Linux
Lab Manual

Student Name :_____

Faculty Name :_____

Branch :_____

Batch :_____

Xunil
Gunemidsu

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```
(PRESENTATION = RO)

)

)
```

TO AUTOMATE THE LSNRCTL AND ORACLE STARTING

1. Make a script file and write the following code in it.

```
su -oracle << EOF

/u01/app/oracle/product/9.2.0/bin  sqlplus /nolog

<< EOF

connect /as sysdba;

startup;

spool off;

EOF

su -oracle << EOF

lsnrctl start << EOF

exit 0
```

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Network Administration

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INSTALLATION

Minimum Hardware Requirements:-

		Minimum	Recommended
Processor		Pentium Pro-I	Pentium III
RAM	Text	96 MB	256 MB
	GUI	128 MB	512 MB
Hard Disk Space	Text	1 GB	As per requirement
	GUI	3 GB	As per requirement

Setting the boot sequence:-

To start the installation from a DVD or CD the computer BIOS must be set to:-

First boot device CD/DVD ROM

Second boot device Harddisk

Installation:-

If the installation is done using a DVD a single DVD is required. If the installation is done using CDs then 5 CDs are required.

This installation guide is a step by step instruction on how to install Linux without any other operating system present in the Hard disk [new hard disk]. All the existing partitions, if any, will be overwritten.

Installation can be done in 2 modes

- Graphical User Interface (GUI) Mode

  or

- Text Mode

Installation Steps:-

Insert the DVD or the first CD and restart the system.

At ***"boot:"*** prompt press Enter to start installation in GUI mode

boot: press Enter

or

At ***"boot:"*** prompt type linux text and then press Enter to start installation in text mode

boot: linux text press Enter

To check the installation media (DVD/CD)

Select ok and press enter to perform the media check.

To skip the media check select skip and press enter.

Welcome Screen

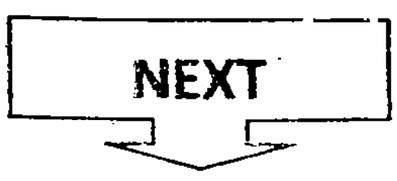
In the welcome screen click on next.

Select the installation language

Select the installation language as **English (English)** and click next

Select the Keyboard Layout

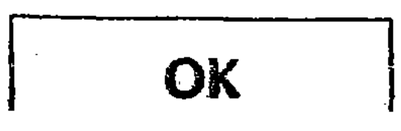
Select the keyboard as **U.S. English** and click next



Installation Key

To activate all features (virtualization and clustering) provide the installation Key and click on OK.

To skip select the option 'Skip entering installation Number' and click OK



Partitioning

From the drop down list Select Custom Layout and delete all partitions if any.

To delete the partitions select the partition and click on delete.

Then create 6 partitions as given below.

To create the partitions, click on New, select the Partition Name (mount point), and give the size.

Partition Name	Partition Size
/boot	100 MB
/	3000 MB
/usr	6000 MB
/var	2000 MB
/home	2000 MB
SWAP	2 x RAM Size recommended but maximum 4 GB To check RAM size press Ctrl+Alt+F2 and use the command 'free' # free To get back to the GUI interface use Ctrl-Alt-F6

NEXT

Boot Loader

Leave the default value and click next.

NEXT

Network Devices

Click on the edit button

Select **DHCP** to provide IP address automatically

Select **manually** to provide a static IP Address

For e.g.:

IP Address: 192.168.0.1/255.255.255.0

HostName: station1.galaxygroup.com

Gateway 192.168.0.254

DNS 192.168.0.1

(See the label on your computer and provide the values as per that label)

NEXT

Region (Time Zone)

Select the time zone as **Asia/Calcutta**

NEXT

Root (Administration) Password

Enter the password for the root (linux Administrator)

In the labs, please provide the password as **galaxy_123**

NEXT

Application and services to be installed.

Select the option **Customize Now** near the bottom of the screen

In the window that opens select the following options

Desktop Environments	→	GNOME Desktop Environment
Application	→	Editors Graphical Internet Text based internet
Base Systems	→	Select all the options

Note: Remaining Packages can be installed even after operation system has been installed.

NEXT

Reboot

After the installation completes the system has to be rebooted (restart).

Post installation welcome screen

Click on forward

Forward

License Agreement

Select the option **'Yes, I agree to the license agreement'** and click forward.

Firewall

Select the option **'disable'** and click on forward

In the confirmation box click on **'Yes'**

SELinux

Select the option **'disable'** and click on forward

In the confirmation box click on **'Yes'**

Kdump

Make sure the tick mark is removed from the option 'Enable kdump' and click on forward

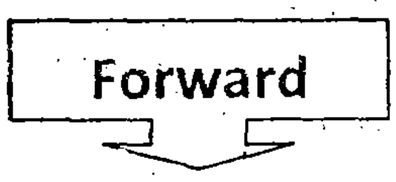
Set system Date and time

Set Up Software updates

Select the option **'No, I prefer to register at a later time'** and click forward

In the confirmation box, select **'No thanks I will connect later'**

Finish Updates Setup



Create Users

Click on forward

In the confirmation box click on continue

Sound Card

To install additional Software Insert Installation CDs

The installation is now completed.

In the Login Screen provide =>

Username root

Password galaxy_123

Explore the Linux Operating System

Basic Commands I

To check the present working directory

Syntax:-

[root@localhost ~]# pwd

Example:-

[root@ localhost ~]# pwd

/root

To see the contents of a directory (folder)

Syntax:-

[root@ localhost ~]# ls <option> <argument>

Options:

-l	Long list including attributes
-a	All files and directories including hidden
-d	To check for a particular file or directory
-R	Recursively, to see the contents in a tree structure

Example:- To list the contents of the present working directory

[root@ localhost ~]# ls

anaconda-ks.cfg Desktop install.log install.log.syslog

Example:- To see the list of files and directories along with their attributes (properties)

[root@ localhost ~]# ls -l

total 76

-rw-r--r--	1	root	root	1049	Apr 2	18:30 anaconda-ks.cfg
drwxr-xr-x	2	root	root	4096	Mar 14	20:13 Desktop
-rw-r--r--	1	root	root	4687	Apr 2	18.30 install.log
-rw-r--r--	1	root	root	5136	Apr 2	18.30 install.log.syslog

Example:- To see all files and directories including hidden files of and directories

