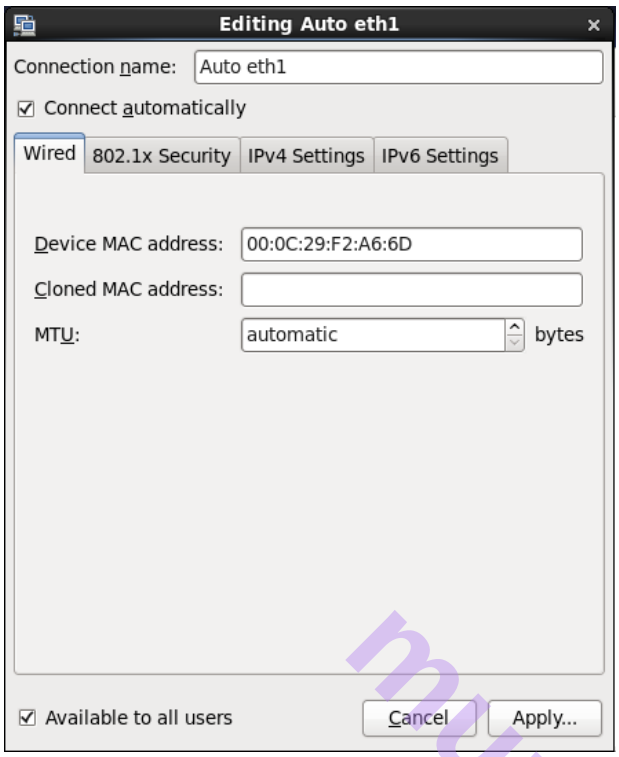
Through wizard we will check on network

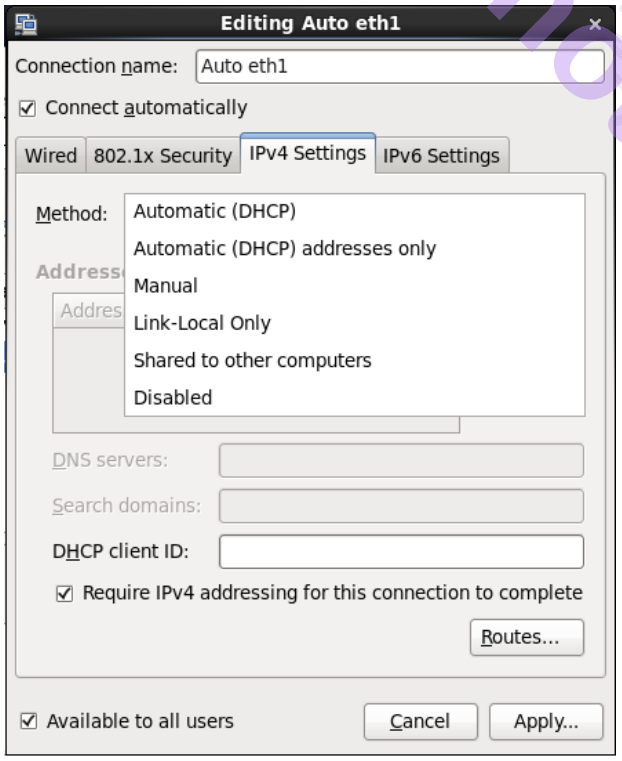
Right click on Network icon at right top corner on desktop-→ Edit Connection → Select system eth0

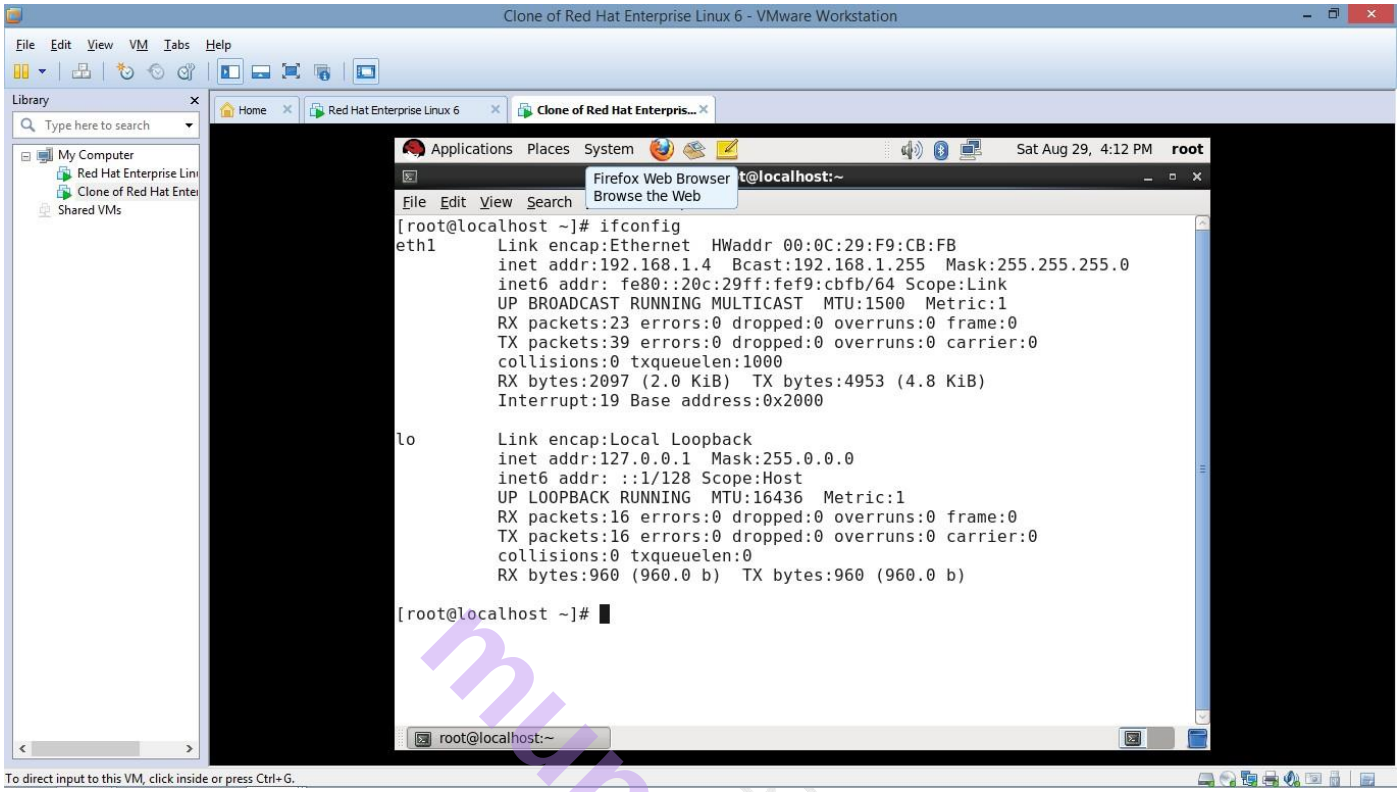
→Click on Edit button -→ select IPv4 setting option → see the method manual Change it to DHCP (Automatically)











 # ifconfig

OR

This command is use 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 thes4e 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 a 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.

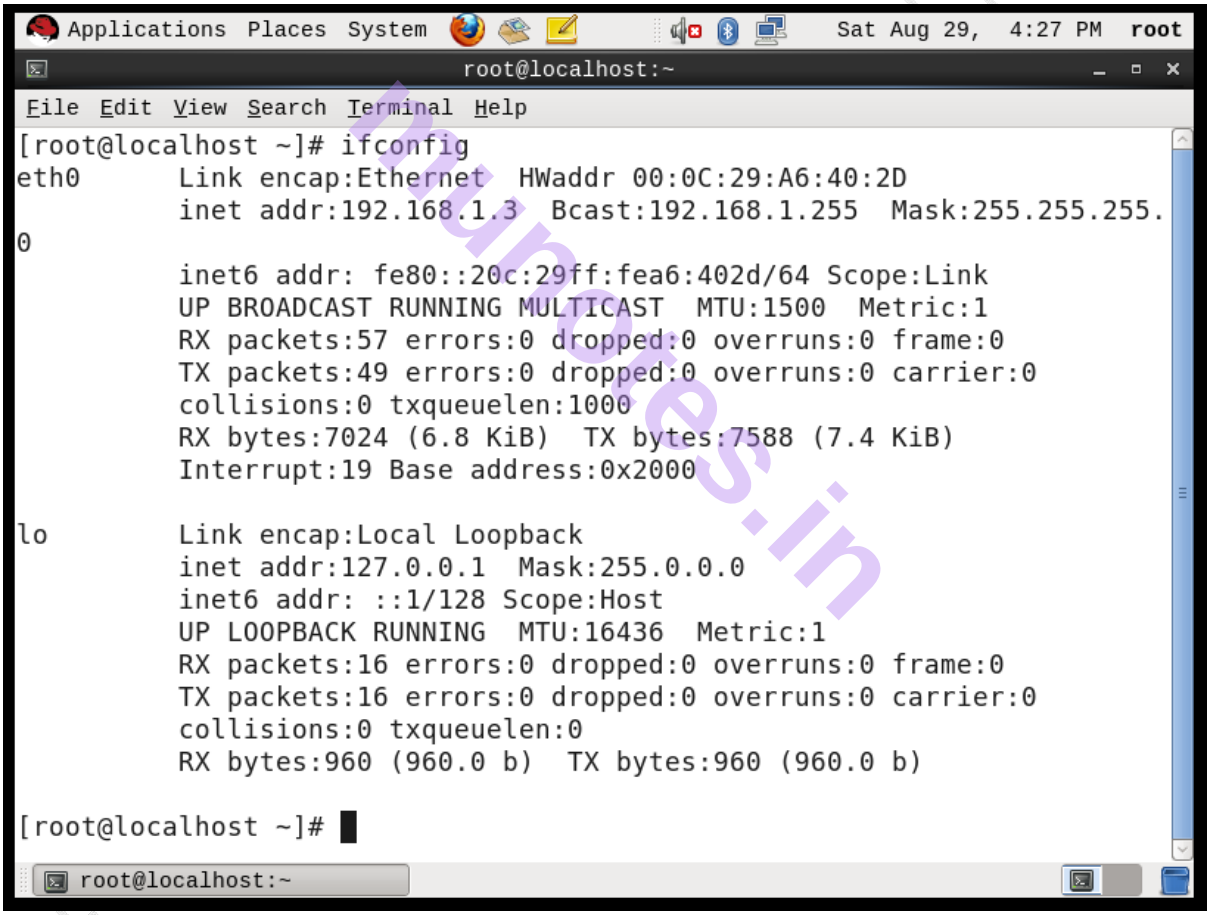
➔ named.ca – The file contains the name and address of root servers. Used for the purpose of caching of forward zone. It is found in /var/named.

➔ 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.

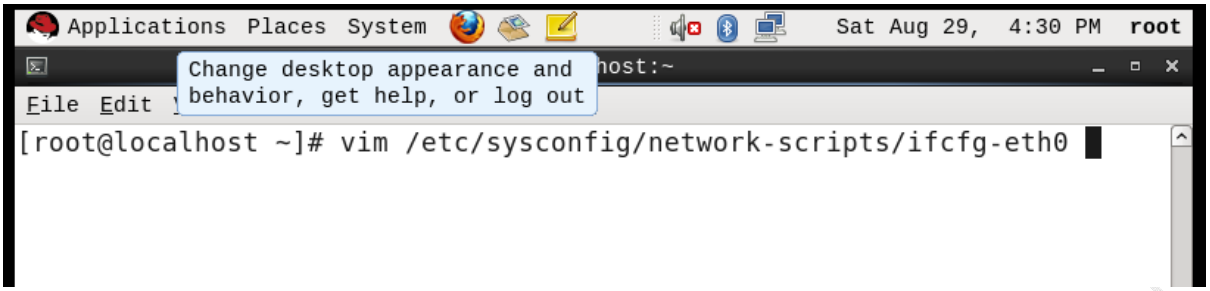
It is found in /var/named/
The 2 additional files required for the master domain server are:
(i)zone – This file contains the names and addresses of hosts in the local domain and maps names to IP address.
(ii)reverse.zone – This file provides information to map ip-address to names Hence reverse.

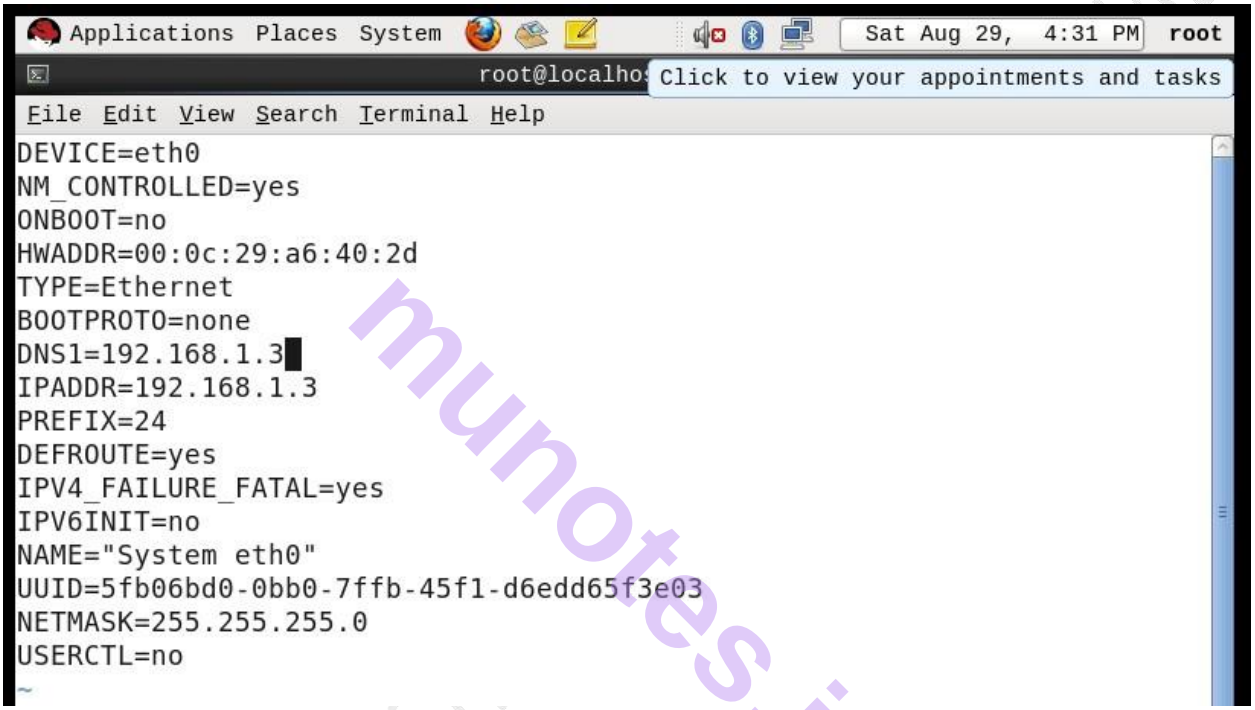
DNS Configuration

1) root@server ~]#ifconfig

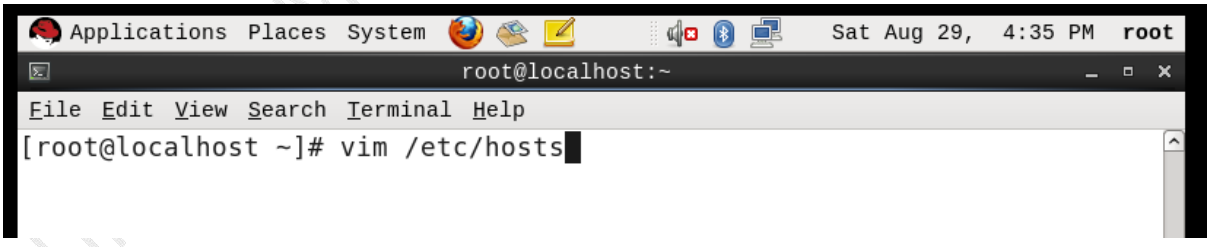


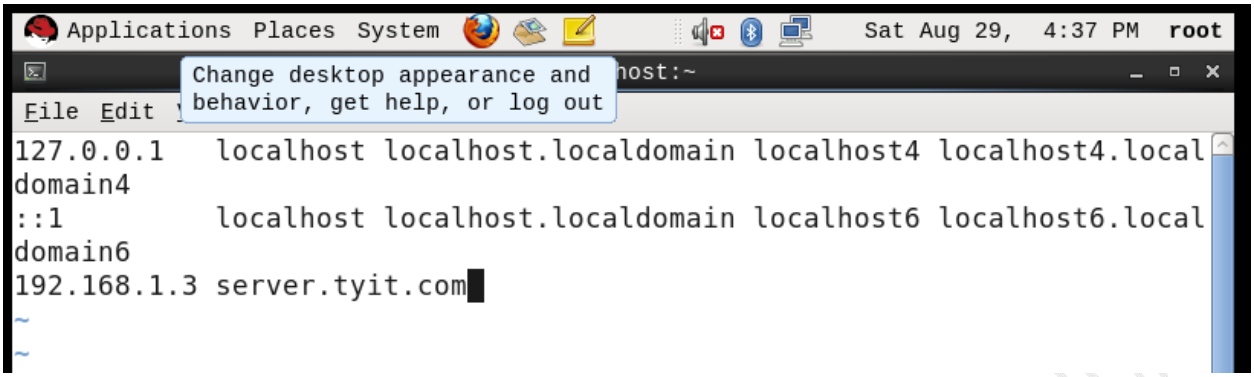
2) root@server ~]#vim /etc/sysconfig/network-script/ifcfg – etho



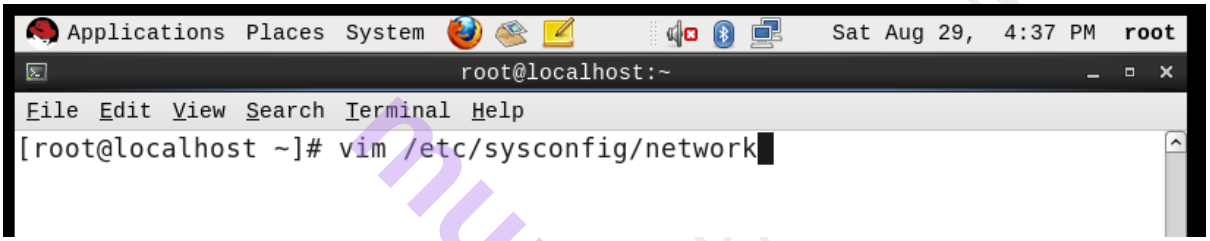


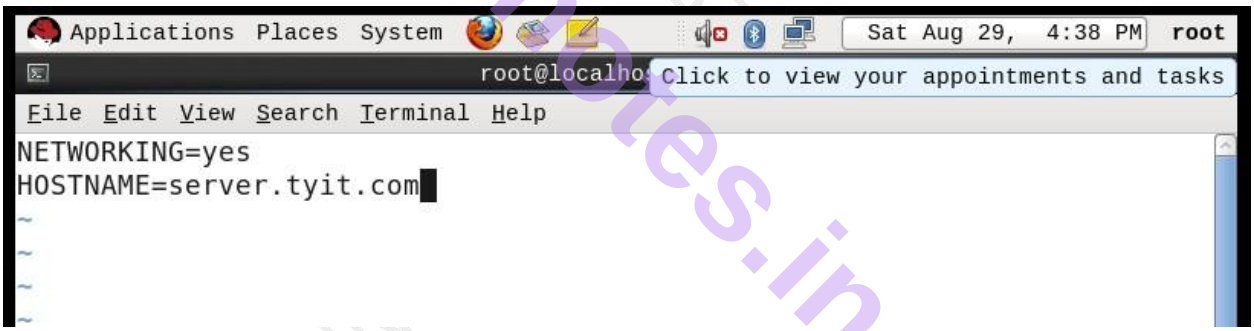
3) root@server ~]#vim /etc/hosts



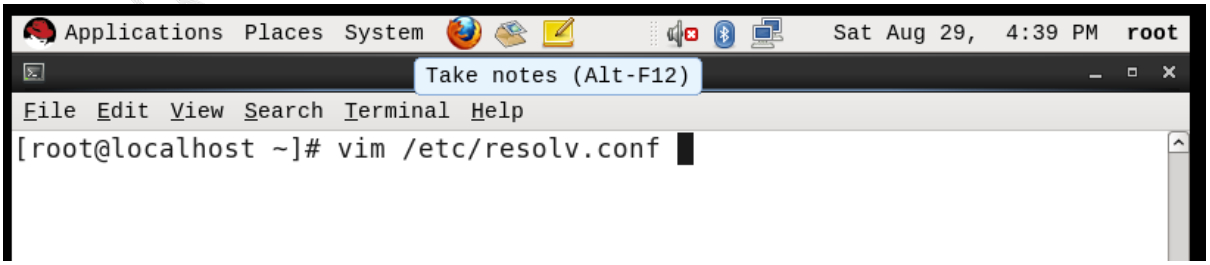


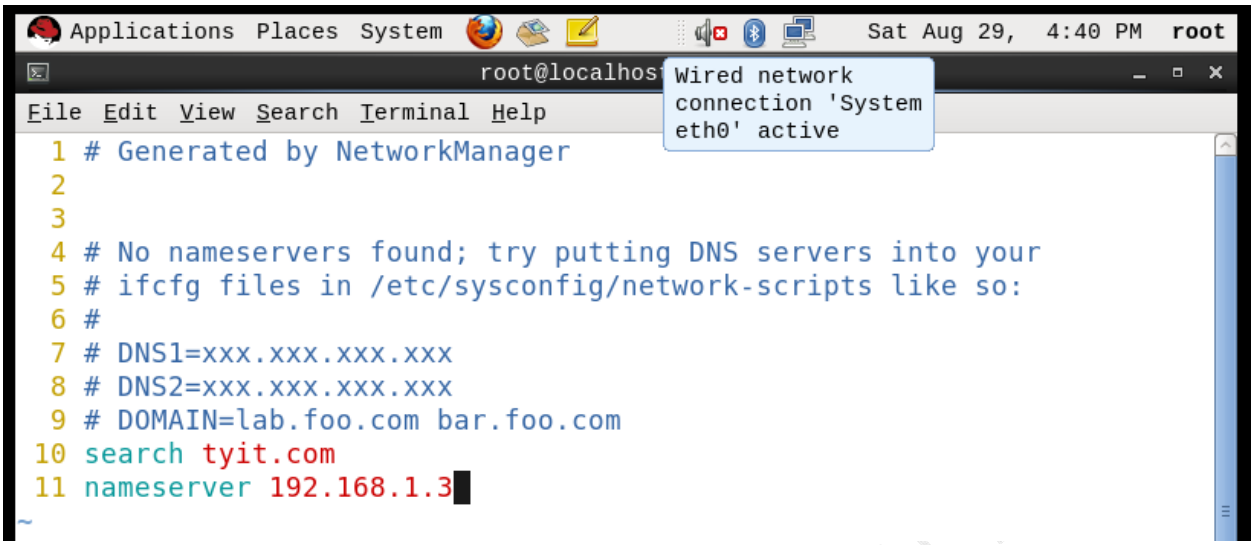
4) root@server ~] #vim /etc/sysconfig/network





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

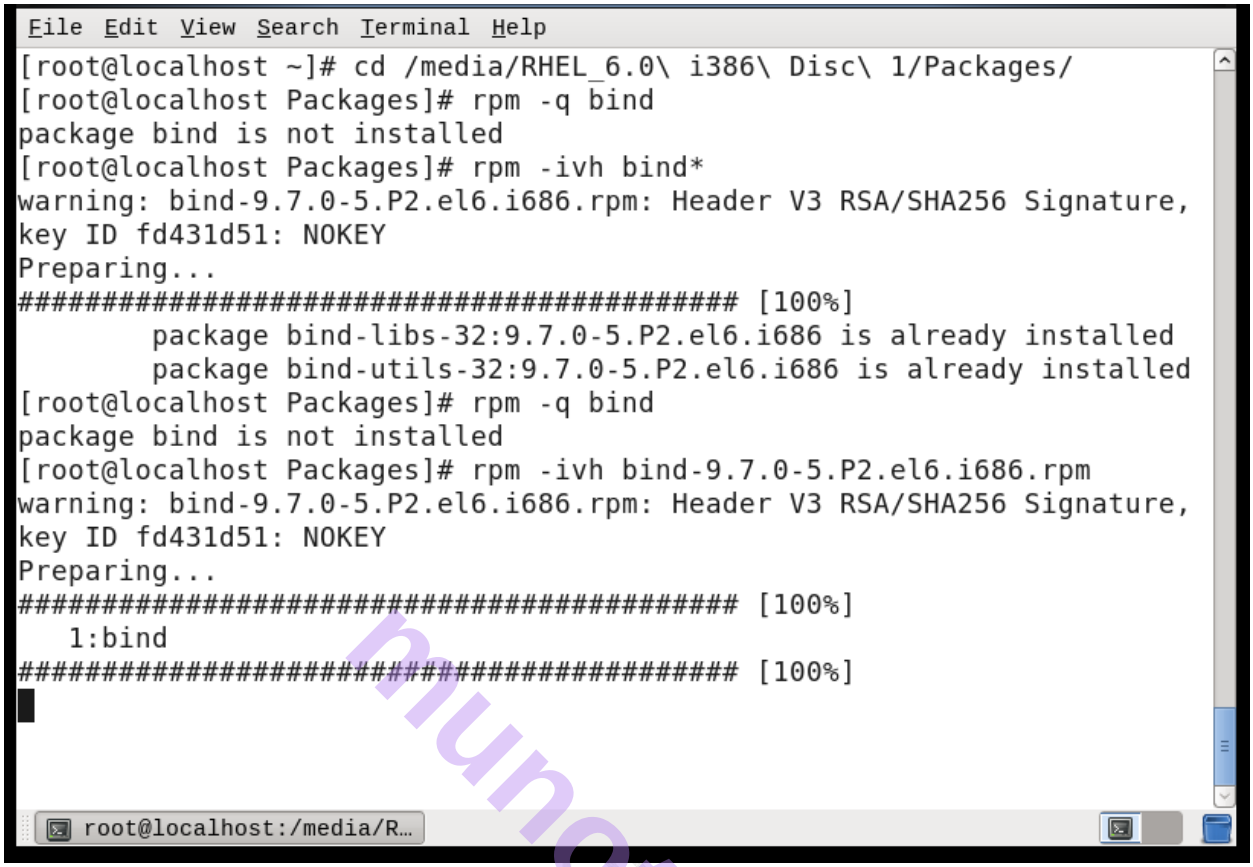




6) root@server ~]service network restart

7) To install bind package :-

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



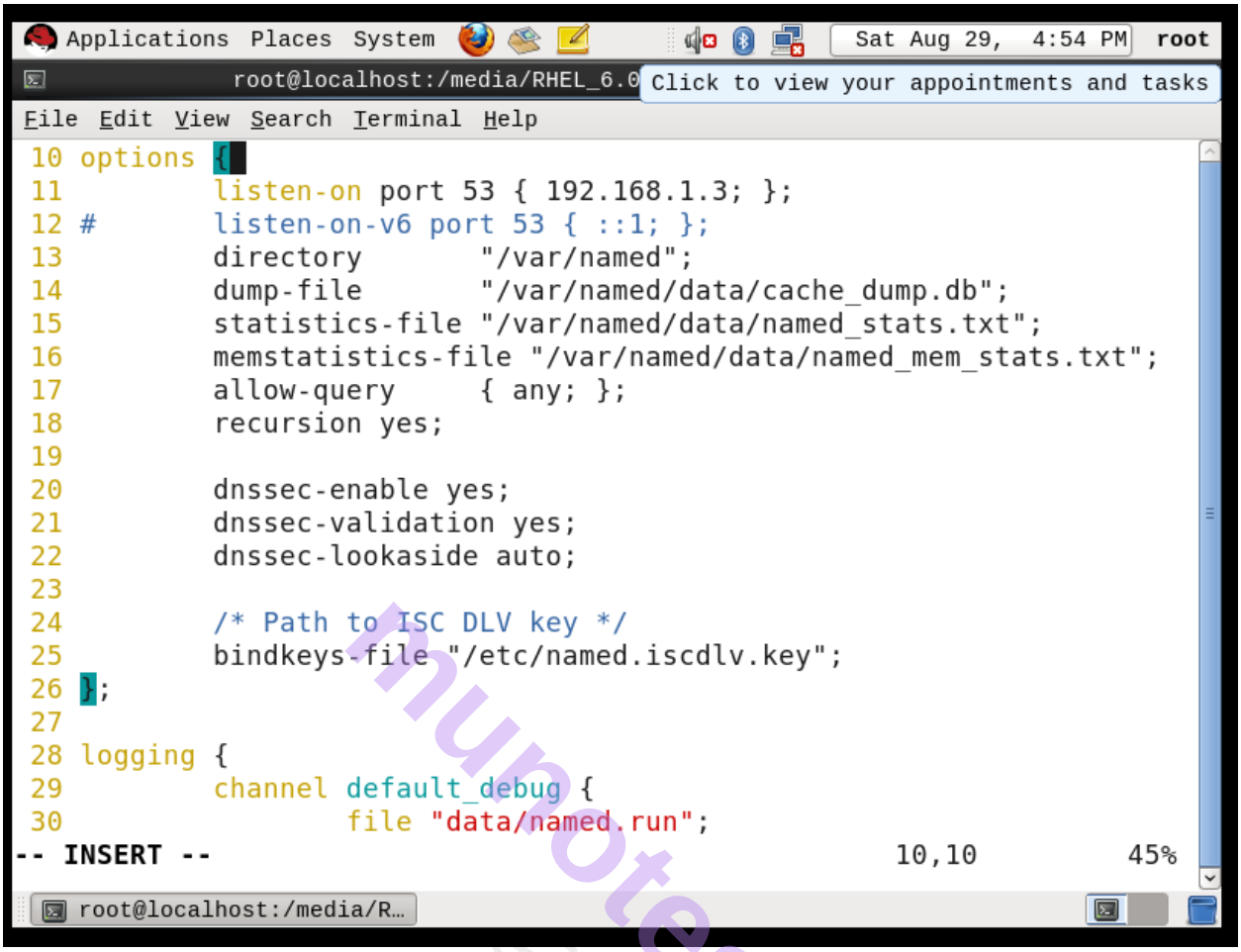
root@server ~]vim /etc/named.conf.

