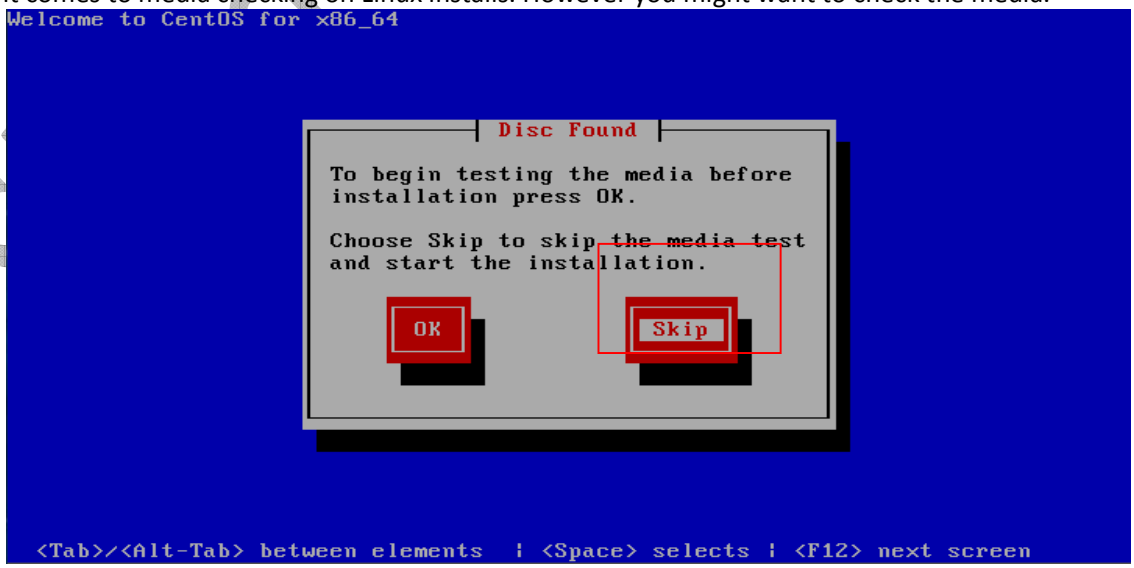
Installation of RHEL/CentOS/ 6 updates for Servers & Desktops

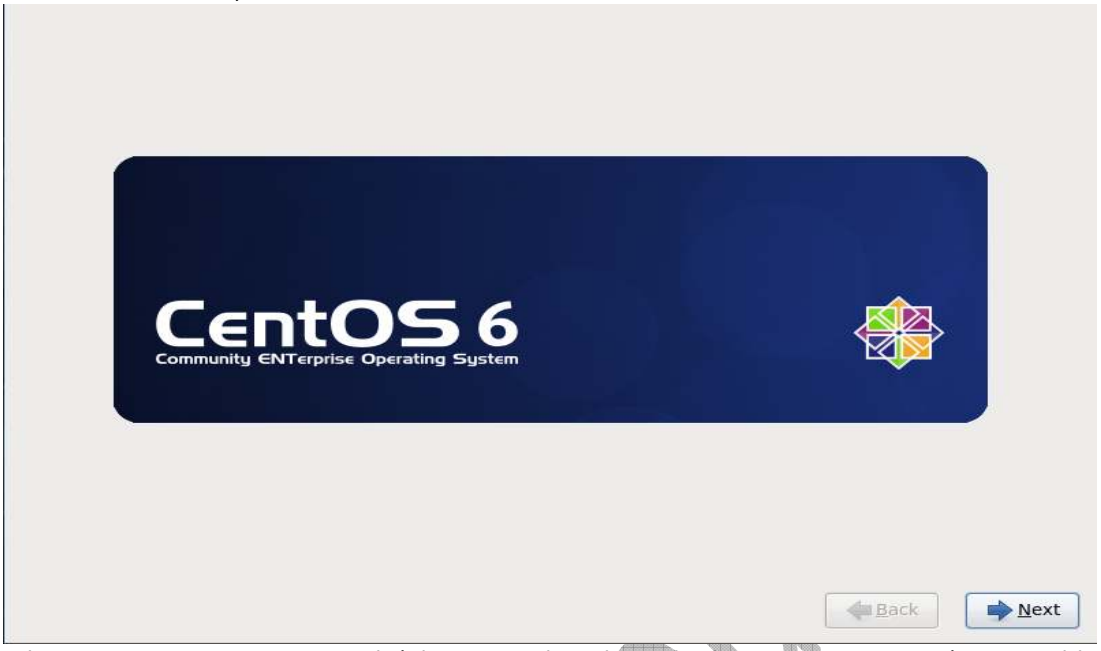
1. Set your computers BIOS to boot form CD / DVD
2. Insert the CentOS 6 CD or DVD
3. When presented with the following screen press **enter** on **Install or upgrade an existing system.**

4. You will now be presented with a CD Check, I always skip this step… I live life on the edge when it comes to media checking on Linux installs. However you might want to check the media.

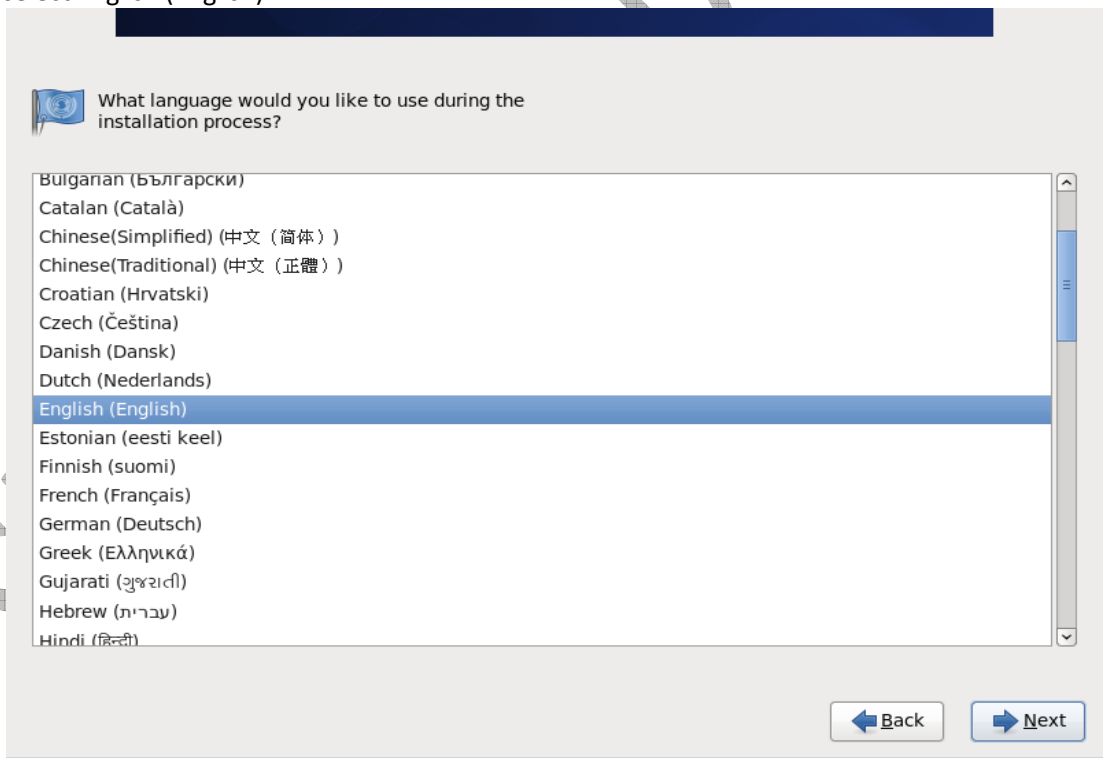


5. You will now see some black and white text on your screen as your computer loads the X11 environment for the CentOS install, after 30 seconds or so you will be presented with the

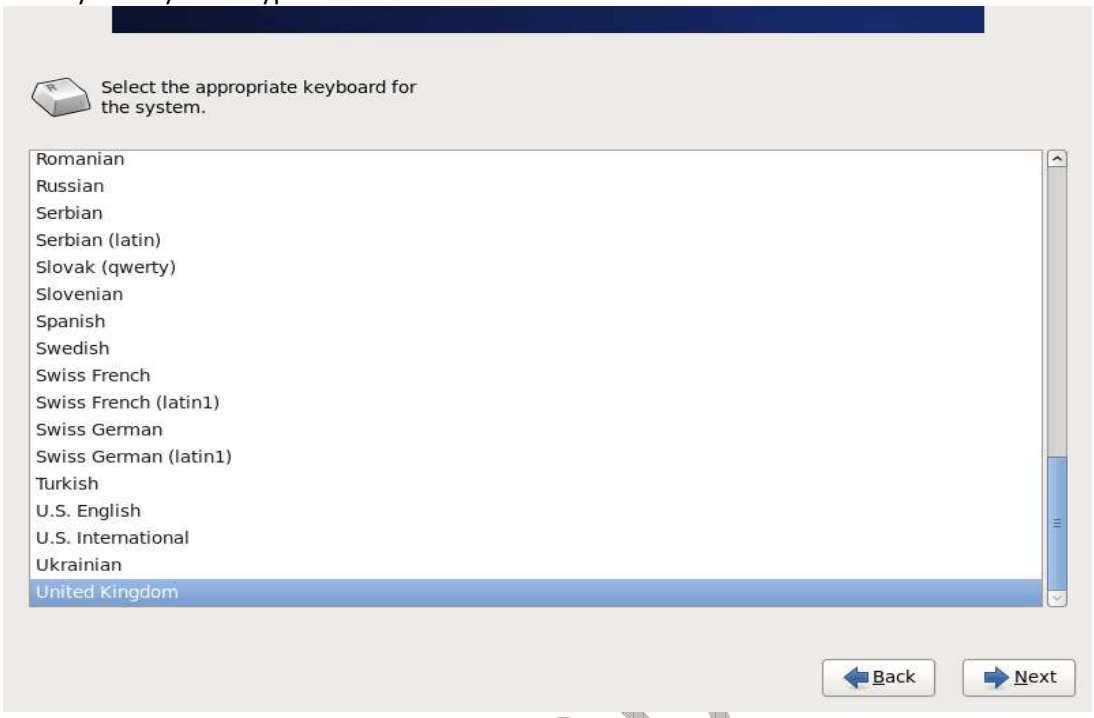
CentOS GUI installer, click next.



6. Select your Language, I am British (please no jokes about drinking tea on Twitter…) so I would select English (English).



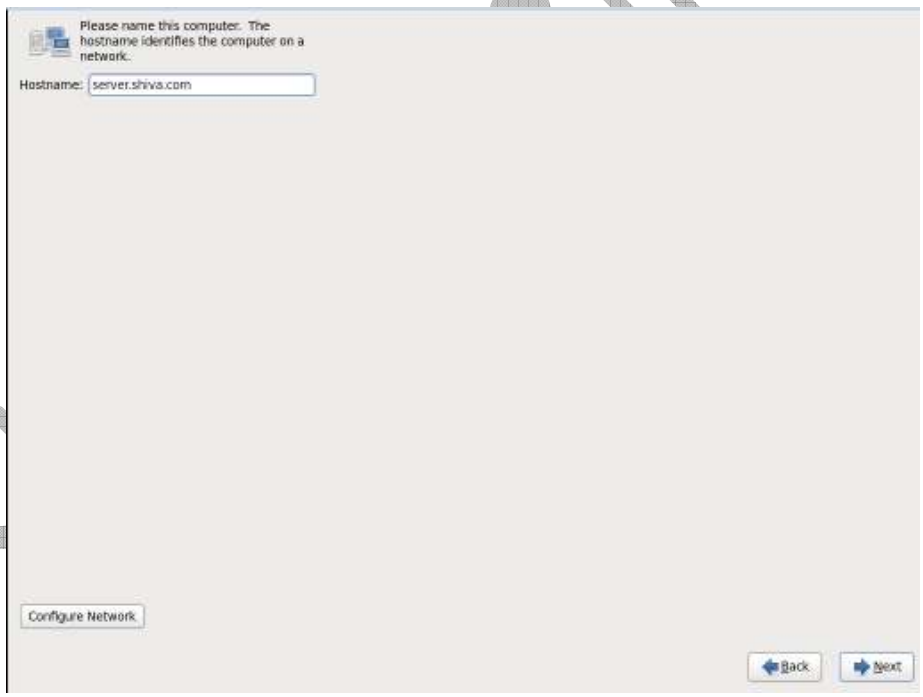
7. Select your keyboard type



8. Storage type, as I am installing on my local hard drive I selected “Basic storage type” if you are using iSCSI or similar technology now would be the time to set it up.

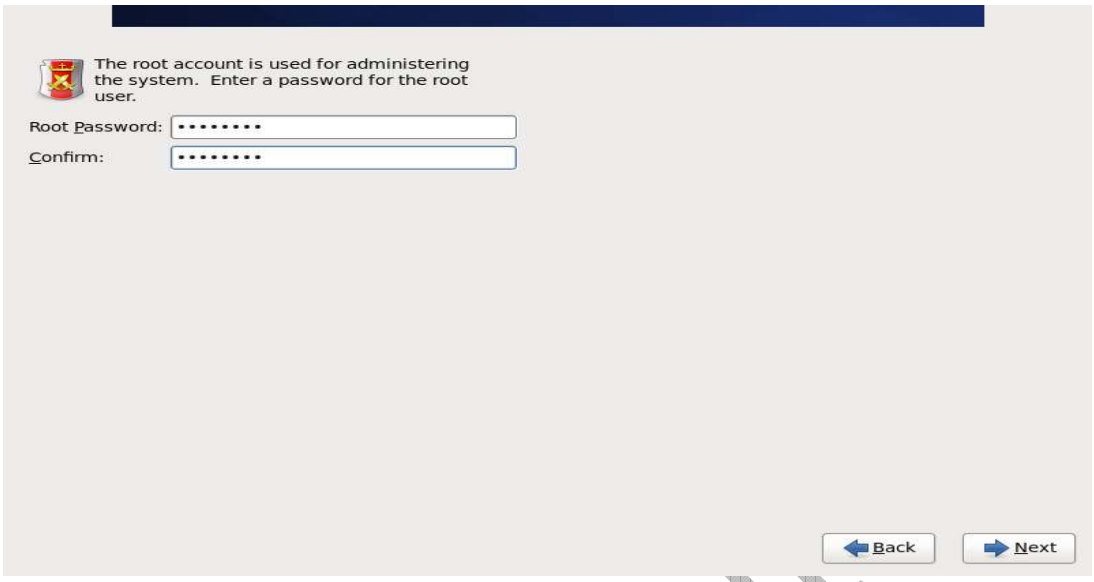
9. As this is a clean install and the drive has never been formatted before I got the following Initialize drive warning, you might get the same if your drive (or virtual hard disk) is brand new.

10. Set the hostname for your Server

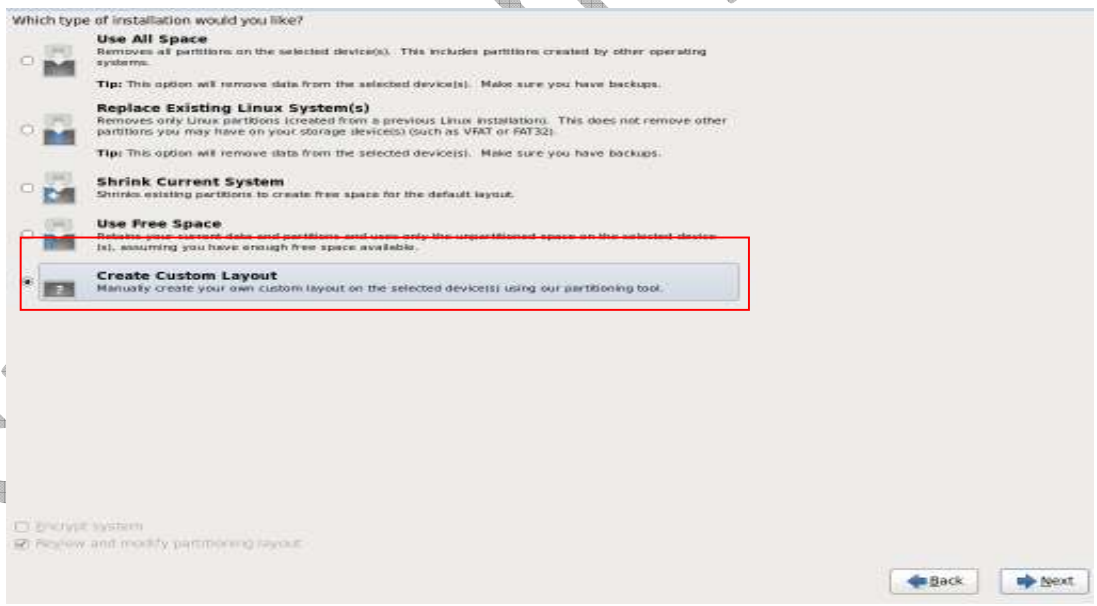


11. Set your root password, something sensible please… Don't set weak dictionary passwords or you will get hacked by a 13yr old russian super hackz0r… You might want to check out my guide

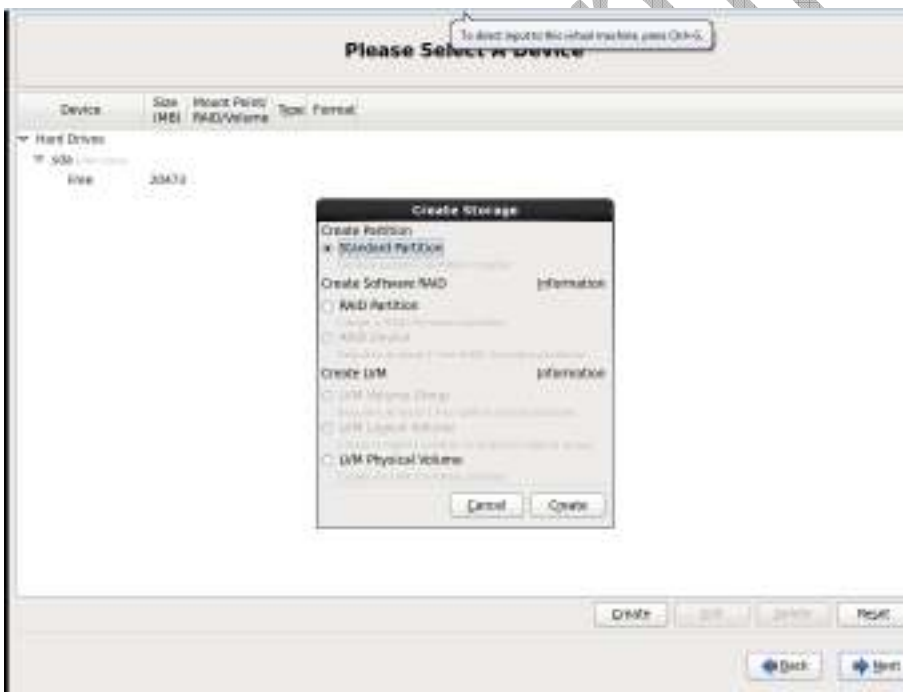
on how to secure SSH.