```
[root@ localhost ~]# ls  -a
.                    .camel_certs    .esd_auth       .gnome2_private    .metacity
..                   .config         .evolution      .gstreamer-0.8     .mozilla
anaconda-ks.cfg      .cshrc          .fonts.cache-1  .gtkrc             .nautilus
.bash_history        Desktop         .gconf          .gtkrc-1.2-gnome2  .recently-used
.bash_logout         .dmrc           .gconfd         .ICEauthority      .rhn-applet.conf
.bash_profile        .eggcups        gnome           install.log        .rnd
.bashrc              .elinks         .gnome2         install.log.syslog .ssh
```

Example:- To check if a particular file or directory is present

```
[root@ localhost ~]# ls  -d   Desktop
Desktop
```

Example:- To see tree structure of nested directories

```
[root@ localhost ~]# ls -R /opt
/opt:
galaxy
/opt/galaxy:
galaxya
/opt/galaxy/galaxya:
galaxyb
/opt/galaxy/galaxya/galaxyb:
galaxys
/opt/galaxy/galaxya/galaxyb/galaxys:
```

Example:- To see a list of all file or directories starting with a particular letter

```
[root@ localhost ~]# ls  i*
install.log  install.log.syslog
```

Example:- To see a the attributes of a particular file or directory

```
[root@ localhost ~]# ls  -ld  install.log.syslog
-rw-r--r--        1 root root       5136  Apr  2  18.30 install.log.syslog
```

Creating files and adding data using cat command

Syntax:-

[root@localhost ~]# cat <option> <arguments>

Example:- To create a file along with some data

[root@localhost ~]# cat > salesreport

This file contains the sales report for the month of May.

(Now press Ctrl+d to save)

Example:- To create a file along with some data

[root@localhost ~]# cat > mktgreport

This file contains the mktg report for the month of May.

(Now press Ctrl+d to save)

Example:- To read the contents of a file

[root@localhost ~]# cat salesreport

This file contains the sales report for the month of May.

Example:- To append (add) to a file

[root@localhost ~]# cat >> mktgreport

This year the efforts in mktg have increased.

Ctrl+d

Check the contents of the file mktgreport

[root@localhost ~]# cat mktgreport

This file contains the mktg report for the month of May.

This year the efforts in mktg have increased.

Example:- To merge contents of two files into a third file

[root@localhost ~]# cat salesreport mktgreport >> completereport

Check the contents of the file mktgreport

[root@localhost ~]# cat completereport

This file contains the sales report for the month of May.

This file contains the mktg report for the month of May.

This year the efforts in mktg have increased.

Creating 0 byte (empty) files using touch command

Syntax:- Creating a single file with the touch command

[root@localhost ~]# touch <filename>

Example:- Creating a single file with the touch command

[root@localhost ~]# touch file1

To check if the file has been created

[root@localhost ~]# ls -ld file1

-rw-r--r-- 1 root root 0 Apr 2 18.30 file1

Example:- Creating multiple file using the touch command

[root@localhost ~]# touch file2 file3 file4

To check if the file has been created

[root@localhost ~]# ls -ld file*

-rw-r--r-- 1 root root 0 Apr 2 18.30 file1

-rw-r--r-- 1 root root 0 Apr 2 18.30 file2

-rw-r--r-- 1 root root 0 Apr 2 18.30 file3

-rw-r--r-- 1 root root 0 Apr 2 18.30 file4

To change the timestamp (date and time of modification) of a file or directory

Syntax:-

[root@localhost ~]# touch <option> <arguments> <file or directory name>

Example:- To change to the current date and time

```
[root@localhost ~]# touch  file1
```

To check if the timestamp has changed

```
[root@localhost ~]# ls  -ld  file1
-rw-r--r--          1 root root       0  Apr  2   19.00 file1
```

Syntax:-

```
[root@localhost ~]# touch  -t  YYYYMMDDhhmm <file or directory name>
```

Example:- To change to a different date and time

```
[root@localhost ~]# touch  -t 200905150645  file2
```

To check if the timestamp has changed

```
[root@localhost ~]# ls  -ld  file2
-rw-r--r--          1 root root       0  May  15   06.45 file2
```

Creating directories

Syntax:-

```
[root@localhost ~]# mkdir <option> <directory name>
```

Example:- Creating a single directory

```
[root@localhost ~]# mkdir  directory1
```

Example:- Creating multiple directories

```
[root@localhost ~]# mkdir  directory2  directory3  directory4
```

To check if the directories have been created

```
[root@localhost ~]# ls  -d directory*
directory1  directory2  directory3  directory4
```

Example: To create nested directories (sub directories inside directories)

```
[root@localhost ~]# mkdir -p d1/d2/d3/d4
```

To check if the nested directories have been created

```
[root@localhost ~]# ls -R d1
d1:
d2
d1/d2:
d3
d1/d2/d3:
d4
d1/d2/d3/d4:
```

Note:- To list the contents and create a file or directory in a location different from the present working directory, specify the complete path (example /var/directory1)

Directory navigation

Syntax:-

```
[root@localhost ~]# cd <argument>
```

Example:- To go into a directory

```
[root@localhost ~]# cd d1
[root@localhost d1]# cd d2
[root@localhost d2]#
```

Example:- To back one level, type cd press spacebar then dot dot

```
[root@localhost d2]# cd ..
[root@localhost d1]#
```

Example:- To go back two levels

```
[root@localhost d1]# cd ../..
[root@localhost /]#
```

Example:- To go to the previous working directory

```
[root@localhost /]# cd -
/root/d1
```

Example:- To go to current logged in user's home directory

```
[root@localhost d1]# cd
[root@localhost ~]# pwd
/root
```

Basic Commands II

Copying files and directories

Syntax:-

[root@localhost ~]# cp <option> <source> <destination>

Example:- To copy a file

[root@localhost ~]# cp completereport /opt

To check if the file has been copied

[root@localhost ~]# cd /opt

[root@localhost opt]# ls

completereport

Example:- To copy a directory

[root@localhost ~]# cp -r directory1 /opt

To check if the directory has been copied

[root@localhost ~]# cd /opt

[root@localhost opt]# ls

completereport directory1

Moving files and directories

Syntax:-

[root@localhost ~]# mv <option> <source> <destination>

Example:- To move a file

[root@localhost ~]# mv salesreport /opt

To check if the file has been moved

[root@localhost ~]# ls

anaconda-ks.cfg	dir1	directory3	file2	install.log
completereport	directory1	directory4	file3	install.log.syslog
Desktop	directory2	file1	file4	mktgreport

[root@localhost]# ls /opt

completereport	directory1	salesreport

Example:- To move a directory

```
[root@localhost ~]# mv   dir1  /opt
```

To check if the directory has been moved