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

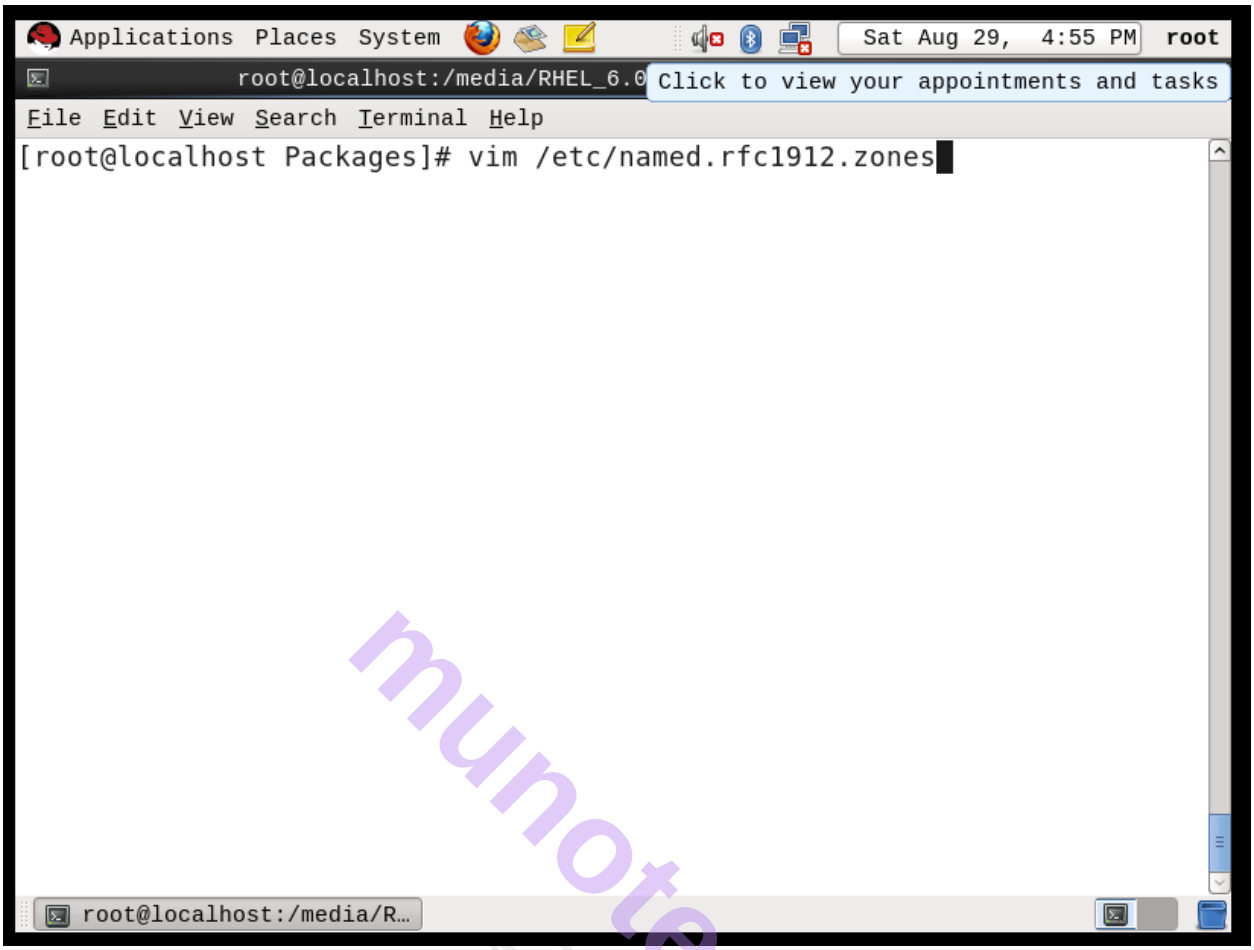
  Change this from 127.0.0.1 to current Machine IP address.
- Line no.12 :- Comment it using "#"

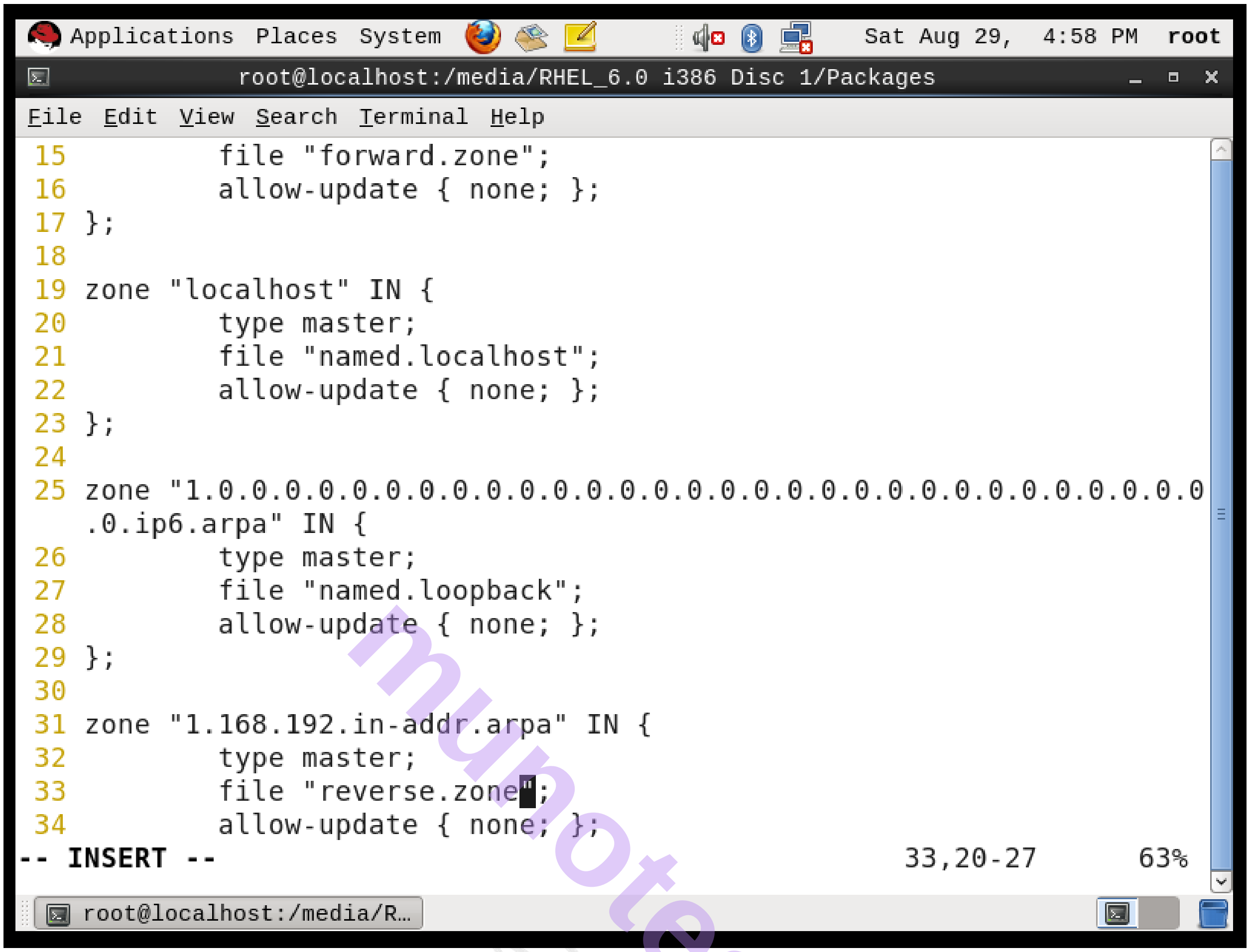
  # listen –on – v6 port 53{ : : 1:};
- Line no.17 :- allow – query{any;}

- Check and Notedown the last line of the file :-



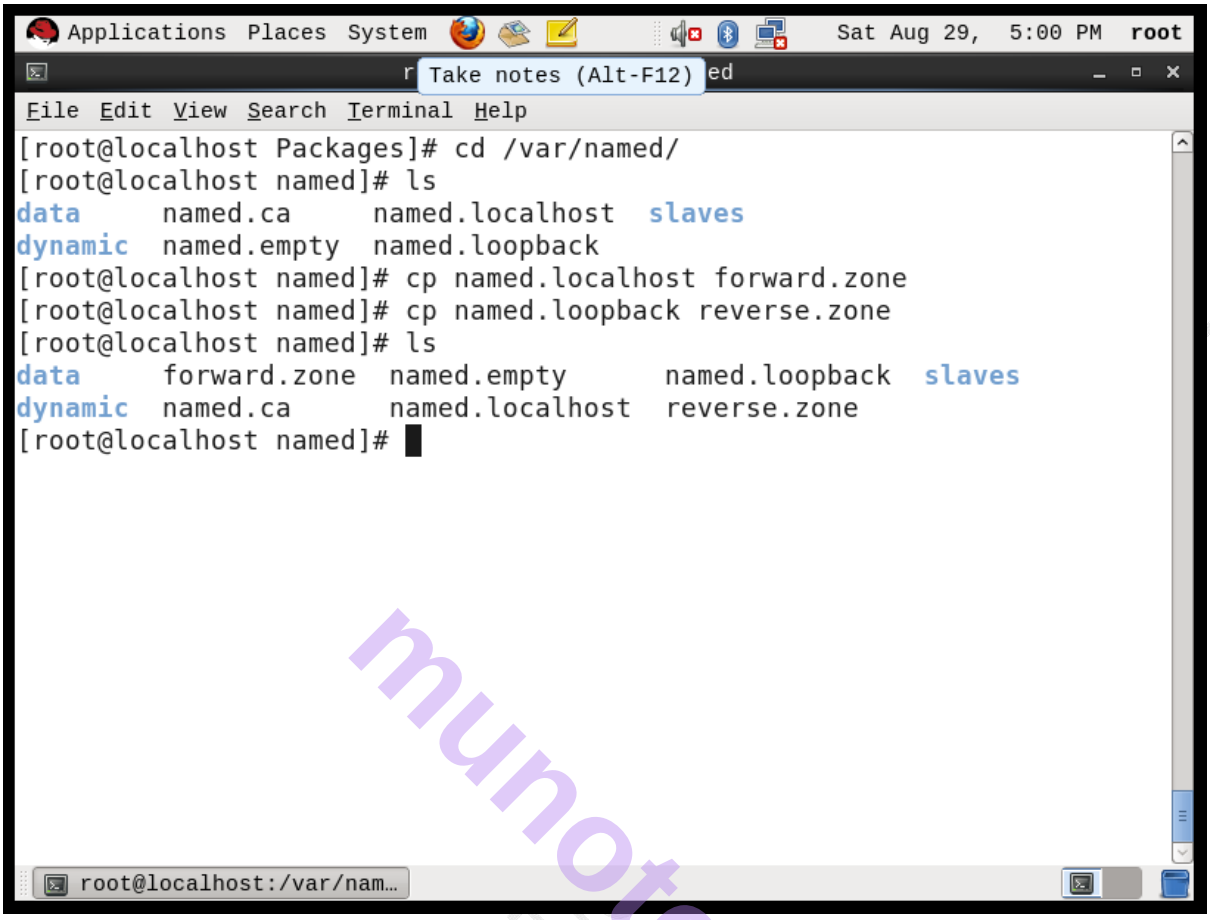
8) root@server ~] #vim /etc/named.rfc1912.zones





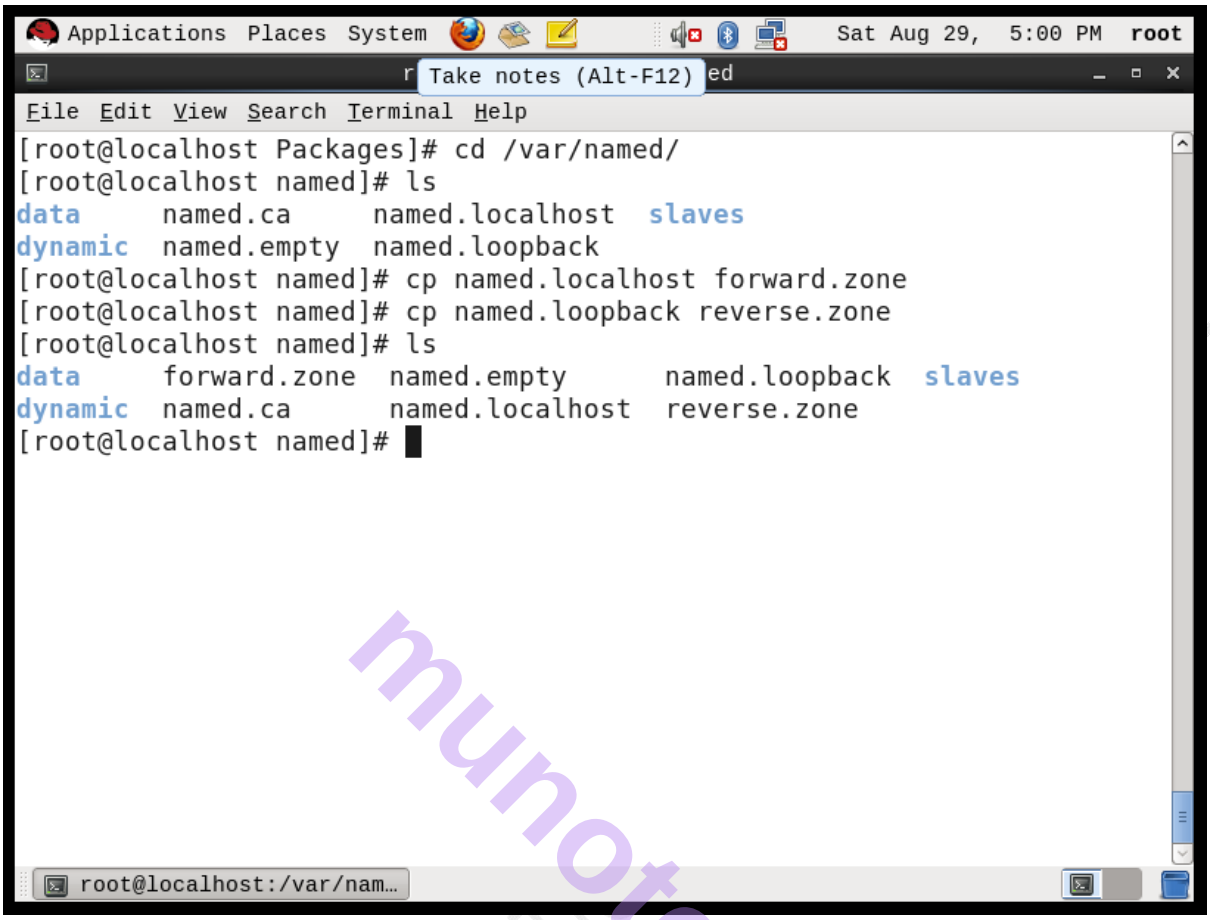
Save the file :- **:wq**

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

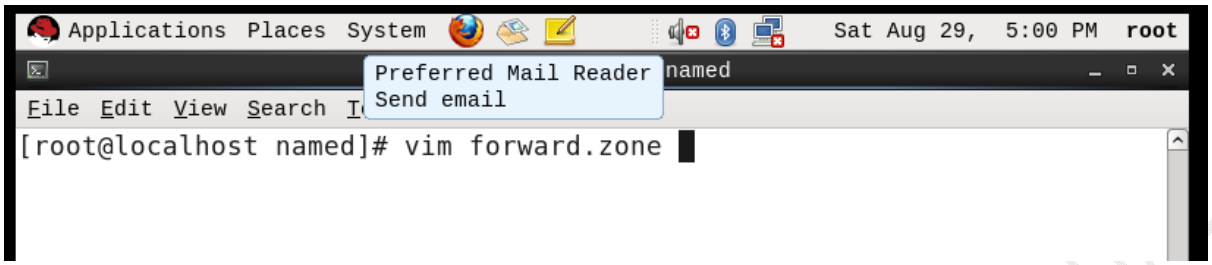


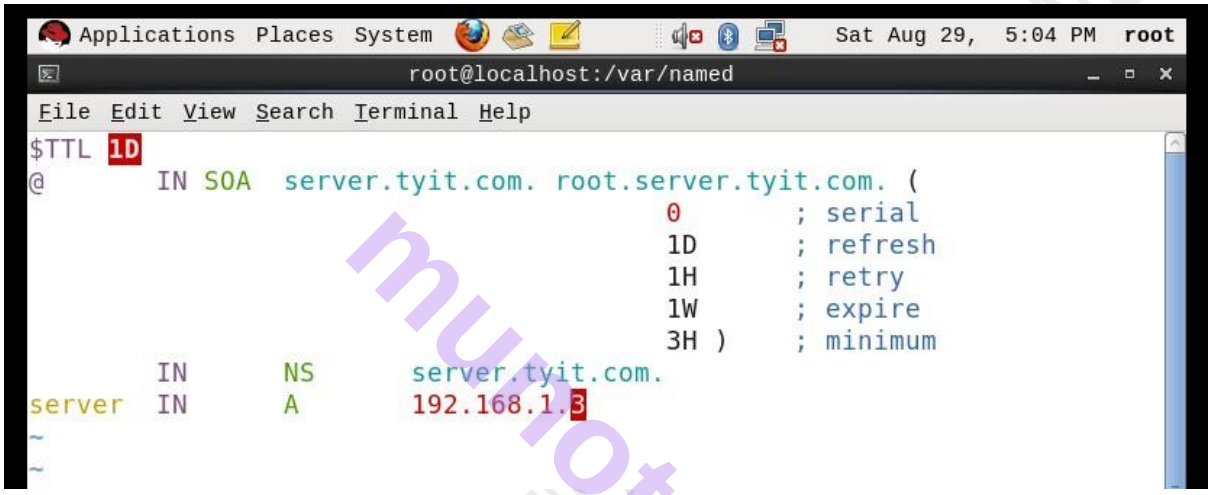
10) root@server named]#cp named.localhost forward.zone

11) root@server named]#cp named.loopback reverse.zone

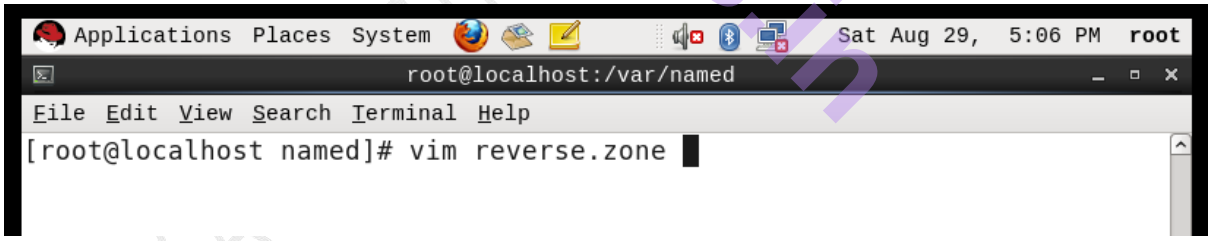


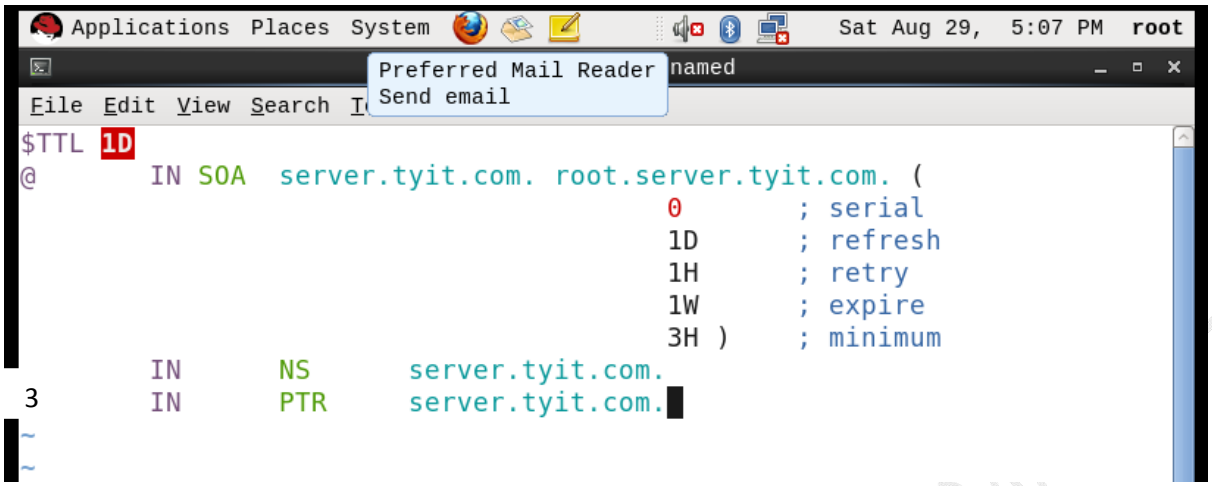
root@server named]#vim forward.zone



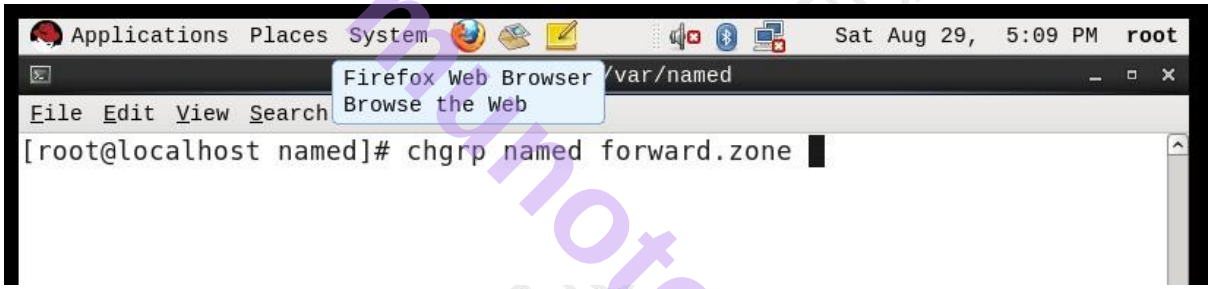


12) root@server named]#vim reverse.zone

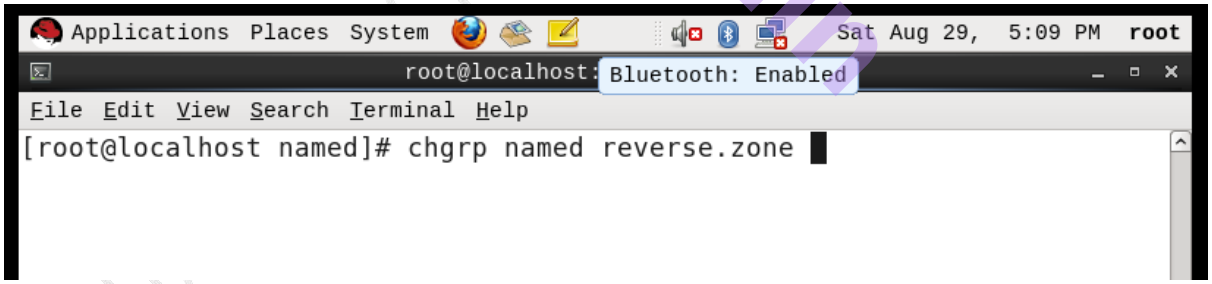




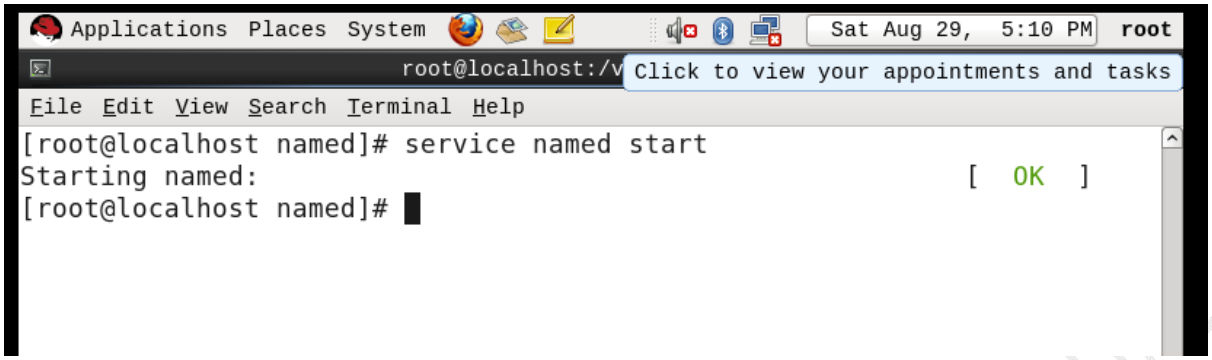
13) root@server named]#chgrp named forward.zone