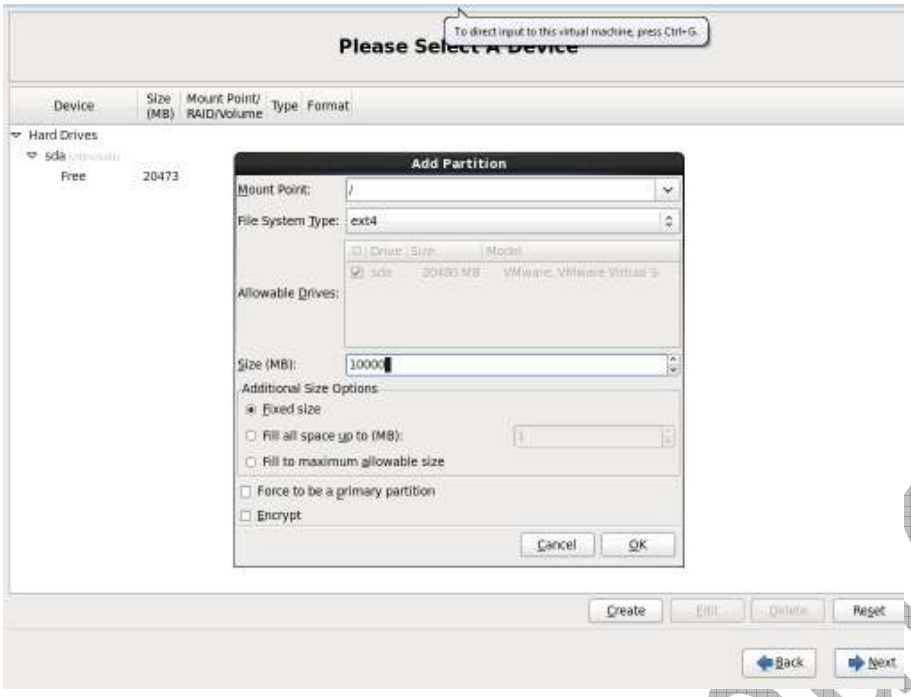


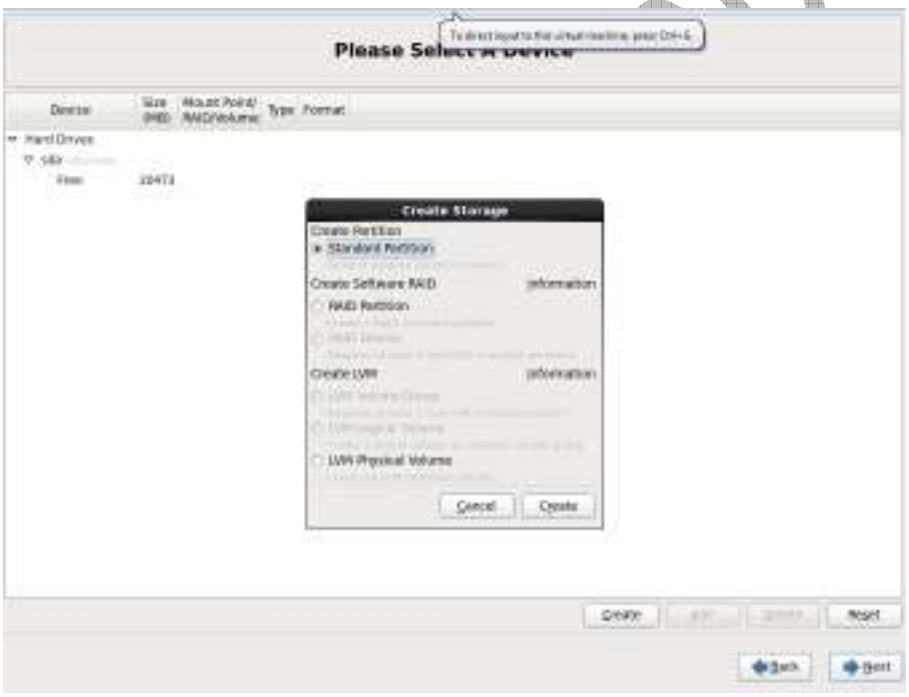
12. You will now be set with a bunch of options for your disk partitioning, as this is a new fresh install I selected the option Create custom for creating own format.

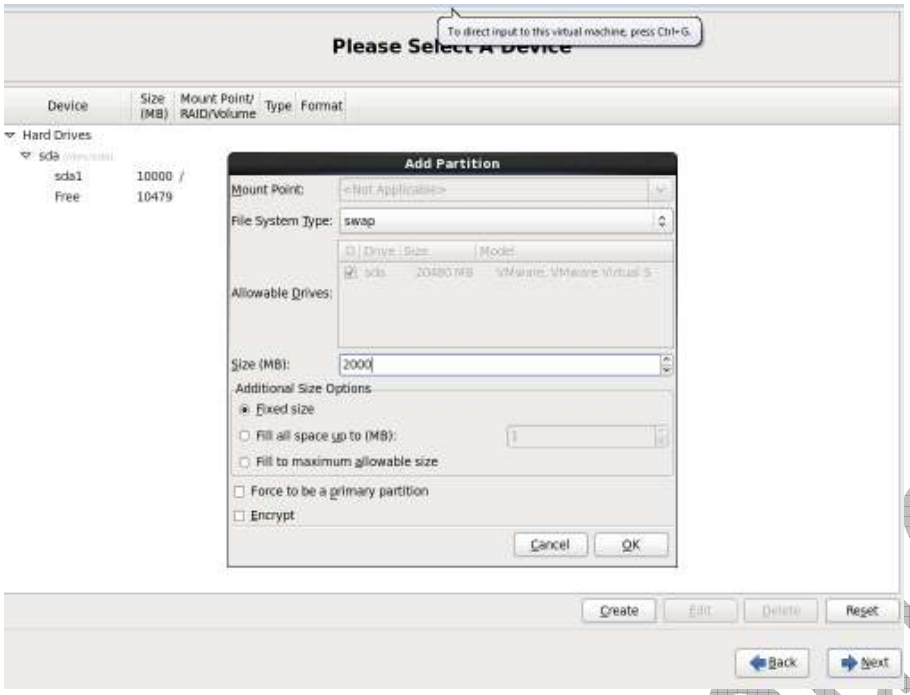


13. Creating minimum partition of root and swap partition .

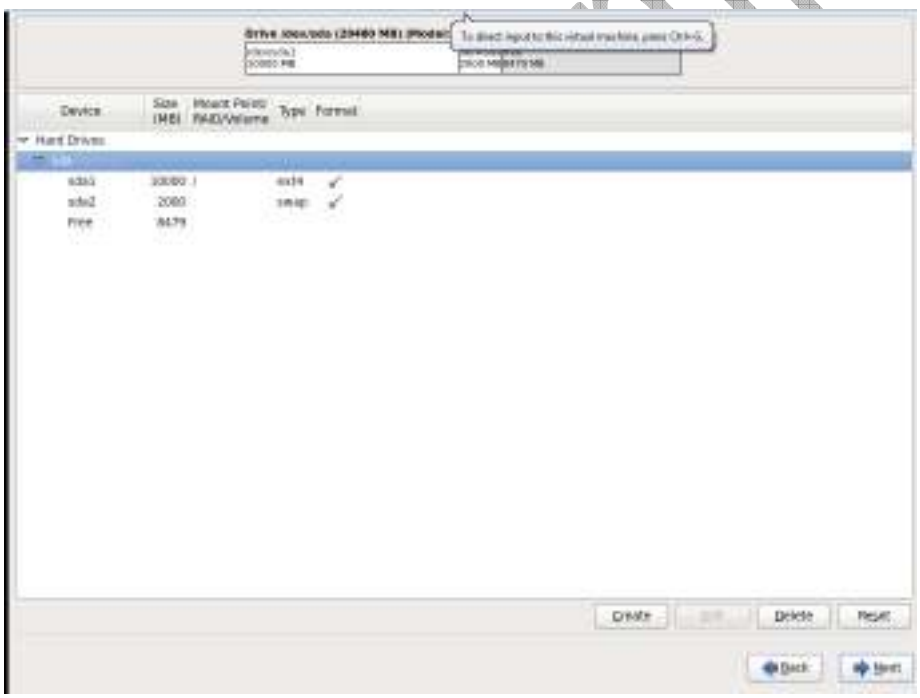



To direct input to this virtual machine, press Ctrl+G.
Please Select A Device
Device
Size (MB)
Mount Point/ RAID/Volume
Type
Format
Hard Drives
sda
Free
20473
Add Partition
Mount Point:
/
File System Type:
ext4
Allowable Drives:
Size (MB):
10000
Additional Size Options
Fixed size
Fill all space up to (MB):
Fill to maximum allowable size
Force to be a primary partition
Encrypt
Cancel
OK
Create
Reset
Back
Next


Please Select A Device
Create Storage
Create Partition
Standard Partition
Create Software RAID
RAID Partition
Create LVM
LVM Physical Volume
Cancel
Create
Reset
Back
Next

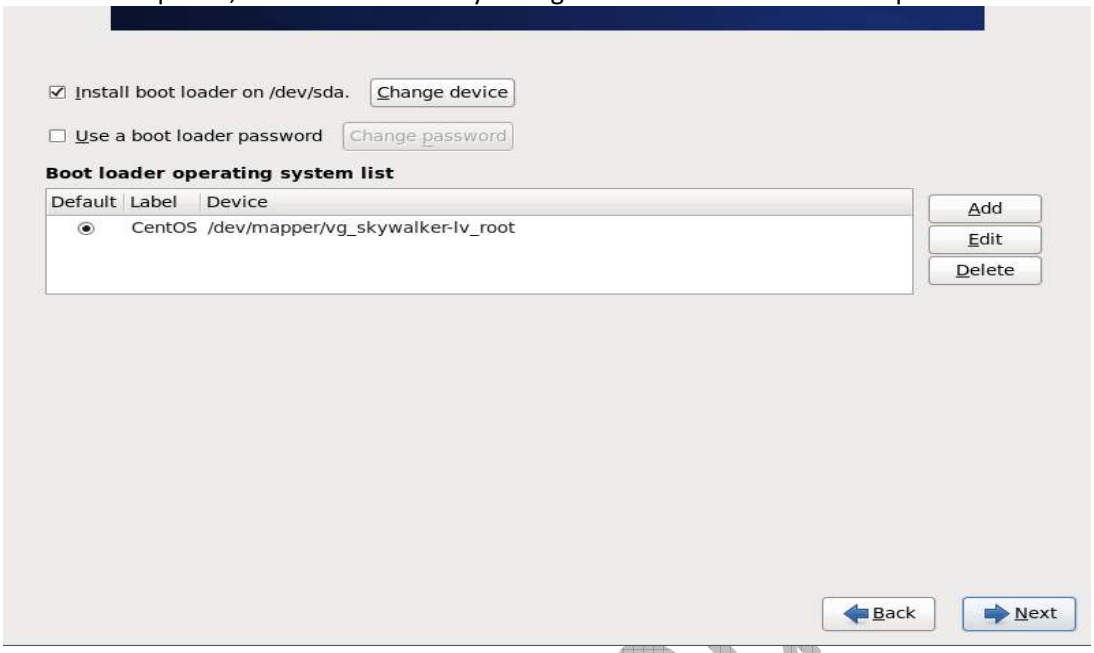


14. Format warning, click on Format (this will delete your data.

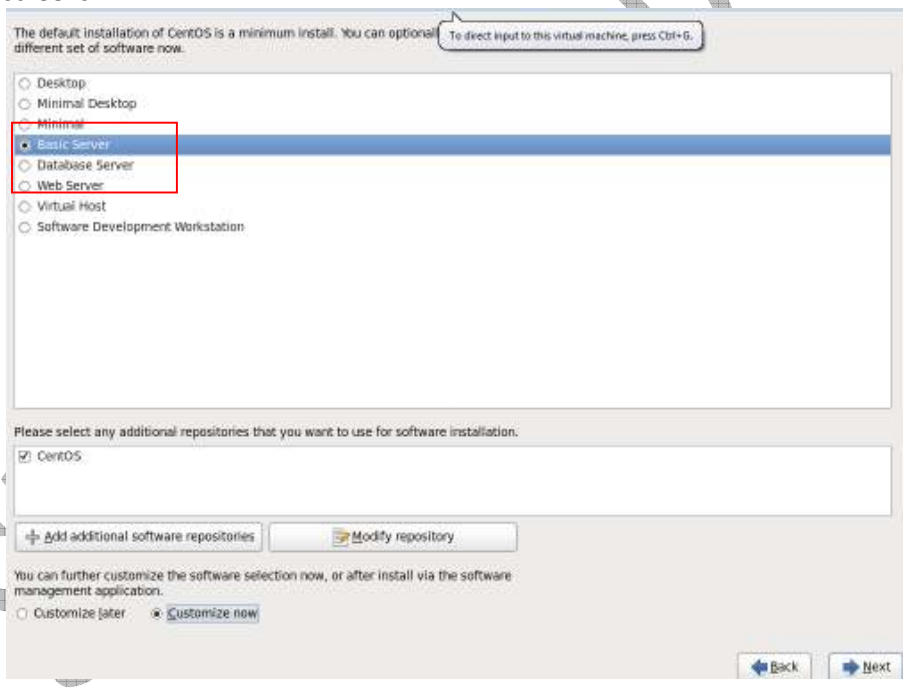


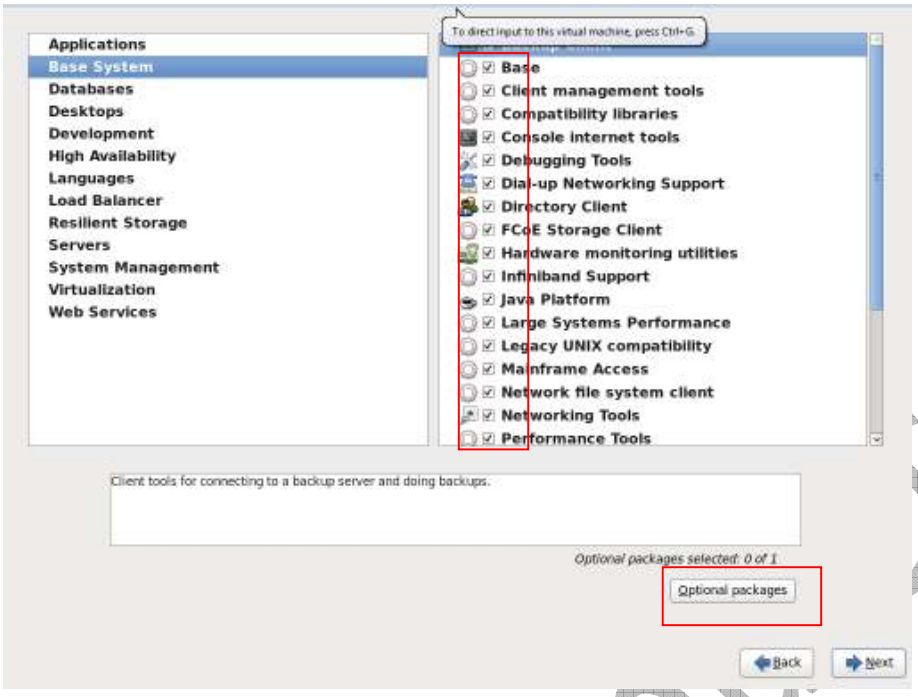
15. You will now see a warning about writing the changes to disk, click on Write changes to disk.