```
[root@localhost ~]# cd /opt
[root@localhost opt]# ls
completereport   directory1      dir1      salesreport
```

Renaming files and directories

Syntax:-

```
[root@localhost ~]# mv <old name> <new name>
```

Example:- To remane a file

```
[root@localhost ~]# mv  completereport  fullreport
```

To check if the file has been moved

```
[root@localhost ~]# ls
anaconda-ks.cfg        directory2      file1    file4          install.log.syslog
Desktop                directory3      file2    fullreport     mktgreport
directory1             directory4      file3    install.log
```

Deleting an empty directory

Syntax:-

```
[root@localhost ~]# rmdir  <directory name>
```

Example:- To delete an empty directory

```
[root@localhost ~]# rmdir  directory2
```

To check if the directory has been deleted

```
[root@localhost ~]# ls
anaconda-ks.cfg        directory3      file2    fullreport     mktgreport
Desktop                directory4      file3    install.log
directory1             file1           file4    install.log.syslog
```

Deleting a file or a directory

Syntax:-

[root@localhost ~]# rm <option> <file or directory name>

Options:

-r recursive

-f forcefully

Example:- To delete a file

[root@localhost ~]# rm file4

rm: remove regular file `file4'? y

To check if the file has been deleted

[root@localhost ~]# ls

anaconda-ks.cfg	directory3	file2	install.log
Desktop	directory4	file3	install.log.syslog
directory1	file1	fullreport	mktgreport

Example:- To delete a file forcefully

[root@localhost ~]# rm -f mktgreport

To check if the file has been deleted

[root@localhost ~]# ls

anaconda-ks.cfg	directory3	file2	install.log
Desktop	directory4	file3	install.log.syslog
directory1	file1	fullreport	

Example:- To delete a directory

[root@localhost ~]# cd /opt

[root@localhost opt]# rm -rf dir1

To check if the directory has been deleted

[root@localhost opt]# ls

completereport directory1 salesreport

To view the system date and time

Example:-

```
[root@localhost ~]# date
Fri  Jul 4        14:35:35        IST      2009
```

To change the system date and time

Syntax:-

```
[root@localhost ~]# date –s "MM/DD/YYYY hh:mm:ss"
```

Example:-

```
[root@localhost ~]# date –s "07/15/2009 00:06:00 "
Tue Jul 15 00:06:00 IST 2009
```

To view the calender

Example:- To see the current month

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

Example:- To see the past, current and next month

```
[root@localhost ~]# cal -3
```

Example:- To see the calender of the current year

```
[root@localhost ~]# cal -y
```

Example:- To see the calender for the month of December for the year 2010

```
[root@localhost ~]# cal 12 2010
```

Example:- To see the calander for the full year

```
[root@localhost ~]# cal 2009
```

To view help for a command (manual pages)

Syntax:-

```
[root@localhost ~]# man <command>
```

Example:- To see the help for the command mkdir

```
[root@localhost ~]# man  mkdir
```

To see the content screen wise

Example:-

```
[root@localhost ~]# less  /etc/mail/sendmail.mc
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 #    make -C /etc/mail
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.
:
```

To veiw the top 10 lines of a file

Example:-

```
[root@localhost ~]# head anaconda-ks.cfg
# Kickstart file automatically generated by anaconda.
install
cdrom
key 49af89414d147589
lang en_US.UTF-8
keyboard us
xconfig --startxonboot
network --device eth0 --bootproto dhcp
rootpw --iscrypted $1$MPNm.Pdp$2eTr4vp5.R9I2XUPhFLHJ1
```

To veiw the top 5 lines of a file

Example:-

```
[root@localhost ~]# head -5 anaconda-ks.cfg
# Kickstart file automatically generated by anaconda.


install
cdrom
key 49af89414d147589
```

To veiw the bottom 10 lines of a file

Example:-

```
[root@localhost ~]# tail  anaconda-ks.cfg
#part /var --fstype ext3 --size=8000
#part / --fstype ext3 --size=5000
#part swap --size=2048
#part /home --fstype ext3 --size=2000

%packages
@cluster-storage
@clustering
@gnome-desktop
@virtualization
```

To veiw the bottom 3 lines of a file

Example:-

```
[root@localhost ~]# tail  -3 anaconda-ks.cfg
@clustering
@gnome-desktop
@virtualization
```

VI Editor

To create or to open a text file for editing

Syntax:-

[root@localhost ~]# vi <file name>

Example:-

[root@localhost ~]# vi fullreport

To go to insert mode

i - inserts the text at current cursor position

I - inserts the text at beginning of line

a - appends the text after current cursor position

A - appends the text at end of line

o - inserts a line below current cursor position

O - inserts a line above current cursor position

r - replace a single char at current cursor position

Commands in execute mode

:q	- quit without saving
:q!	- quit forcefully without saving
:w	- save
:wq	- save & quit
:wq!	- save & quit forcefully
:se nu	- Setting line numbers
:se nonu	- Removing line numbers
:84	- Press enter goes to line 84

:1,$s/hp/ibm

:sh (temp)

Command's at command mode

dd	- Deletes a line
2dd	- Deletes 2 lines
yy	- Copy a line
2yy	- Copies 2 lines
p	- put (paste deleted or copied text)
u	- Undo (can undo 1000 times)
Ctrl+r	- Redo
G	- Moves cursor to last line of file (shift+G)
/<word to find>	- To search for a particular word search word / Linux

User Administration

Creating an user

Syntax:-

[root@localhost ~]# useradd <username>

or

[root@localhost ~]# useradd <option> <argument> <username>

Options:

-u	UID	-c	Comment
-g	Primary Group Name or GID	-d	Home directory
-o	Override	-s	Shell
-G	Secondary Group		

Example:- Creating a user ravi with default options

[root@localhost ~]# useradd ravi

To check if the user has been created

[root@localhost ~]# tail -5 /etc/passwd

pegasus:x:66:65:tog-pegasusOpenPegasusWBEMservices:/var/lib/Pegasus:/sbin/nologin

luci:x:100:101::/var/lib/luci:/sbin/nologin

piranha:x:60:60::/etc/sysconfig/ha:/sbin/nologin

ricci:x:101:102::/var/lib/ricci:/sbin/nologin

ravi:x:500:500::/home/ravi:/bin/bash

Example:- Creating a user ali whose user id (UID) is 2001

[root@localhost ~]# useradd -u 2001 ali

To check if the user has been created

[root@localhost ~]# tail -5 /etc/passwd

luci:x:100:101::/var/lib/luci:/sbin/nologin

piranha:x:60:60::/etc/sysconfig/ha:/sbin/nologin

ricci:x:101:102::/var/lib/ricci:/sbin/nologin

ravi:x:500:500::/home/ravi:/bin/bash

ali:x:2001:2001::/home/ali:/bin/bash

Example:- Creating a user tom with a comment 'manager'