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



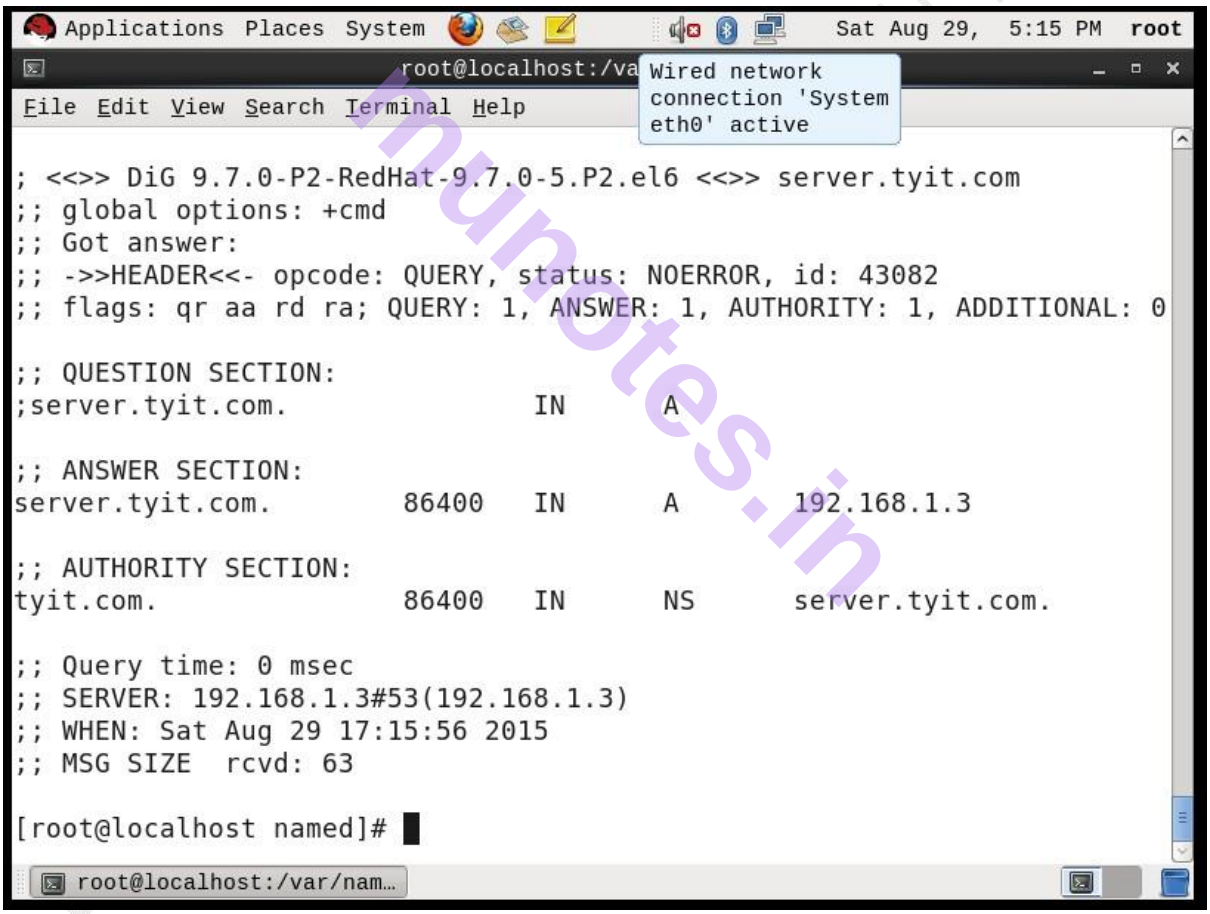
15) root@server named]#server named start



16) To check whether DNS is working type the following

1) dig server.tyit.com

2) dig -x 192.168.1.3



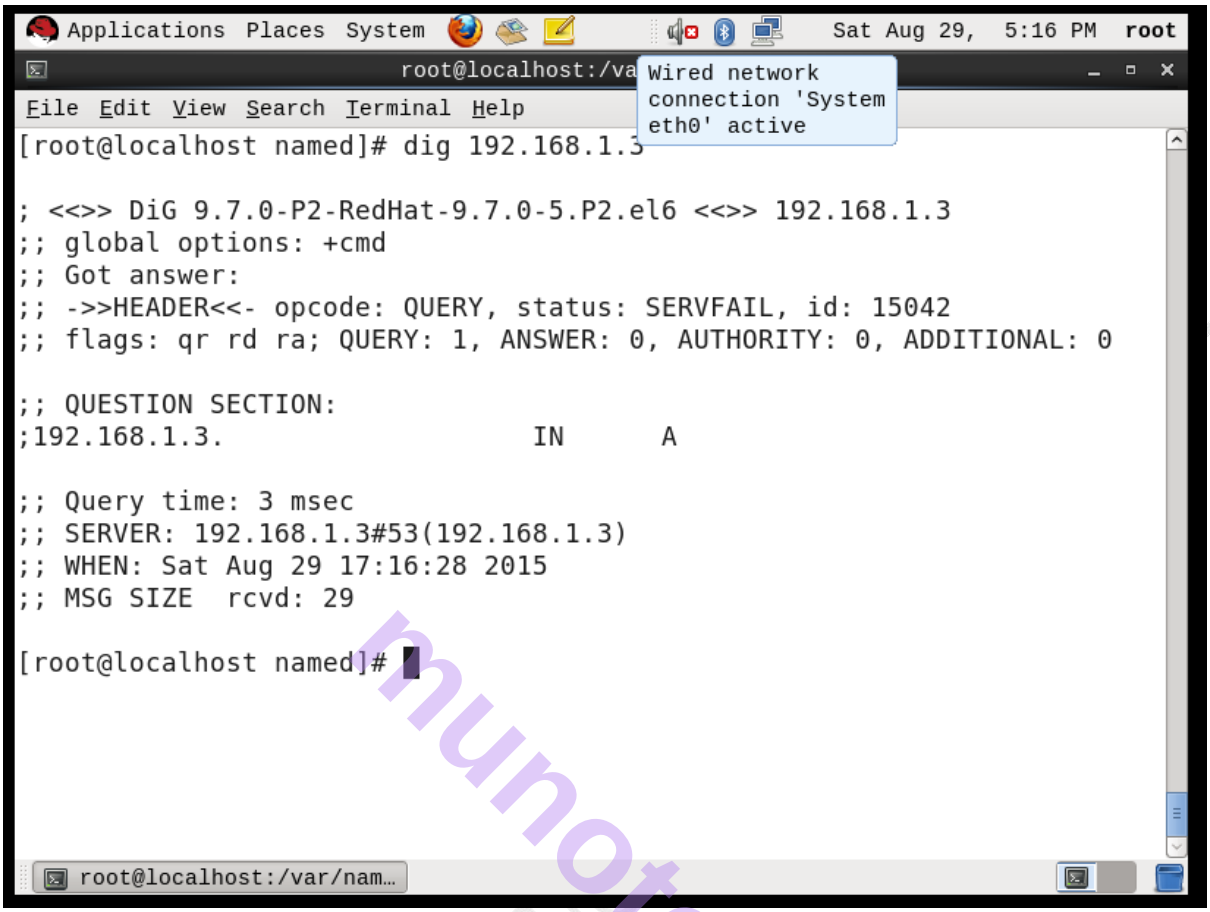
17) To check in the network,type the following

(i)**ns lookup**

>server.tyit.com

>192.168.1.3

>exit.



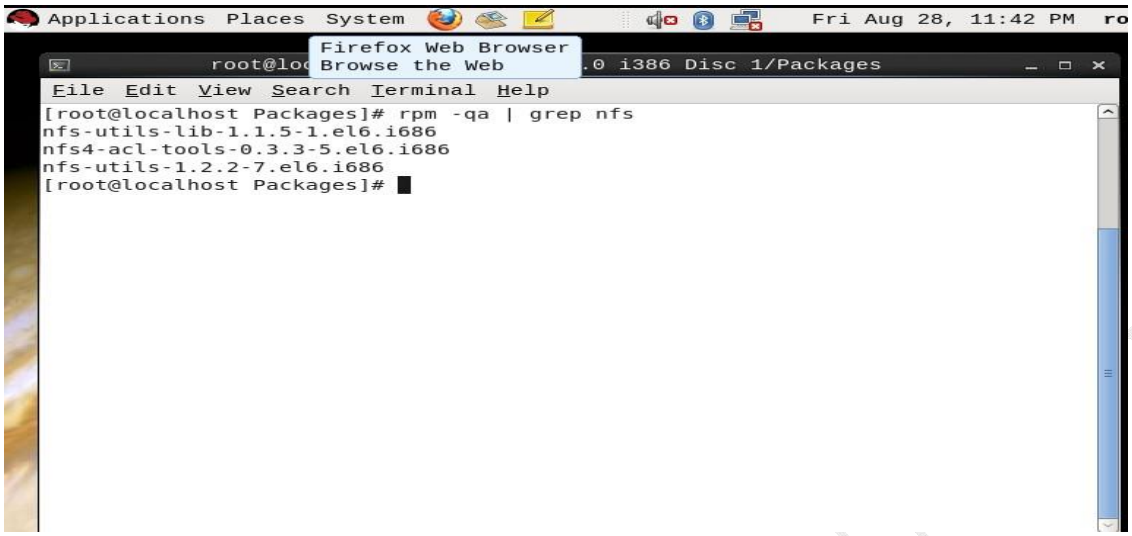
Practical no 8 : Configure a Linux Server and transfer files to windows client.(Setting up NFS File Server)

- The **N**etwork **F**ile **S**ystem **(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.

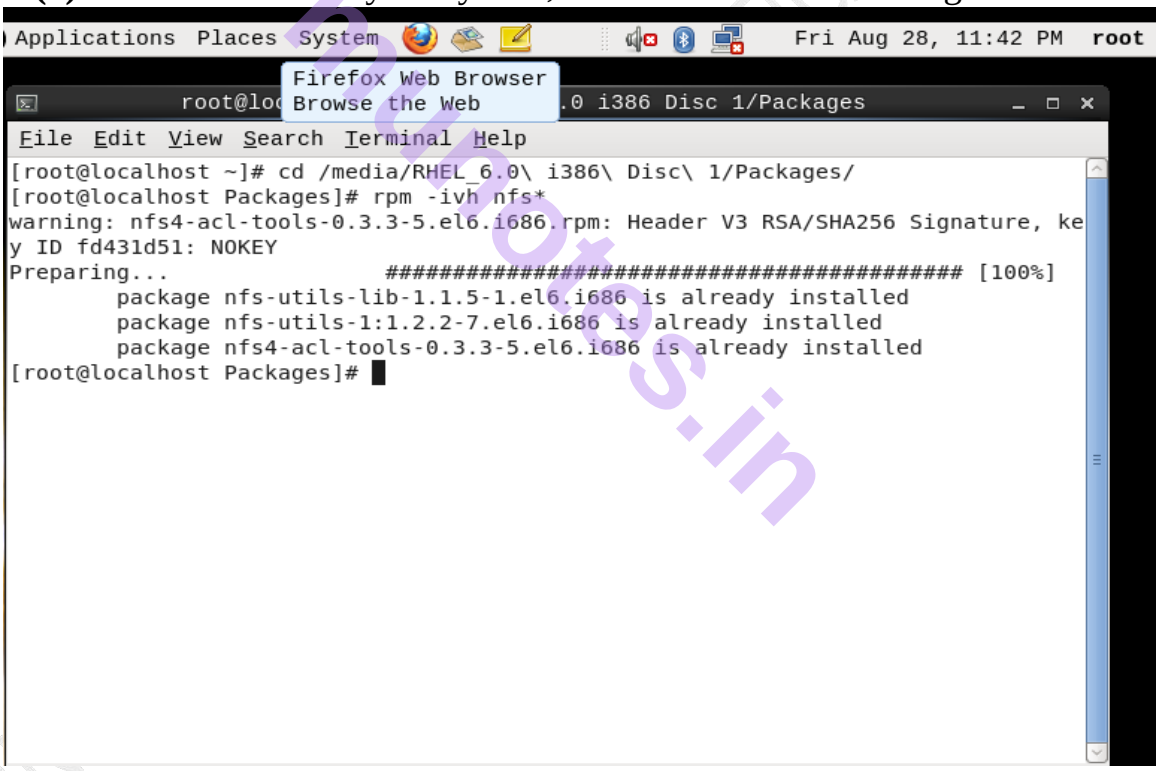
The mounted file system is known as **NFS mount.**

Setting Up NFS Server:

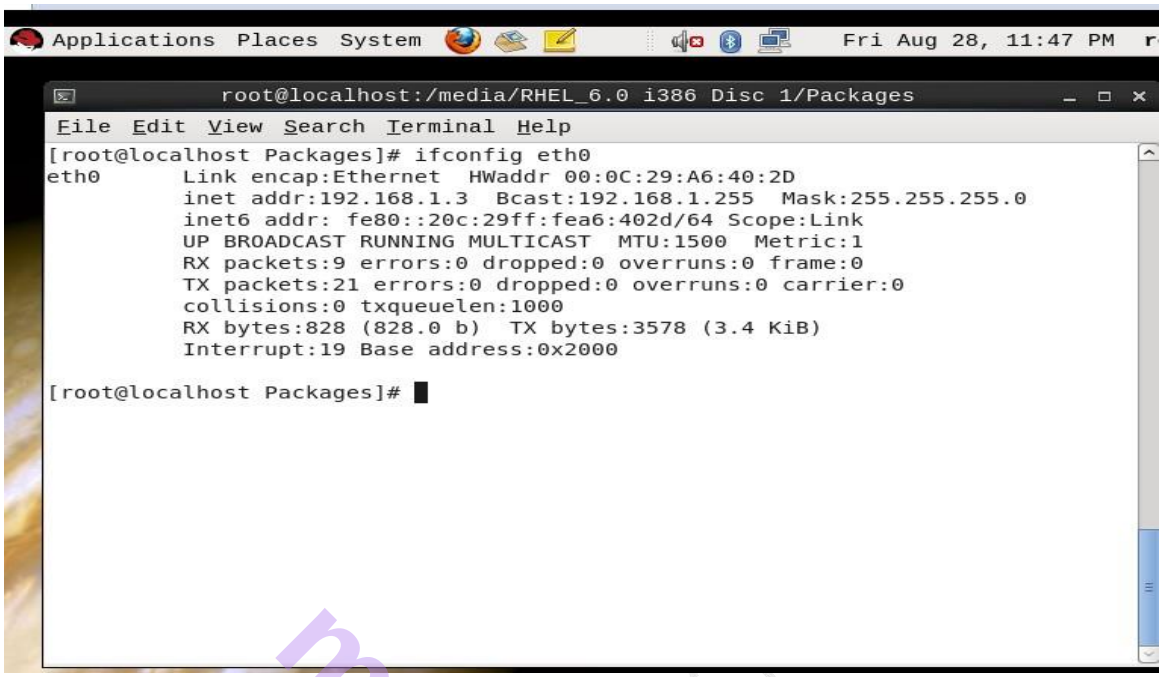
(1) Verify the package of NFS whether installed as shown below:



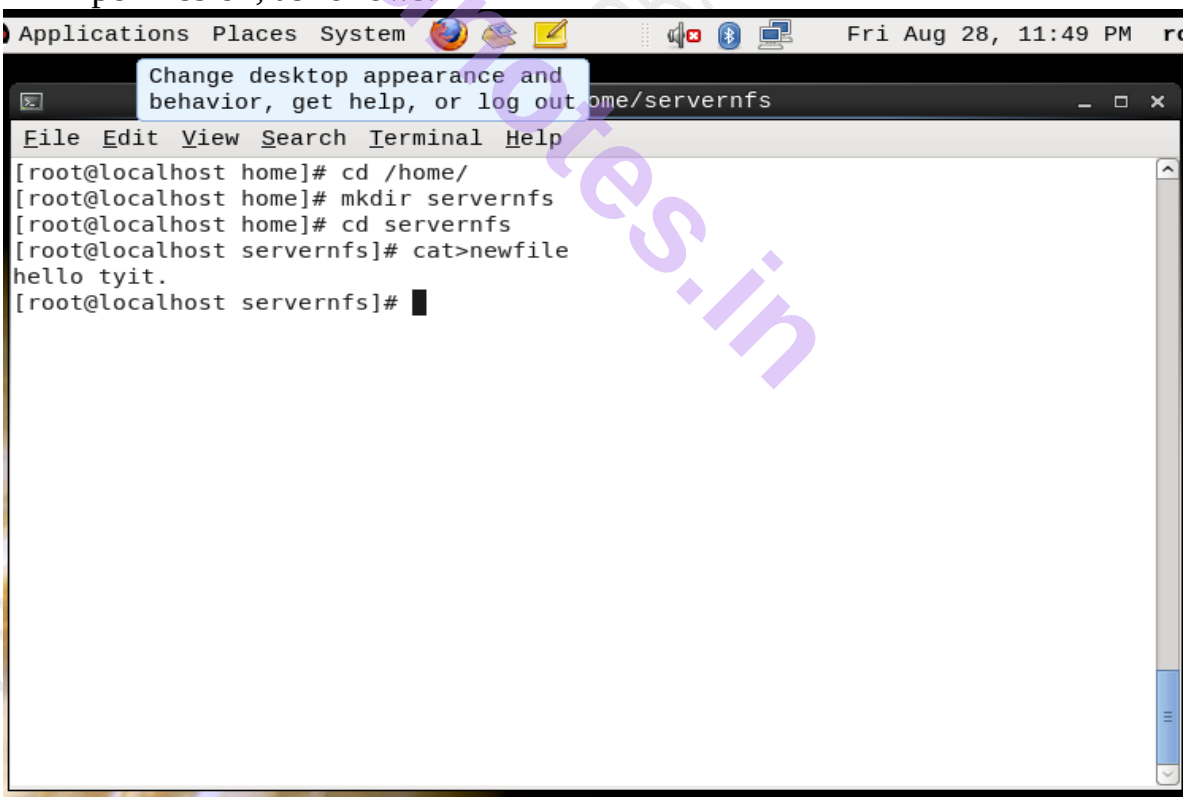
(2) If not installed on your system, then execute the following command:



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

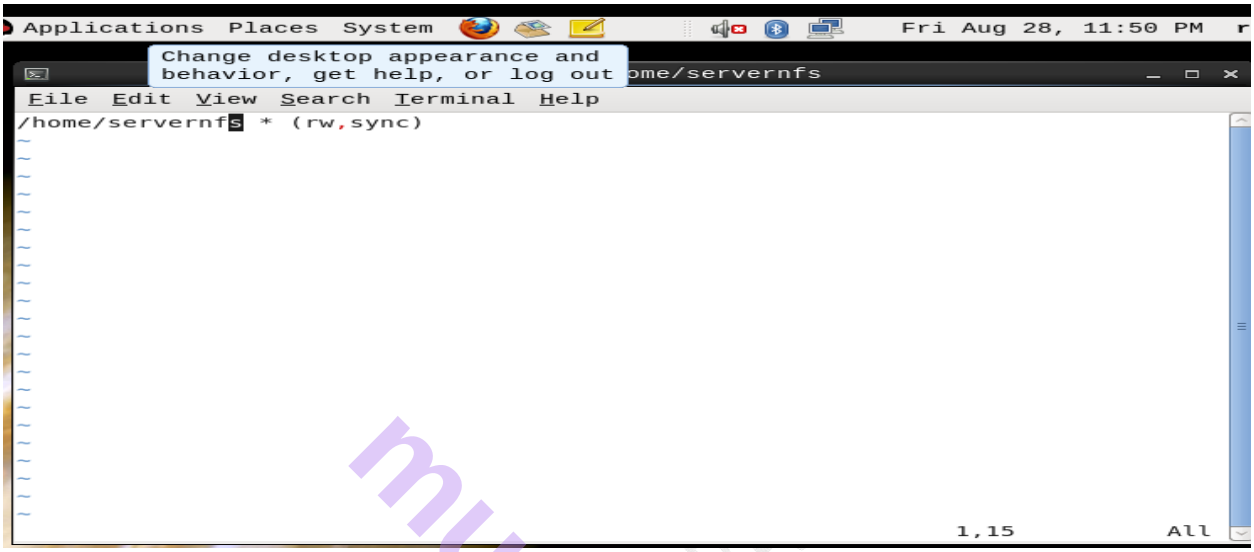


(4) Make a directory to be exported, create few files into it and give it full permission, as follows:



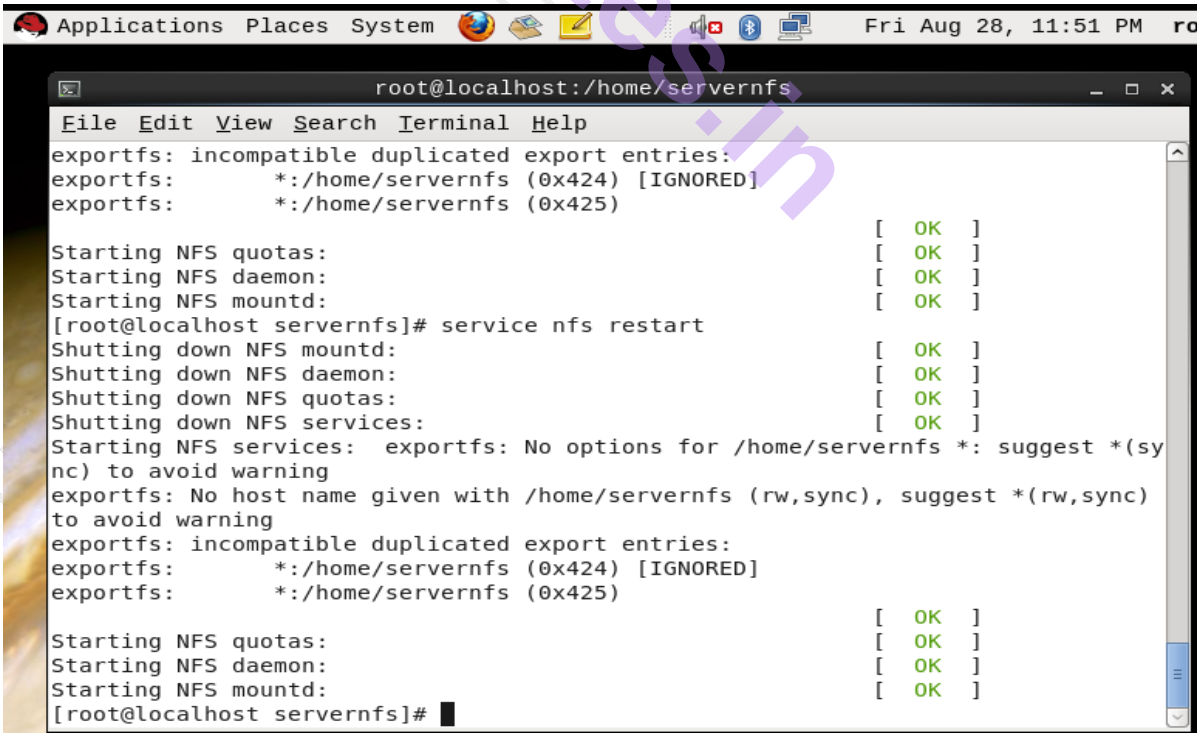
(5) Open the configuration file of NFS, i.e, /etc/exports and write the following lines under it:

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

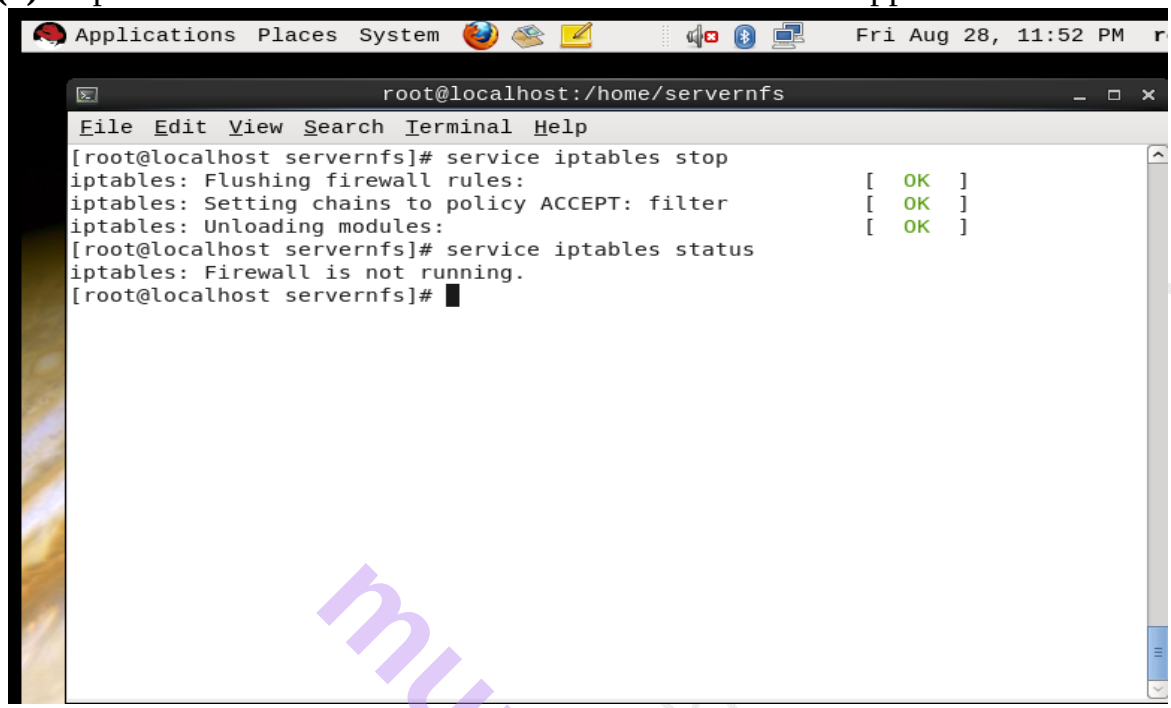


The above entry says that server export directory has been exported to the network 192.168.1.3