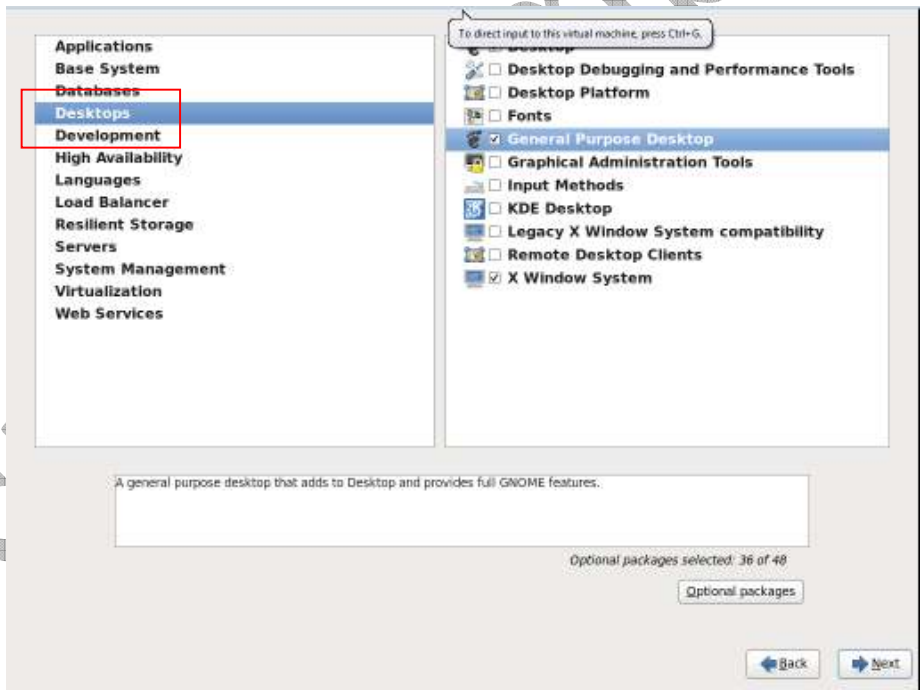
16. Boot loader options, I left this as default you might want to set a boot loader password.



17. The next part is important selecting which programs to be install on the server follow the screens .




To direct input to this virtual machine, press Ctrl+G.
Applications
Base System
Databases
Desktops
Development
High Availability
Languages
Load Balancer
Resilient Storage
Servers
System Management
Virtualization
Web Services
Base
Client management tools
Compatibility libraries
Console internet tools
Debugging Tools
Dial-up Networking Support
Directory Client
FCoE Storage Client
Hardware monitoring utilities
Infiniband Support
Java Platform
Large Systems Performance
Legacy UNIX compatibility
Mainframe Access
Network file system client
Networking Tools
Performance Tools
Client tools for connecting to a backup server and doing backups.
Optional packages selected: 0 of 1
Optional packages
Back
Next


To direct input to this virtual machine, press Ctrl+G.
Applications
Base System
Databases
Desktops
Development
High Availability
Languages
Load Balancer
Resilient Storage
Servers
System Management
Virtualization
Web Services
Desktop Debugging and Performance Tools
Desktop Platform
Fonts
General Purpose Desktop
Graphical Administration Tools
Input Methods
KDE Desktop
Legacy X Window System compatibility
Remote Desktop Clients
X Window System
A general purpose desktop that adds to Desktop and provides full GNOME features.
Optional packages selected: 36 of 48
Optional packages
Back
Next

18. CentOS 6 will install

19. CentOS 6 has installed, congrats

20. Reboot and login as root.

Basic command

To view list of files

```
[root@server ~]# ls

anaconda-ks.cfg   anand2     Documents   install.log              Music
Public    Templates  webmin-1.590

anand1              Desktop   Downloads   install.log.syslog   Pictures
rpmbuild  Videos     webmin-1.590.tar.gz
```

To view list of files and folders with details

```
[root@server ~]# ls -l

total 18656

-rw-------.   1 root root     1570 Jun 11 20:47 anaconda-ks.cfg

drwxr-xr-x.   2 root root     4096 Jul 22 09:48 anand1

drwxr-xr-x.   2 root root     4096 Jul 22 09:48 anand2

drwxr-xr-x.   2 root root     4096 Jun 11 22:11 Desktop

drwxr-xr-x.   2 root root     4096 Jun 11 22:11 Documents

drwxr-xr-x.   2 root root     4096 Jul 22 07:30 Downloads

-rw-r--r--.   1 root root    47353 Jun 11 20:47 install.log
```

To view list of files and folders with details human readable format

```
[root@server ~]# ls -lh

total 19M

-rw-------.   1 root root 1.6K Jun 11 20:47 anaconda-ks.cfg

drwxr-xr-x.   2 root root 4.0K Jul 22 09:48 anand1

drwxr-xr-x.   2 root root 4.0K Jul 22 09:48 anand2

drwxr-xr-x.   2 root root 4.0K Jun 11 22:11 Desktop

drwxr-xr-x.   2 root root 4.0K Jun 11 22:11 Documents

drwxr-xr-x.   2 root root 4.0K Jul 22 07:30 Downloads

-rw-r--r--.   1 root root  47K Jun 11 20:47 install.log

-rw-r--r--.   1 root root  12K Jun 11 20:44 install.log.syslog
```

To clear screen

```
[root@server ~]# clear or ctrl + l
```

To view hidden files and folders

```
[root@server ~]# ls -a

.                .bash_logout   .dbus      .gconfd          .gtk-
bookmarks      .local     .pulse               .spice-vdagent  webmin-
1.590.tar.gz

..               .bash_profile  Desktop    .gnome2          .gvfs
.mozilla   .pulse-cookie        .ssh            .xsession-errors
```

To view list of files and folders with tree structure format

```
[root@server ~]#ls -R

./webmin-1.590/zones/images:

icon.gif  smallicon.gif  tzone4.jpg  zone.gif

./webmin-1.590/zones/lang:

ca  ca.UTF-8  de  de.UTF-8  en
```

Present working directory

```
[root@server ~]# pwd

[root@server ~]# ls -l /etc/

[root@server ~]# ls | less or more
```

To create a blank file

```
[root@server ~]# touch hyderabad

[root@server ~]# touch hyderabad
```

Creating a file with cat command

```
[root@server ~]# cat > delhi

delhi is captial of india

************************

[root@server ~]# ls
```

To view the file

```
[root@server ~]# cat delhi

delhi is captial of india

************************
```

```
[root@server ~]# ls
```

To create a directory

```
[root@server ~]# mkdir india
[root@server ~]# ls
```

Creating multiple directories

```
[root@server ~]# mkdir india1 india2 india3
[root@server ~]# ls
```

Creating multiple nested directories

```
[root@server ~]# mkdir -p kumar1/kumar2/kumar3
[root@server ~]# ls -lR kumar1/
kumar1/:
total 4
drwxr-xr-x 3 root root 4096 Jul 25 10:48 kumar2
kumar1/kumar2:
total 4
drwxr-xr-x 2 root root 4096 Jul 25 10:48 kumar3
kumar1/kumar2/kumar3:
total 0
```

Changing directory

```
[root@server ~]#cd /kumar1
[root@server kumar]# ls
kumar2
```

Back to directory

```
[root@server ~]# cd ..
```

Removing a file

```
[root@server ~]# rm delhi
rm: remove regular file `delhi'? y
[root@server ~]# ls
```

```
anaconda-ks.cfg  anand2  Desktop    Downloads  india   india2  install.log
kumar   Music     Public    Templates  webmin-1.590 anand1          d1      Documents
hyderabad  india1  india3  install.log.syslog  kumar1  Pictures  rpmbuild  Videos
webmin-1.590.tar.gz
```

Removing a empty directory

```
[root@server ~]# rmdir india

[root@server ~]# ls

anaconda-ks.cfg  anand2  Desktop    Downloads  india1  india3       install.log.syslog
kumar1  Pictures  rpmbuild   Videos        webmin-1.590.tar.gz anand1          d1
Documents  hyderabad  india2  install.log  kumar Music   Public    Templates  webmin-
1.590

[root@server /]# rmdir kumar1/

rmdir: failed to remove `kumar1/': Directory not empty
```

Removing a filed directory

```
[root@server /]# rm -rf kumar1/
```

Copying a file

```
[root@server ~]# cp hyderabad Desktop/

[root@server ~]# cd Desktop

[root@server Desktop]# ls

[root@server Desktop]# cd ..
```

Copying a complete directory

```
[root@server ~]# cp -r /boot/ shiva/
```

Rename a file

```
[root@server ~]# mv hyderabad hyderabad2

[root@server ~]# cat > hyderabad2

This is anand

This is kumar

they students in computers
```

Search a word in file

```
[root@server ~]# grep 'kumar' hyderabad2

This is kumar
```

```
[root@server ~]# cat /etc/shadow | grep 'anand'

anand:$6$hslH52Z5$OIyifFiYWz6xce1g5T9T.5bElOHYY1f2uWeuRaYgZTqazYJcEgoW
BgQEMyoj2LRLv432g82gZd7Am0az0KtmU/:15543:0:99999:7:::

anand2:$6$0yfKjYdK$UofWZugkLX/SXSJXqJap6Y/zgp2YNbCWLobbZOiAYYO4d5SAewI
97Du/GjFkeJAFAMMMHMjuU4zqkCsZ2xZ9O1:15546:0:99999:7:::
```

To view date and time

```
[root@server ~]# date

Wed Jul 25 11:05:28 IST 2012
```

To get calendar

```
[root@server ~]# cal 12 2011

    December 2011

Su Mo Tu We Th Fr Sa

             1  2  3

 4  5  6  7  8  9 10

11 12 13 14 15 16 17

18 19 20 21 22 23 24

25 26 27 28 29 30 31
```

To get commands history

```
[root@server ~]# history
```

To Clear history

```
[root@server ~]# history -c
```

To get disk usage

```
[root@server ~]# df -h

Filesystem            Size  Used Avail Use% Mounted on

/dev/sda1             9.7G  2.9G  6.4G  31% /

tmpfs                1012M  112K 1012M   1% /dev/shm

/dev/sda3             985M   18M  918M   2% /dev1

/dev/sda5             985M   18M  918M   2% /dev2
```

To get partition information

```
[root@server ~]# fdisk -l

    Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
/dev/sda2            1275        1785     4096000   82  Linux swap / Solaris
/dev/sda3            1785        1913     1024000   83  Linux
/dev/sda4            1913        2611     5610496    5  Extended
/dev/sda5            1913        2041     1024000   83  Linux
/dev/sda6            2041        2054      111651+  83  Linux
/dev/sda7            2055        2080      208813+  83  Linux
/dev/sda8            2081        2094      112423+  83  Linux
/dev/sda9            2095        2108      112423+  83  Linux
```

To get number command available

```
[root@server ~]-> ->
```

To get help about command

```
[root@server ~]# man ls
q to quit
```

shout down computer now

```
[root@server ~]# shoutdown -h now
[root@server ~]# init 0
or
[root@server ~]# poweroff
or
shout down computer at 10.30pm
[root@server ~]# shoutdown -h 10:30pm
```

To restart computer

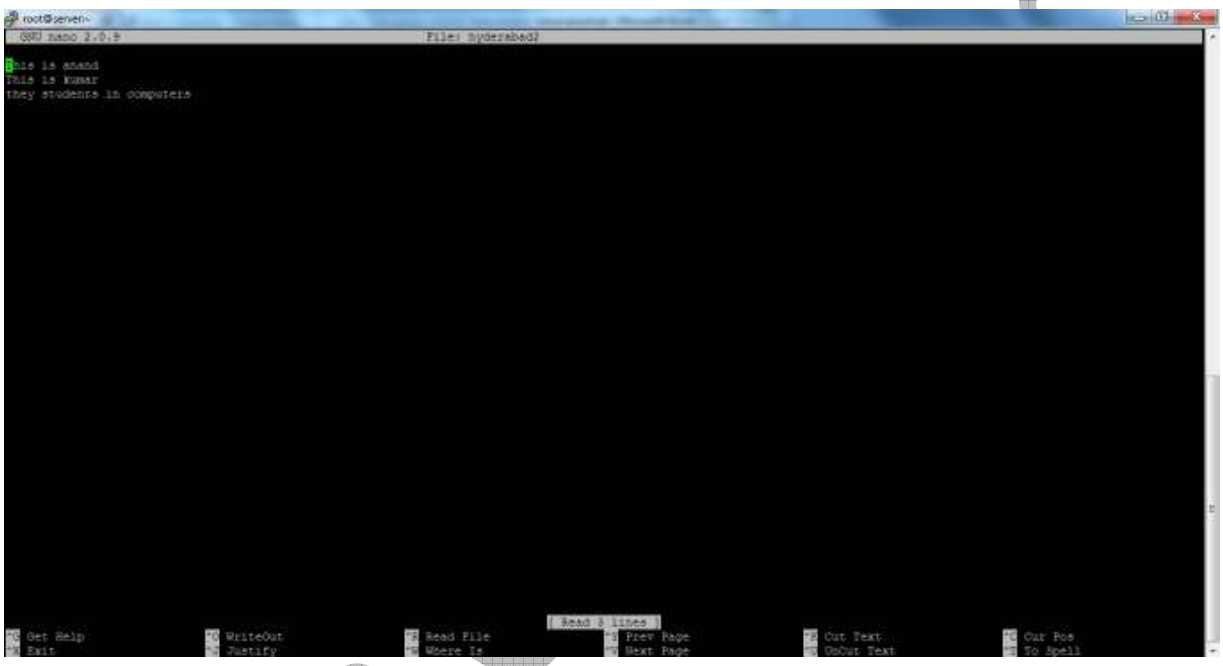
```
[root@server ~]# init 6
```

Editors:

In Linux by default we have 3 editors

- gedit (Graphical mode)
- nano (command mode
- vi (command mode)
- vim (command mode)

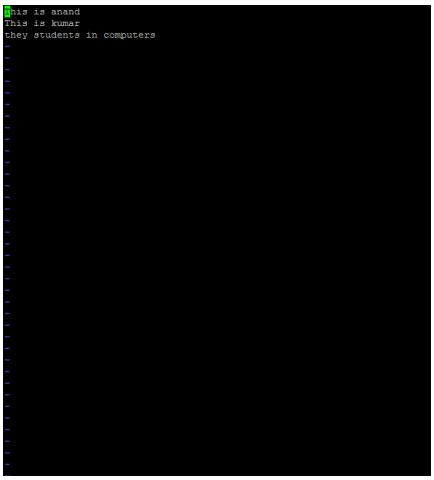
```
[root@server ~]# nano   hyderabad2
```

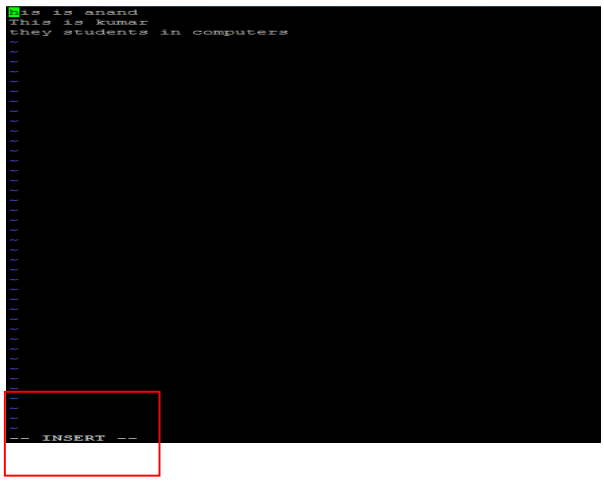


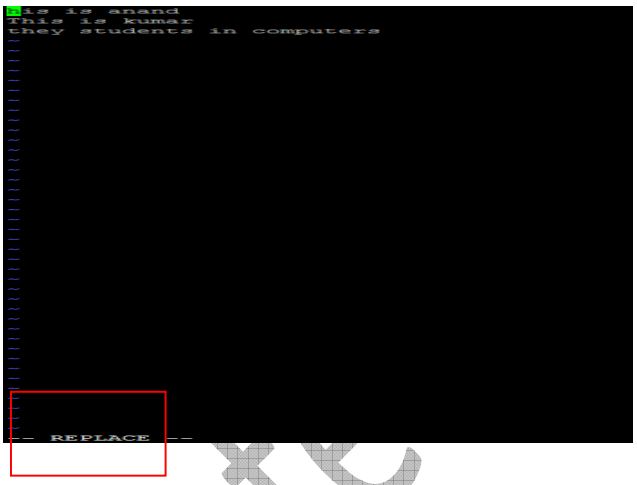

```
ctrl+W to search word in file

ctrl+O to save file

ctrl+X to exit file
```

Vi/VIM editor

```
[root@server ~]# vi hyderabad2
```







Note: To enter in to default mode press "Esc" .

Note: to enter in to insert mode press insert button or a on u r keyboard

Note: to enter in to replace mode press insert button again on u r keyboard

Note: O**nly editing is possible in insert or replace mode**.