```
[root@localhost ~]# useradd -c manager tom
```

To check if the user has been created

```
[root@localhost ~]# tail -5 /etc/passwd
piranha:x:60:60::/etc/sysconfig/ha:/sbin/nologin
ricci:x:101:102::/var/lib/ricci:/sbin/nologin
ravi:x:500:500::/home/ravi:/bin/bash
ali:x:2001:2001::/home/ali:/bin/bash
tom:x:2002:2002:manager:/home/tom:/bin/bash
```

Example:- Creating a user ram whose home directory is inside '/salesdept'

```
[root@localhost ~]# useradd -d /salesdept/ram ram
```

To check if the user has been created

```
[root@localhost ~]# tail -5 /etc/passwd
ricci:x:101:102::/var/lib/ricci:/sbin/nologin
ravi:x:500:500::/home/ravi:/bin/bash
ali:x:2001:2001::/home/ali:/bin/bash
tom:x:2002:2002:manager:/home/tom:/bin/bash
ram:x:2003:2003::/salesdept/ram:/bin/bash
```

Example:- Creating a user Jack whose shell is 'c shell'

```
[root@localhost ~]# useradd -s /bin/csh jack
```

To check if the user has been created

```
[root@localhost ~]# tail -5 /etc/passwd
ravi:x:500:500::/home/ravi:/bin/bash
ali:x:2001:2001::/home/ali:/bin/bash
tom:x:2002:2002:manager:/home/tom:/bin/bash
ram:x:2003:2003::/salesdept/ram:/bin/bash
jack:x:2004:2004::/home/jack:/bin/csh
```

Example:- Create a user abdul with the following parameters

user id (UID)	**800**
comment	**mktg**
home directory	**/mktg**
shell	**c shell**

```
[root@localhost ~]# useradd  -u 800  -c  Mktg  -d /mktg  -s /bin/csh  abdul
```

To check if the user has been created

```
[root@localhost ~]# tail -5 /etc/passwd
ali:x:2001:2001::/home/ali:/bin/bash
tom:x:2002:2002:manager:/home/tom:/bin/bash
ram:x:2003:2003::/salesdept:/bin/bash
jack:x:2004:2004::/home/jack:/bin/csh
abdul:x:800:800:mktg:/mktg:/bin/csh
```

To assign or reset the password for a user

Example:- To set the password for the user ravi

```
[root@localhost ~]# passwd  tom
Changing password for user tom.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

To check the encrypted password

```
[root@localhost ~]# tail -5 /etc/shadow
ali:!!:14349:0:99999:7:::
tom:$1$tI8UbNyr$dY0n3CVBuU6iqFMNEFSDe.!:14349:0:99999:7:::
ram:!!:14349:0:99999:7:::
jack:!!:14349:0:99999:7:::
abdul:!!:14363:0:99999:7:::
```

To modify the properties of a user

Syntax:-

[root@localhost ~]# usermod <options> <arguments> <username>

Options:

-u	UID	-d	Home directory
-g	Primary Group Name or GID	-s	Shell
-o	Override	-l	Login name
-G	Secondary Group	-L	Lock the account
	Comment	-U	Unlock

Example:- Change the user id of ravi to 750

[root@localhost ~]# usermod -u 750 ravi

To check if the user id has been changed

[root@localhost ~]# grep ravi /etc/passwd

ravi:x:750:500::/home/ravi:/bin/bash

Example:- Change the home directory and shell of ali

[root@localhost ~]# usermod -d /newhome -s /bin/csh ali

To check if the users home directory and login shell has been changed

[root@locaihost ~]# grep ali /etc/passwd

ali:x:2001:2001::/newhome:/bin/csh

Example:- Lock the account of the user tom

[root@localhost ~]# usermod -L tom

To check logoff as root and login as tom

Example:- Unlock the account of user tom

[root@localhost ~]# usermod -U tom

To check logoff as root and login as tom

Example:- Change the login name of user tom to jill

```
[root@localhost ~]# usermod -l jill tom
```

To check if the user has been created

```
[root@localhost ~]# tail -5 /etc/passwd
ali:x:2001:2001::/newhome:/bin/csh
jill:x:2002:2002:manager:/home/tom:/bin/bash
ram:x:2003:2003::/salesdept/ram:/bin/bash
jack:x:2004:2004::/home/jack:/bin/csh
abdul:x:800:800:mktg:/mktg:/bin/csh
```

To delete a user

Syntax:-

```
[root@localhost ~]# userdel <options> <username>
```

Options:

-r Recursively (along with the home directory and mailbox)

Example:- Delete the user ravi

```
[root@localhost ~]# userdel ravi
```

To check if the user has been deleted

```
[root@localhost ~]# tail -6 /etc/passwd
ricci:x:101:102::/var/lib/ricci:/sbin/nologin
ali:x:2001:2001::/newhome:/bin/csh
jill:x:2002:2002:manager:/home/tom:/bin/bash
ram:x:2003:2003::/salesdept/ram:/bin/bash
jack:x:2004:2004::/home/jack:/bin/csh
abdul:x:800:800:mktg:/mktg:/bin/csh

[root@localhost ~]# ls /home
lost+found ali jack ravi tom
```

Example:- Delete the user Jack along with his home directory and mail box

```
[root@localhost ~]# userdel  -r  jack
```

To check if the user has been deleted

```
[root@localhost ~]# tail -6 /etc/passwd
ricci:x:101:102::/var/lib/ricci:/sbin/nologin
ali:x:2001:2001::/newhome:/bin/csh
jill:x:2002:2002:manager:/home/tom:/bin/bash
ram:x:2003:2003::/salesdept/ram:/bin/bash
abdul:x:800:800:mktg:/mktg:/bin/csh
[root@localhost ~]# ls  /home
lost+found  ali   ravi   tom
```

To view the details of a user from all database files

Example:- To view the details of a user abdul

```
[root@localhost ~]# grep  abdul  /etc/passwd  /etc/shadow
/etc/passwd:abdul:x:800:800:mktg:/mktg:/bin/csh
/etc/shadow:abdul:!!:14363:0:99999:7:::
```