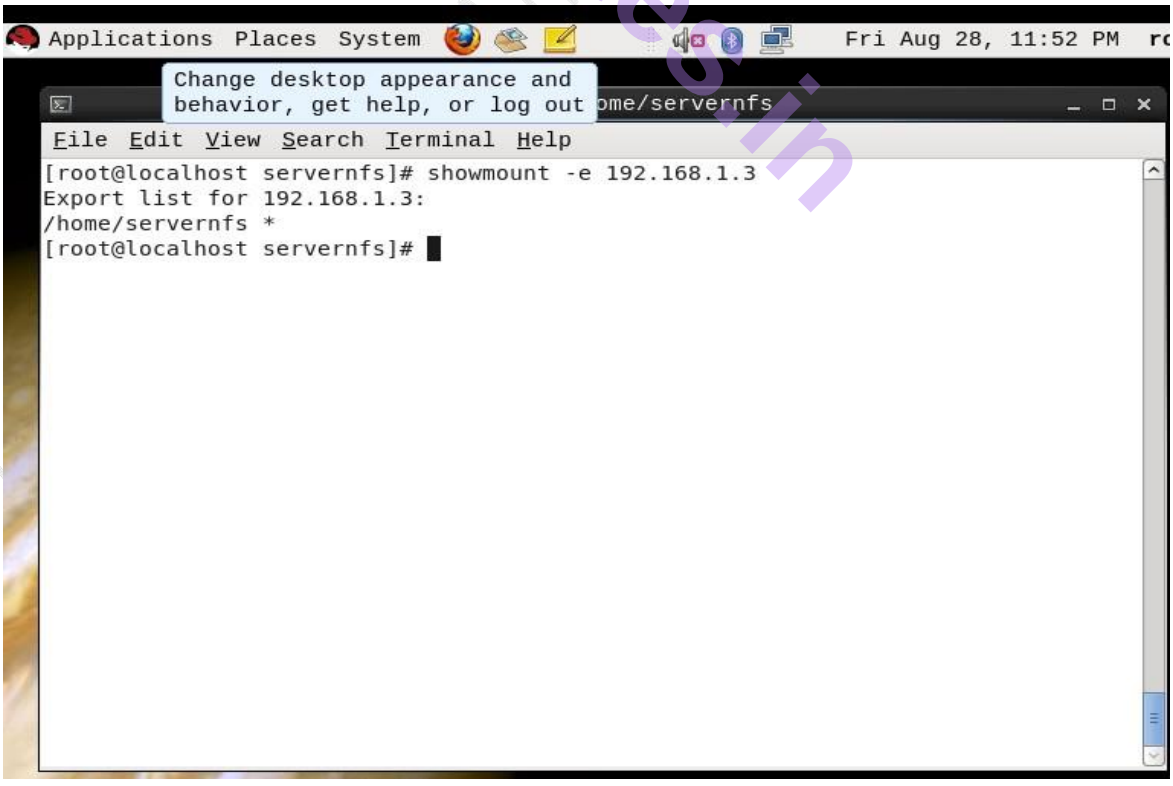
(6) Save and quit the file. Restart the service of nfs and enable it from boot as shown below :



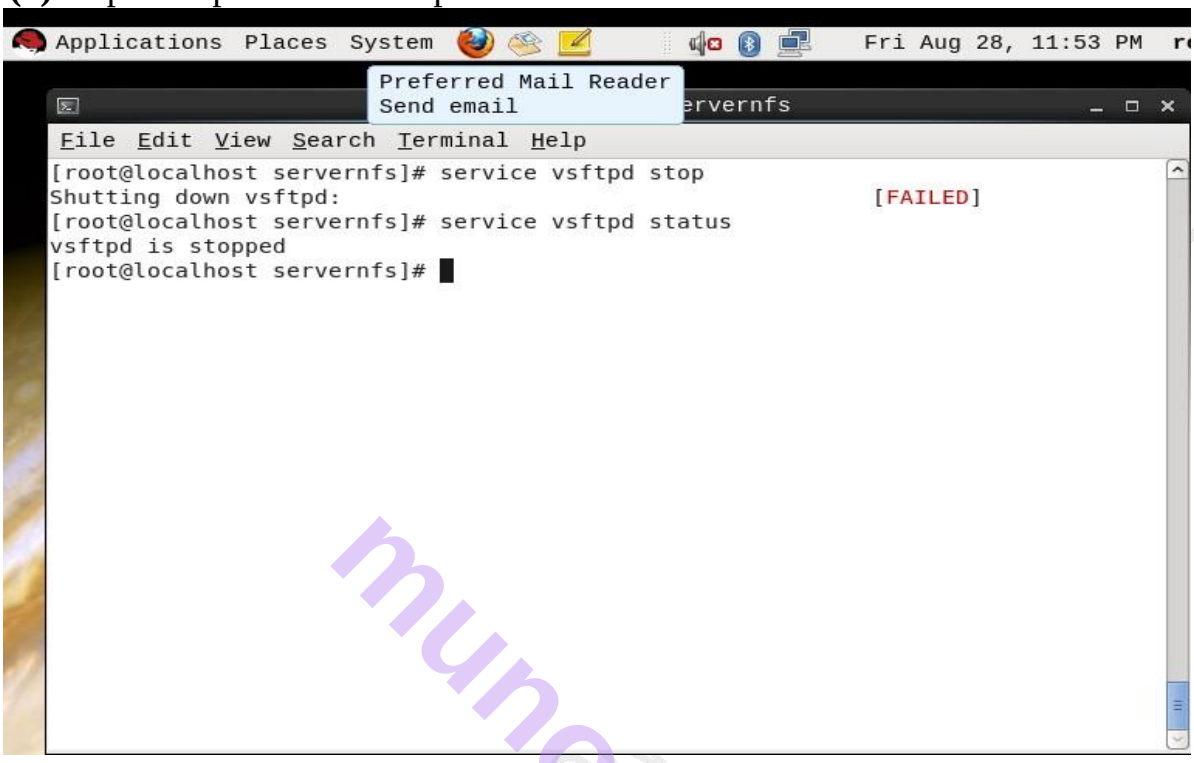
(7) Stop the Firewalls and check the status whether it is stopped.



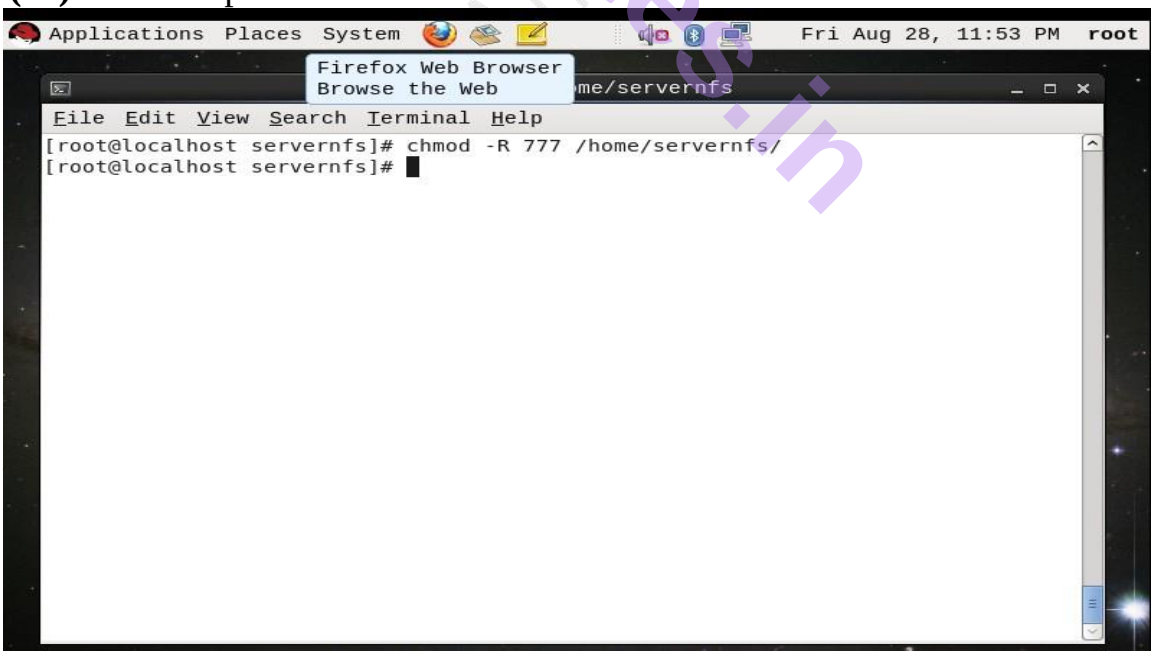
(8) Showmount command shows you all shared directories in given IP address.(Server)



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

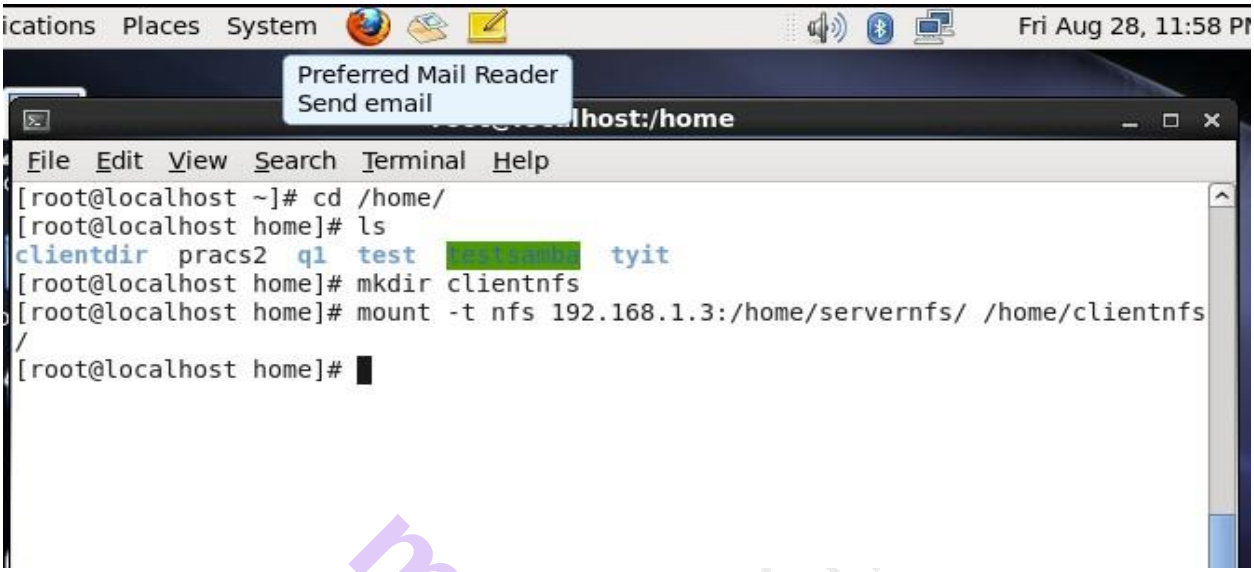


(10) Give full permissions to the shared folder.

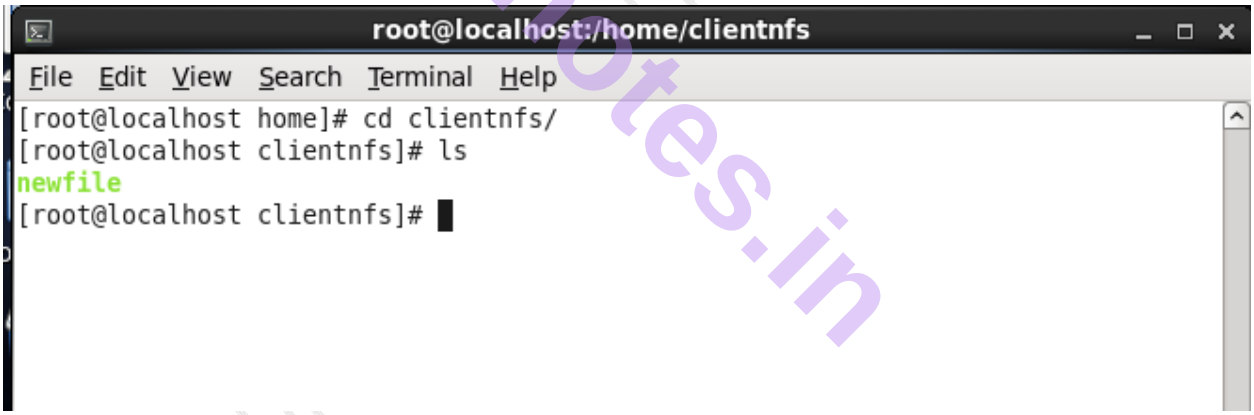


NFS Client:

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



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



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

```
#
# Recommended minimum configuration:
#
acl manager proto cache_object
acl localhost src 127.0.0.1/32
acl localhost src ::1/128
acl to_localhost dst 127.0.0.0/8 0.0.0.0/32
acl to_localhost dst ::1/128

# Example rule allowing access from your local networks.
# Adapt to list your (internal) IP networks from where browsing
# should be allowed
acl localnet src 10.0.0.0/8     # RFC1918 possible internal network
acl localnet src 172.16.0.0/12  # RFC1918 possible internal network
acl localnet src 192.168.0.0/16 # RFC1918 possible internal network
acl localnet src fc00::/7   # RFC 4193 local private network range
acl localnet src fe80::/10  # RFC 4291 link-local (directly plugged) machines

acl SSL_ports port 443
acl Safe_ports port 80          # http
acl Safe_ports port 21          # ftp
acl Safe_ports port 443         # https
acl Safe_ports port 70          # gopher
acl Safe_ports port 210         # wais
acl Safe_ports port 1025-65535  # unregistered ports
acl Safe_ports port 280         # http-mgmt
acl Safe_ports port 488         # gss-http
acl Safe_ports port 591         # filemaker
acl Safe_ports port 777         # multiling http
acl CONNECT method CONNECT
#
# 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.

```
# Recommended minimum Access Permission configuration:
#
acl deny_host src 192.168.1.14
acl allow_network src 192.168.1.0/24
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

```
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.

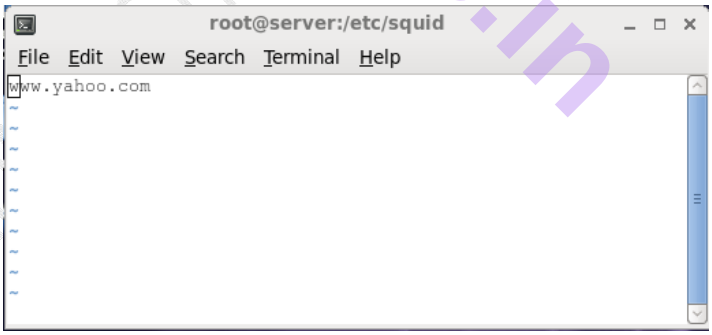
```
69 # Squid normally listens to port 3128
70 http_port 3128
```

: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: ..............                             [  OK  ]
Starting squid: .                                          [  OK  ]
[root@server ~]#
```

We are done with the squid server configuration.

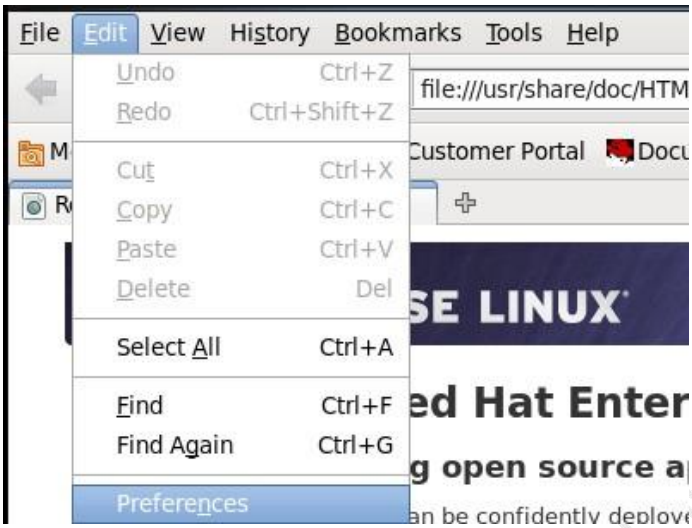
SQUID CLIENT Configuration

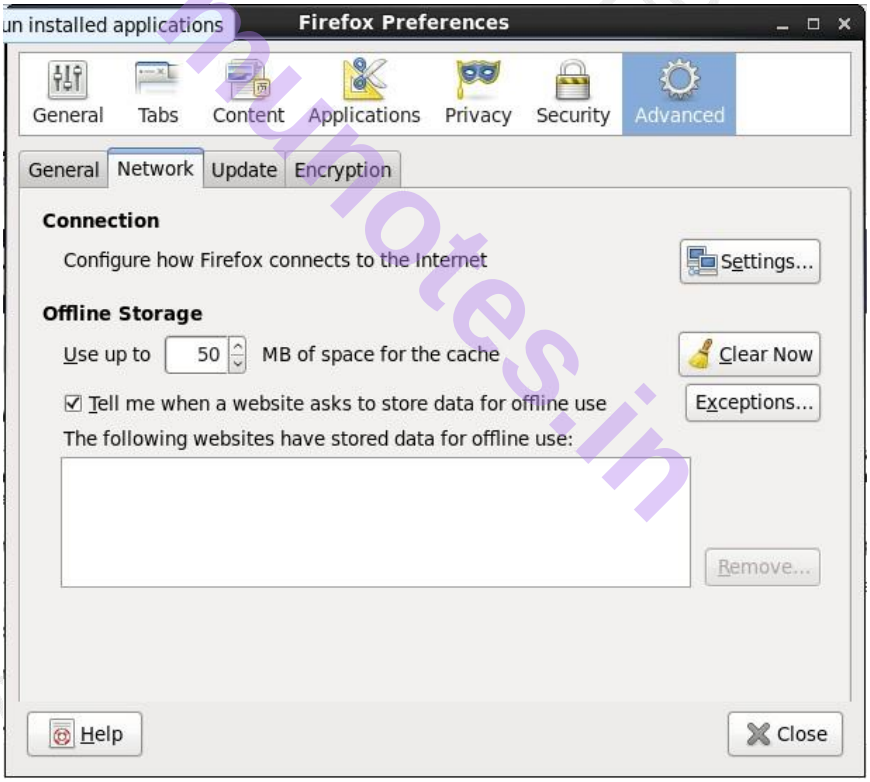
Go to client side/clone side

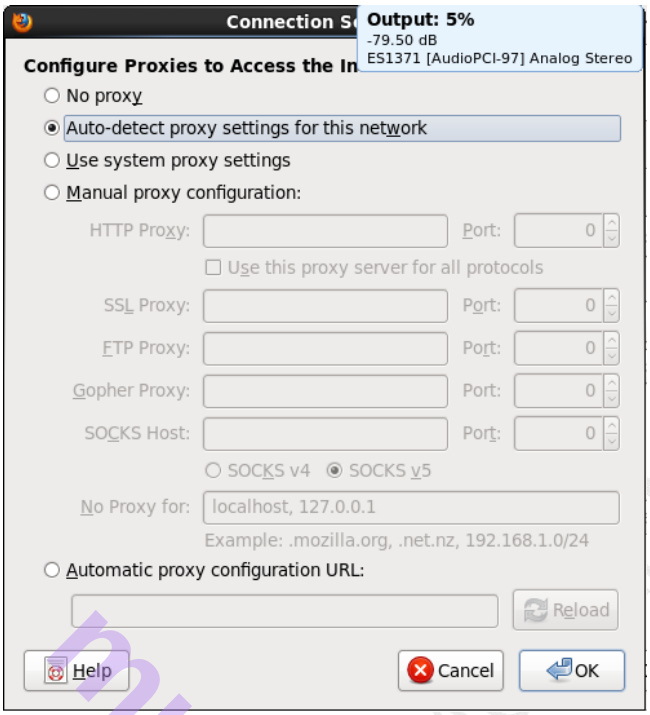
Go to firefox browser-open firefox

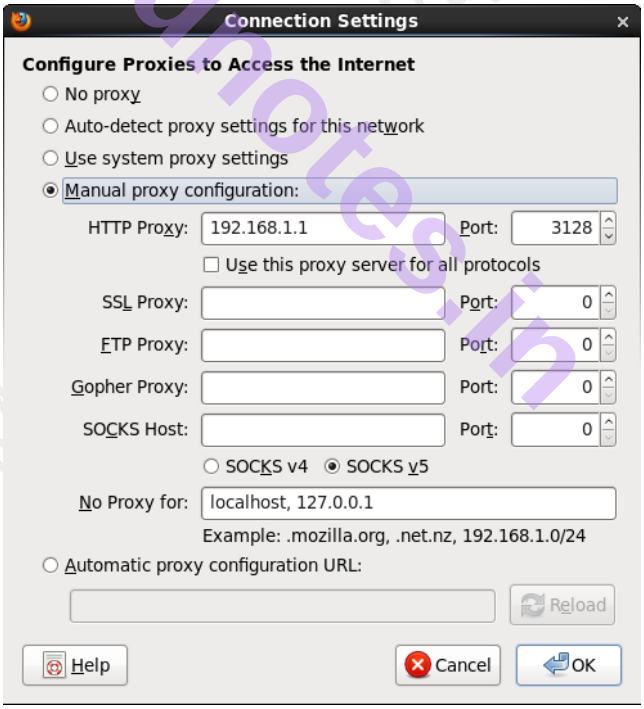
Go to Edit→Preference→advanced→ network tools→ click settings-→ select manual proxy configuration→ HTTP Proxy and enter Squid proxy server IP Address 192.168.1.1 and Port no as 8080

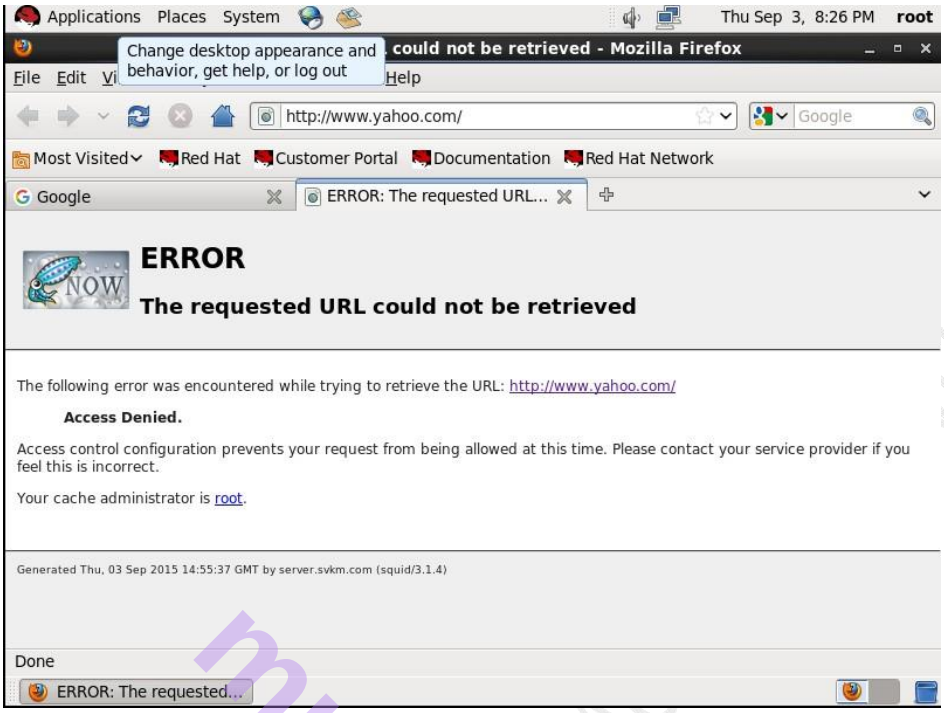
Click on OK and Apply.











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\ Disc\ 1/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]# vim /etc/mail/sendmail.mc
```

```
divert(-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 #
include(`/usr/share/sendmail-cf/m4/cf.m4')dnl
VERSIONID(`setup for linux')dnl
OSTYPE(`linux')dnl
dnl #
dnl # Do not advertize sendmail version.
dnl #
dnl define(`confSMTP_LOGIN_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 define(`confLOG_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 define(`SMART_HOST', `smtp.your.provider')dnl
dnl #
define(`confDEF_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 dnl  # DAEMON_OPTIONS(`Port=smtp, Addr=127.0.0.1,  Name=MTA') dnl
```

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]# vim /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 pervious 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

; <<>> DiG 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
        IN      NS      server.svkm.com
server  IN      A       192.168.1.1
        IN      MX      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:                                    [  OK  ]
Starting sendmail:                                         [  OK  ]
Starting sm-client:                                        [  OK  ]
[root@server Packages]#
```

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

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: testmail
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
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"
&
```

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                                                 (  1%
########################################### [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                                                    ( 70%
########################################### [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

```
[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
```

```
# Example config file /etc/vsftpd/vsftpd.conf
#
# The default compiled in settings are fairly paranoid. This sample file
# loosens things up a bit, to make the ftp daemon more usable.
# Please see vsftpd.conf.5 for all compiled in defaults.
#
# READ THIS: This example file is NOT an exhaustive list of vsftpd options.
# Please read the vsftpd.conf.5 manual page to get a full idea of vsftpd's
# capabilities.
#
# Allow anonymous FTP? (Beware - allowed by default if you comment this out).
anonymous_enable=YES
#
# Uncomment this to allow local users to log in.
local_enable=YES
#
# Uncomment this to enable any form of FTP write command.
write_enable=YES
#
: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

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 configure.Test as FTP client from other machine.