Command which is used in Linux **VI editor**

Commands in vi editors

```
x           delete character
nx          delete n characters
X           delete character before cursor
dw          delete word
ndw         delete n words
dd          delete line
ndd         delete n lines
D           delete characters from cursor to end of line
r           replace character under cursor
cw          replace a word
ncw         replace n words
C           change text from cursor to end of line
o           insert blank line below cursor
               (ready for insertion)
O           insert blank line above cursor
               (ready for insertion)
J           join succeeding line to current cursor line
nJ          join n succeeding lines to current cursor line
u           undo last change
U           restore current line
```

MOVING AROUND IN A FILE

```
w             forward word by word
b             backward word by word
$             to end of line
0 (zero)      to beginning of line
```

```
H             to top line of screen
M             to middle line of screen
L             to last line of screen
G             to last line of file
1G            to first line of file
<Control>f    scroll forward one screen
<Control>b    scroll backward one screen
<Control>d    scroll down one-half screen
<Control>u    scroll up one-half screen
n             repeat last search in same direction
N             repeat last search in opposite direction
```

CLOSING AND SAVING A FILE

```
ZZ             save file and then quit
:w             save file
:q!             discard changes and quit file
```

Users and groups management

```
[root@server ~]# useradd u1

[root@server ~]# passwd u1

Changing password for user u1.

New password:

BAD PASSWORD: it is WAY too short

BAD PASSWORD: is too simple

Retype new password:

passwd: all authentication tokens updated successfully.

[root@server ~]# cat /etc/passwd | grep u1

u1:x:2001:2002::/home/u1:/bin/bash

[root@server ~]# cat /etc/shadow | grep u1

u1:$6$E/UXqIAk$wCMbTNlmbAlM4Z8YHBIk8q3Dek0pDes/miMujoq2u.4v8KKPjSz80MT
VXGQ4Y/z2AyjCD/DFEmCEFCvLI1mto/:15546:0:99999:7:::

[root@server ~]# cat /etc/group | grep u1

u1:x:2002:

[root@server ~]# mkdir /marketing

[root@server ~]# useradd -u 1000 -d /marketing/u2 u2

[root@server ~]# cat /etc/passwd | grep u2

u2:x:1000:1000::/marketing/u2:/bin/bash

[root@server ~]# useradd -u 1500 -d /marketing/u3 -s /bin/zsh u3

[root@server ~]# cat /etc/passwd | grep u3

u3:x:1500:1500::/marketing/u3:/bin/zsh

[root@server ~]# usermod -L u1
```

Log off from root user and log in as u1 user,u1 user should not log in..

Executive the command login as root user

```
[root@server ~]# usermod -U u1
```

Making user blank password

```
[root@server ~]# usermod -p "" u1
```

User to make force to change password

Log off from root user and log in as u1 user,

```
[root@server ~]# chage -d '0' u1
```

Log off from root user and log in as u1 user, change the password..

Changing login name of a user u1 to u1

```
[root@server ~]# usermod -l u100 u1
```

Log off from u1 user and login as u100.

```
[root@server ~]# cat /etc/passwd | grep 'u100'
u100:x:2001:2002::/home/u1:/bin/bash
```

Switching user from root user to u100 user

```
[root@server ~]# su - u100
```

To back to root user

```
[u100@server ~]$exit
```

Creating group named shiva

```
[root@server ~]# groupadd shiva
[root@server ~]# groupadd marketing
[root@server ~]# cat /etc/group | grep shiva
shiva1:x:2001:anand2,tom
shiva:x:2003:
```

Adding u100, u2 user to shiva group as secondary member

```
[root@server ~]# usermod -G shiva u100
[root@server ~]# usermod -G shiva u2
```

Creating user shiva as a primary group

```
[root@server ~]# useradd -g shiva u80
```

Checking user group information

```
[root@server ~]# id u80
```

```
uid=2003(u80) gid=2003(shiva) groups=2003(shiva)
```

Adding u100 secondary member of different group like marketing, shiva1

```
[root@server ~]# usermod -a -G shiva1,marketing u100

[root@server ~]# id u100

uid=2001(u100) gid=2002(u1)
groups=2002(u1),2001(shiva1),2004(marketing)

[root@server ~]# cat /etc/group
```

Changing a user from old shiva group to new group shiva1

```
[root@server ~]# usermod -G shiva1 u100
```

User password account information

```
[root@server ~]# chage -l u80

Last password change                                    : Jul 25, 2012

Password expires                                        : never

Password inactive                                       : never

Account expires                                         : never

Minimum number of days between password change          : 0

Maximum number of days between password change          : 99999

Number of days of warning before password expires       : 7

deleting user

[root@server ~]# userdel u100

deleting user with home directory

[root@server ~]# userdel -r u80

deleting a group

[root@server ~]# groupdel shiva1

[root@server ~]#
```

Permissions

checking user permissions of file

Note: permission can be assigned to files and folders not users and groups.

```
[root@server ~]# ls -l
drwxr-xr-x.   2 root root     4096 Jul 22 09:48 anand1
drwxr-xr-x.   2 root root     4096 Jul 22 09:48 anand2
```

create a user name ramesh

```
[root@server ~]# useradd ramesh
create a file anand
[root@server ~]# touch /anand
[root@server ~]# ls -l /anand
-rw-r--r-- 1 root root 0 Jul 26 05:36 tom
```

Switch to user to ramesh

```
[root@server ~]# su - ramesh
[ramesh@server ~]$ vi /anand
:q!
```

you file will be read only

```
[ramesh@server ~]$exit
[root@server ~]# chmod 647 /anand
[root@server ~]# ls -l /anand
-rw-r--rwx 1 root root 0 Jul 26 05:46 /anand
[root@server ~]# su - ramesh
[ramesh@server ~]$ vi /anand
:wq
[ramesh@server ~]$exit
```

Changing ownership of file

```
[root@server ~]# chown ramesh /anand
[root@server ~]# ls -l /anand
```

```
-rw-r--rwx 1 ramesh root 19 Jul 26 05:54 /anand
```

Changing group ownership of file

```
[root@server ~]# chgrp ramesh /anand
[root@server ~]# ls -l /anand
-rw-r--rwx 1 ramesh ramesh 19 Jul 26 05:54 /anand
[root@server ~]#
```

Stick bit

stick bit can be applied to folders only, which provides full access to all the users but only the user can delete the files who is owner.

```
[root@server ~]# mkdir /delhi

[root@server ~]#useradd u150

[root@server ~]#useradd u160

Applying stick bit to delhi folder

[root@server /]# cd ..

[root@server /]# chmod 1777 /delhi/

[root@server /]# ls -l

total 1536

-rw-r--rwx    1 ramesh ramesh     19 Jul 26 05:54 anand

-rw-r--r--.   1 root   root      512 Jul 22 14:36 backup.cpio

dr-xr-xr-x.   2 root   root     4096 Jul 25 03:38 bin

dr-xr-xr-x.   4 root   root     4096 Jun 11 20:46 boot

drwxr-xr-x.   2 root   root     4096 Sep 23  2011 cgroup

drwxr-xr-x    3 root   root     4096 Jul 25 10:47 d1

drwxrwxrwt    2 root   root     4096 Jul 26 09:31 delhi

[root@server /]# su - u150

[u150@server ~]$ touch /delhi/1.txt

[u150@server ~]$ exit

logout

[root@server /]# su - u160

[u160@server ~]$ touch /delhi/2.txt

[u160@server ~]$ exit

logout

[root@server /]# su - u150

[u150@server ~]$ rm /delhi/2.txt

rm: remove write-protected regular empty file `/delhi/2.txt'? y
```

```
rm: cannot remove `/delhi/2.txt': Operation not permitted
```

U150 trying to remove 2.txt file which is under full permission folder for all users, but stick bit is applied.

Sudo users

Sudo command will provides normal users to root users permission

```
[root@server /]# useradd u200
[root@server /]# passwd u200
[root@server /]# vi /etc/sudoers
line number 96  u160   ALL=(ALL)        ALL
[root@server /]# su - u160
[u160@server ~]$ vi /etc/shadow
[u160@server ~]$ sudo vi /etc/shadow
```

you show not see in the file any thing

```
We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:
    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.
[sudo] password for u160:
enter the password
[u160@server ~]$ sudo vi /etc/shadow
```

Basic networking

To view hostname

[root@localhost ~]# hostname

Assigning hostname

[root@localhost ~]# hostname server.example.com

Setting computer name permanent

[root@localhost ~]# vi /etc/sysconfig/network

```
NETWORKING=yes

HOSTNAME=server.example.com

:wq!
```

All the network related files will be stored in /etc/sysconfig/network-scripts

```
[root@server ~]# cd /etc/sysconfig/network-scripts/

[root@server network-scripts]# ls

ifcfg-eth0   ifdown-eth   ifdown-isdn   ifdown-sit     ifup-bnep  ifup-ipv6   ifup-
post    ifup-tunnel       network-functions

ifcfg-lo     ifdown-ib    ifdown-post   ifdown-tunnel  ifup-eth   ifup-isdn   ifup-
ppp     ifup-wireless     network-functions-ipv6

ifdown       ifdown-ippp  ifdown-ppp    ifup           ifup-ib    ifup-plip   ifup-
routes  init.ipv6-global

ifdown-bnep  ifdown-ipv6  ifdown-routes  ifup-aliases   ifup-ippp  ifup-plusb  ifup-
sit     net.hotplug
```

Note: network cad file name is ifcfg-eth0

```
[root@server network-scripts]# cat ifcfg-eth0

DEVICE=eth0

NM_CONTROLLED=yes

ONBOOT=no

TYPE=Ethernet

BOOTPROTO=dhcp

DEFROUTE=yes

IPV4_FAILURE_FATAL=yes

IPV6INIT=no
```

```
NAME="System eth0"

UUID=5fb06bd0-0bb0-7ffb-45f1-d6edd65f3e03

HWADDR=00:0c:29:22:0b:fe

PEERROUTES=yes

USERCTL=no

PEERDNS=yes
```

Assigning IP address

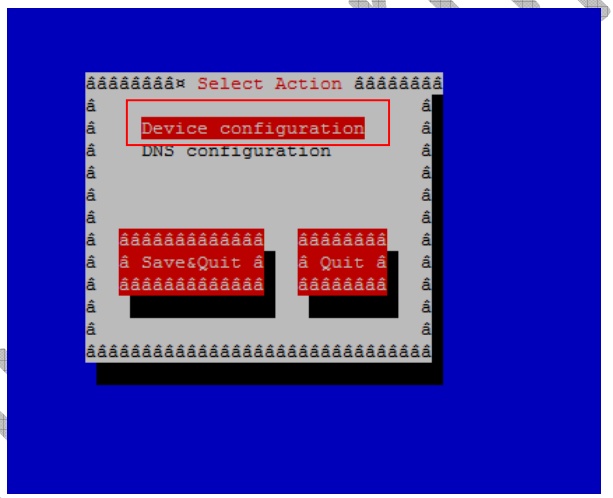
There are 2 ways IP address can be assigned

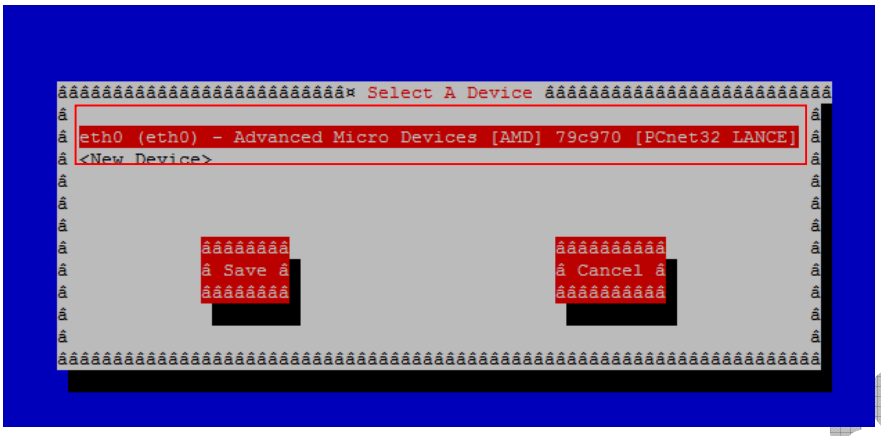
- Using tool
- Manually

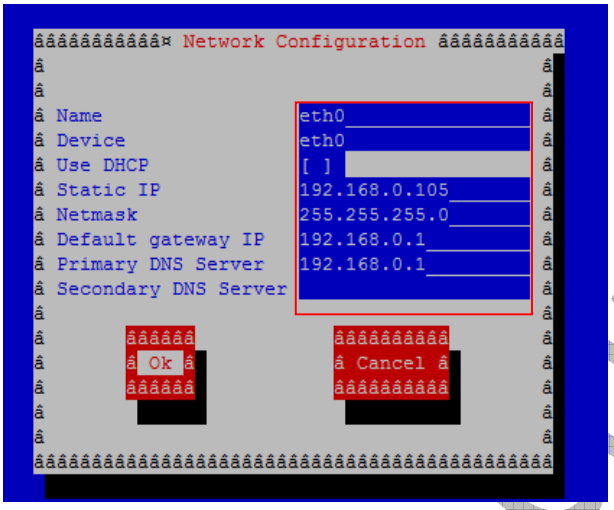
Using tools 1) system-config-network-tui 2)setup 3)ifconfig

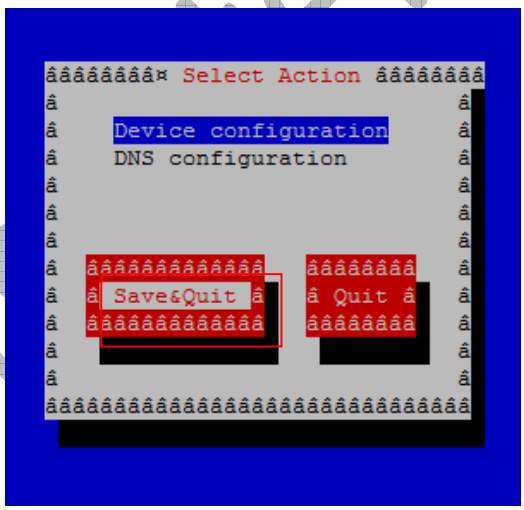
Steep1 :

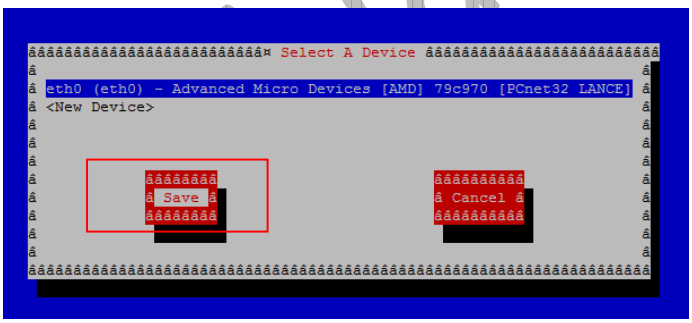
```
[root@localhost /]# system-config-network-tui
```











steep2: Restart the network service

```
[root@localhost /]# service network restart

[root@localhost /]# ifup eth0
```

To check IP address

[root@server ~]# ifconfig

```
eth0      Link encap:Ethernet  HWaddr 00:0C:29:22:0B:FE
          inet addr:192.168.0.101  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe22:bfe/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:13377 errors:0 dropped:0 overruns:0 frame:0
          TX packets:11895 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3585144 (3.4 MiB)  TX bytes:4250314 (4.0 MiB)
          Interrupt:19 Base address:0x2000
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:54 errors:0 dropped:0 overruns:0 frame:0
          TX packets:54 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:3792 (3.7 KiB)  TX bytes:3792 (3.7 KiB)
```

or

```
[root@server ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
qlen 1000
    link/ether 00:0c:29:22:0b:fe brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.101/24 brd 192.168.0.255 scope global eth0
    inet6 fe80::20c:29ff:fe22:bfe/64 scope link
       valid_lft forever preferred_lft forever
```

```
3: pan0: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN

    link/ether be:c0:bf:39:81:a4 brd ff:ff:ff:ff:ff:ff
```

To assigning IP address using ifconfig

```
[root@server network-scripts]# ifconfig eth0 192.168.0.102 netmask
255.255.255.0 gateway 192.168.0.1 dns1 192.168.0.1
```

Assigning Another IP address to same network card which is known as virtual Ethernet card.

steep1: creating or copying network sample file

```
[root@server network-scripts]# cd /etc/sysconfig/network-scripts/

[root@server network-scripts]# cp ifcfg-eth0 ifcfg-eth0:1
```

steep2: change Ethernet name and ip address in virtual file

```
[root@localhost /]# vi ifcfg-eth0:1

DEVICE=eth0:1

NM_CONTROLLED=yes

ONBOOT=no

TYPE=Ethernet

BOOTPROTO=dhcp

DEFROUTE=yes

IPV4_FAILURE_FATAL=yes

NAME="System eth0:1"
```

steep3: assigning IP address

```
[root@server network-scripts]# ifconfig eth0:1 192.168.0.102 netmask
255.255.255.0 gateway 192.168.0.1 dns1 192.168.0.1
```

steep4: check IP Address

```
[root@server network-scripts]# ifconfig eth0:1

eth0:1    Link encap:Ethernet  HWaddr 00:0C:29:22:0B:FE

          inet addr:192.168.0.5  Bcast:192.168.0.255  Mask:255.255.255.0

          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

          Interrupt:19 Base address:0x2000
```

Note: you can create 0-253 virtual IP address for one network card

To active your network card

```
[root@server ~]# ifup eth0
```

To deactivate your network card

```
[root@server ~]# ifdown eth0
```

To get number users logged in to the computer

```
[root@server ~]# who -a
           system boot  2012-07-25 01:25
           run-level 5  2012-07-25 01:25
LOGIN      tty2         2012-07-25 01:26              1978 id=2
LOGIN      tty3         2012-07-25 01:26              1980 id=3
LOGIN      tty4         2012-07-25 01:26              1982 id=4
LOGIN      tty5         2012-07-25 01:26              1984 id=5
LOGIN      tty6         2012-07-25 01:26              1986 id=6
root     + tty7         2012-07-25 10:08  old         10939 (:0)
           pts/0        2012-07-25 08:57                0 id=/0    term=0 exit=0
root     + pts/1        2012-07-25 12:07   .          11915 (192.168.0.100)
           pts/2        2012-07-25 10:08               9413 id=ts/2  term=0 exit=0
           pts/3        2012-07-25 13:20              11300 id=ts/3  term=0 exit=0
           pts/4        2012-07-25 08:55              10104 id=ts/4  term=0 exit=0
           pts/0        2012-07-25 12:11              10471 id=ts/0  term=0 exit=0
root     + pts/2        2012-07-25 10:09 02:31        11208 (:0.0)
```

To get which user logged in to computer

```
[root@server ~]# whoami
root
```

To get network card hardware info

```
[root@server ~]# ethtool eth0
```

Installing programs on Linux

There are three different ways you can install programs on Linux

1) Using .rpm
2) Yum
3) Source

1 using rpm

Working with CD/DVD-ROMS and USB devices.