To view the uid and gid of a user

Example:- To view the details of a user abdul

```
[root@localhost ~]# id  ali
uid=2001(ali) gid=2001(ali) groups=2001(ali)
```

To change the password parameters

Syntax:-

[root@localhost ~]# chage <username>

Example:- To change the password parameters for the user Jill

[root@localhost ~]# chage Jill

Changing the aging information for test1

Enter the new value, or press ENTER for the default

Minimum Password Age [0]: 1

Maximum Password Age [99999]: 10

Last Password Change (YYYY-MM-DD) [2008-07-18]:

Password Expiration Warning [7]: 4

Password Inactive [-1]:

Account Expiration Date (YYYY-MM-DD) [1969-12-31]:

To check do the following steps

1. Log off Root
2. Log in as Jill
3. Try changing the password
4. Log off as Jill
5. Log in as Root
6. Change the system date to two days ahead
7. Log off as Root
8. Login as Jill
9. Try changing the password

Group Administration

Creating a group

Syntax:-

[root@localhost ~]# groupadd <groupname>

or

[root@localhost ~]# groupadd <option> <argument> <groupname>

Options:

-g Group ID

-o Override

Example:- Creating a group Sales with default options

[root@localhost ~]# groupadd sales

To check if the group has been created

[root@localhost ~]# tail -5 /etc/group

pegasus:x:65:

luci:x:101:

piranha:x:60:

ricci:x:102:

sales:x:500:

Example:- Creating a group mktg whose group id (GID) is 750

[root@localhost ~]# groupadd -g 750 mktg

To check if the group has been created

[root@localhost ~]# tail -5 /etc/group

luci:x:101:

piranha:x:60:

ricci:x:102:

sales:x:500:

mktg:x:750:

Modifying the properties of a group

Syntax:-

[root@localhost ~]# groupmod <option> <argument> <groupname>

Options:

-g Group ID

-o Override

-n Group name

Example:- Change the GID of the group sales to 800

[root@localhost ~]# groupmod -g 800 sales

To check if the group ID has changed

[root@localhost ~]# tail -5 /etc/group

luci:x:101:

piranha:x:60:

ricci:x:102:

sales:x:800:

mktg:x:750:

Example:- Change the group name of the group mktg to marketing

[root@localhost ~]# groupmod -n marketing mktg

To check if the group has been created

[root@localhost ~]# tail -5 /etc/group

luci:x:101:

piranha:x:60:

ricci:x:102:

sales:x:800:

marketing:x:750:

Deleting a group

Syntax:-

[root@localhost ~]# groupdel <groupname>

Example:- Delete the group sales

[root@localhost ~]# groupdel sales

To check if the group has been created

[root@localhost ~]# tail -5 /etc/group

pegasus:x:65:

luci:x:101:

piranha:x:60:

ricci:x:102:

marketing:x:750:

Group membership

Syntax:-

[root@localhost ~]# gpasswd <option> <arguments> <groupname>

Options:

-M Add multiple users to a group

-A Add a group administrator

-a Add a single user to a group

-d Delete a user from a group

Example:- Add multiple users (ravi, tom, sunil) to the group marketing

[root@localhost ~]# useradd ravi

[root@localhost ~]# useradd tom

[root@localhost ~]# useradd sunil

[root@localhost ~]# gpasswd -M ravi,tom,sunil marketing

To check if the users are added to the group

[root@localhost ~]# grep marketing /etc/group

marketing:x:750:ravi,tom,sunil

Example:- Add the user rani as the administrator for the group marketing

[root@localhost ~]# useradd rani

[root@localhost ~]# gpasswd -A rani marketing

To check if rani has been added as the administrator for the group marketing

[root@localhost ~]# grep marketing /etc/gshadow

marketing:!:rani:ravi,tom,sunil

Example:- Add a user ahmed to the group marketing

[root@localhost ~]# useradd ahmed

[root@localhost ~]# gpasswd -a ahmed marketing

Adding user ahmed to group marketing

To check if the user has been added to the group

[root@localhost ~]# grep marketing /etc/group

marketing:x:750:ravi,tom,sunil,ahmed

Example:- Delete the user tom from the group marketing

[root@localhost ~]# gpasswd -d tom marketing

Removing user tom from group marketing

To check if the user has been deleted from the group

[root@localhost ~]# grep marketing /etc/group

marketing:x:750:ravi,sunil,ahmed

Creating a user along with it group membership

Example:- Creating a user jill with primary group as hr and member of the group finance

[root@localhost ~]# groupadd hr

[root@localhost ~]# groupadd finance

[root@localhost ~]# useradd -g hr -G finance jill

To check if the user has been created along with group membership

[root@localhost ~]# grep jill /etc/passwd /etc/group

/etc/passwd:jill:x:505:801::/home/jill:/bin/bash

/etc/group:finance:x:2011:jill

Adding/modifying/deleting users and groups using a graphical tool

Open the graphical tool using the command

```
[root@localhost ~]# system-config-users &
```

Permissions

Create three users

Example

[root@localhost ~]# useradd kavita

[root@localhost ~]# useradd ramu

[root@localhost ~]# useradd srinu

Make ramu the member of the group kavita

Example

[root@localhost ~]# gpasswd -a ramu kavita

Create a directory

Example

[root@localhost ~]# mkdir /linux

Check the default permission of the above created directory

Example

[root@localhost ~]# ls –ld /linux

Output

drwxr-x-r-x 2 root root 4096 Jul 13 00:06 /linux

Give full permissions to the above created directory

Example using absolute mode

[root@localhost ~]# chmod 777 /linux

or

Example using symbolic mode

[root@localhost ~]# chmod ugo=rwx /linux

Check the permission on the directory

Example

[root@localhost ~]# ls -ld /linux

Output

drwxrwxrwx 2 root root 4096 Jul 13 00:06 /linux

Log in as the user kavita

Example

[root@localhost ~]#su - kavita

As user kavita create a file inside the above created directory

[kavita@localhost ~]$ cd /linux

[kavita@localhost linux]$ cat > fedora

This is a version of Linux operating system

Ctrl+d

Check the permission on the file

Example

[kavita@localhost linux]$ ls –l

Output

-rw-rw-r-- 1 kavita kavita 44 Jul 13 00:50 fedora

Explaination

- The user kavita has Read and Write permission on this file
- The group kavita has Read and Write permission on this file (as ramu is a member of the group kavita he will also have read and write permission.
- Others will have read only permission (as srinu belongs to others he will have only read permission.