Use the following command.

#ftp 192.168.1.1

It will prompt for username and password. If your 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 login with username anonymous. It will not allow to login with anonymous username and gives you login 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

```
[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

```
[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

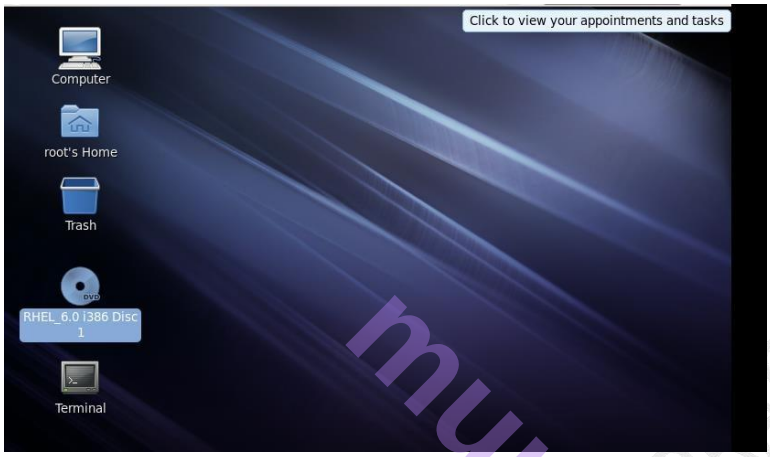
To exit from ftp use bye command.

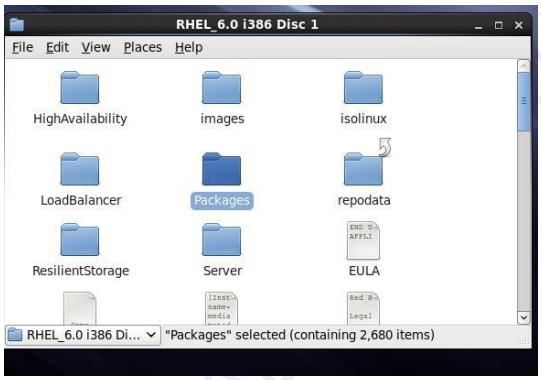
Practical no 12: Using gcc complier(Programming using c)

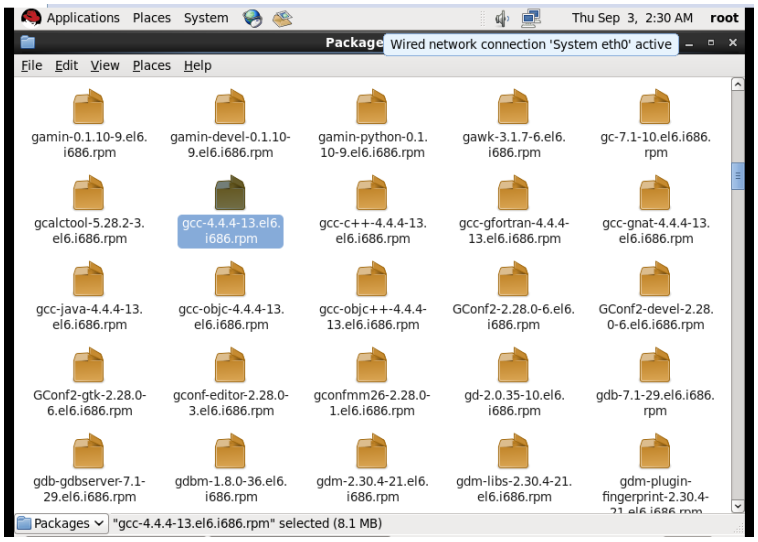
Executing shell scripts with C using gcc compiler

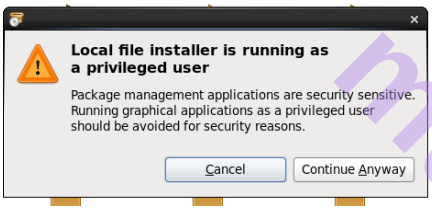
Installation of gcc package:

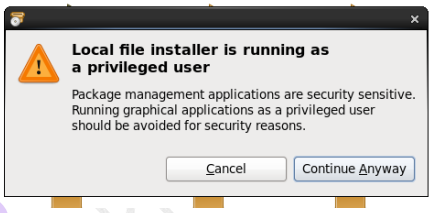
#rpm –ivh gcc

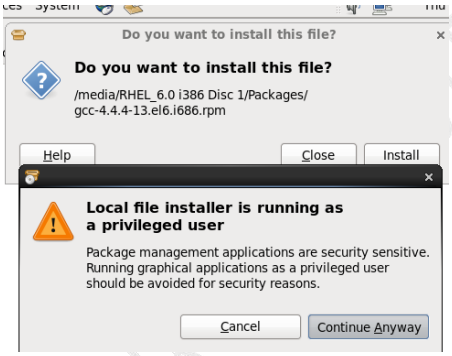


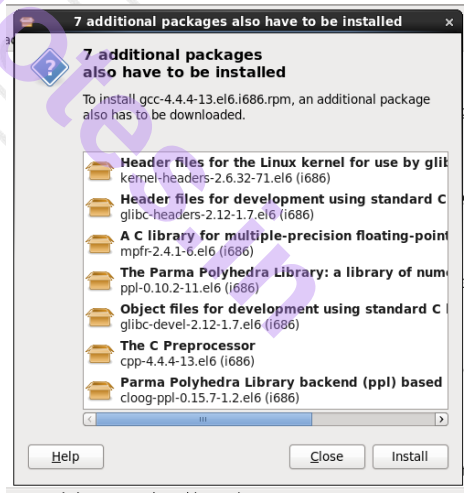


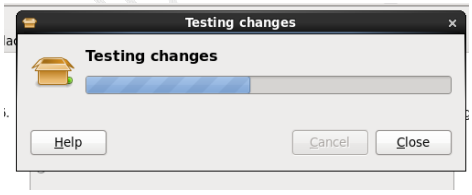

Applications Places System
Thu Sep 3, 2:30 AM root
Package
Wired network connection 'System eth0' active
File Edit View Places Help
gamin-0.1.10-9.el6.i686.rpm
gamin-devel-0.1.10-9.el6.i686.rpm
gamin-python-0.1.10-9.el6.i686.rpm
gawk-3.1.7-6.el6.i686.rpm
gc-7.1-10.el6.i686.rpm
gcalctool-5.28.2-3.el6.i686.rpm
gcc-4.4.4-13.el6.i686.rpm
gcc-c++-4.4.4-13.el6.i686.rpm
gcc-gfortran-4.4.4-13.el6.i686.rpm
gcc-gnat-4.4.4-13.el6.i686.rpm
gcc-java-4.4.4-13.el6.i686.rpm
gcc-objc-4.4.4-13.el6.i686.rpm
gcc-objc++-4.4.4-13.el6.i686.rpm
GConf2-2.28.0-6.el6.i686.rpm
GConf2-devel-2.28.0-6.el6.i686.rpm
GConf2-gtk-2.28.0-6.el6.i686.rpm
gconf-editor-2.28.0-3.el6.i686.rpm
gconfmm26-2.28.0-1.el6.i686.rpm
gd-2.0.35-10.el6.i686.rpm
gdb-7.1-29.el6.i686.rpm
gdb-gdbserver-7.1-29.el6.i686.rpm
gdbm-1.8.0-36.el6.i686.rpm
gdm-2.30.4-21.el6.i686.rpm
gdm-libs-2.30.4-21.el6.i686.rpm
gdm-plugin-fingerprint-2.30.4-
Packages "gcc-4.4.4-13.el6.i686.rpm" selected (8.1 MB)

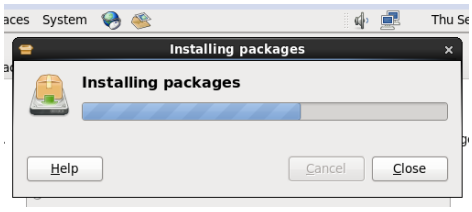

Local file installer is running as a privileged user
Package management applications are security sensitive. Running graphical applications as a privileged user should be avoided for security reasons.
Cancel
Continue Anyway

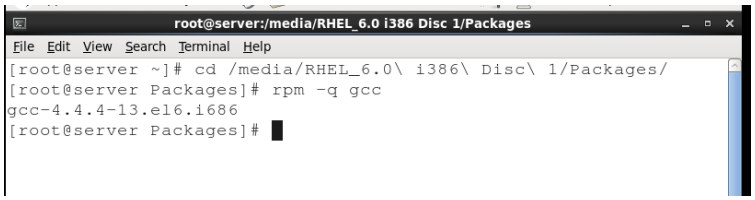

Local file installer is running as a privileged user
Package management applications are security sensitive. Running graphical applications as a privileged user should be avoided for security reasons.
Cancel
Continue Anyway


Do you want to install this file?
Do you want to install this file?
/media/RHEL_6.0 i386 Disc 1/Packages/gcc-4.4.4-13.el6.i686.rpm
Help
Close
Install
Local file installer is running as a privileged user
Package management applications are security sensitive. Running graphical applications as a privileged user should be avoided for security reasons.
Cancel
Continue Anyway


7 additional packages also have to be installed
7 additional packages also have to be installed
To install gcc-4.4.4-13.el6.i686.rpm, an additional package also has to be downloaded.
Header files for the Linux kernel for use by glib
kernel-headers-2.6.32-71.el6 (i686)
Header files for development using standard C
glibc-headers-2.12-1.7.el6 (i686)
A C library for multiple-precision floating-point
mpfr-2.4.1-6.el6 (i686)
The Parma Polyhedra Library: a library of num
ppl-0.10.2-11.el6 (i686)
Object files for development using standard C
glibc-devel-2.12-1.7.el6 (i686)
The C Preprocessor
cpp-4.4.4-13.el6 (i686)
Parma Polyhedra Library backend (ppl) based
cloog-ppl-0.15.7-1.2.el6 (i686)
Help
Close
Install


Testing changes
Testing changes
Help
Cancel
Close

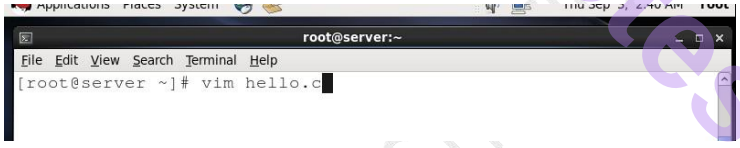

System
Installing packages
Installing packages
Help
Cancel
Close

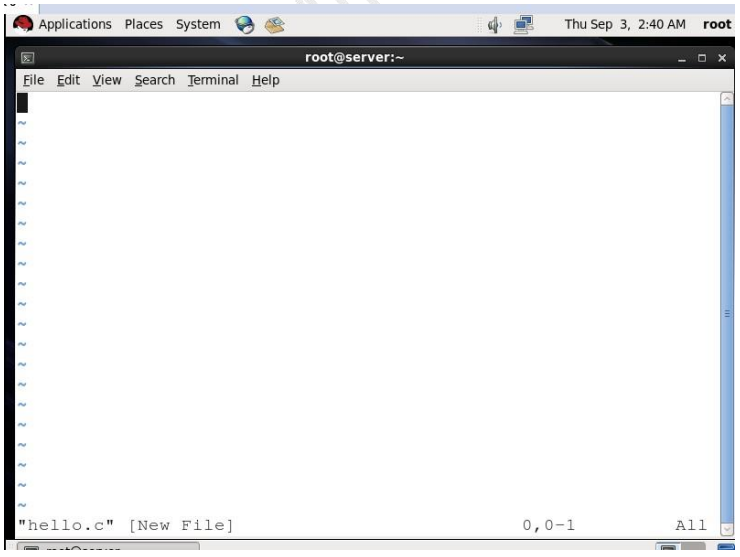


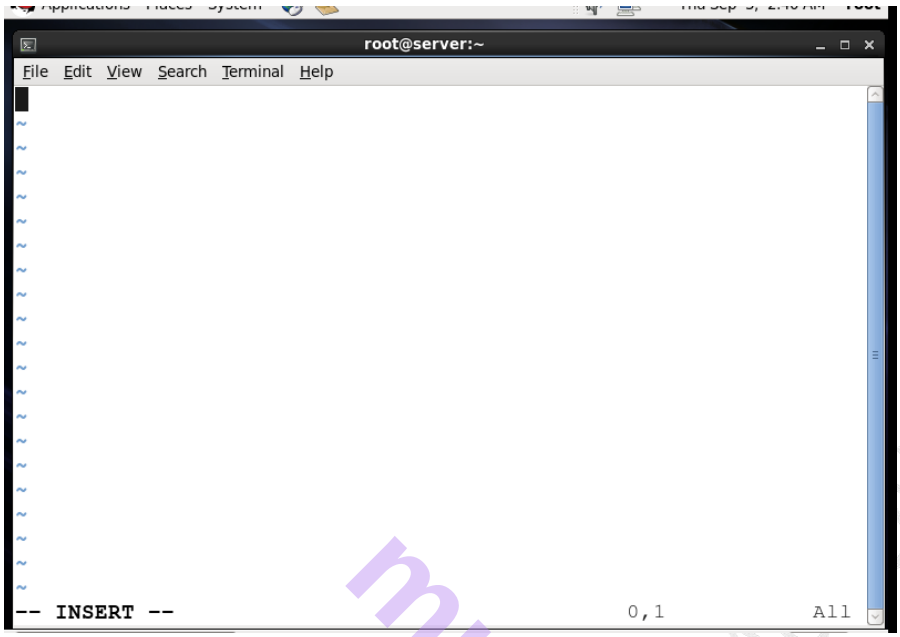
1. Program to display hello world:

Open vi Editor to type C program or follows:

#vim hello.c





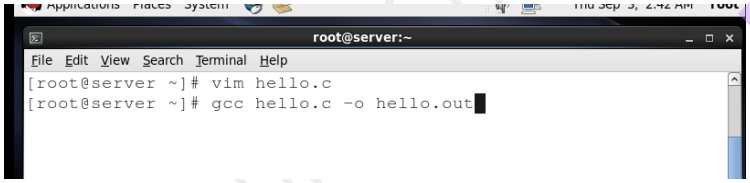


Type the following code:

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



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:

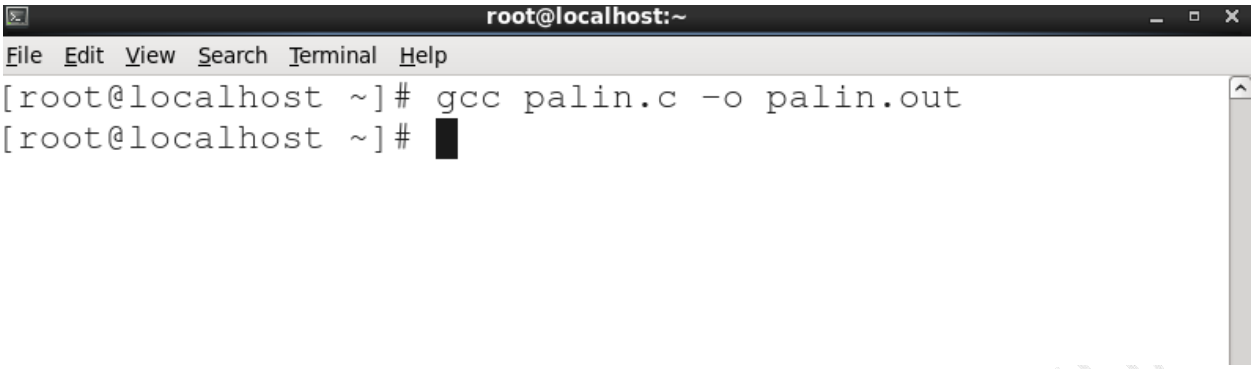
Open vi Editor to type C program or follows:

#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%
root@localhost:~
```

#gcc palin.c –o palin.out



Finally run the program and obtain the output

To Run,execute the following command:

#./palin.out

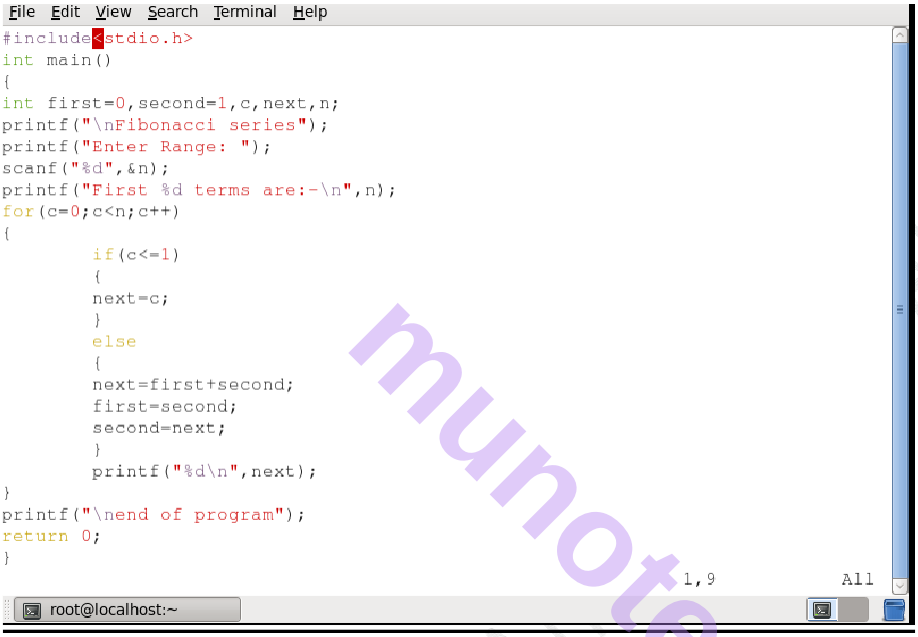
```
File  Edit  View  Search  Terminal  Help
[root@localhost ~]# gcc palin.c -o palin.out
[root@localhost ~]# ./palin.out
Enter Number:123
123 This is not a palindrome.
[root@localhost ~]#
```

3. Write a program to find Fibonacci series:

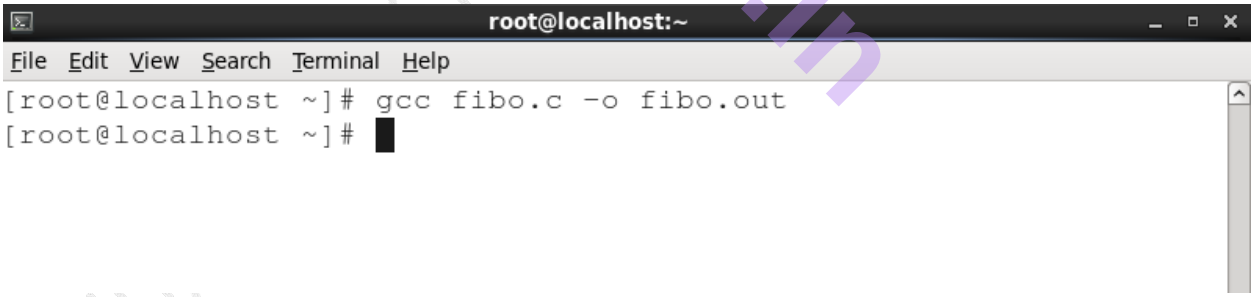
Open vi Editor to type C program or follows:

#vim fibo.c

Type the following code:



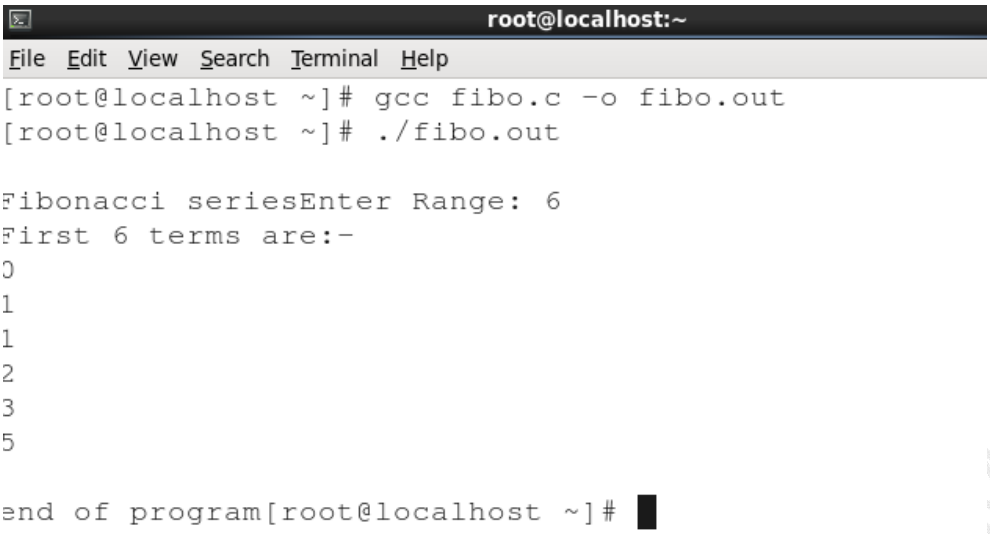
#gcc fibo.c –o fibo.out



Finally run the program and obtain the output

To Run,execute the following command:

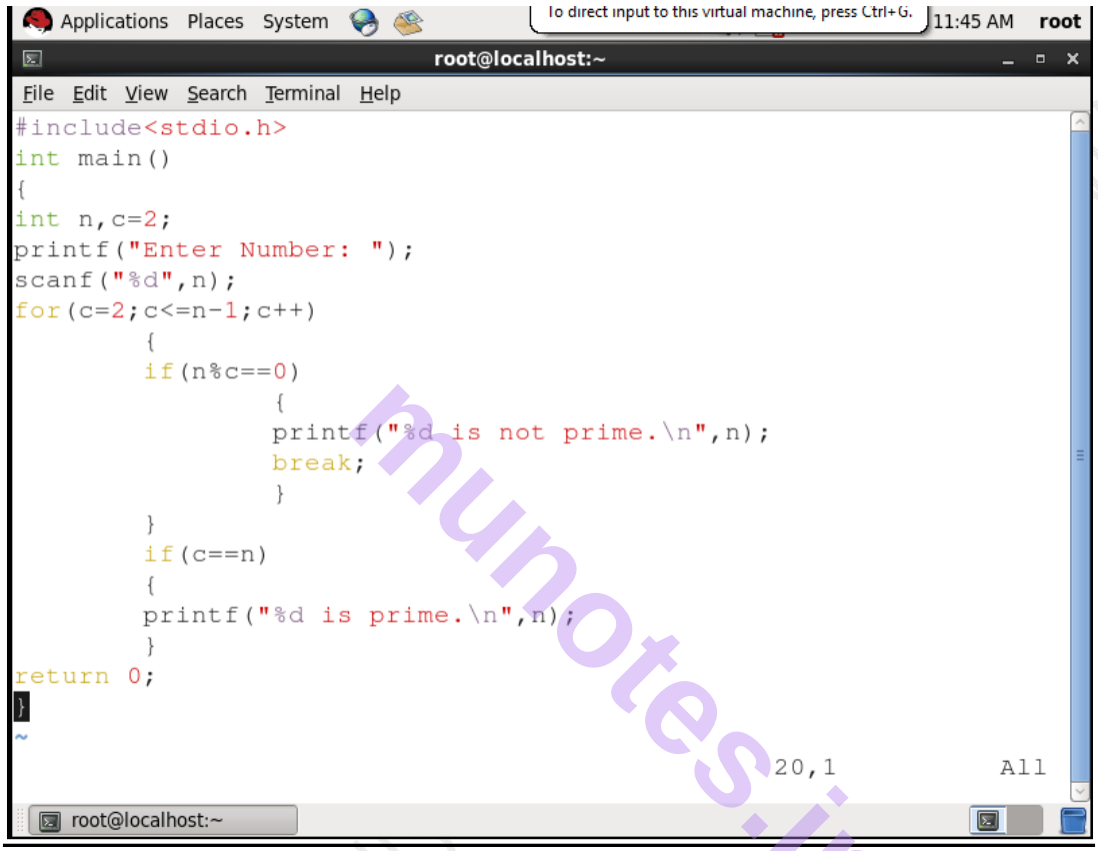
#./fibo.out



4.Write a program to find prime number:

#vim prime .c

Type the following code:

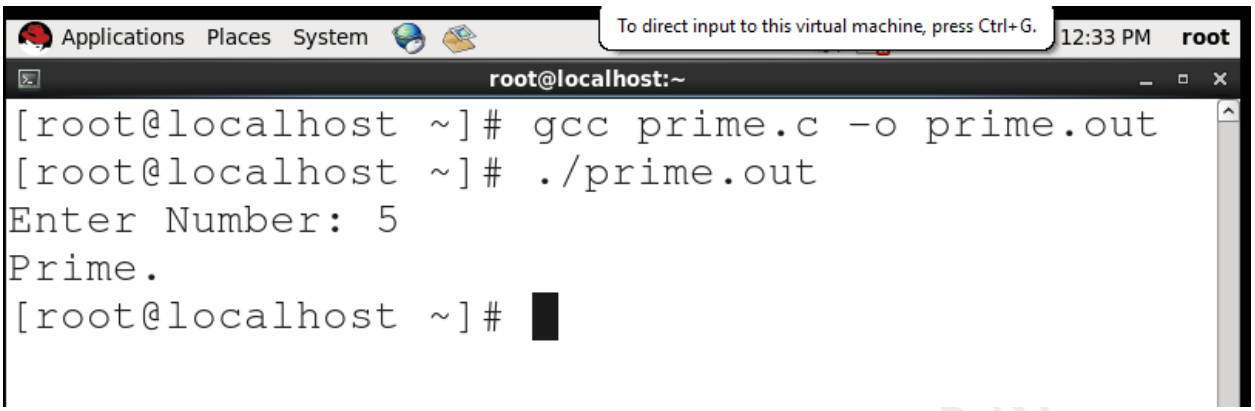


#gcc prime.c –o prime.out

Finally run the program and obtain the output

To Run,execute the following command:

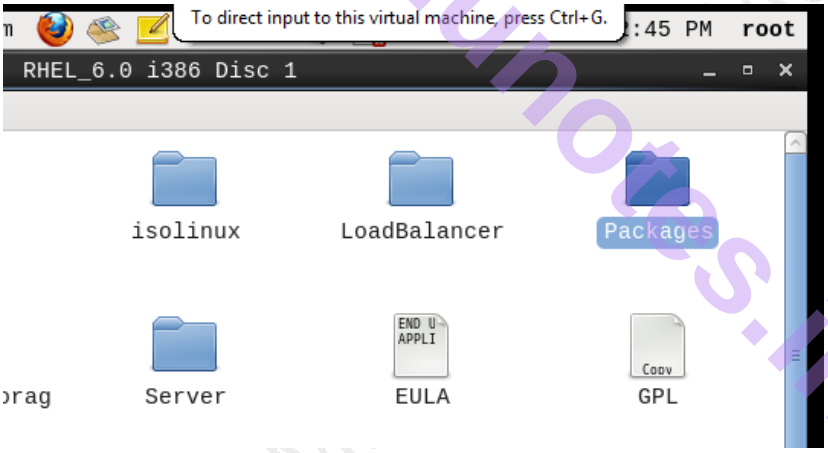
#./prime.out

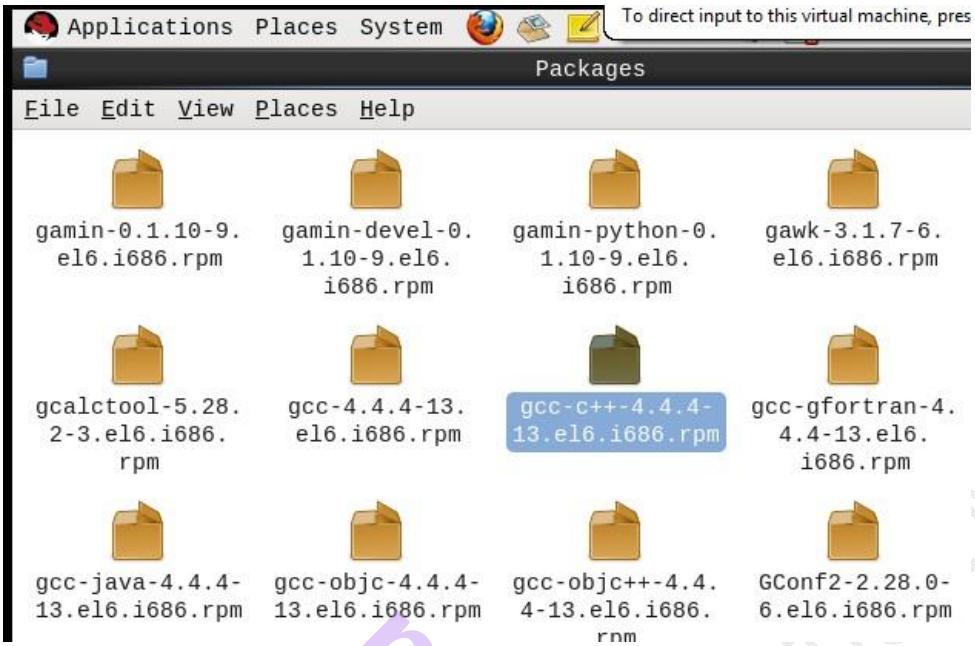


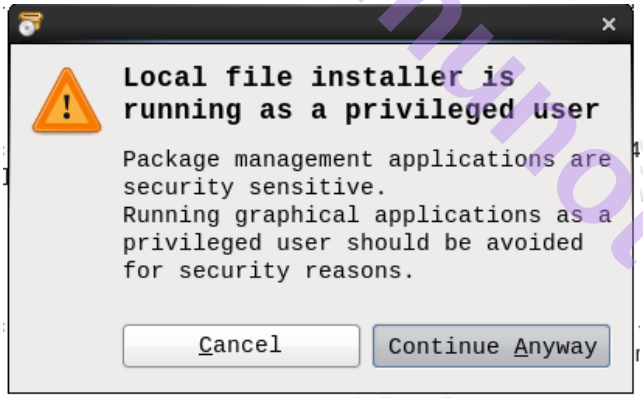
Practical no 13: Using gc++ complier(Programming using c++)

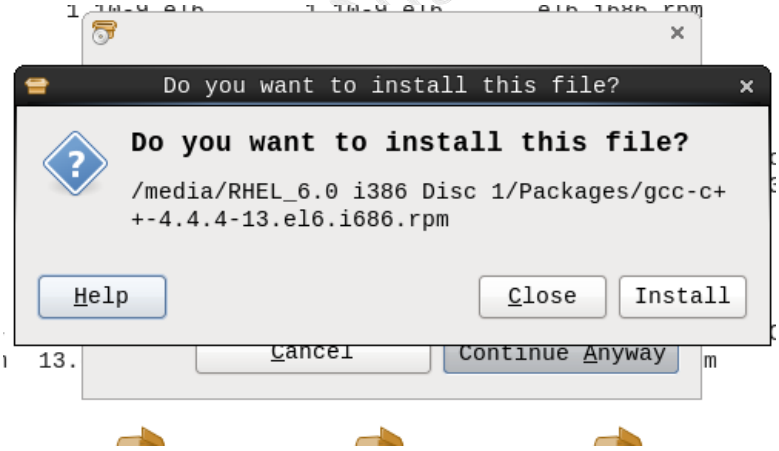
Executing shell scripts with C++ using g++ Compiler

Installation of g++ package:







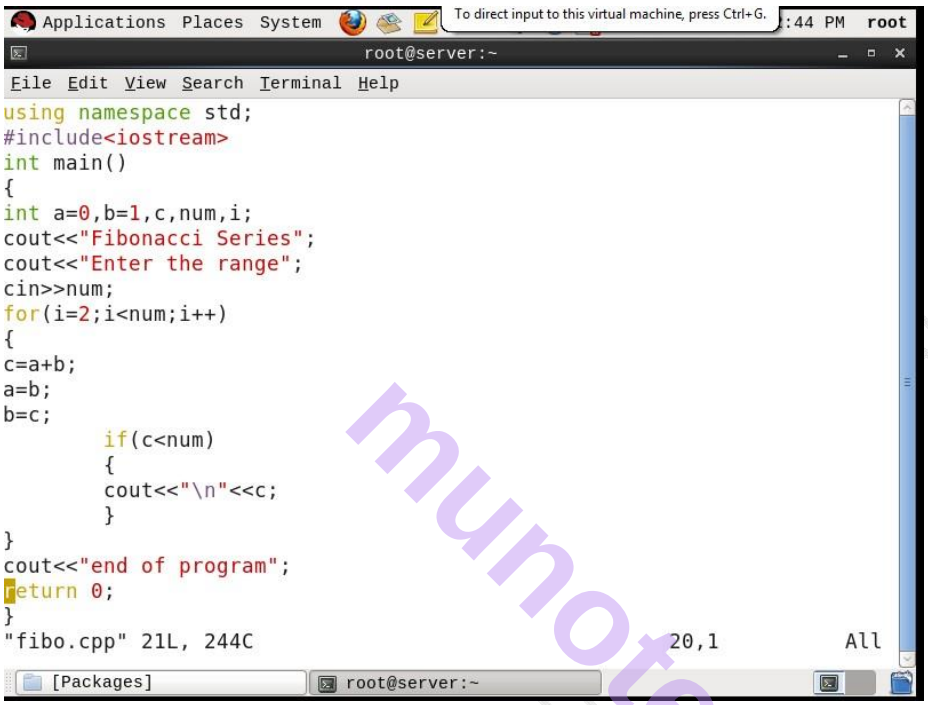


Open vi Editor to type C++ program as follows:

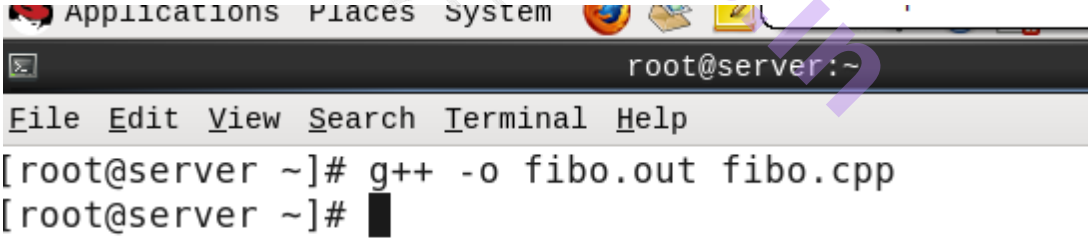
1.Write a program to display Fibonacci series:

 # vim fibo.cpp

Type the following code:



 # g++ fibo.cpp –o fibo.out



Finally run the program and obtain the output

To run, execute the following command:

#./fibo.out

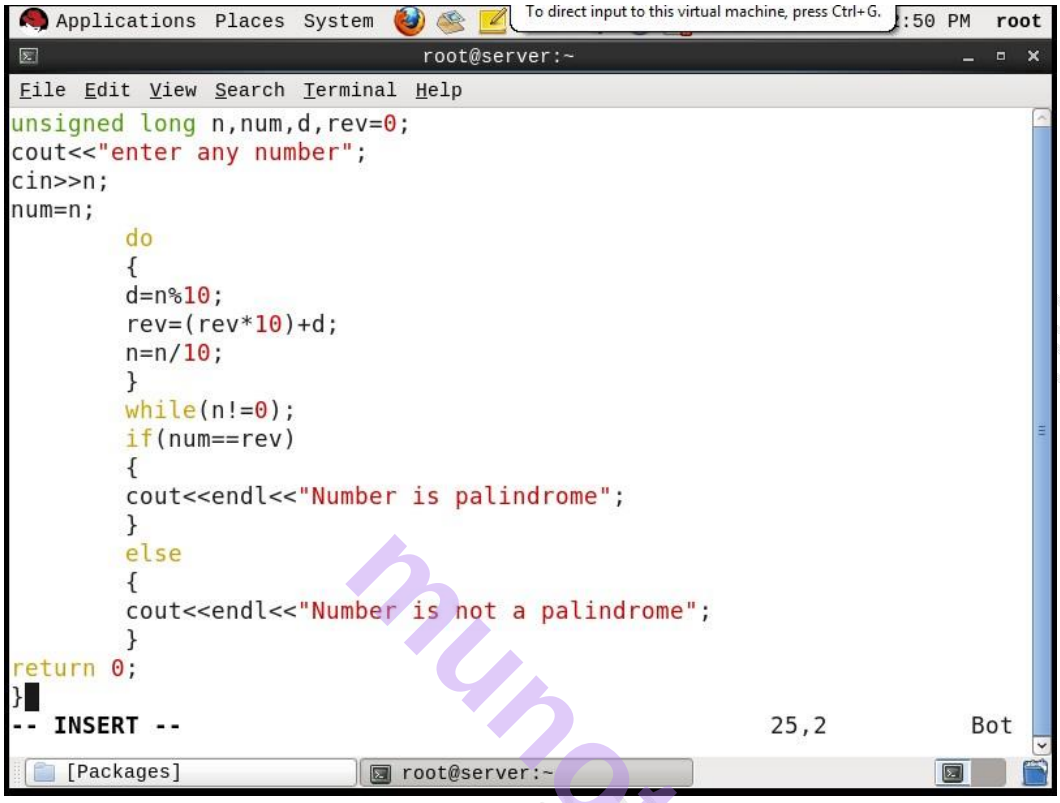
```
Applications  Places  System
                                        root@serv
File  Edit  View  Search  Terminal  Help
[root@server ~]# ./fibo.out
Fibonacci SeriesEnter the range10

1
2
3
5
End of program[root@server ~]#
```

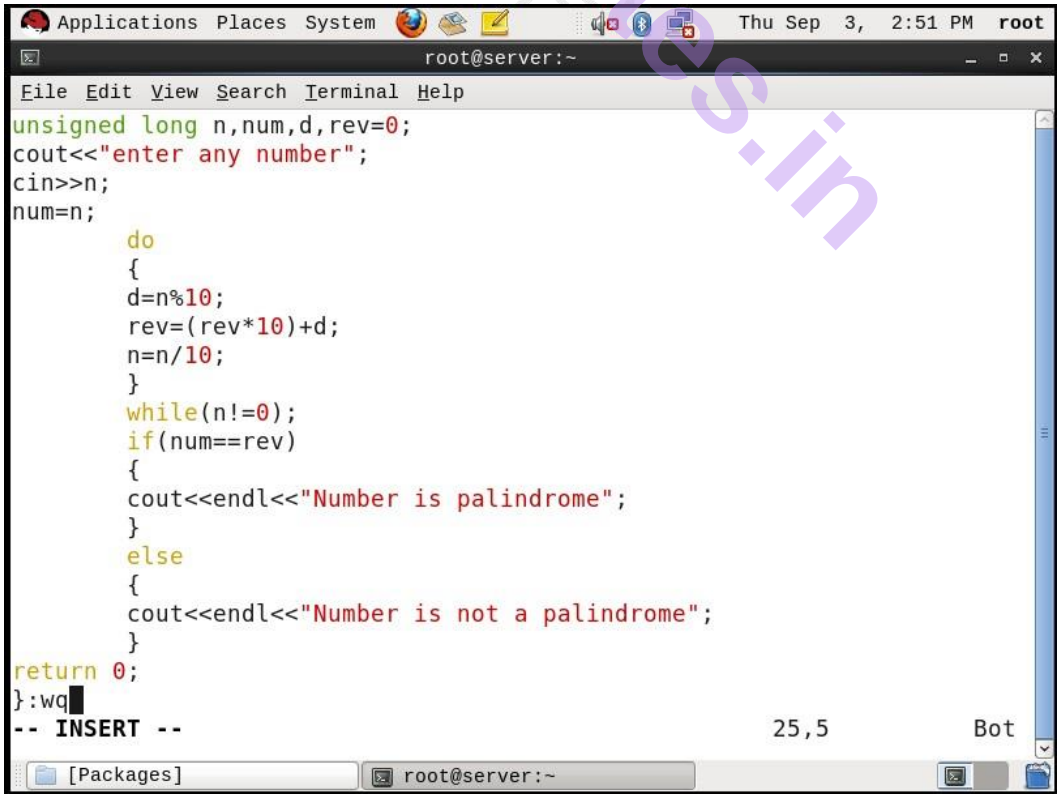
3.Write a program to find whether the number is palindrome:

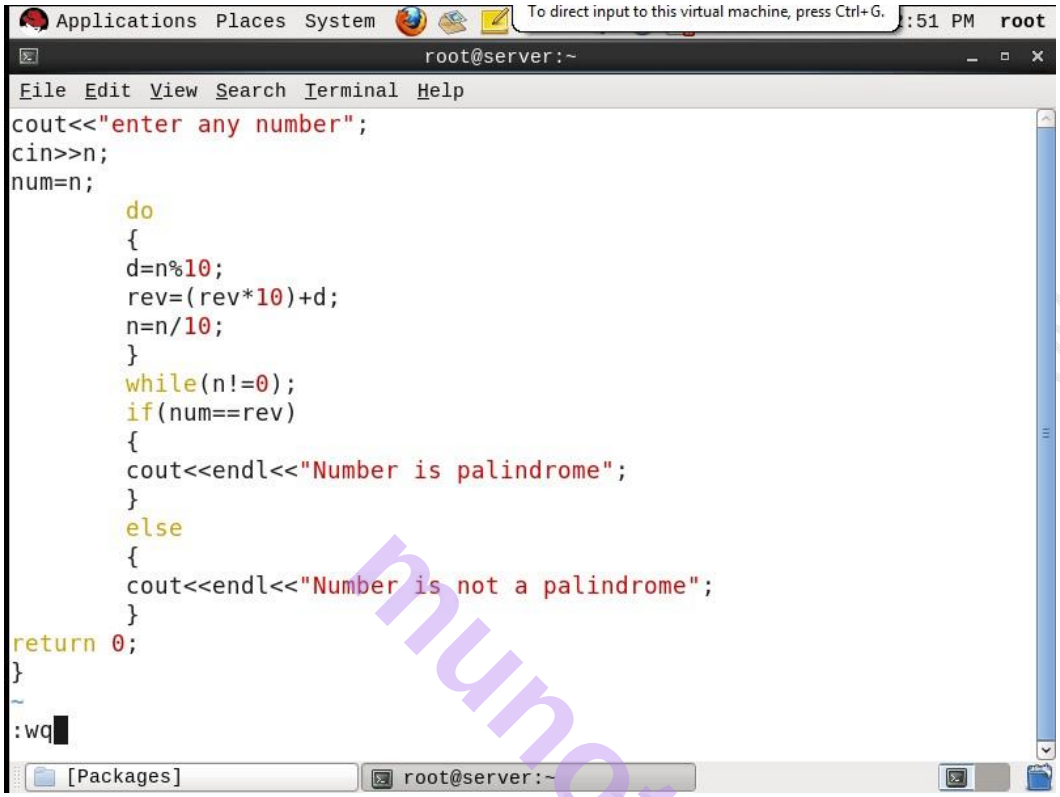
 # vim palin.cpp

Type the following code:

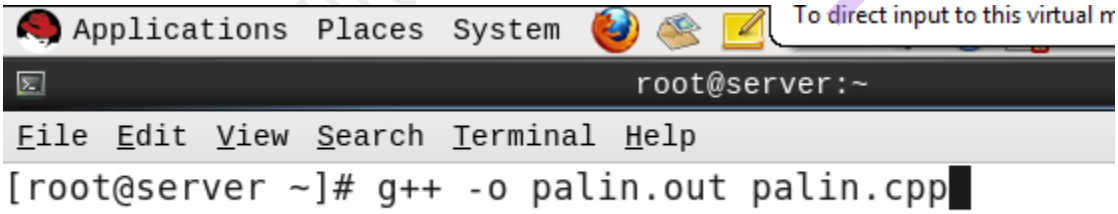
```
Applications  Places  System   To direct input to this virtual machine, press Ctrl+G.   :50 PM  root
                                root@server:~
File  Edit  View  Search  Terminal  Help
using namespace std;
#include<iostream>
int main()
{
unsigned long n,num,d,rev=0;
cout<<"enter any number";
cin>>n;
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
 [Packages]   root@server:~
```


Applications Places System
To direct input to this virtual machine, press Ctrl+G.
:50 PM root
root@server:~
File Edit View Search Terminal Help
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
[Packages]
root@server:~


Applications Places System
Thu Sep 3, 2:51 PM root
root@server:~
File Edit View Search Terminal Help
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
[Packages]
root@server:~



 # g++ palin.cpp –o palin.out



Finally run the program and obtain the output

To run, execute the following command:

#./palin.out

```
Applications  Places  System                    To direct input to this virtual r
                                  root@server:~
File  Edit  View  Search  Terminal  Help
[root@server ~]# ./palin.out
enter any number123

Number is not a palindrome[root@server ~]#
```

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
```

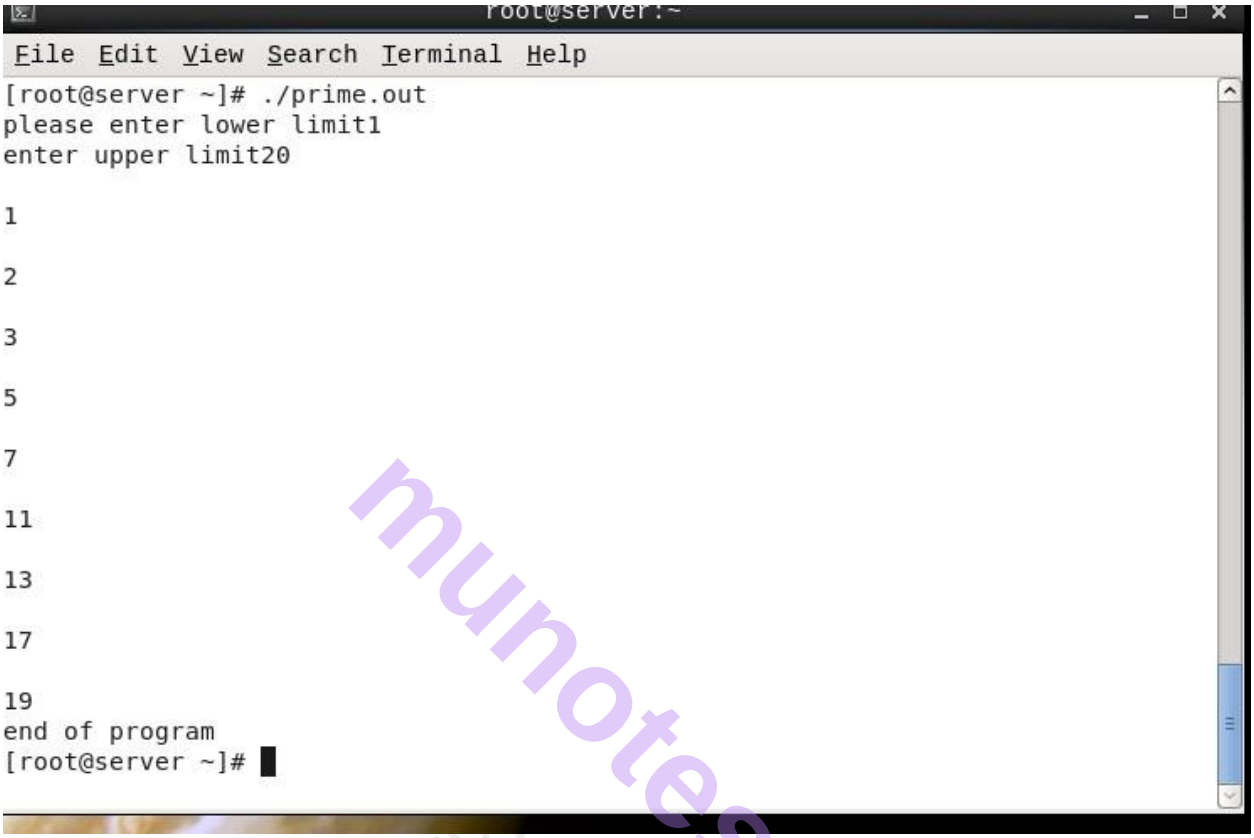
 # g++ prime.cpp –o prime.out

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

Finally run the program and obtain the output

To run, execute the following command:

#./prime.out



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

Document Root /var/www/virtual/server.svkm.com/html

ServerName 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

```
[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.

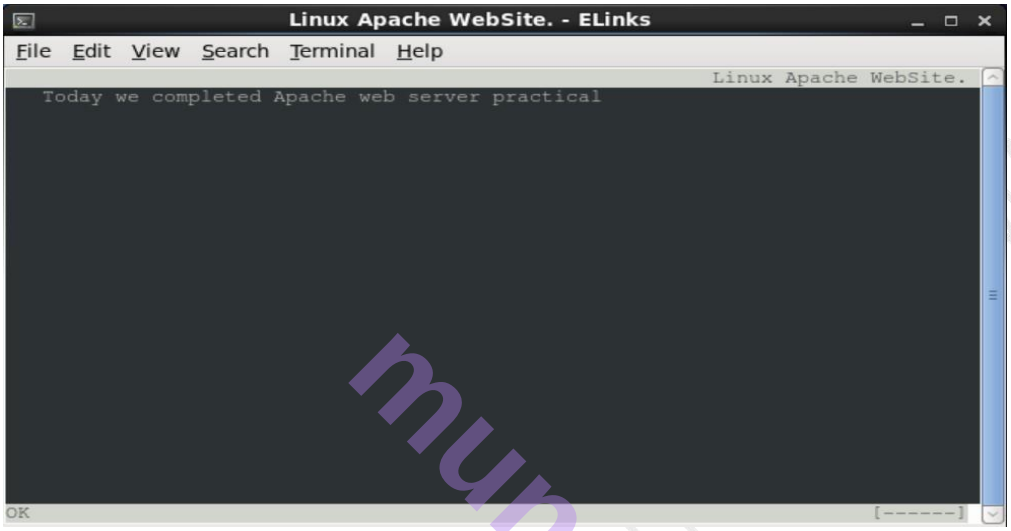
#links 192.168.1.1

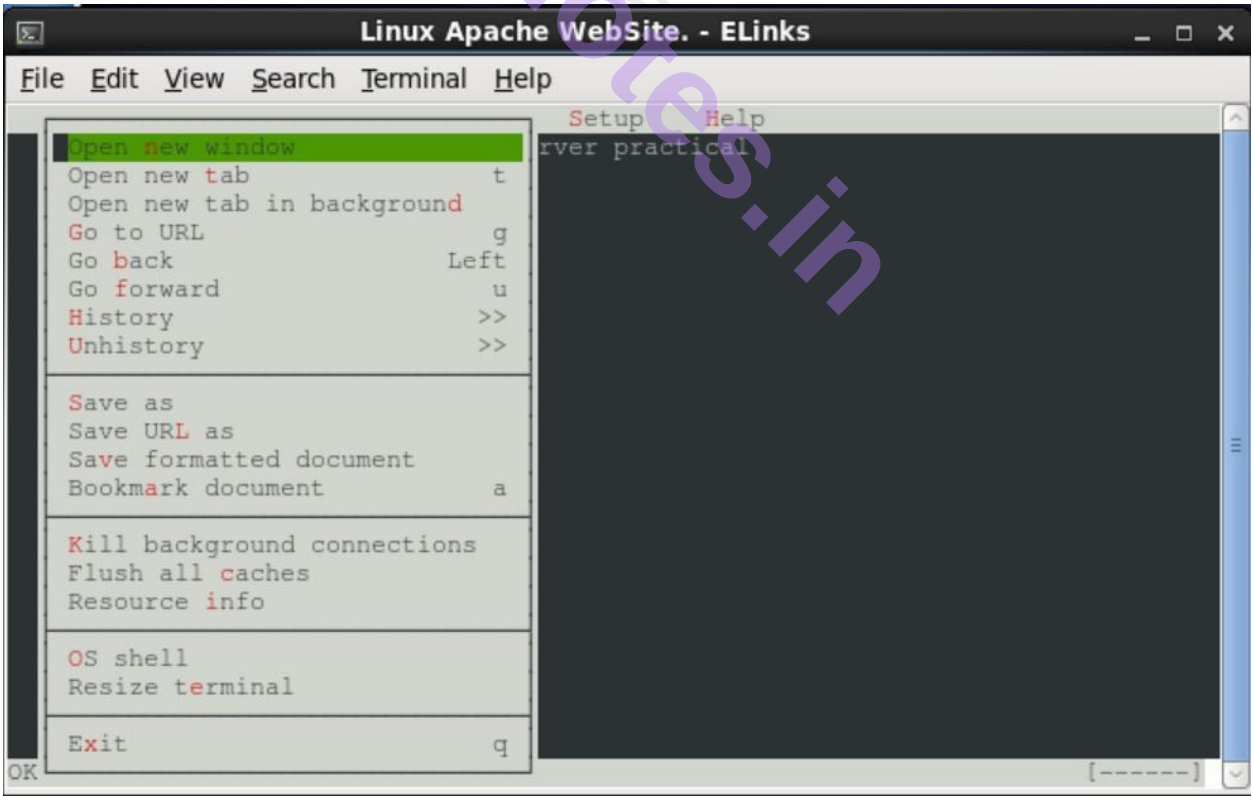
```
[root@server ~]# links 192.168.1.1
```

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

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

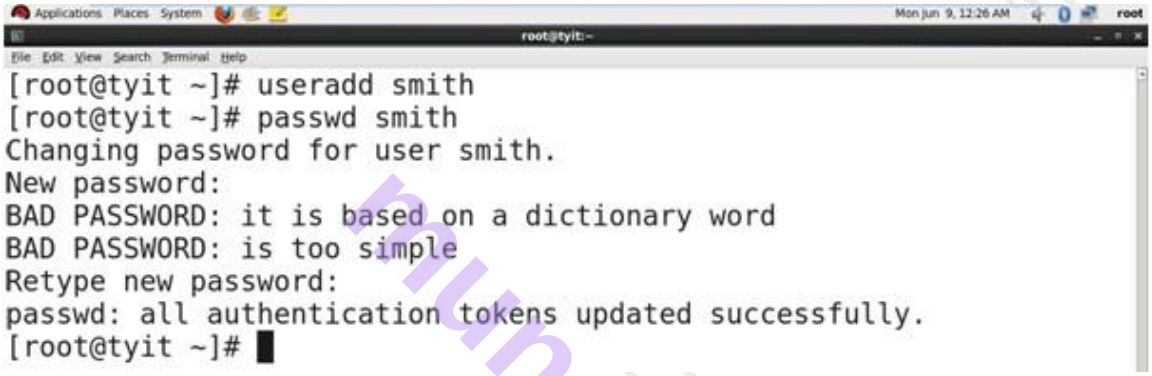




Practical no 15: Linux System Administration

(A) Becoming super user:

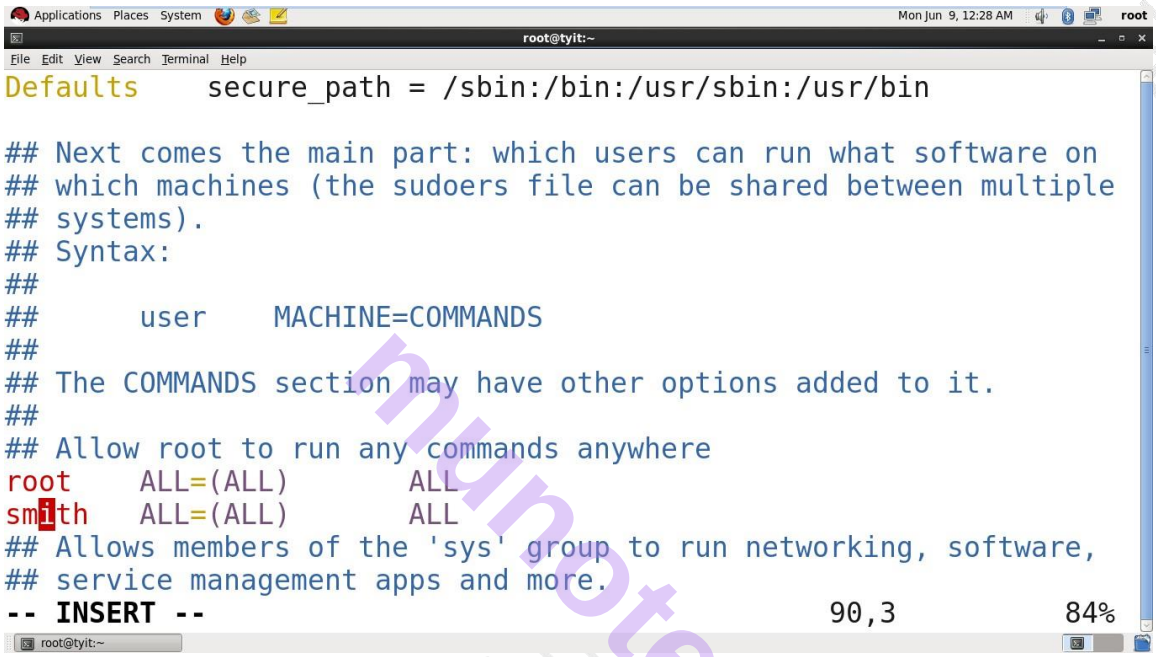
(1) Create a user account to grant him the privilege of super user, as shown below:



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

SMITH ALL = (ALL) ALL

It is as shown below:

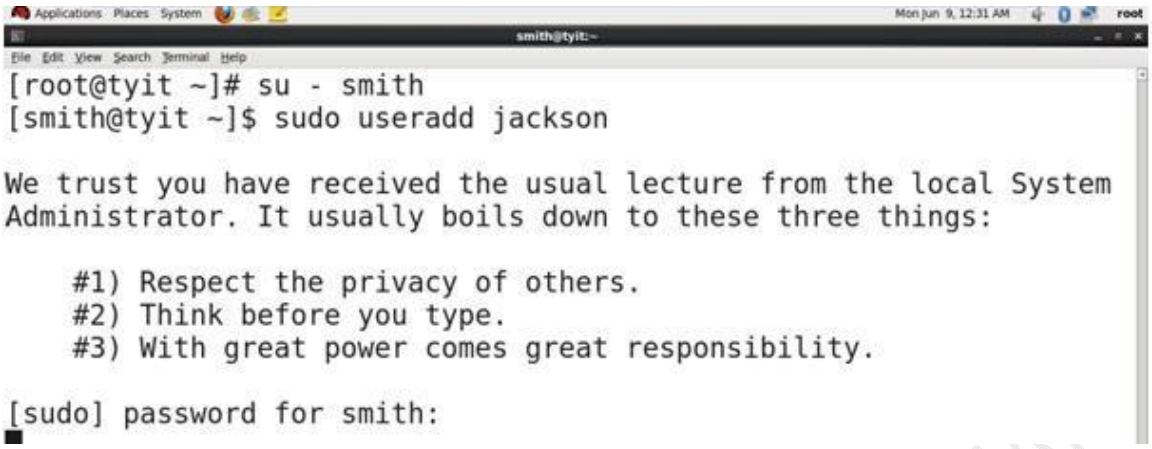


(3) Run the command visudo:

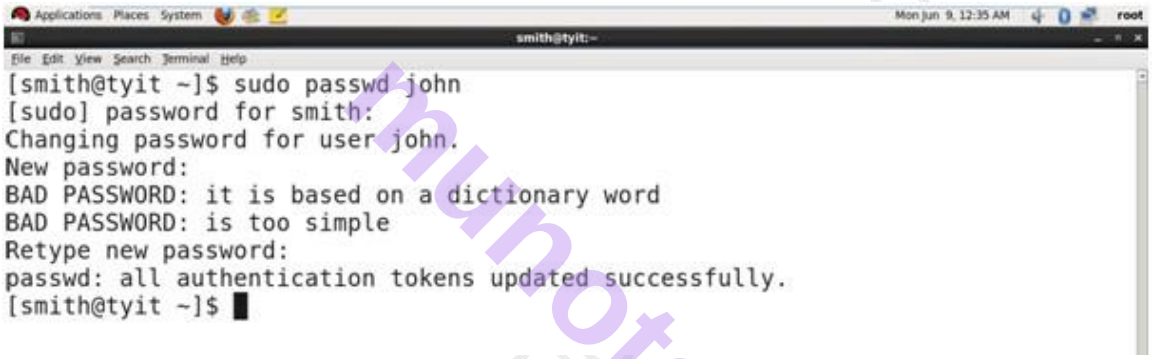
#visudo

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

(i) Add user Jackson using sudo:



(ii) Changing password of john using sudo:



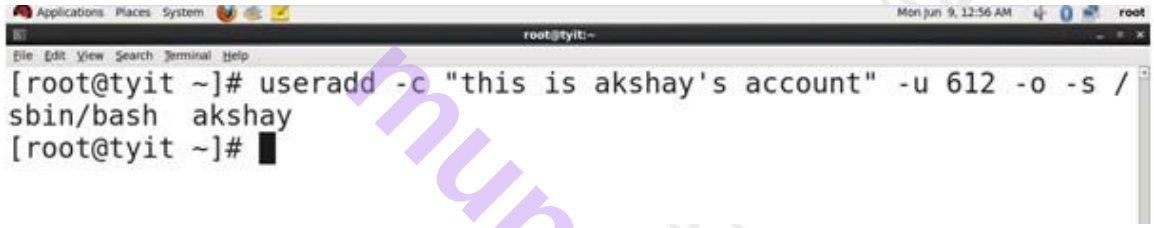
(B) **<u>Temporarily changing identity with the help of su command:</u>**

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

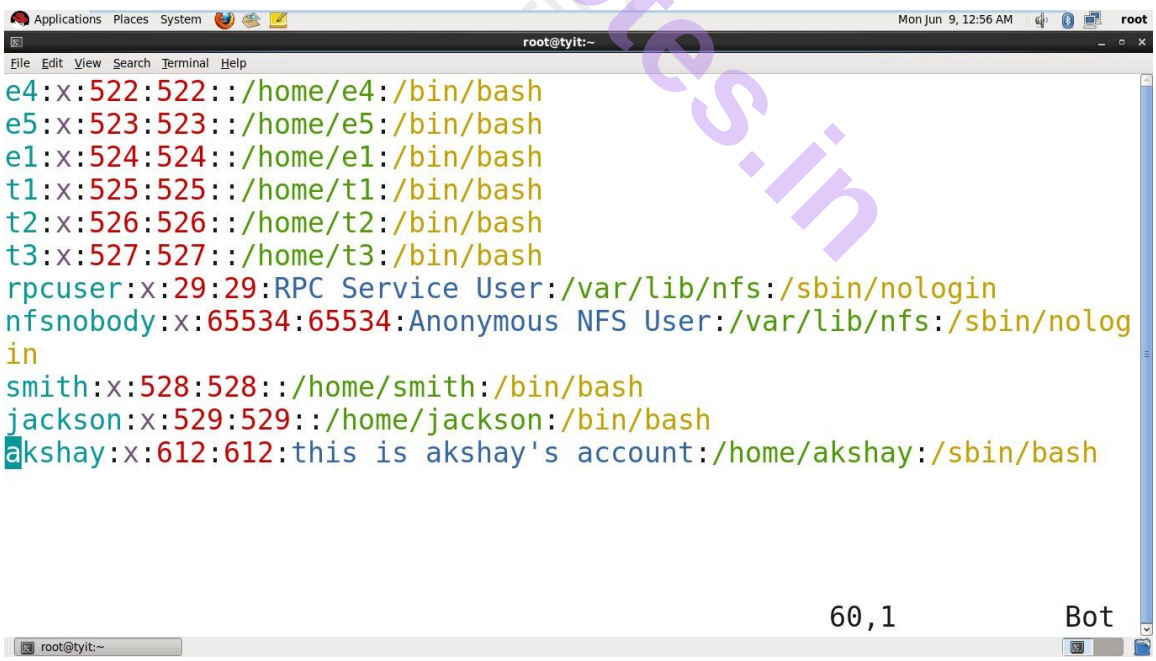
(2) But when any local user tries to change the identity temporarily, redhat system asks for the password as shown below:

(C) Administrative Commands:

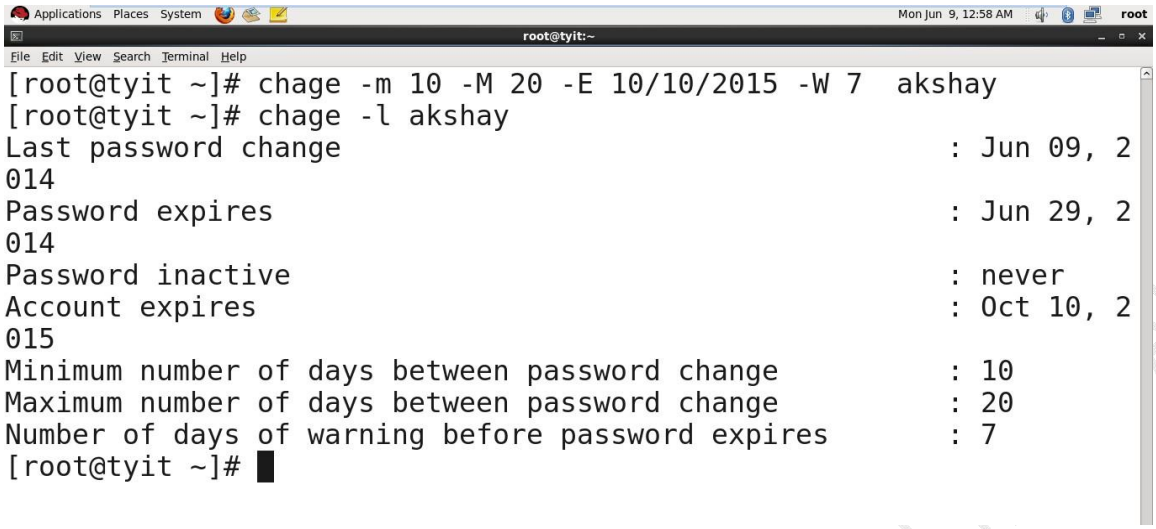
(1) useradd command with its options:



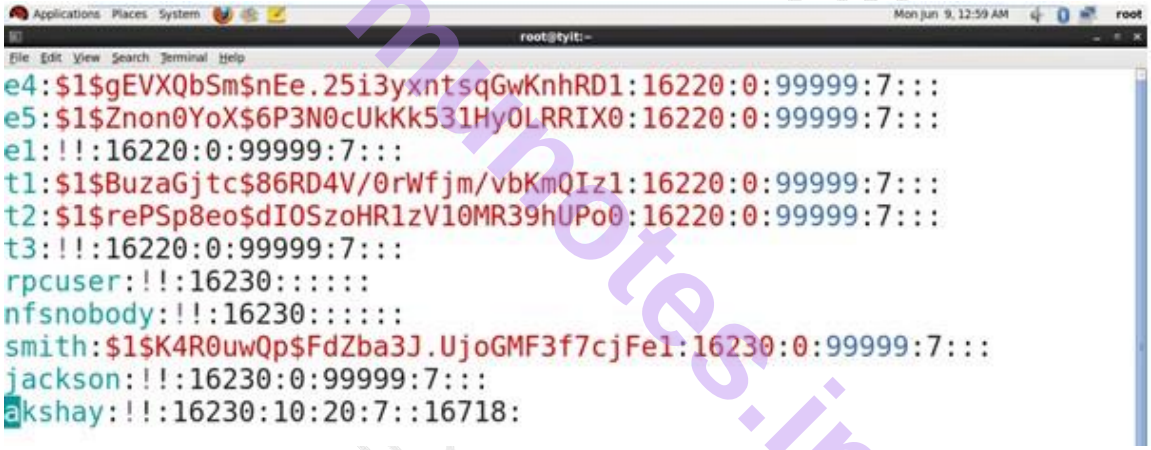
The file /etc/passwd also shows the entry of the user as follow:



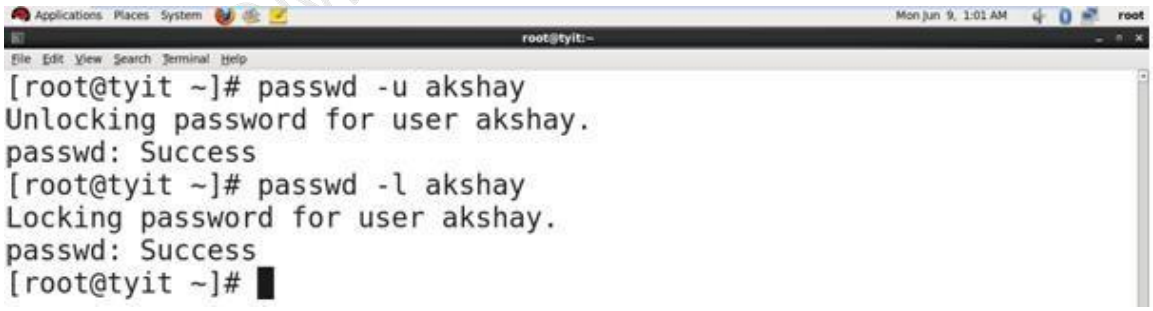
(2) chage command to change the age of user's password :



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

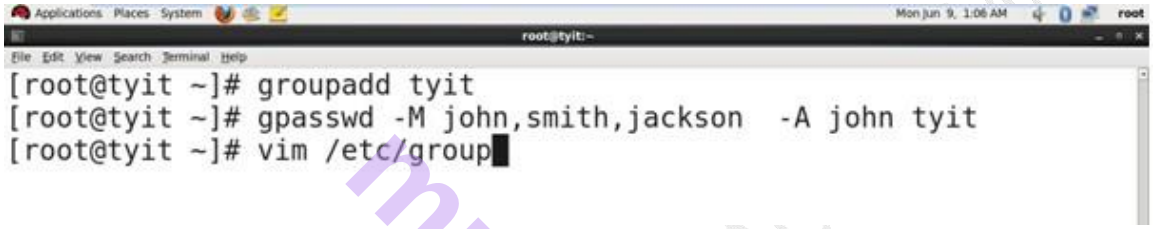


(3) passwd command to lock or unlock user's password:

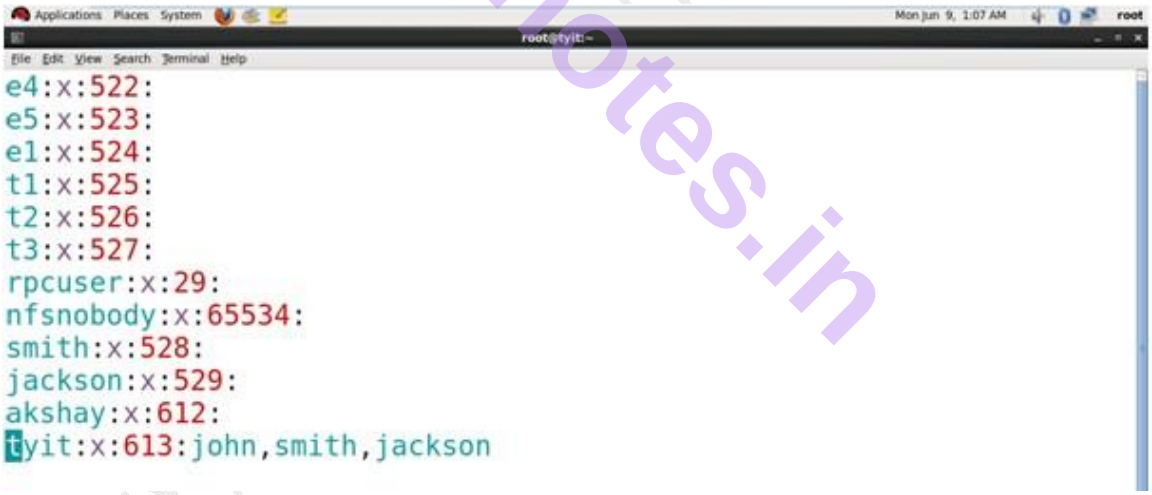


(4) chsh command to change the shell of user:

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



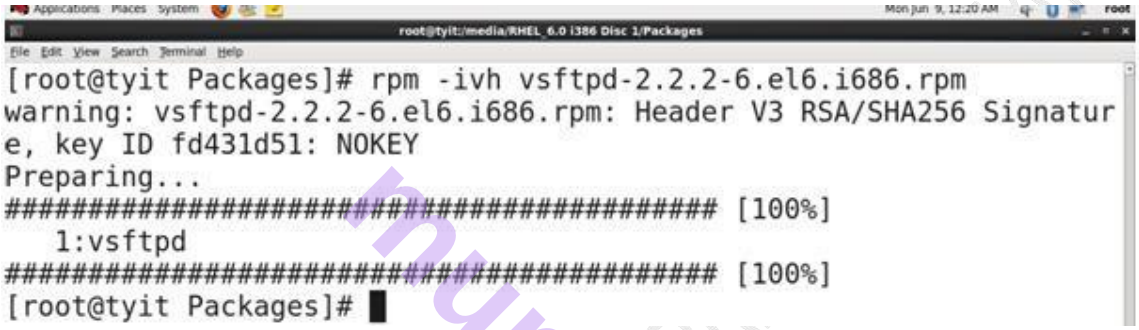
The above command also affect the file /etc/group as shown:



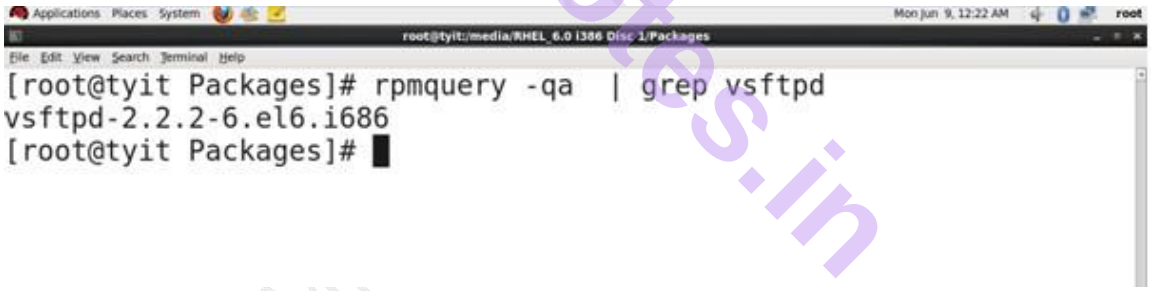
(6) rpm:

(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.,

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



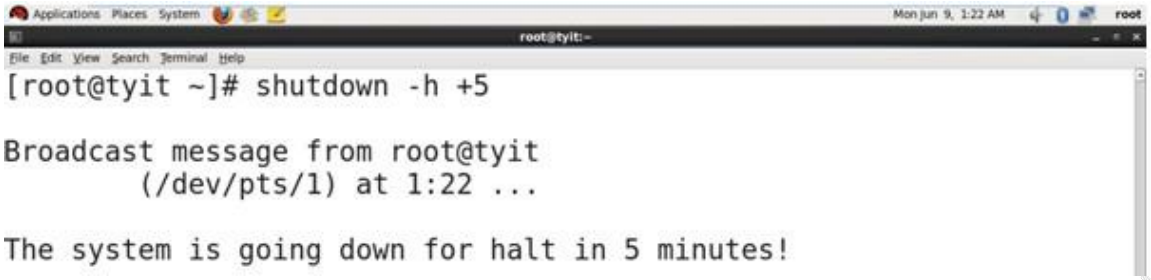
(iii) To query and verify use rpmquery or rpm -qa, as shown below:



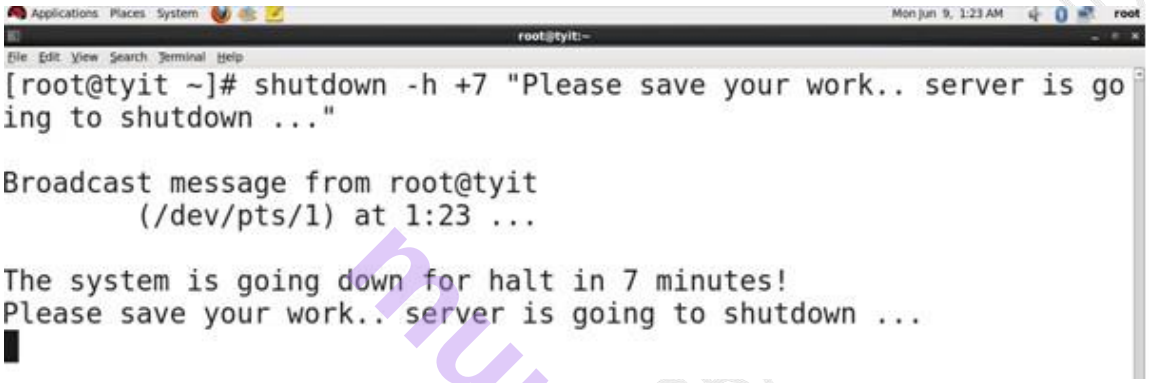
(iv) To delete any installed package, use rpm with –e option to erase:

(7) Shutdown command:

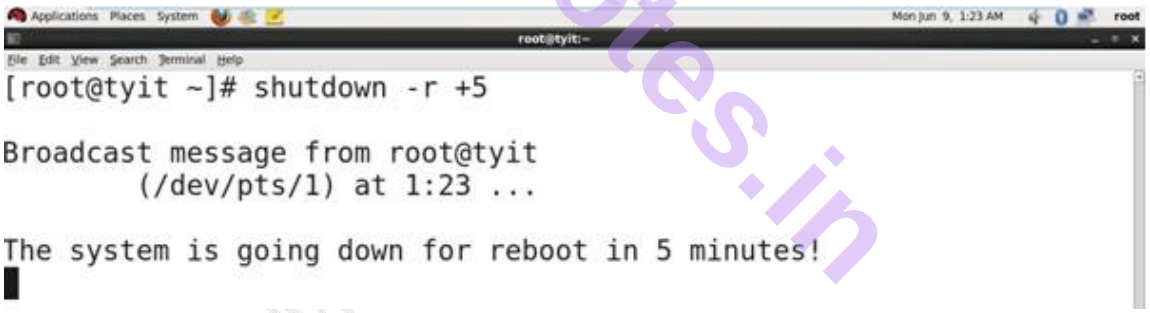
(i) To shutdown after 5 mins:



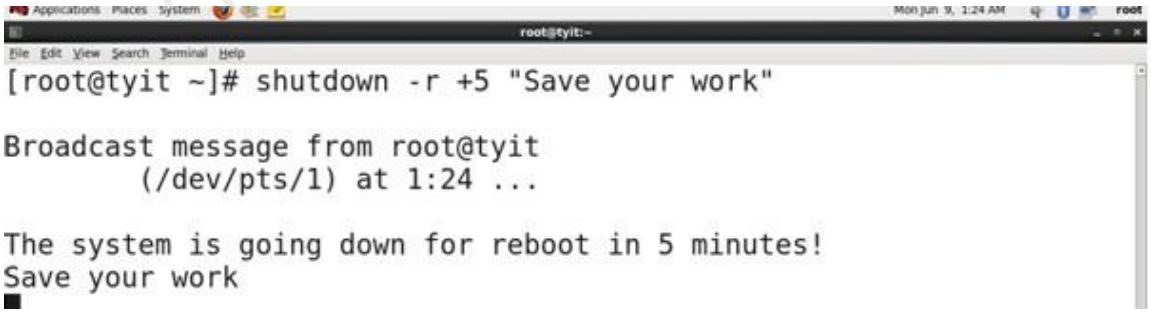
(ii) To shutdown with a particular broadcast message:



(iii) To reboot after 5 mins:



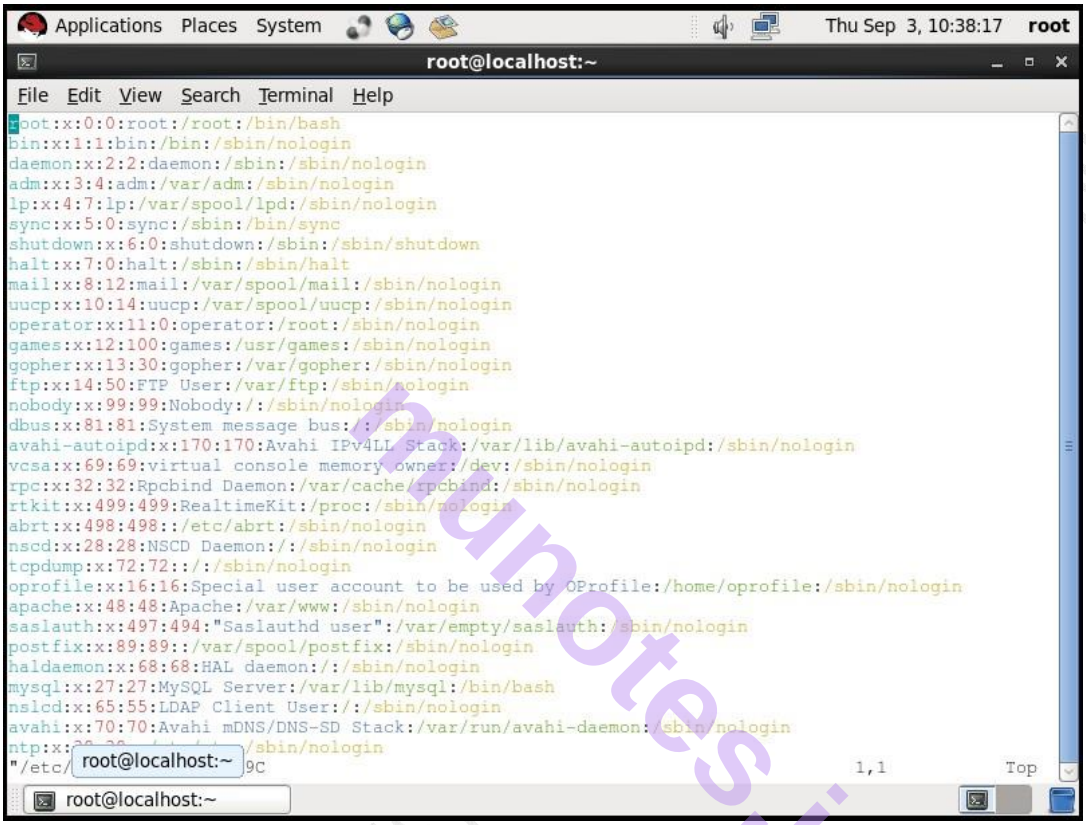
(iv) To with specific broadcast message:



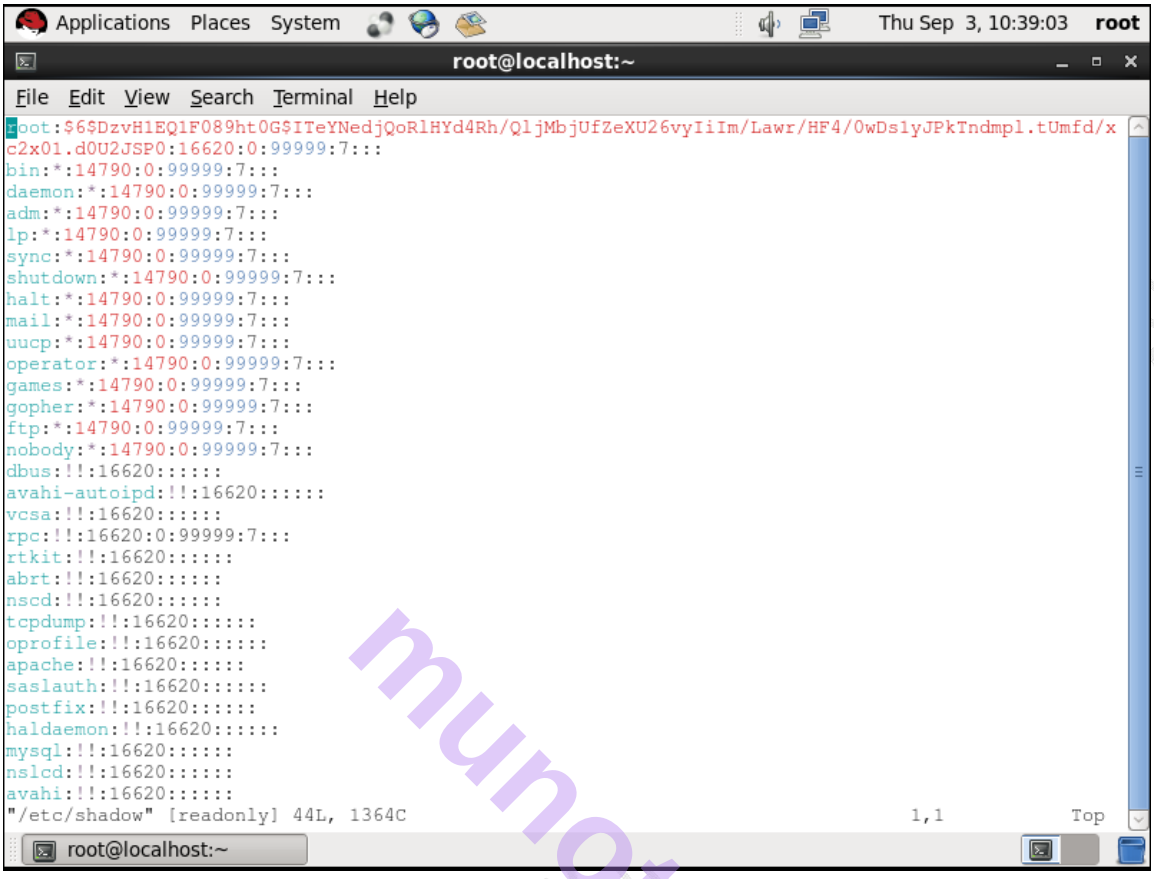
(D) Administrative Files:

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

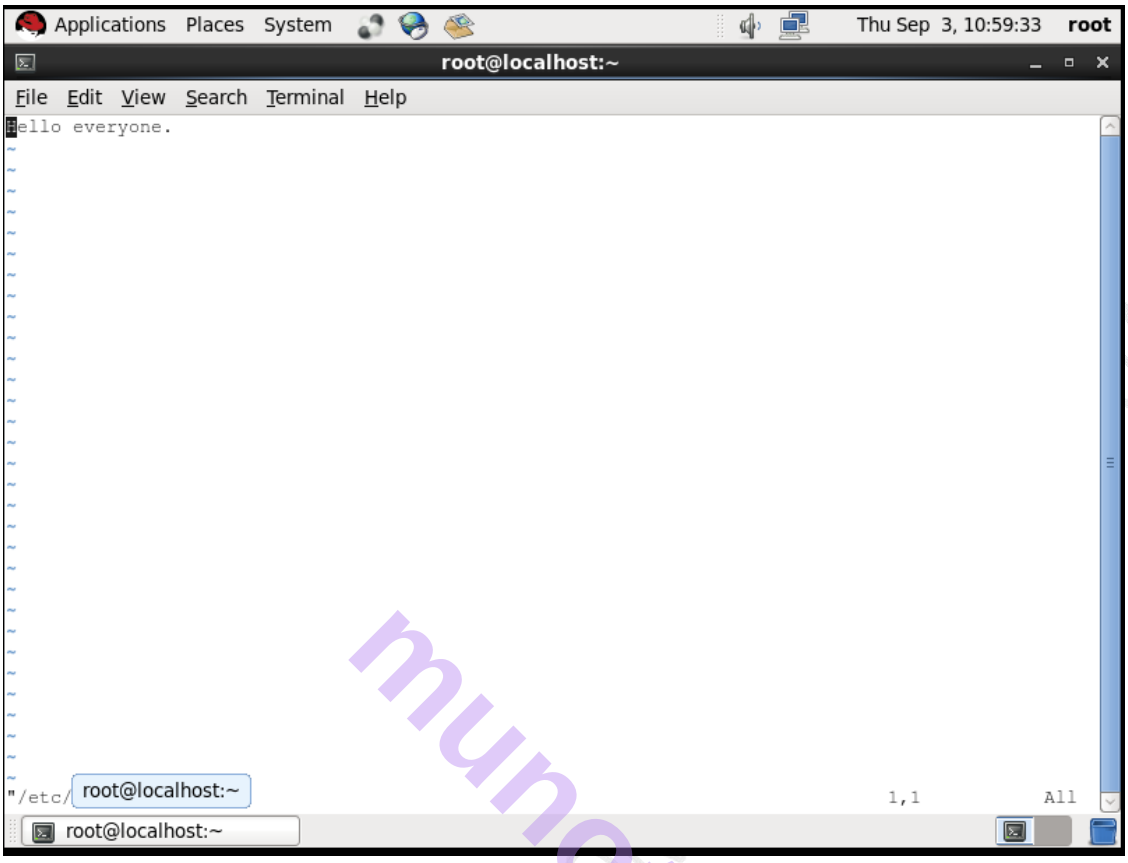
(2) /etc/passwd

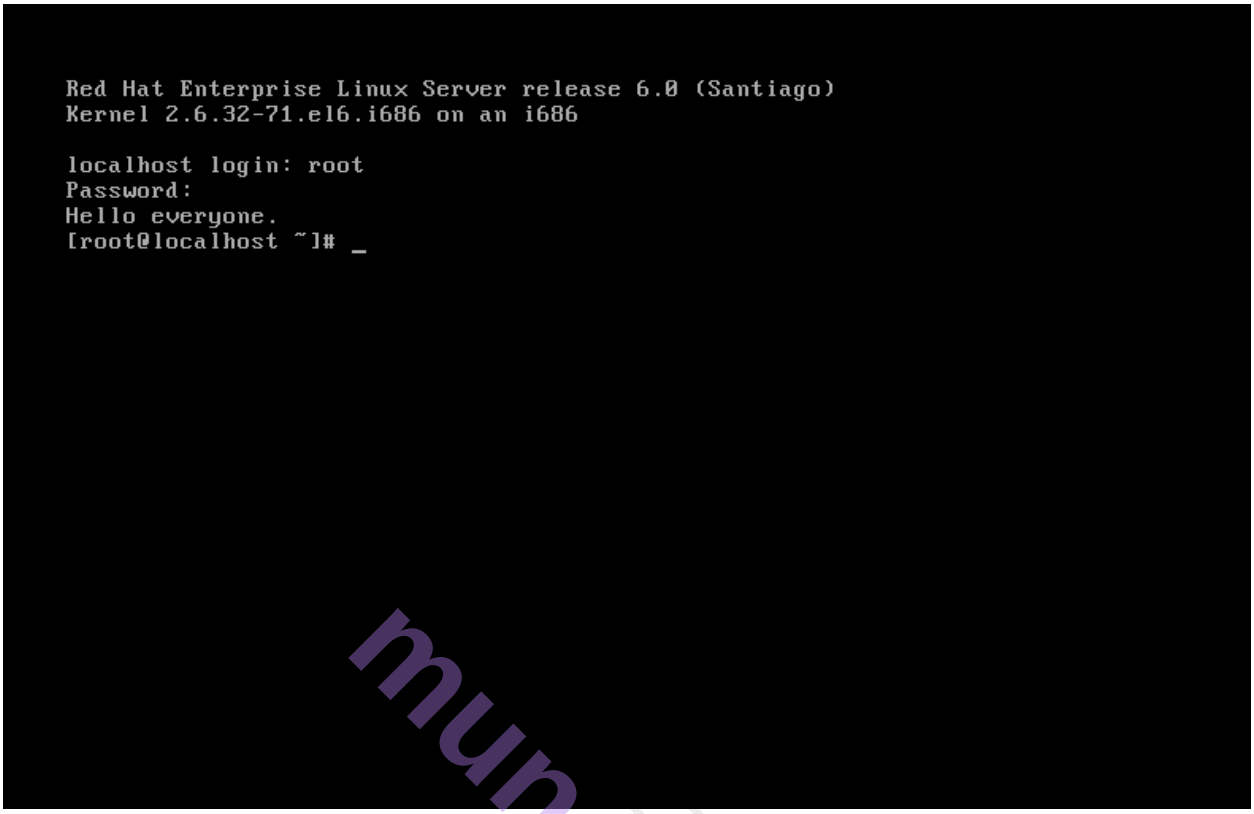


(3) /etc/shadow

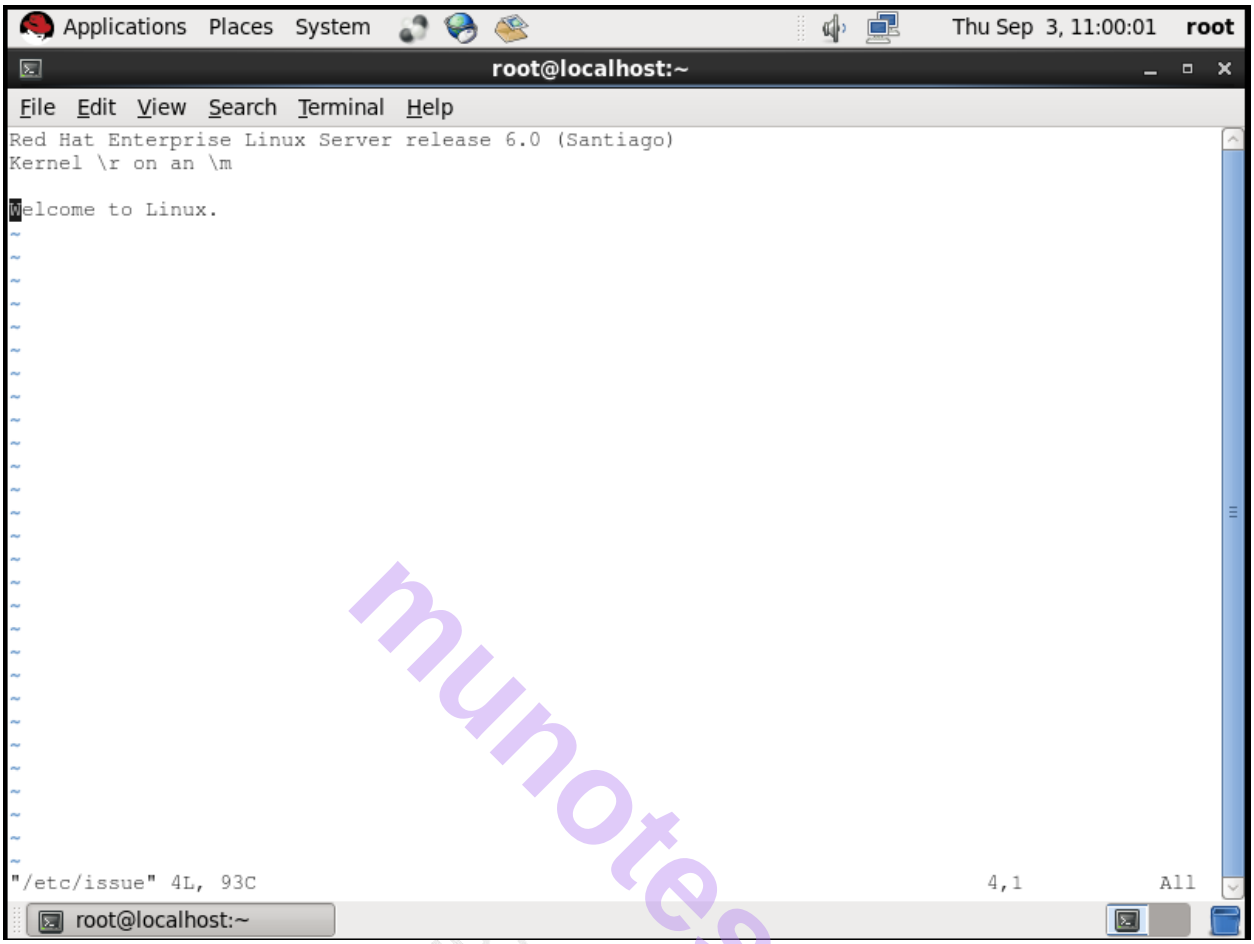


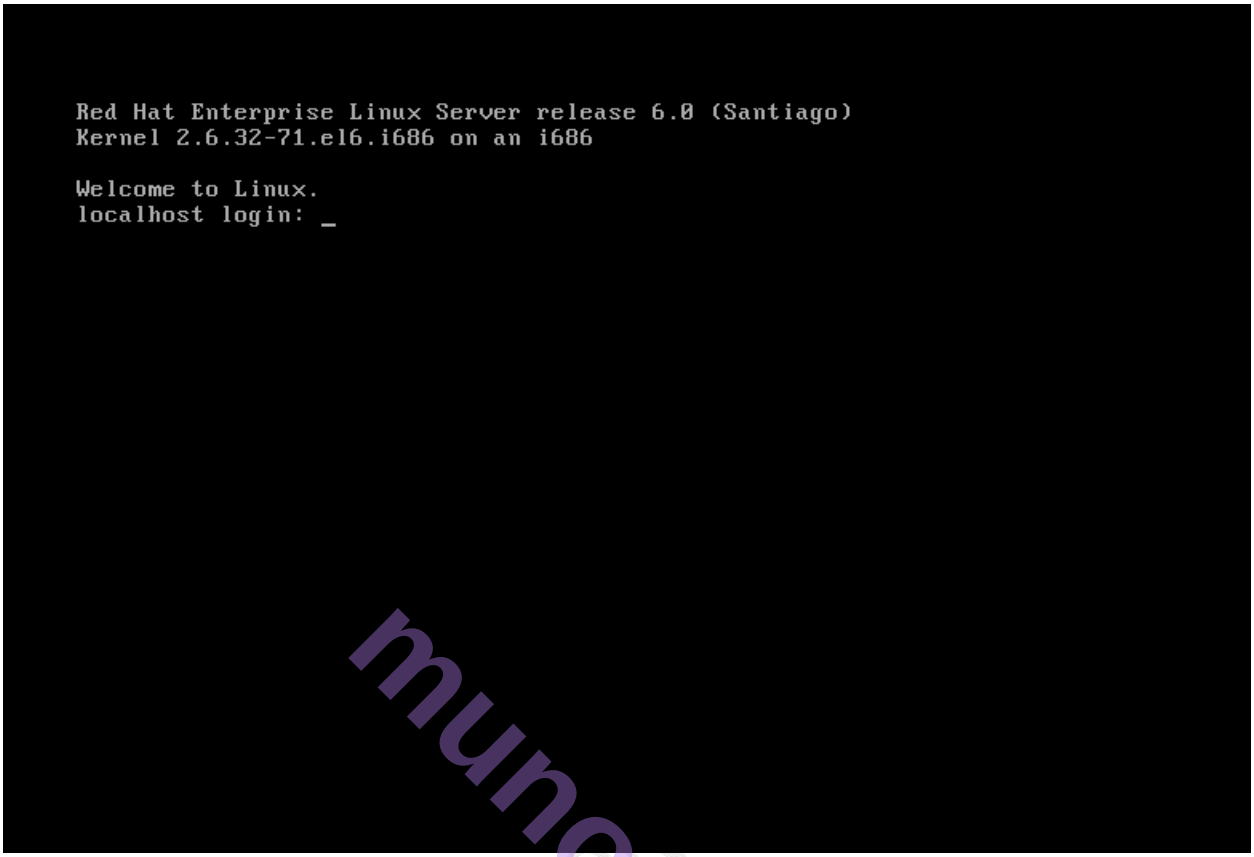
(4) /etc/motd





(5) /etc/issue



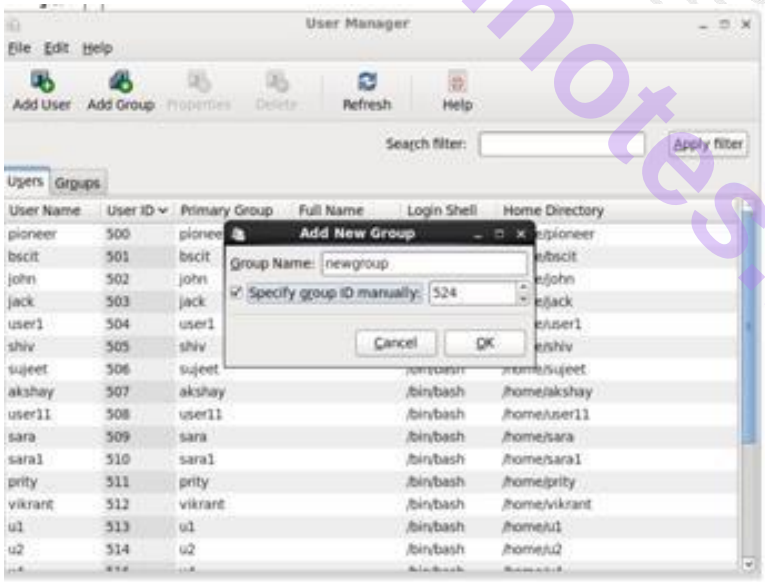


(E) Graphical Tools:

(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.

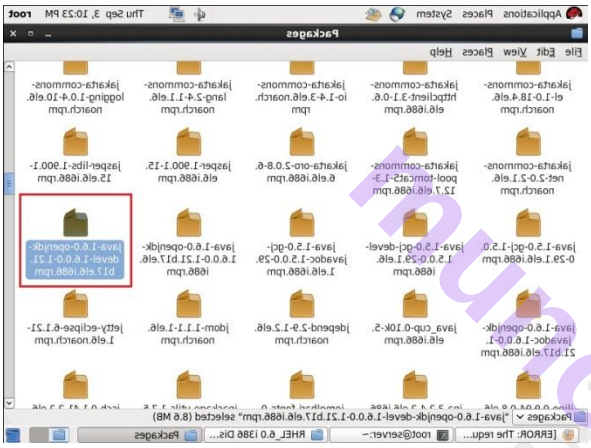


Practical no 16: Using javac compiler

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

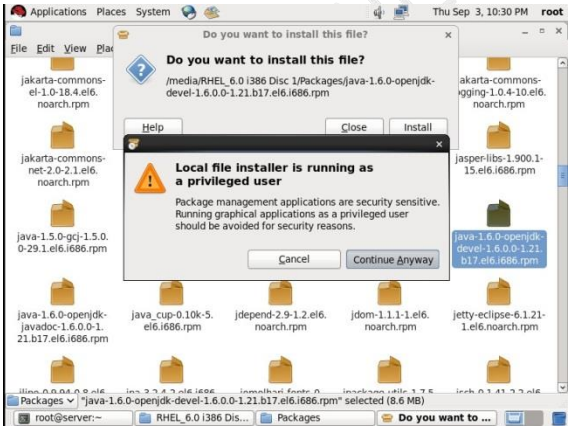
1) Java package installation :=

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.

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.

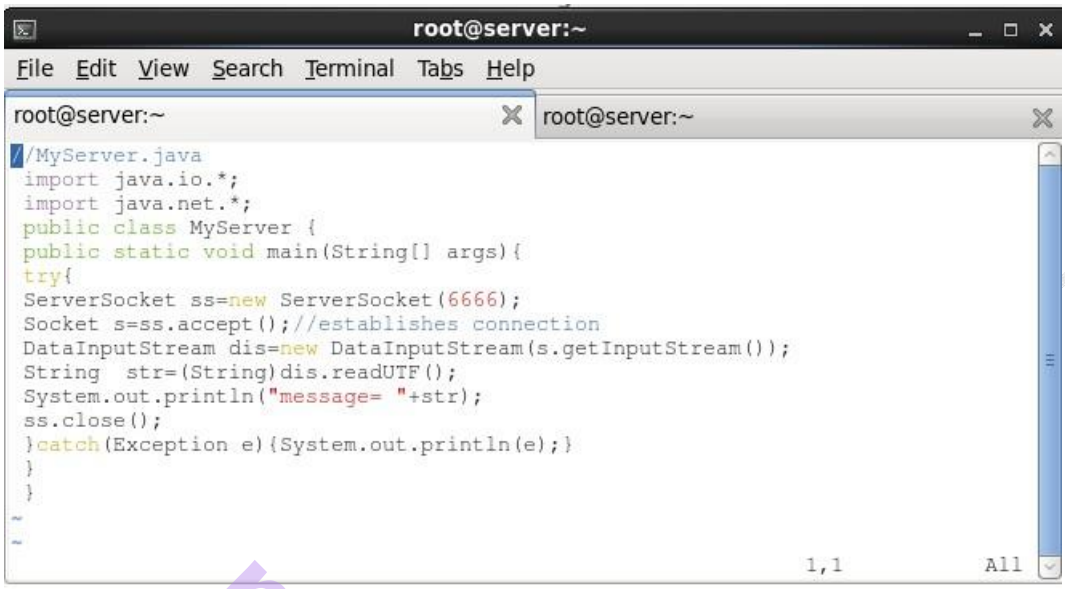
```
[root@server ~]# vim HelloWorld.java
[root@server ~]# javac HelloWorld.java
[root@server ~]# java HelloWorld
Hello world
[root@server ~]#
```

(II) Socket Programming using Java:

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

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

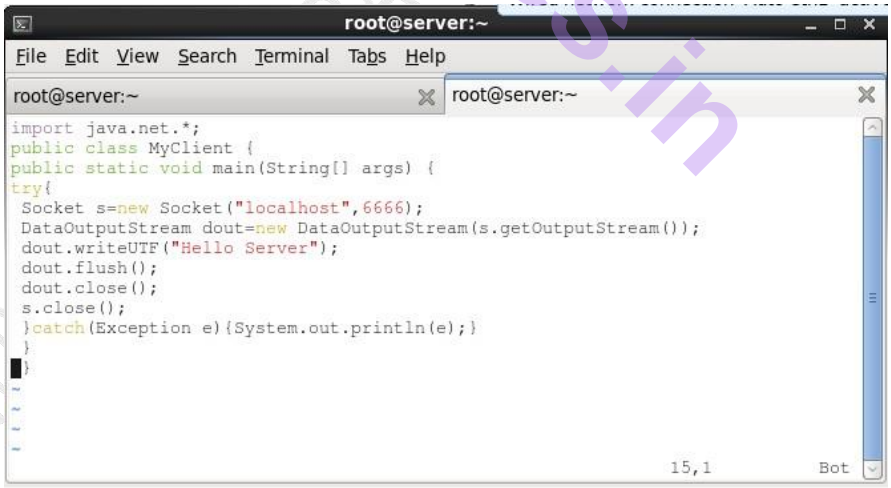
2) Add the following code to file and save and exit.



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



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

```
[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 ~]#
```