Insert the CD/DVD, then follow the steeps

```
[root@localhost ~]# mount /dev/dvdrw /media/
mount: block device /dev/sr0 is write-protected, mounting read-only
[root@localhost ~]# cd /media/
[root@localhost media]# ls
[root@localhost media]# cd Packages/
[root@localhost Packages]# ls
```

Steep1: Installing rpm packages

```
[root@localhost Packages]# rpm -ivh httpd-2.2.15-15.el6.centos.i686.rpm
```

or

```
[root@localhost Packages]# rpm -ivh httpd*  --force
Preparing...        ########################################### [100%]
   1:httpd          ########################################### [100%]
```

Steep2: checking rpm package

```
[root@localhost Packages]# rpm -q httpd
httpd-2.2.15-15.el6.centos.i686
[root@localhost Packages]# rpm -qa | grep 'httpd'
httpd-2.2.15-15.el6.centos.i686
httpd-tools-2.2.15-15.el6.centos.i686
```

Installation Location

```
[root@localhost Packages]# whereis httpd

httpd: /usr/sbin/httpd.event /usr/sbin/httpd.worker /usr/sbin/httpd
/etc/httpd /usr/lib/httpd /usr/share/man/man8/httpd.8.gz
```

Steep 3: Updating package

```
[root@localhost Packages]# rpm -Uvh package.rpm

or

[root@localhost Packages]# up2date -i package-name
```

Steep4: removing packages

```
[root@localhost /]# rpm -e samba

[root@localhost /]# rpm -e samba --nodeps
```

2) Using yum

```
Steep1: Listing available packages

[root@localhost /]# yum list samba

[root@localhost /]# yum list updates or all

[root@localhost /]# yum group list
```

Steep2: installing packeges

```
[root@localhost /]# yum install vsftp* -y

[root@localhost /]# yum install package1 packege2 -y

[root@localhost /]# yum groupinstall "Development Tools"
```

Steep3: Updating packages

```
[root@localhost /]# yum update vsftp

[root@localhost /]# yum update

[root@localhost /]# yum groupupdate "Development Tools"

[root@localhost /]# yum upgrade
```

Steep4: removing packegs

```
[root@localhost /]# yum remove vsftp

[root@localhost /]# yum grouremove "Development Tools"
```

3 Source or manual Installation of programs:

Download the package, which will be in tar.gz format

```
[root@localhost /]# tar zxf software_package

[root@localhost /]#cd software_package

[root@localhost /]#configure

[root@localhost /]#make

[root@localhost /]# make install
```

Note: All the source installation is same.

Accessing pen drive

```
[root@localhost /]# mkdir –p /mnt/pen

[root@localhost /]# mount /dev/sda1 /mnt/pen

[root@localhost /]# cd /mnt/pen

[root@localhost /]# ls
```

Job scheduling

Job scheduling can be done two ways

1) cron tab

2) at

1) Cron tab

To add new job, edit job, delete a job

```
[root@server /]# crontab -e

30 08 10 06 * /home/ramesh/full-backup.sh
0 22 * * * poweroff
```

:wq!

```
[root@server /]# crontab -l

30 08 10 06 * /home/ramesh/full-backup.sh

0 22 * * * poweroff

# crontab -ir
crontab: really delete root's crontab? n
```

In crontab total 6 columns which are given bellow

1) MIN Minute field 0 to 59
2 HOUR Hour field 0 to 23
3) DOM Day of Month 1-31
4) MON Month field 1-12
6) DOW Day Of Week 0-6
7) CMD Command Any command to be executed.

1) For first line a backup script will be starts

- **30** – 30th Minute
- **08** – 08 AM
- **10** – 10th Day
- **06** – 6th Month (June)
- ***** – Every day of the week

2) second line Every day at 10Pm system will be shutdown.

- **0** – every minute
- **22** – 20 PM
- ***** – everyday
- ***** – every month
- ***** – Every day of the week

2) At Command

Adding a job

```
[root@server /]# at -m 01:35

at> poweroff
```

press ctrl+d

at> <EOT>

Viewing jobs

```
[root@server /]# at -l
```

1 2011-10-10 01:35AM pweroff

Removing a job 1

```
[root@server /]# atrm 1
```

Fdisk: (creating partitions)

Steep1: checking the partitions

```
[root@localhost ~]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.7G  2.8G  6.4G  31% /
tmpfs                1012M  284K 1012M   1% /dev/shm
/dev/sda3             985M   18M  918M   2% /dev1
/dev/sr0              3.6G  3.6G     0 100% /media/CentOS_6.2_Final
[root@localhost ~]# fdisk -l
Disk /dev/sda: 21.5 GB, 21474836480 bytes
255 heads, 63 sectors/track, 2610 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0000bff6
   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
/dev/sda2            1275        1785     4096000   82  Linux swap / Solaris
/dev/sda3            1785        1913     1024000   83  Linux
/dev/sda4            1913        2611     5610496    5  Extended
/dev/sda5            1913        2041     1024000   83  Linux
```

Steep2: Creating new partitions using fdisk

```
[root@localhost ~]# fdisk /dev/sda
WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
        switch off the mode (command 'c') and change display units to
         sectors (command 'u').
Command (m for help): m
Command action
   d   delete a partition
   l   list known partition types
   n   add a new partition
```

```
   p   print the partition table

   q   quit without saving changes

   t   change a partition's system id

   v   verify the partition table


Command (m for help): n

First cylinder (2041-2611, default 2041):

Using default value 2041 Last cylinder, +cylinders or +size{K,M,G} (2041-
2611, default 2611): +100M

Command (m for help): n

First cylinder (2055-2611, default 2055):

Using default value 2055 Last cylinder, +cylinders or +size{K,M,G} (2055-
2611, default 2611): +200M

Command (m for help): n

First cylinder (2081-2611, default 2081):

Using default value 2081 Last cylinder, +cylinders or +size{K,M,G} (2081-
2611, default 2611): +100M

Command (m for help): p

   Device Boot      Start         End      Blocks   Id  System

/dev/sda1   *           1        1275    10240000   83  Linux

/dev/sda2            1275        1785     4096000   82  Linux swap / Solaris

/dev/sda3            1785        1913     1024000   83  Linux

/dev/sda4            1913        2611     5610496    5  Extended

/dev/sda5            1913        2041     1024000   83  Linux

/dev/sda6            2041        2054      111651+  83  Linux

/dev/sda7            2055        2080      208813+  83  Linux

/dev/sda8            2081        2094      112423+  83  Linux

Command (m for help): wq
```

Steep3: reboot operating system

```
[root@localhost ~]# init 6
```

Steep4 : creating file system for newly created /dev/sda6, /dev/sda7, /dev/sda8.

```
[root@localhost ~]# mkfs.ext2 /dev/sda6

[root@localhost ~]# mkfs.ext3 /dev/sda7

[root@localhost ~]# mkfs.ext4 /dev/sda8
```

Steep5 : mount the partition on folder to make use it

```
[root@localhost ~]# mkdir /dev6
[root@localhost ~]# mkdir /dev7
[root@localhost ~]# mkdir /dev8
[root@localhost ~]# mount /dev/sda6 /dev6/
[root@localhost ~]# mount /dev/sda7 /dev7/
[root@localhost ~]# mount /dev/sda8 /dev8/

[root@localhost /]# cd /dev6
[root@localhost dev6]# ls
lost+found
[root@localhost dev6]# cd ..
[root@localhost /]# cd /dev7
[root@localhost dev7]# ls
lost+found
[root@localhost dev7]# cd ..
[root@localhost /]# cd /dev8/
[root@localhost dev8]# ls
lost+found
[root@localhost dev8]# cd ..
[root@localhost /]#
```

Note: in all the mount folder u should see Lost+found folder

Steep6: checking the disk usage

```
[root@localhost /]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.7G  2.8G  6.4G  31% /
tmpfs                1012M  284K 1012M   1% /dev/shm
/dev/sda3             985M   18M  918M   2% /dev1
```

```
/dev/sr0              3.6G  3.6G     0 100% /media/CentOS_6.2_Final
/dev/sda6             106M  1.6M   99M   2% /dev6
/dev/sda7             198M  5.8M  182M   4% /dev7
/dev/sda8             107M  5.6M   96M   6% /dev8
```

Steep7: to view all the mount point links in your system

```
[root@localhost /]# mount
```

At last it should like this

```
/dev/sda6 on /dev6 type ext2 (rw)
/dev/sda7 on /dev7 type ext3 (rw)
/dev/sda8 on /dev8 type ext4 (rw)
```

To remove Linux partition

```
 [root@ns1 ~]# umount /dsda8
[root@ns1 ~]# fdisk /dev/sda
Command (m for help): d
Partition number (1-8): 8
Command (m for help): p
   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
/dev/sda2            1275        1530     2048000   82  Linux swap / Solaris
/dev/sda3            1530        2610     8675801    5  Extended
/dev/sda5            1530        1555      201482   83  Linux
/dev/sda6            1556        1581      208813+  83  Linux
/dev/sda7            1582        1607      208813+  83  Linux
Command (m for help): wq
```

Restart the system

```
[root@ns1 ~]# init 6
```

LVM (Logical volume manager)

Steep1: Checking hard disk partition

```
[root@localhost ~]# fdisk -l

Disk /dev/sda: 21.5 GB, 21474836480 bytes

255 heads, 63 sectors/track, 2610 cylinders

Units = cylinders of 16065 * 512 = 8225280 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk identifier: 0x0000bff6

   Device Boot      Start         End      Blocks   Id  System

/dev/sda1   *           1        1275    10240000   83  Linux

/dev/sda2            1275        1785     4096000   82  Linux swap / Solaris

/dev/sda3            1785        1913     1024000   83  Linux

/dev/sda4            1913        2611     5610496    5  Extended

/dev/sda5            1913        2041     1024000   83  Linux
```

Steep2: Creating new partitions using fdisk

```
[root@localhost ~]# fdisk /dev/sda

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to

        switch off the mode (command 'c') and change display units to

         sectors (command 'u').

Command (m for help): n

First cylinder (2041-2611, default 2041):

Using default value 2041 Last cylinder, +cylinders or +size{K,M,G} (2041-
2611, default 2611): +100M

Command (m for help): n

First cylinder (2055-2611, default 2055):

Using default value 2055 Last cylinder, +cylinders or +size{K,M,G} (2055-
2611, default 2611): +200M

Command (m for help): n

First cylinder (2081-2611, default 2081):

Using default value 2081 Last cylinder, +cylinders or +size{K,M,G} (2081-
2611, default 2611): +100M
```

```
Command (m for help): p

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
/dev/sda2            1275        1785     4096000   82  Linux swap / Solaris
/dev/sda3            1785        1913     1024000   83  Linux
/dev/sda4            1913        2611     5610496    5  Extended
/dev/sda5            1913        2041     1024000   83  Linux
/dev/sda6            2041        2054      111651+  83  Linux
/dev/sda7            2055        2080      208813+  83  Linux
/dev/sda8            2081        2094      112423+  83  Linux
Command (m for help): wq
```

Steep3: reboot operating system

```
[root@localhost ~]# init 6
```

Steep4 : creating file system for newly created /dev/sda6, /dev/sda7, /dev/sda8.

```
[root@localhost ~]# mkfs.ext4 /dev/sda6
[root@localhost ~]# mkfs.ext4 /dev/sda7
[root@localhost ~]# mkfs.ext4 /dev/sda8
[root@localhost ~]# fdisk -l
Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
/dev/sda2            1275        1785     4096000   82  Linux swap / Solaris
/dev/sda3            1785        1913     1024000   83  Linux
/dev/sda4            1913        2611     5610496    5  Extended
/dev/sda5            1913        2041     1024000   83  Linux
/dev/sda6            2041        2054      111651+  83  Linux
/dev/sda7            2055        2080      208813+  83  Linux
/dev/sda8            2081        2094      112423+  83  Linux
```

Steep5: creating physical volumes

```
[root@localhost ~]# pvcreate /dev/sda6 /dev/sda7 /dev/sda8
  Writing physical volume data to disk "/dev/sda6"
  Physical volume "/dev/sda6" successfully created
  Writing physical volume data to disk "/dev/sda7"
```

```
  Physical volume "/dev/sda7" successfully created
  Writing physical volume data to disk "/dev/sda8"
  Physical volume "/dev/sda8" successfully created
[root@localhost ~]# pvdisplay
  "/dev/sda6" is a new physical volume of "109.03 MiB"
  --- NEW Physical volume ---
  PV Name               /dev/sda6
  VG Name
  PV Size               109.03 MiB
  Allocatable           NO
  PE Size               0
  Total PE              0
  Free PE               0
  Allocated PE          0
  PV UUID               abgRMn-cr4I-dyF0-ekY9-SaWm-CeyW-j5ifMS
  "/dev/sda7" is a new physical volume of "203.92 MiB"
  --- NEW Physical volume ---
  PV Name               /dev/sda7
  VG Name
  PV Size               203.92 MiB
  Allocatable           NO
  PE Size               0
  Total PE              0
  Free PE               0
  Allocated PE          0
  PV UUID               STQw3d-8ffF-D9Yq-9ji3-xGug-ADcD-FlgHIf
  "/dev/sda8" is a new physical volume of "109.79 MiB"
  --- NEW Physical volume ---
  PV Name               /dev/sda8
  VG Name
  PV Size               109.79 MiB
  Allocatable           NO
  PE Size               0
  Total PE              0
```

```
  Free PE               0
  Allocated PE          0
  PV UUID               RNbNM6-d4v7-qKfM-UVOb-76sa-qTsK-8OUCor
```

Step 6: creating volume group

```
[root@localhost ~]# vgcreate vg1 /dev/sda6 /dev/sda7 /dev/sda8
  Volume group "vg1" successfully created
[root@localhost ~]# vgdisplay
  --- Volume group ---
  VG Name               vg1
  System ID
  Format                lvm2
  Metadata Areas        3
  Metadata Sequence No  1
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                0
  Open LV               0
  Max PV                0
  Cur PV                3
  Act PV                3
  VG Size               416.00 MiB
  PE Size               4.00 MiB
  Total PE              104
  Alloc PE / Size       0 / 0
  Free  PE / Size       104 / 416.00 MiB
  VG UUID               u1QKS0-5EiL-jghL-Owj9-0brg-QWD8-1zOooC
```

Steep7: creating LV (logical volume)

```
[root@localhost ~]# lvcreate vg1 -L +200m -n lv1
  Logical volume "lv1" created
[root@localhost ~]# lvdisplay
```

```
  --- Logical volume ---
  LV Name                /dev/vg1/lv1
  VG Name                vg1
  LV UUID                ZzIF11-rkjv-inkb-UiFF-8i3l-YN9n-7qZ2ei
  LV Write Access        read/write
  LV Status              available
  # open                 0
  LV Size                200.00 MiB
  Current LE             50
  Segments               1
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     256
  Block device           253:0
```

Steep8: creating file system for /dev/vg1/lv1 newly created Lv partition

```
[root@localhost ~]#mkfs.ext4 /dev/vg1/lv1
```

Steep9: mounting the newly created partition on lv1 folder

```
[root@localhost ~]# mkdir /lv1
[root@localhost ~]# mount /dev/vg1/lv1   /lv1/
[root@localhost ~]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.7G  2.5G  6.7G  27% /
tmpfs                1012M  112K 1012M   1% /dev/shm
/dev/sda3             985M   18M  918M   2% /dev1
/dev/sda5             985M   18M  918M   2% /dev2
/dev/mapper/vg1-lv1   194M  5.6M  179M   4% /lv1
```

Resizing Logical volume

Before resizing you must umount the partition.