To check the permissions

Example:- As kavita try to read and add some content to the file

```
[kavita@localhost linux]$ cat fedora
This is a version of Linux operating system
[kavita@localhost linux]$ cat >> fedora
This line has been added by kavita
[kavita@localhost linux]$ cat fedora
This is a version of Linux operating system
This line has been added by kavita
[kavita@localhost linux]$
```

Example:- As ramu try to read and add some content to the file (open another terminal and do the following)

```
[root@localhost ~]# su - ramu
[ramu@localhost ~]$ cd /linux
[ramu@localhost linux]$ cat fedora
This is a version of Linux operating system
This line has been added by kavita
[ramu@localhost linux]$ cat >> fedora
This line has been added by ramu
[ramu@localhost linux]$ cat fedora
This is a version of Linux operating system
This line has been added by kavita
This line has been added by ramu
[ramu@localhost linux]$
```

Example:- As srinu try to read and add some content to the file (open another terminal and do the following)

```
[root@localhost ~]# su - srinu
[srinu@localhost ~]$ cd /linux
[srinu@localhost linux]$ cat fedora
This is a version of Linux operating system
This line has been added by kavita
This line has been added by ramu
[ramu@localhost linux]$ cat >> fedora
-bash: fedora: Permission denied
[ramu@localhost linux]$
```

Change the permissions on the above file

Example:- Remove write permission for the group kavita

```
[kavita@localhost linux]$ chmod g=r fedora
[kavita@localhost linux]$ ls –l
-rw-r--r-- 1 kavita kavita 44 Jul 13 00:50 fedora
[kavita@localhost linux]$
```

Check the permissions on the above file

Example:- As ramu try to read and add some content to the file

```
[ramu@localhost linux]$ cat fedora
This is a version of Linux operating system
This line has been added by kavita
This line has been added by ramu
[ramu@localhost linux]$ cat >> fedora
-bash: fedora: Permission denied
[ramu@localhost linux]$
```

Change the permissions on the above file

Example:- Give write permission for others

```
[kavita@localhost linux]$ chmod 646 fedora
[kavita@localhost linux]$ ls -l
-rw-r--rw- 1 kavita kavita 44 Jul 13 00:50 fedora
[kavita@localhost linux]$
```

Check the permissions on the above file

Example:- As srinu try to read and add some content to the file

```
[srinu@localhost linux]$ cat fedora
This is a version of Linux operating system
This line has been added by kavita
This line has been added by ramu
[srinu@localhost linux]$ cat >> fedora
This line has been added by srinu
ctrl+d
[srinu@localhost linux]$ cat fedora
This is a version of Linux operating system
This line has been added by kavita
This line has been added by ramu
This line has been added by srinu
[srinu@localhost linux]$
```

Partitions I

To view the existing partitions

Command:-

```
[root@localhost ~]# fdisk  -l
Disk /dev/hda: 80.0 GB, 80026361856 bytes
255 heads, 63 sectors/track, 9729 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

   Device     Boot    Start       End     Blocks      Id  System
/dev/hda1     *        1          13     104391      83  Linux
/dev/hda2              14        1288   10241437+    83  Linux
/dev/hda3            1289        2308    8193150     83  Linux
/dev/hda4            2309        9729   59609182+    5  Extended
/dev/hda5            2309        2945    5116671     83  Linux
/dev/hda6            2946        3206    2048256     83  Linux
/dev/hda7            3207        3461    2096451     82  Linux swap / Solaris
```

Partition administration using fdisk

Command:-

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

The number of cylinders for this disk is set to 9729.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help):
```

Creating new partitions

```
Command (m for help): n
First cylinder (3462-9729, default 4328):
Using default value 3462
Last cylinder or +size or +sizeM or +sizeK (3462-9729, default 9729): +200M

Command (m for help): n
First cylinder (3487-9729, default 4353):
Using default value 3487
Last cylinder or +size or +sizeM or +sizeK (3487-9729, default 9729): +150M

Command (m for help): n
First cylinder (3506-9729, default 4372):
Using default value 3506
Last cylinder or +size or +sizeM or +sizeK (3506-9729, default 9729): +300M
```

Check if the new partitions have been created

```
Command (m for help): p
Disk /dev/hda: 80.0 GB, 80026361856 bytes
255 heads, 63 sectors/track, 9729 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

  Device   Boot   Start    End   Blocks    Id  System
/dev/hda1    *      1      13    104391    83  Linux
/dev/hda2           14    1288  10241437+  83  Linux
/dev/hda3         1289    2308   8193150   83  Linux
/dev/hda4         2309    9729  59609182+   5  Extended
/dev/hda5         2309    2945   5116671   83  Linux
/dev/hda6         2946    3206   2048256   83  Linux
/dev/hda7         3207    3461   2096451   82  Linux swap / Solaris
/dev/hda8         3462    3486    200781   83  Linux
/dev/hda9         3487    3505    152586   83  Linux
/dev/hda10        3506    3542    297171   83  Linux
```

Deleting a partition

```
Command (m for help): d

Partition number (1-10): 10
```

#specify the partition number that is to be deleted
Note: Do not delete the partition 1 to 7

Saving the partitions

```
Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.
```

To update the partitions without restarting the system

Syntax:-

```
[root@localhost ~]# partprobe   <device name>
```

Example:-

```
[root@localhost ~]# partprobe  /dev/hda
```

Formatting the partitions

Syntax:-

```
[root@localhost ~]# mkfs.<file format>  <partition name>
```

Example:- To format the 8th partition with ext3

```
[root@localhost ~]# mkfs.ext3  /dev/hda8
```

Example:- To format the 9th partition with vfat