Steep1: Logical volume in increased to 50MB

```
[root@localhost ~]# umount /lv1/
```

```
[root@localhost ~]# lvresize -L +50m /dev/vg1/lv1
  Rounding up size to full physical extent 52.00 MiB
  Extending logical volume lv1 to 252.00 MiB
  Logical volume lv1 successfully resized
```

Steep2: repeat steep 10 for mount partition

If you want decrease Logical volume

```
[root@localhost ~]# lvresize -L -100m /dev/vg1/lv1
  WARNING: Reducing active logical volume to 152.00 MiB
  THIS MAY DESTROY YOUR DATA (filesystem etc.)
Do you really want to reduce lv1? [y/n]: y
  Reducing logical volume lv1 to 152.00 MiB
  Logical volume lv1 successfully resized
Steep 10 repeat for mounting
```

Increasing volume group

Steep1: Increasing Volume group.

Note: before increasing volume group have to increase physical volume

Steep2: Create new partition /dev/sda9

```
[root@localhost ~]# fdisk /dev/sda
Command (m for help): p
   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
/dev/sda2            1275        1785     4096000   82  Linux swap / Solaris
/dev/sda3            1785        1913     1024000   83  Linux
/dev/sda4            1913        2611     5610496    5  Extended
/dev/sda5            1913        2041     1024000   83  Linux
/dev/sda6            2041        2054      111651+  83  Linux
/dev/sda7            2055        2080      208813+  83  Linux
```

```
/dev/sda8            2081        2094      112423+  83  Linux

Command (m for help): n

First cylinder (2095-2611, default 2095):

Using default value 2095

Last cylinder, +cylinders or +size{K,M,G} (2095-2611, default 2611): +100M

Command (m for help): wq

The partition table has been altered!

Calling ioctl() to re-read partition table.
```

Steep3: restart the system

```
[root@localhost /]# init 6
```

Steep3: create new physical volume

```
[root@localhost /]# pvcreate /dev/sda9
  Writing physical volume data to disk "/dev/sda9"
  Physical volume "/dev/sda9" successfully created
```

Steep4: Increasing volume group

```
[root@localhost /]# vgextend vg1 /dev/sda9
  Volume group "vg1" successfully extended
```

Removing complete LVM

Steep1: remove Logical volume

```
[root@localhost /]# lvremove /dev/vg1/lv1
Do you really want to remove active logical volume lv1? [y/n]: y
  Logical volume "lv1" successfully removed
```

Steep2: remove volume group

```
 [root@localhost /]# vgremove vg1
  Volume group "vg1" successfully removed
```

Steep3: remove physical volume

```
[root@localhost /]# pvremove /dev/sda6 /dev/sda7 /dev/sda8 /dev/sda9
```

```
  Labels on physical volume "/dev/sda6" successfully wiped
  Labels on physical volume "/dev/sda7" successfully wiped
  Labels on physical volume "/dev/sda8" successfully wiped
  Labels on physical volume "/dev/sda9" successfully wiped
```

Steep4: checking LVM remove or not

```
[root@localhost /]# lvdisplay
  No volume groups found
[root@localhost /]# vgdisplay
  No volume groups found
[root@localhost /]# pvdisplay
[root@localhost /]#
```

Steep5: how to make the partition permanent mounting at boot time.

```
[root@localhost ~]# vi /etc/fstab
```

At last

```
/dev/sda6       /dev6   ext2 defaults 0 0
/dev/sda7       /dev7   ext3 defaults 0 0
/dev/sda8       /dev8   ext4 defaults 0 0
```

RAID- 1/5

steep1: Creating 3 partitions sda5, sda6, sda7 which are 200M, 200M 100M.

```
[root@ns1 ~]# fdisk /dev/sda

Command (m for help): n

Command action

   l   logical (5 or over)

   p   primary partition (1-4)

l

First cylinder (1556-2610, default 1556):

Using default value 1556

Last cylinder, +cylinders or +size{K,M,G} (1556-2610, default 2610): +200M


Command (m for help): n

Command action

   l   logical (5 or over)

   p   primary partition (1-4)

l

First cylinder (1582-2610, default 1582):

Using default value 1582

Last cylinder, +cylinders or +size{K,M,G} (1582-2610, default 2610): +200M


Command (m for help): n

Command action

   l   logical (5 or over)

   p   primary partition (1-4)

l

First cylinder (1608-2610, default 1608):

Using default value 1608

Last cylinder, +cylinders or +size{K,M,G} (1608-2610, default 2610): +200M


Command (m for help): p

   Device Boot      Start         End      Blocks   Id  System

/dev/sda1   *           1        1275    10240000   83  Linux
```

```
/dev/sda2            1275        1530     2048000   82  Linux swap / Solaris
/dev/sda3            1530        2610     8675801    5  Extended
/dev/sda5            1530        1555      201482   83  Linux
/dev/sda6            1556        1581      208813+  83  Linux
/dev/sda7            1582        1607      208813+  83  Linux
/dev/sda8            1608        1633      208813+  83  Linux

Command (m for help): t
Partition number (1-8): 8
Hex code (type L to list codes): fd
Changed system type of partition 8 to fd (Linux raid autodetect)

Command (m for help): t
Partition number (1-8): 7
Hex code (type L to list codes): fd
Changed system type of partition 7 to fd (Linux raid autodetect)

Command (m for help): p
    Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
/dev/sda2            1275        1530     2048000   82  Linux swap / Solaris
/dev/sda3            1530        2610     8675801    5  Extended
/dev/sda5            1530        1555      201482   83  Linux
/dev/sda6            1556        1581      208813+  83  Linux
/dev/sda7            1582        1607      208813+  fd  Linux raid autodetect
/dev/sda8            1608        1633      208813+  fd  Linux raid autodetect

Command (m for help): t
Partition number (1-8): 6
Hex code (type L to list codes): fd
Changed system type of partition 6 to fd (Linux raid autodetect)
Command (m for help): p
   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1        1275    10240000   83  Linux
```

```
/dev/sda2            1275        1530     2048000   82  Linux swap / Solaris
/dev/sda3            1530        2610     8675801    5  Extended
/dev/sda5            1530        1555      201482   83  Linux
/dev/sda6            1556        1581      208813+  fd  Linux raid autodetect
/dev/sda7            1582        1607      208813+  fd  Linux raid autodetect
/dev/sda8            1608        1633      208813+  fd  Linux raid autodetect
```

Note: RAID 1 is mirroring, when configuring RAID 1 your HDD partitions size should be same.

Steep2 : Creating mdadm for raid

```
[root@ns1 ~]# mdadm --create /dev/md0 --level=1 --raid-devices=2
/dev/sda6 /dev/sda7
mdadm: /dev/sda6 appears to contain an ext2fs file system
    size=208812K  mtime=Thu Jan  1 05:30:00 1970
mdadm: Note: this array has metadata at the start and
    may not be suitable as a boot device.  If you plan to
    store '/boot' on this device please ensure that
    your boot-loader understands md/v1.x metadata, or use
    --metadata=0.90
mdadm: /dev/sda7 appears to contain an ext2fs file system
    size=112420K  mtime=Thu Jan  1 05:30:00 1970
mdadm: largest drive (/dev/sda6) exceeds size (112411K) by more than 1%
Continue creating array?
Continue creating array? (y/n) y
mdadm: Defaulting to version 1.2 metadata
mdadm: array /dev/md0 started.
```

Steep3 : provides information regarding RAID devices.

```
[root@ns1 ~]# cat /proc/mdstat
Personalities : [raid1]
md0 : active raid1 sda7[1] sda6[0]
      112411 blocks super 1.2 [2/2] [UU]
unused devices: <none>
```

or

To view the details of raid

```
[root@ns1 ~]# mdadm -D /dev/md0
/dev/md0:
        Version : 1.2
  Creation Time : Mon Jul 30 17:59:56 2012
     Raid Level : raid1
     Array Size : 112411 (109.79 MiB 115.11 MB)
  Used Dev Size : 112411 (109.79 MiB 115.11 MB)
   Raid Devices : 2
  Total Devices : 2
    Persistence : Superblock is persistent
    Update Time : Mon Jul 30 17:59:58 2012
          State : clean
 Active Devices : 2
Working Devices : 2
 Failed Devices : 0
  Spare Devices : 0
           Name : ns1.example.com:0  (local to host ns1.example.com)
           UUID : 4488587c:00e56ff3:854194c1:0845c4fa
         Events : 17
    Number   Major   Minor   RaidDevice State
       0       8        6        0      active sync   /dev/sda6
       1       8        7        1      active sync   /dev/sda7
```

Steep4 : Creating File system

```
[root@ns1 ~]# mkfs.ext3 /dev/md0
```

Steep5 : Checking disk usage on computer.

```
[root@ns1 ~]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.7G  2.4G  6.8G  27% /
tmpfs                1012M  264K 1012M   1% /dev/shm
```

Steep6:Mounting RAID partition /dev/mdo .

```
[root@ns1 ~]# mkdir /raidvol

[root@ns1 ~]# mount /dev/md0 /raidvol/

[root@ns1 ~]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.7G  2.4G  6.8G  27% /
tmpfs                1012M  264K 1012M   1% /dev/shm
/dev/md0              107M  5.6M   96M   6% /raidvol
```

Replacing failed HDD

Steep7:replaceing RAID partition /dev/mdo .

```
[root@ns1 ~]# mdadm --fail /dev/md0 /dev/sda7
mdadm: set /dev/sda7 faulty in /dev/md0
[root@ns1 ~]# mdadm -D /dev/md0
/dev/md0:
        Version : 1.2
  Creation Time : Mon Jul 30 17:59:56 2012
     Raid Level : raid1
     Array Size : 112411 (109.79 MiB 115.11 MB)
  Used Dev Size : 112411 (109.79 MiB 115.11 MB)
   Raid Devices : 2
  Total Devices : 2
    Persistence : Superblock is persistent
    Update Time : Mon Jul 30 18:07:46 2012
          State : clean, degraded
 Active Devices : 1
Working Devices : 1
 Failed Devices : 1
  Spare Devices : 0
           Name : ns1.example.com:0  (local to host ns1.example.com)
```

```
           UUID : 4488587c:00e56ff3:854194c1:0845c4fa
         Events : 18

    Number   Major   Minor   RaidDevice State
       0       8        6        0      active sync   /dev/sda6
       1       0        0        1      removed
       1       8        7        -      faulty spare   /dev/sda7
```

```
[root@ns1 ~]# cat /proc/mdstat
Personalities : [raid1]
md0 : active raid1 sda7[1](F) sda6[0]
      112411 blocks super 1.2 [2/1] [U_]
unused devices: <none>
```

Steep7:removing /dev/sda7 from RAID.

```
[root@ns1 ~]# mdadm --remove /dev/md0 /dev/sda7
mdadm: hot removed /dev/sda7 from /dev/md0
[root@ns1 ~]# mdadm -D /dev/md0
/dev/md0:
        Version : 1.2
  Creation Time : Mon Jul 30 17:59:56 2012
     Raid Level : raid1
     Array Size : 112411 (109.79 MiB 115.11 MB)
  Used Dev Size : 112411 (109.79 MiB 115.11 MB)
   Raid Devices : 2
  Total Devices : 1
    Persistence : Superblock is persistent
    Update Time : Mon Jul 30 18:08:31 2012
          State : clean, degraded
 Active Devices : 1
Working Devices : 1
 Failed Devices : 0
  Spare Devices : 0
```

```
           Name : ns1.example.com:0  (local to host ns1.example.com)
           UUID : 4488587c:00e56ff3:854194c1:0845c4fa
         Events : 21

    Number   Major   Minor   RaidDevice State
       0       8        6        0      active sync   /dev/sda6
       1       0        0        1      removed
```

Steep8:Adding new /dev/sda8 to RAID.

```
[root@ns1 ~]# mdadm --add /dev/md0 /dev/sda8
mdadm: added /dev/sda8
[root@ns1 ~]# mdadm -D /dev/md0
/dev/md0:
        Version : 1.2
  Creation Time : Mon Jul 30 17:59:56 2012
     Raid Level : raid1
     Array Size : 112411 (109.79 MiB 115.11 MB)
  Used Dev Size : 112411 (109.79 MiB 115.11 MB)
   Raid Devices : 2
  Total Devices : 2
    Persistence : Superblock is persistent
    Update Time : Mon Jul 30 18:10:15 2012
          State : clean
 Active Devices : 2
Working Devices : 2
 Failed Devices : 0
  Spare Devices : 0
           Name : ns1.example.com:0  (local to host ns1.example.com)
           UUID : 4488587c:00e56ff3:854194c1:0845c4fa
         Events : 42
    Number   Major   Minor   RaidDevice State
       0       8        6        0      active sync   /dev/sda6
```

```
       2       8        8        1      active sync   /dev/sda8
```

```
[root@ns1 ~]# cat /proc/mdstat
```

```
Personalities : [raid1]
```

```
md0 : active raid1 sda8[2] sda6[0]
```

```
      112411 blocks super 1.2 [2/2] [UU]
```

Steep10: removing RAID or stopping raid.

```
 [root@ns1 ~]# umount /raidvol
```

```
[root@ns1 ~]# mdadm -S /dev/md0
```

```
mdadm: stopped /dev/md0
```

```
[root@ns1 ~]#
```

RAID 5

Follow all the steeps same except steep 2

[root@ns1 ~]# mdadm --create /dev/md0 --level=5 --raid-devices=3 /dev/sda6 /dev/sda7 /dev/sda8

Note raid 5 don't requires same HDD.

Backups:

Backups software is used depends upon your requirement of the company. General tools are used for backup in the market

1) veritas netbackup
2) tar
3) cpio
4) dd
5) bacula (network backup server)
6) Amanda (network backup server)
7) rsync (remote sync)

1) Tar tool

```
[root@localhost /]# mkdir /xyz

[root@localhost /]# cd xyz

[root@localhost xyz]# touch shiva shiva1 hyd hyd2

[root@localhost xyz]# cd ..
```

Steep1: creating tar backup and zip

```
[root@localhost /]# tar -cvf /backup.tar /xyz/

Or

[root@localhost /]# tar -cvzf /backup.tar.zg /xyz/ (backup with zip)

tar: Removing leading `/' from member names
/xyz/
/xyz/shiva1
/xyz/hyd2
/xyz/shiva
/xyz/hyd

[root@localhost /]# ls -l backup.tar

Or

[root@localhost /]# ls -l backup.tar*

-rw-r--r--. 1 root root 10240 Jul 22 14:19 backup.tar

-rw-r--r--. 1 root root 10240 Jul 22 14:19 backup.tar.gz
```

Steep2: to view the backup file

```
[root@localhost /]# tar -tvf /backup.tar
```

Or

```
[root@localhost /]# tar -tvf /backup.tar.gz (with zip)
drwxr-xr-x root/root         0 2012-07-22 14:18 xyz/
-rw-r--r-- root/root         0 2012-07-22 14:18 xyz/shiva1
-rw-r--r-- root/root         0 2012-07-22 14:18 xyz/hyd2
-rw-r--r-- root/root         0 2012-07-22 14:18 xyz/shiva
-rw-r--r-- root/root         0 2012-07-22 14:18 xyz/hyd
[root@localhost /]# rm -rf xyz/
```

Steep3: To restore the backup

```
[root@localhost /]# tar -xvf /backup.tar
```

Or

```
[root@localhost /]# tar -xvf /backup.tar.gz  (backup with zip)
xyz/
xyz/shiva1
xyz/hyd2
xyz/shiva
xyz/hyd
[root@localhost /]#
```

Creating Zip file by gzip

```
[root@localhost /]# gzip -9  filename
```

To Unzip

```
[root@localhost /]# gunzip  filename.gz
```

2) CPIO (copy input and output)

```
[root@localhost /]# mkdir /xyz/
```

Stee1: To create a backup

```
[root@localhost /]# find /xyz/ | cpio -ov > backup.cpio
/xyz/
/xyz/shiva1
/xyz/hyd2
/xyz/shiva
/xyz/hyd
1 block
```

Steep2: To view files

```
[root@localhost /]# cpio -ivt < backup.cpio
drwxr-xr-x   2 root     root            0 Jul 22 14:18 /xyz/
-rw-r--r--   1 root     root            0 Jul 22 14:18 /xyz/shiva1
-rw-r--r--   1 root     root            0 Jul 22 14:18 /xyz/hyd2
-rw-r--r--   1 root     root            0 Jul 22 14:18 /xyz/shiva
-rw-r--r--   1 root     root            0 Jul 22 14:18 /xyz/hyd
1 block
```

Steep3: making zip

```
[root@localhost /]# gzip -9 backup.cpio
[root@localhost /]# ls -l backup.cpio.gz
-rw-r--r--. 1 root root 133 Jul 22 14:36 backup.cpio.gz
[root@localhost /]# rm -rf xyz/
```

Steep4: making unzip

```
[root@localhost /]# gunzip backup.cpio.gz
```

Steep5: To restore backup

```
[root@localhost /]# cpio -iv < backup.cpio
/xyz
/xyz/shiva1
/xyz/hyd2
/xyz/shiva
/xyz/hyd
1 block
```

3) rsync (remote synce)

Steep1: creating some files and folders

```
[root@localhost /]# mkdir /xyz

[root@localhost /]# cd xyz

[root@localhost xyz]# touch shiva shiva1 hyd hyd2

[root@localhost xyz]# cd ..
```

Steep2: using rsync tool

```
[root@localhost /]# rsync -avz 192.168.1.101:/xyz/  /dev8/

The authenticity of host '192.168.1.101 (192.168.1.101)' can't be
established.

RSA key fingerprint is 5e:3c:0b:b5:91:0e:46:1f:57:39:ff:f7:41:99:13:3b.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added '192.168.1.101' (RSA) to the list of known hosts.

root@192.168.1.101's password:

receiving incremental file list

./

hyd

hyd2

shiva

shiva1

sent 90 bytes  received 220 bytes  36.47 bytes/sec

total size is 0  speedup is 0.00


[root@localhost /]# cd /dev8/

[root@localhost dev8]# ls

hyd  hyd2  lost+found  shiva  shiva1
```

Mysql databases server backup:

Steep1: Database backup

```
[root@localhost /]# mysqldump –u root –p databasename  > backup_20072011.sql
```

Database particular tables backup

```
[root@localhost /]# mysqldump –u root –p databasename table1 table2 >
backup_20072011.sql
```

To restore backup

```
[root@localhost /]# mysql –u root –p databasename  < backup_20072011.sql
```

Process management

To get number of process

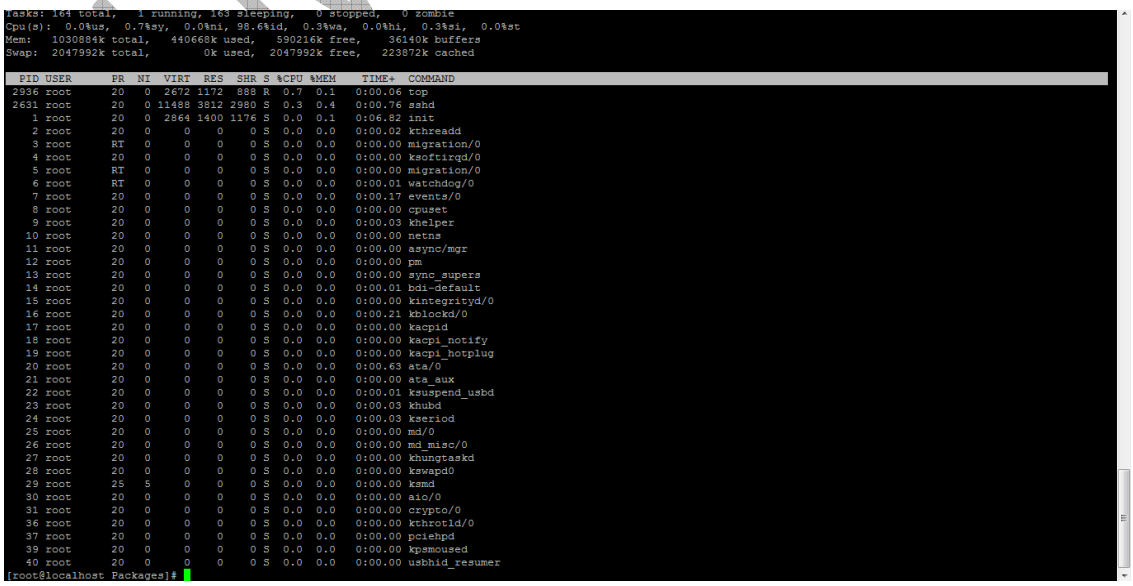
```
[root@localhost /]# ps

  PID TTY          TIME CMD

 2635 pts/1    00:00:00 bash

 2863 pts/1    00:00:00 ps
```

```
[root@localhost /]#ps -e
```

```
[root@localhost Packages]# ps -ef | grep httpd

root      2894     1  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2897  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2898  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2899  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2900  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2901  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2902  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2903  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

apache    2904  2894  0 02:57 ?        00:00:00 /usr/sbin/httpd

root      2907  2635  0 02:58 pts/1    00:00:00 grep httpd
```

To get average load on server

```
[root@localhost /] top
```



To get ram usage

```
[root@localhost ~]# free -m
             total       used       free     shared    buffers     cached
Mem:          1006        430        576          0         35        218
-/+ buffers/cache:        176        830
Swap:         1999          0       1999
```

To get virtual memory status

```
[root@localhost ~]# vmstat
procs -----------memory---------- ---swap-- -----io---- --system-- -----cpu-----
 r  b   swpd   free   buff  cache   si   so    bi    bo   in   cs us sy id wa st
 0  0      0 590232  36404 223876    0    0    40    11   83  196  2  4 93  1  0
```

To get number of ports active

```
[root@localhost ~]# netstat -tulnp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address               Foreign Address             State
PID/Program name
tcp        0      0 0.0.0.0:111                 0.0.0.0:*                   LISTEN
1320/rpcbind
tcp        0      0 0.0.0.0:22                  0.0.0.0:*                   LISTEN
1686/sshd
tcp        0      0 127.0.0.1:631               0.0.0.0:*                   LISTEN
1488/cupsd
tcp        0      0 127.0.0.1:25                0.0.0.0:*                   LISTEN
1776/master
tcp        0      0 0.0.0.0:49373               0.0.0.0:*                   LISTEN
1439/rpc.statd
tcp        0      0 0.0.0.0:5672                0.0.0.0:*                   LISTEN
1819/qpidd
tcp        0      0 :::111                      :::*                        LISTEN
1320/rpcbind
```

To get number of ports Listening

```
[root@localhost ~]# netstat -tulnp | grep LISTEN
tcp        0      0 0.0.0.0:111                 0.0.0.0:*                   LISTEN      1320/rpcbind
tcp        0      0 0.0.0.0:22                  0.0.0.0:*                   LISTEN      1686/sshd
tcp        0      0 127.0.0.1:631               0.0.0.0:*                   LISTEN      1488/cupsd
```

```
tcp        0      0 127.0.0.1:25                0.0.0.0:*                   LISTEN      1776/master

tcp        0      0 0.0.0.0:49373               0.0.0.0:*                   LISTEN      1439/rpc.statd

tcp        0      0 0.0.0.0:5672                0.0.0.0:*                   LISTEN      1819/qpidd
```

To get number connection at port 80

```
# netstat -plan|grep :80|awk {'print $5'}|cut -d: -f 1|sort|uniq -
c|sort -nk 1
```

To get uptime running your server

```
[root@localhost ~]# uptime

 03:14:35 up  1:58,  3 users,  load average: 0.00, 0.00, 0.00
```

To get number of in and out for process and hdd

```
[root@localhost ~]# iostat

Linux 2.6.32-220.el6.i686 (localhost.localdomain)       07/30/2012      _i686_  (1
CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle

           1.85    0.00    3.76    0.76    0.00   93.63

Device:            tps   Blk_read/s   Blk_wrtn/s   Blk_read   Blk_wrtn

scd0              0.05         0.28         0.00       1872          0

sda               1.90        71.91        20.63     484066     138848
```

To get hardware information on /proc folder

```
[root@localhost ~]# cd /proc/

[root@localhost proc]# cat cpuinfo
```

To get version of Linux Kernel

```
[root@localhost proc]# cat version

Linux version 2.6.32-220.el6.i686
(mockbuild@c6b18n3.bsys.dev.centos.org) (gcc version 4.4.6 20110731
(Red Hat 4.4.6-3) (GCC) ) #1 SMP Tue Dec 6 16:15:40 GMT 2011

[root@localhost proc]# uname -r

2.6.32-220.el6.i686

[root@localhost proc]# uname -a

Linux localhost.localdomain 2.6.32-220.el6.i686 #1 SMP Tue Dec 6
16:15:40 GMT 2011 i686 i686 i386 GNU/Linux
```

To get version of redhat

```
[root@localhost proc]# cat /etc/redhat-release
CentOS release 6.2 (Final)
```

killing a process

```
[root@localhost ~]# kill pidno
```

example

```
[root@localhost ~]# vi india
```

press ctrl + z

```
[1]+  Stopped                 vi india
[root@localhost ~]# ps
  PID TTY          TIME CMD
 2635 pts/1    00:00:00 bash
 3028 pts/1    00:00:00 vi
 3158 pts/1    00:00:00 ps
[root@localhost ~]# kill 3028
[root@localhost ~]# ps
  PID TTY          TIME CMD
 2635 pts/1    00:00:00 bash
 3028 pts/1    00:00:00 vi
 4298 pts/1    00:00:00 ps
[root@localhost ~]# kill -9 3028
[root@localhost ~]# ps
  PID TTY          TIME CMD
 2635 pts/1    00:00:00 bash
 6766 pts/1    00:00:00 ps
[1]+  Killed                  vi india
[root@localhost ~]#cat /etc/service
```

Servers

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NFS server Configuration:

NFS server is used to share the data in to the network like Linux/Unix/ AIX/SUN environment.

Note: By defult NFS server will be installed with operating system.

Server side Configuration

Step1 : Checking Nfs installed or not

```
[root@node2 /]# rpm -qa | grep nfs
[root@node2 /]# yum list installed | grep nfs
```

Steep2: Installing NFS server using yum

```
[root@node2 Packages]# yum   install nfs*  -y
```

Installing NFS server using rpm

```
[root@node2 Packages]# cd   /media/CentOS_6.2_Final/Packages/
[root@node2 Packages]# rpm    -ivh  nfs* --force
```

Steep3: Create a folder to share in to the network named anand.

```
[root@node2 Packages]# mkdir /anand
[root@node2 Packages]# chmod 777 /anand
[root@node2 Packages]# cd /anand
[root@node2 anand]# touch shiva1.txt shiva2.txt shiva3.txt
[root@node2 anand]# ls
shiva1.txt  shiva2.txt  shiva3.txt
[root@node2 anand]# cd /
```

Steep4: Add entries in /etc/exports

```
[root@node2 /]# vi     /etc/exports
/anand 192.168.0.0/255.255.255.0(rw,sync)
/anand1 *(r,sync)
:wq!
```

Steep5: export the data in to network

```
[root@node2 /]# exportfs -v
```

Steep6: start NFS service

```
[root@node2 /]#Service   nfs  restart
```

Steep7: start NFS service at boot time

```
[root@node2 /]#chkconfig nfs on
```

Client Side:

Check the list of folder shared in the network

```
[root@client /]# showmount   -e  <nfs server name/IP>

[root@client /]#shomount   -e    192.168.0.X

[root@clinet /]#mkdir   /shiva

[root@client/]# mount    <nfsservername/IP>:/share folder    /shiva

[root@client/]# mount    192.168.0.X:/anand   /shiva

[root@client/]# cd  /shiva

[root@client/]#ls
```

DHCP Server Configuration

Dhcp server provides IP address to the computes in the network.

Steep1: Checking and installing dhcp server

```
[root@node2 /]# rpm –qa | grep 'dhcp'

[root@node2 /]# cd /media/CentOS_6.2_Final/Packages/

[root@node2 /]# rpm -ivh dhcp-4.1.1-25.P1.el6.i686.rpm

Or

[root@node2 /]# yum install dhcp*  -y
```

Steep2: By default in the main configuration file is black, so u need to copy from /usr/share/doc/dhc*/dhcp.conf.sample

```
[root@node2 /]# cp /usr/share/doc/dhcp-4.1.1/dhcpd.conf.sample
/etc/dhcp/dhcpd.conf
```

Steep3: open main configuration file

```
[root@node2 /]# vi /etc/dhcp/dhcpd.conf

Line 7  option domain-name "shiva.net";

Line 27 subnet 192.168.0.0 netmask 255.255.255.0 {

Line 28 range 192.168.0.10  192.168.0.20; }

:wq!
```

Steep4: start DHCP start

```
[root@node2 /]# Service dhcpd start
```

Steep5: Reservation or fixed IP address for a particular computer

```
[root@node2 /]# vi /etc/dhcp/dhcpd.conf

Line 75   host server.shiva.com {

Line 76   hardware ethernet 08:00:07:26:c0:a5;

Line 77   fixed-address 192.168.0.X;

Line 78 }

:wq!
```

Steep6: restart dhcp service

```
[root@node2 /]# Service dhcpd start
```

DHCP client Configuration

Steep1: select dynamic IP by using different tool

```
[root@node2 /]#system-config-network-tui

Select Device--eathernet---select [*] use dynamic ip

Ok---save---save quit
```

Steep2: restart network service

```
[root@node2 /]# service network restart

[root@node2 /]# ifconfig   (to check system ip)
```

FTP Server Configuration:

Steep1: Checking and installing vsftp package

```
[root@node2 /]# rpm  -qa | grep 'vsftp'

[root@node2 /]# rpm  -ivh   /media/CentOS_6.2_Final/Packages/vsftpd-
2.2.2-6.el6_0.1.i686.rpm

Or

[root@node2 /]# yum  install  vsftp*  -y
```

Steep2: Sharing a folder for ftp server

```
[root@node2 /]# useradd   u1

[root@node2 /]# passwd  u1

[root@node2 /]# cd   /home/u1

[root@node2 /]# touch   1.txt   2.txt

[root@node2 /]# ls

[root@node2 /]# cd /var/ftp/pub

[root@node2 /]# touch   1.txt   2.txt
```

Steep3: Edit the vsftpd.conf main configuration

```
[root@node2 /]# vi /etc/vsftpd/vsftpd.conf

anonymous_enable=YES

local_enable=YES

ftpd_banner=Welcome to shiva FTP service.

# userlist_enable=YES

 userlist_deny=NO

:wq!
```

Note: if u wants to change the default port 21 to other then

```
[root@node2 /]#  vi   /etc/vsftpd/vsftpd.conf
```

Note: at last add this script

```
Listen_port=40

:wq!
```

Steep 4: if you want block few users user, then add the user in /etc/vsftpd/ftpusers

```
[root@node2 /]#  vi   /etc/vsftpd/ftpusers
u1
:wq!
```

FTP Client side

Open the browser like Firefox or internet explore

ftp://u1@192.168.0.X

enter the password

or

If u has another port number then you can access like

ftp://u1@192.168.0.X:40

You can also use some ftp client software like gftp, coreftp, leap ftp, fizalla etc

Or

From Command mode

```
[root@client /]# ftp 192.168.0.X
Connected to 192.168.0.X (192.168.0.X).
220 (vsFTPd 2.2.2)
Name (192.168.0.102:root): u1
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ls
ftp> bye
221 Goodbye.
```

Samba Configuration

Samba is a service is used to share data from Linux/Unix to windows operating system.

Steep1: checking and installing samba server

```
[root@node2 ~]# rpm -qa | grep 'samba'
[root@node2 ~]# cd /media/CentOS_6.2_Final/Packages/
[root@node2 Packages]# rpm    -ivh    samba-3.5.10-114.el6.i686.rpm
Or
[root@node2 Packages]# yum   install  samba*  -y
```

Steep2: create share folder in samba to share from windows (/shiva) and create some users to log in from windows

```
[root@node2 ~]# useradd   u1
[root@node2 ~]# passwd  u1
[root@node2 ~]# useradd   u2
[root@node2 ~]# passwd  u2
[root@node2 ~]# mkdir   /shiva
[root@node2 ~]# chmod  777  /shiva
[root@node2 ~]# cd   /shiva
[root@node2 ~]# touch  1.txt  2.txt  3.txt
```

Steep3: edit the main configuration file /etc/samba/smb.conf

```
[root@node2 ~]#  vi /etc/samba/smb.conf
Note: at last
[public-share]
        comment = Public Stuff for all
        path = /shiva
        valid users = u1 u1
        public = no
        writable = yes
        printable = no
```

```
:wq!
```

Steep4: to test the smb.conf script

```
[root@node2 Packages]#   testparm
[public-share]
        comment = Public Stuff for all
        path = /shiva
        valid users = u1, u1
        read only = No
```

steep5: Adding and enabling users in samba server

```
[root@node2 ~]# smbpasswd   -a   u1
[root@node2 ~]# smbpasswd   -a   u2
[root@node2 ~]# smbpasswd   -e   u1
[root@node2 ~]# smbpasswd   -e   u2
```

Settp6 : starting samba Server

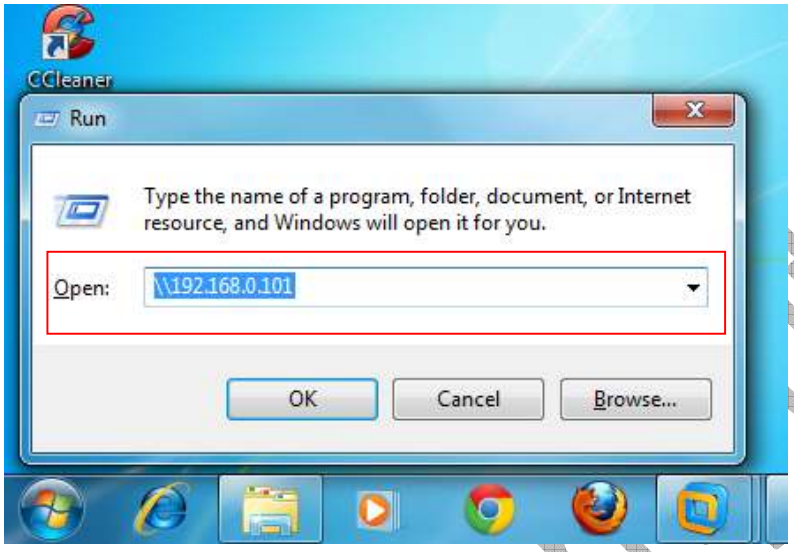
```
[root@node2 ~]#  service   smb  start
```

Samba Client configuration

From Windows:

Click on start-----run---[\\sambaserver ip address]

Ex:



Enter username and password for u1 or u2 user

Form Linux client:

Steep1: to view samba share folder

```
[root@client/]#  smbclient     -L   192.168.0.X    -U     u1
Enter u1's password:
```

Steep2 : Log in to samba server from Linux Client

```
[root@client /]# smbclient   //192.168.0.X/sharefoldername   -U   u1
Or
Ex:  [root@client/]# smbclient    //192.168.0.102/u1   -U   u1
Enter u1's password:
Domain=[MYGROUP] OS=[Unix] Server=[Samba 3.5.10-114.el6]
smb: \> ls
```

```
smb: \> exit
```

steep3: If u wants to access windows shared folder in Linux then

```
[root@node2 /]# mkdir  //<winip/name>/foldername  /linuxfolder  -o
username=name .
```

```
Ex: [root@node2 /]# mount //192.168.0.101/anand  /win  -o
username=anand
```

```
[root@node2 /]# cd /win
```

```
[root@node2 /]# ls
```

DNS server Configuration

DNS server is provides names to the computes in the network.