```
[root@localhost ~]# mkfs.vfat  /dev/hda9
```

Mounting the partitions

Syntax:-

[root@localhost ~]# mount <partition name> <mount point directory>

Example:- To mount the 8th partition on a directory /mntpoint

[root@localhost ~]# mkdir /mntpoint

[root@localhost ~]# mount /dev/hda8 /mntpoint

Example:- To mount the 9th partition on a directory /mntpointfat

[root@localhost ~]# mkdir /mntpointfat

[root@localhost ~]# mount /dev/hda9 /mntpointfat

To view the mounted partitions

Command:-

[root@localhost ~]# mount

/dev/hda5 on / type ext3 (rw)

proc on /proc type proc (rw)

sysfs on /sys type sysfs (rw)

devpts on /dev/pts type devpts (rw,gid=5,mode=620)

/dev/hda1 on /boot type ext3 (rw)

tmpfs on /dev/shm type tmpfs (rw)

/dev/hda6 on /home type ext3 (rw)

/dev/hda2 on /usr type ext3 (rw)

/dev/hda3 on /var type ext3 (rw)

none on /proc/sys/fs/binfmt_misc type binfmt_misc (rw)

/proc on /var/named/chroot/proc type none (rw,bind)

/var/run/dbus on /var/named/chroot/var/run/dbus type none (rw,bind)

sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw)

nfsd on /proc/fs/nfsd type nfsd (rw)

/dev/hda8 on /mntpoint type ext3 (rw)

/dev/hda9 on /mntpointfat type vfat (rw)

To unmounted a partition

Syntax:-

[root@!localhost ~]# umount <mount point directory>

Example:- To unmount the 9th partition from the directory /mntpointfat

[root@localhost ~]# umount /mntpointfat

To access the partition

Syntax:-

[root@localhost ~]# cd <mount point directory>

Example:- To access the partition 8th

[root@localhost ~]# cd /mntpoint

[root@localhost mntpoint]# touch a b c d

[root@localhost mntpoint]# ls

a b c d

[root@localhost mntpoint]#

Partitions II

To view the usage information of partitions

Command:-

```
[root@localhost ~]# df  -h
Filesystem        Size    Used   Avail   Use%   Mounted on
/dev/hdb5         4.8G    2.6G   2.0G    58%    /
/dev/hdb1         99M     16M    79M     17%    /boot
tmpfs             463M    0      463M    0%     /dev/shm
/dev/hdb7         1.9G    37M    1.8G    2%     /home
/dev/hdb2         9.5G    3.0G   6.1G    33%    /usr
/dev/hdb3         7.6G    7.1G   98M     99%    /var
/dev/hdb8         200M    0      200M    0%     /mntpoint
```

To see the size of the contents of a directory

Command:-

```
[root@localhost ~]# du  -h
12K    ./.gconf/apps/panel/applets/workspace_switcher
64K    ./.gconf/apps/panel
12K    ./.gconf/apps/gnome-settings
200K   ./.gconf/apps
8.0K   ./.gconf/desktop/gnome/interface
32K    ./.gconf/desktop/gnome/peripherals
8.0K   ./.gconf/desktop/gnome/background
12K    ./.gnome
4.0K   ./.gnome2_private
14M    ./Desktop
8.0K   ./.config/gtk-2.0
12K    ./.config
4.0K   ./.Trash
68M    .
```

To see the total size of particular directory

Command:-

```
[root@localhost ~]# du -sh /root
68M .
```

To check the block size of a partition

Syntax:-

```
[root@localhost ~]# blockdev --getbsz <partition name>
```

Example:- To see the block size of the 2nd partition

```
[root@localhost ~]# blockdev --getbsz /dev/hda2
4096
```

To assign a label to the partition

Syntax:-

```
[root@localhost ~]# e2label <partition name> <label>
```

Example:- To assign the label data to the 9th partition

```
[root@localhost ~]# e2label /dev/hda9 data
```

To check label

```
[root@localhost ~]# e2label /dev/hda9
data
```

To mount the partition with label name

```
[root@localhost ~]# mkdir /hyd
[root@localhost ~]# mount LABEL=data /hyd
```

To check the mounted partition along with their labels

```
[root@localhost ~]# mount -l
/dev/hdb5 on / type ext3 (rw) [/]
/dev/hdb1 on /boot type ext3 (rw) [/boot]
/dev/hdb7 on /home type ext3 (rw) [/home]
/dev/hdb2 on /usr type ext3 (rw) [/usr1]
/dev/hdb3 on /var type ext3 (rw) [/var]
/dev/hda9 on /hyd type vfat (rw) [data]
```

Creating a swap partition

To create a swap partition, do the following steps

1. Create a partition
2. **Update the partition table**
3. Format the partition as swap
4. **Turn on swap**

Command:-

[root@localhost ~]# fdisk /dev/hda

The number of cylinders for this disk is set to 9729.

There is nothing wrong with that, but this is larger than 1024,

and could in certain setups cause problems with:

1) software that runs at boot time (e.g., old versions of LILO)

2) booting and partitioning software from other OSs

(e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): n

First cylinder (3506-9729, default 4328):

Using default value 3506

Last cylinder or +size or +sizeM or +sizeK (3506-9729, default 9729): **+300**M

Check if the new partitions have been created

Command (m for help): p

Disk /dev/hda: 80.0 GB, 80026361856 bytes

255 heads, 63 sectors/track, 9729 cylinders

Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/hda1	*	1	13	104391	83	Linux
/dev/hda2		14	1288	10241437+	83	Linux
/dev/hda3		1289	2308	8193150	83	Linux
/dev/hda4		2309	9729	59609182+	5	Extended
/dev/hda5		2309	2945	5116671	83	Linux
/dev/hda6		2946	3206	2048256	83	Linux
/dev/hda7		3207	3461	2096451	82	Linux swap / Solaris
/dev/hda8		3462	3486	200781	83	Linux
/dev/hda9		3487	3505	152586	83	Linux
/dev/hda10		3506	3542	297171	83	Linux

Saving the partitions

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.

To update the partitions to the os without restarting the system

Command:-

[root@localhost ~]# partprobe /dev/hda

Formatting the partition with swap file system

Syntax:-

[root@localhost ~]# mkswap <partition name>

Example:- To format the 10th partition using swap filesystem

[root@localhost ~]# mkswap /dev/hda10

Setting up swapspace version 1, size = 304295 kB

To turn on swap

Syntax:-

[root@localhost ~]# swapon <partition name>

Example:-

[root@localhost ~]# swapon /dev/hda10

To check the status

[root@localhost ~]# swapon -s

Filename	Type	Size	Used	Priority
/dev/hda7	partition	1052216	0	-1
/dev/hda10	partition	401584	0	-2

To turn off swap

Syntax:-

[root@localhost ~]# swapoff <partition name>

Example:-

[root@localhost ~]# swapoff /dev/hda10

To check the status

[root@localhost ~]# swapon –s

Filename	Type	Size	Used	Priority
/dev/hda7	partition	1052216	0	-1

Mounting a partition permanently

Example:-

Create a directory for mounting

[root@localhost ~]# mkdir /data

Mounting a partition permanently

Command:-

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

LABEL=/	/	ext3	defaults	1 1
LABEL=/boot	/boot	ext3	defaults	1 2
devpts	/dev/pts	devpts	gid=5,mode=620	0 0
tmpfs	/dev/shm	tmpfs	defaults	0 0
LABEL=/home	/home	ext3	defaults	1 2
proc	/proc	proc	defaults	0 0
sysfs	/sys	sysfs	defaults	0 0
LABEL=/usr	/usr	ext3	defaults	1 2
LABEL=/var	/var	ext3	defaults	1 2
LABEL=SWAP-hda7	swap	swap	defaults	0 0
LABEL=dump	/var/dump	ext3	defaults	1 0
/dev/hda8	**/data**	**ext3**	**defaults**	**0 0**

:wq

To check already mounted partitions

Command:-