Note: DNS server IP address is 192.168.1.7

Webserver IP address is 192.168.1.9

Main server IP address is 192.168.1.10

DNS server domain name is localdomain.com

Steep1: Check and install DNS server related packages

```
[root@node2 /]# rpm –qa | grep 'bind*'
[root@node2 /]# rpm –qa | grep 'cachefilesd'
[root@node2 /]# cd /media/CentOS_6.2_Final/Packages/
[root@node2 /]# rpm -ivh bind-9.7.3-8.P3.el6.i686.rpm
[root@node2 Packages]# rpm -ivh bind-chroot-9.7.3-8.P3.el6.i686.rpm
[root@node2 Packages]# rpm -ivh cachefilesd-0.10.2-1.el6.i686.rpm
Or
[root@node2 /]# yum install bind* cachefilesd -y
```

Steep2: check IP address and host entry

```
[root@node2 /]# ifconfig
[root@node2 /]# hostname
[root@node2 /]# hostname node2.localdomain.com
[root@node2 /]# vi /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=node2.localdomain.com
:wq!
[root@node2 /]# service network restart
```

Steep3: open main configuration file /etc/named.conf

```
[root@node2 /]# vi /etc/named.conf

Line 12   listen-on port 53 { 192.168.1.X; };

Line 18   allow-query     { any; };
```

Steep5: edit /etc/resolve.conf

```
[root@node2 /]# vi /etc/resolve.conf

search localdomain.com

nameserver 192.168.1.7
```

Steep6: open main configuration file /etc/named.rfc1912.zone

```
[root@node2 /]# vi /etc/ named.rfc1912.zone
```

Forward look up zone

```
     Line 13 zone "localdomain.com" IN {

     Line 14         type master;

     Line 15         file "fzone";

     Line 16         allow-update { none; };

     Line 17 };
```

Reverse Look zone file

```
     Line 31 zone "1.168.192.in-addr.arpa" IN {

     Line 32         type master;

     Line 33         file "rzone";

     Line 34         allow-update { none; };

     Line 35 };
```

Steep7 : creating forward and reverse look up zone files

```
[root@node2 /]# cd /var/named

[root@node2 named]# cp named.localhost  fzone

[root@node2 named]# cp named.loopback  rzone
```

Steep8: adding the forward and reverse look up zones to named group

```
[root@node2 named]# chgrp named fzone

[root@node2 named]# chgrp named rzone
```

Steep9: edit fzone file (forward look up zone)

```
[root@node2 named]# vi fzone
$TTL 1D
@       IN SOA  node2.localdomain.com. root.node2.localdomain.com. (
                                        0       ; serial
                                        1D      ; refresh
                                        1H      ; retry
                                        1W      ; expire
                                        3H )    ; minimum
        In NS   node2.localdomain.com.
node2   IN A    192.168.1.7

web     IN A    192.168.1.9
www     CNAME    web

mailser       IN A    192.168.1.10
localdomain.com  IN MX   mailser
```

Steep10: edit rzone file (reverse look up zone)

```
[root@node2 named]# vi rzone
$TTL 1D
@       IN SOA  node2.localdomain.com. root.node2.localdomain.com. (
                                        0       ; serial
                                        1D      ; refresh
                                        1H      ; retry
                                        1W      ; expire
                                        3H )    ; minimum
        IN NS   node2.localdomain.com.
7        IN PTR  node2.localdomain.com.
9        IN PTR  web.localdomain.com.
10       IN PTR  mailserv.localdomain.com.
```

Step 11: start named service

```
[root@node2 /]# service named restart
```

Step 12: checking DNS service

```
[root@node2 /]# dig -x 192.168.1.7    (with IP address)
[root@node2 /]# dig node2.localdomain.com  (With Name)
[root@node2 /]# nslookup
Enter ipaddress or domainname.
```

Note: when you're checking DNS server you have to get quary 1 and answer 1 must.

Apache server configuration

Apache is web server. In one web server we can host number of websites depending up on the capable of server.

To host one web site we need One IP address, one name and one port number must.

Note: It is also possible we can configure Apache without name.

Note: Before configuring Apache web server it is always bet practice to configure DNS server.

Apache web server can be configured three ways

1) **Name based hosting.**
2) **Port based hosting**
3) **IP based hosting.**

Steep1: checking and installing Apache web server

```
[root@node2 /]#rpm –qa | grep 'apache'
[root@node2 /]# cd /media/CentOS_6.2_Final/Packages/
[root@node2 Packege]# rpm –ivh httpd*
or
[root@node2 Packege]# yum install httpd* -y
```

Note: Apache web server IP Address is 192.168.1.X and name is webserv.localdomain.com.

Configuring single website on apache web server.

Steep2: Host entries in /etc/hosts

```
[root@node2 /]# vi /etc/hosts
192.168.1.X     www.localdomain.com
:wq!
```

Steep3: edit main configuration file /etc/httpd/conf/httpd.conf

```
[root@node2 ~]# vi /etc/httpd/conf/httpd.conf

Line 262 ServerAdmin root@localdomain.com

Email to send to manage apache webserver

Line 277 ServerName http://localdomain.com:80

Name of the web site

Line 292 DocumentRoot "/var/www/html/"

Website location

Line 402 DirectoryIndex index.html index.html.var

Website first page or home page

:wq!
```

Steep4: Checking script

```
[root@node2 ~]# httpd -t

Syntax OK
```

Steep5: Start the httpd service

```
[root@node2 ~]# service httpd start

[root@node2 ~]# chkconfig httpd on

[root@node2 ~]# cd /var/www/html

[root@node2 html]# vi index.html

<html>

<body>

************************ this first website******************

</body>

</html>

:wq!

[root@node2 html]#
```

Open the browser and type

```
http://<ipaddress>
```

```
or

http://localdomain.com
```

Configuring multiple websites on apache

Name based: we are going to host name based like www.localdomain.com, www.example.com, www.example1.com and www.example2.com

Port based: Port based web site runs under port 100.

IP based hosting: We are going to create another virtual IP 192.168.1.XX, and www.example2.com website runs on this ip address

Name based hosting:

Steep1 : entries in /etc/hosts

```
[root@node2 /]# vi /etc/hosts

192.168.1.X     www.localdomain.com

192.168.1.X     www.example.com

192.168.1.X     www.example1.com

192.168.1.XX    www.example2.com

:wq!
```

Steep2: edit main configuration file /etc/httpd/conf/httpd.conf

```
[root@node2 ~]# vi /etc/httpd/conf/httpd.conf

<VirtualHosting 192.168.1.x:80>

ServerAdmin root@example.com

ServerName www.example.com

DocumentRoot "/var/www/html/example"

</VirtualHosting>

:wq!
```

Steep3: Checking script

```
[root@node2 ~]# httpd -t
```

```
Syntax OK
```

Steep4: restart the httpd service

```
[root@node2 ~]# service httpd restart
```

Port based hosting

Steep1: edit main configuration file /etc/httpd/conf/httpd.conf

```
[root@node2 ~]# vi /etc/httpd/conf/httpd.conf
listen 100
<VirtualHosting 192.168.1.x:80>
ServerAdmin root@example1.com
ServerName www.example1.com
DocumentRoot "/var/www/html/example1"
</VirtualHosting>
:wq!
```

Steep2: Checking script

```
[root@node2 ~]# httpd -t
Syntax OK
```

Steep3: restart the httpd service

```
[root@node2 ~]# service httpd start
```

IP based hosting

Steep1: Creating and checking new virtual network card:

Note: Follow network practical for how to create new virtual eathernet card.

```
[root@node2 ~]# ifconfig
```

Steep2: edit main configuration file /etc/httpd/conf/httpd.conf

```
[root@node2 ~]# vi /etc/httpd/conf/httpd.conf
<VirtualHosting 192.168.1.XX:80>
ServerAdmin root@example2.com
```

```
ServerName www.example2.com

DocumentRoot "/var/www/html/example2"

</VirtualHosting>

:wq!
```

Steep3: Checking script

```
[root@node2 ~]# httpd -t

Syntax OK

Steep4: restart the httpd service

[root@node2 ~]# service httpd start
```

Apache Client Side

Open the browser

Type http://localdomain.com

http://example.com

http://example1.com:100

http://<new virtual ipaddress> or http://192.168.1.XX

Installing webmin

Webmin is a graphical web based interface to mange Linux operating system

Download webmin software from www.webmin.com website.

Steep1: Installing webmin program from command mode

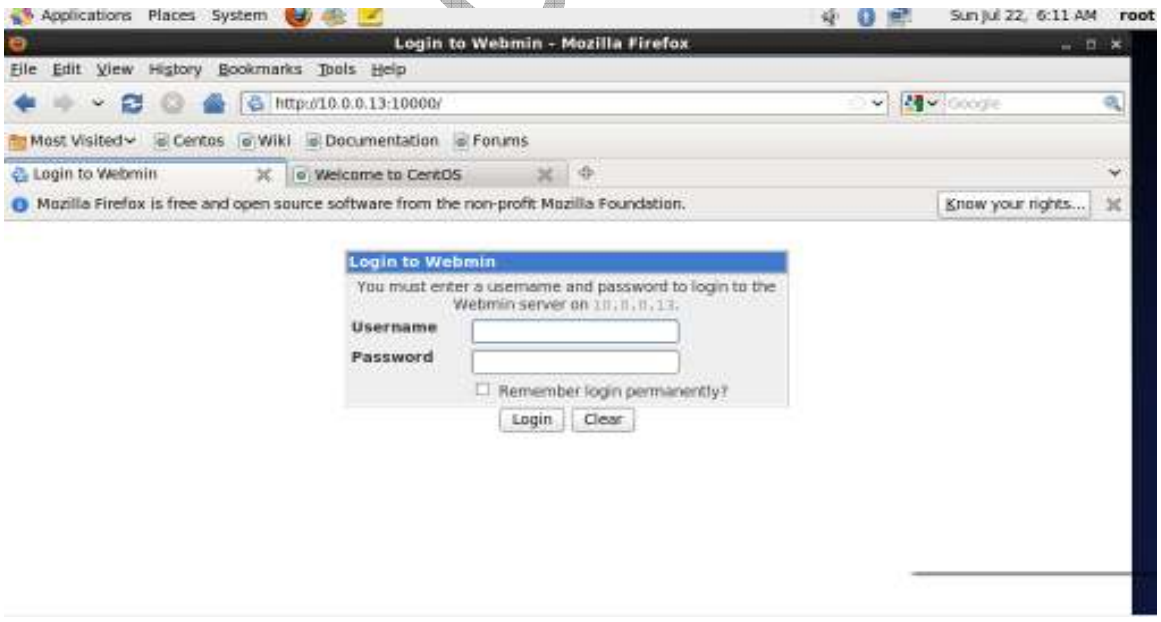
```
[root@localhost ~]# wget
http://prdownloads.sourceforge.net/webadmin/webmin-1.590.tar.gz
```

Steep2: unzip the file

```
[root@localhost ~]# tar -xvzg  webmin-1.590.tar.gz

Steep3: Installing webmin

[root@localhost ~]# cd webmin-1.590

[root@localhost ~]# ./setup.pl

Follow the instructions

[root@localhost ~]# service httpd restart
```

Open the browser and type

http://<ipaddress>:10000 Provide the username and password



Mounting an ISO image on a folder

creating a mount point – an empty directory

```
[root@localhost ~]#mkdir /rhel6
```

actual mounting is taken place

```
[root@localhost ~]#mount –t iso9660 –o loop rhel6.iso /rhel6
```

Change the directory

```
[root@localhost ~]#cd /rhel6
```

List the content

```
[root@localhost ~]#ls
```

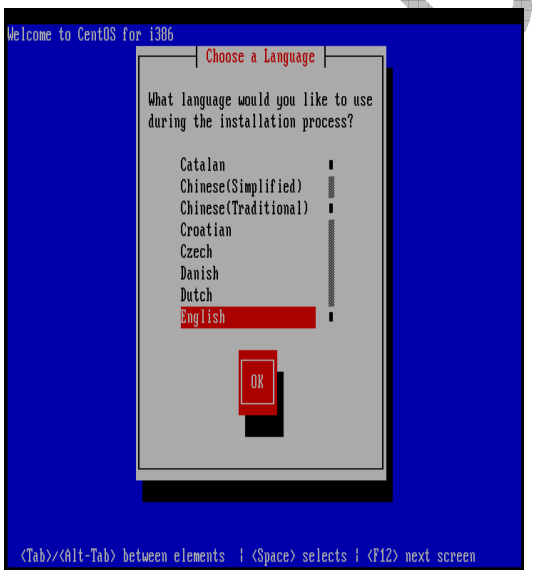
Linux Network installation

When the network installer image has booted press the Esc key on the boot menu screen, enter the following command at the boot: prompt and press the enter key

Pre requirements for Network installation: Copy all the data from dvd to a new folder. Configure NFS server with shared folder.

Steep1: Linux askmethod

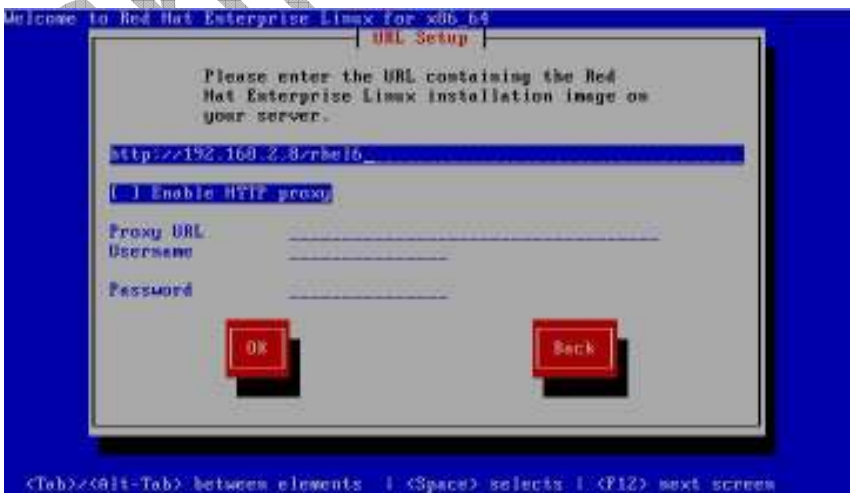
Steep2: select Language and keyboard



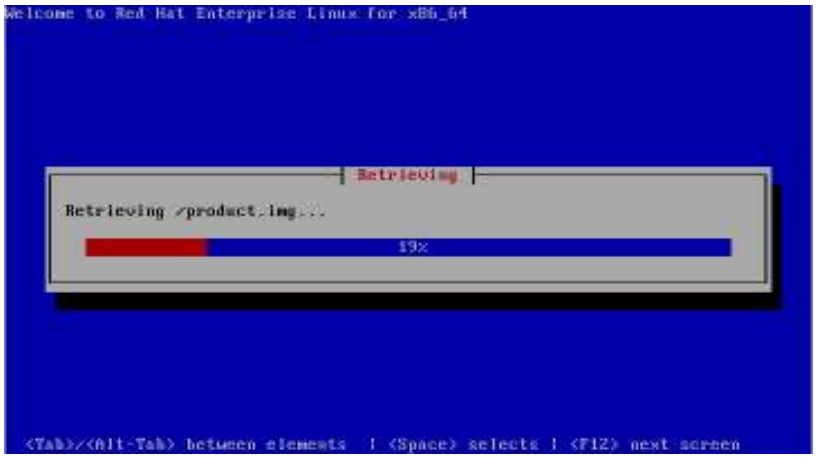
Steep3 : Select NFS directory

Steep4: Assign IP address

Steep5: NFS server path



steep6: installation begins



Steep7: Follow remaining steeps from (steeps 8) onwards which given on top.