```
[root@localhost ~]# mount

/dev/hda5 on / type ext3 (rw)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devpts on /dev/pts type devpts (rw,gid=5,mode=620)
/dev/hda1 on /boot type ext3 (rw)
tmpfs on /dev/shm type tmpfs (rw)
/dev/hda6 on /home type ext3 (rw)
/dev/hda3 on /usr type ext3 (rw)
/dev/hda2 on /var type ext3 (rw)
none on /proc/sys/fs/binfmt_misc type binfmt_misc (rw)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw)
nfsd on /proc/fs/nfsd type nfsd (rw)
```

To mount all partitions specified in the /etc/fstab file

Command:-

```
[root@localhost ~]# mount –a
```

To check if all the partitions have been mounted

Command:-

```
[root@localhost ~]# mount

/dev/hda5 on / type ext3 (rw)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
/dev/hda1 on /boot type ext3 (rw)
tmpfs on /dev/shm type tmpfs (rw)
/dev/hda6 on /home type ext3 (rw)
/dev/hda3 on /usr type ext3 (rw)
/dev/hda2 on /var type ext3 (rw)
none on /proc/sys/fs/binfmt_misc type binfmt_misc (rw)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw)
nfsd on /proc/fs/nfsd type nfsd (rw)
/dev/hda8 on /data type ext3 (rw)
```

Mounting the cdrom

Example:-

```
[root@localhost ~]# mount    /dev/cdrom    /media
```

Logical Volume Manager (LVM)

1. **Create 3 partitions of size 200MB, 300MБ and 400MB.**
2. **Convert the partitions into physical volumes.**
3. **Combine the first 2 physical volumes (200MB and 300MB) into a volume group.**
4. **Create a logical volume from this volume group of size 450MB.**

Create partitions using fdisk

Command:-

[root@localhost ~]# fdisk /dev/hda

The number of cylinders for this disk is set to 9729.

There is nothing wrong with that, but this is larger than 1024,

and could in certain setups cause problems with:

1) software that runs at boot time (e.g., old versions of LILO)

2) booting and partitioning software from other OSs

(e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): n

First cylinder (3169-4865, default 3169):

Using default value 3169

Last cylinder or +size or +sizeM or +sizeK (3169-4865, default 4865): **+200M**

Command (m for help): n

First cylinder (3194-4865, default 3194):

Using default value 3194

Last cylinder or +size or +sizeM or +sizeK (3194-4865, default 4865): **+300M**

Command (m for help): n

First cylinder (3231-4865, default 3231):

Using default value 3231

Last cylinder or +size or +sizeM or +sizeK (3231-4865, default 4865): **+400M**

Check if the new partitions have been created

Command (m for help): p

Disk /dev/hda: 40.0 GB, 40020664320 bytes

255 heads, 63 sectors/track, 4865 cylinders

Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/hda1	*	1	13	104391	83	Linux
/dev/hda2		14	778	6144862+	83	Linux
/dev/hda3		779	1415	5116702+	83	Linux
/dev/hda4		1416	4865	27712125	5	Extended
/dev/hda5		1416	2052	5116671	83	Linux
/dev/hda6		2053	2307	2048256	83	Linux
/dev/hda7		2308	2438	1052226	82	Linux swap / Solaris
/dev/hda8		2439	3168	5863693+	83	Linux
/dev/hda9		3169	3193	200781	83	Linux
/dev/hda10		3194	3230	297171	83	Linux
/dev/hda11		3231	3280	401593+	83	Linux

Saving the partitions

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.

To update the kernel without restarting the system

Command:-

[root@localhost ~]# partprobe /dev/hda

Step 1) Create physical volumes

Syntax:-

```
[root@localhost ~]#  pvcreate <partition name 1> <partition name 2> <partition name 3>
```

Example:- To create physical volumes of partition /dev/hda9, /dev/hda10 and /dev/hda11

```
[root@localhost ~]# pvcreate /dev/hda9 /dev/hda10 /dev/hda11
  Physical volume "/dev/hda9" successfully created
  Physical volume "/dev/hda10" successfully created
  Physical volume "/dev/hda11" successfully created
```

To see the physical volumes create

```
[root@localhost ~]# pvdisplay
--- NEW Physical volume ---
  PV Name       /dev/hda9
  VG Name
  PV Size       196.08 MB
  Allocatable   NO
  PE Size (KByte) 0
  Total PE      0
  Free PE       0
  Allocated PE  0
  PV UUID       q5AFAl-ge7q-0K6J-5w18-BfoH-xPAd-3z7cy6
--- NEW Physical volume ---
  PV Name       /dev/hda10
  VG Name
  PV Size       290.21 MB
  Allocatable   NO
  PE Size (KByte) 0
  Total PE      0
  Free PE       0
  Allocated PE  0
  PV UUID       SfLI2h-rJXR-anRE-IkSv-MaZ5-s1lX-TegbTq
```

```
--- NEW Physical volume ---
PV Name          /dev/hda11
VG Name
PV Size          392.18 MB
Allocatable      NO
PE Size (KByte)  0
Total PE         0
Free PE          0
Allocated PE     0
PV UUID          ztDP8T-DrQ7-7Hx0-mHja-70Es-iFlC-y3mkgi
```

Step 2) Create a volume group

Syntax:-

```
[root@localhost ~]#  vgcreate <volume group name> <physical volume 1> <physical volume
                     name 2>
```

Example:- To create a volume group named data with the first two physical volumes /dev/hda9 and/dev/hda10

```
[root@localhost ~]# vgcreate data /dev/hda9 /dev/hda10
  Volume group "data" successfully created
```

To see the volume group create

```
[root@localhost ~]# vgdisplay
  --- Volume group ---
  VG Name               data
  System ID
  Format                lvm2
  Metadata Areas        2
  Metadata Sequence No  2
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                1
  Open LV               0
  Max PV                0
  Cur PV                2
  Act PV                2
  VG Size               480.00 MB
  PE Size               4.00 MB
  Total PE              120
  Alloc PE / Size       113 / 452.00 MB
  Free  PE / Size       7 / 28.00 MB
  VG UUID               LFwe0b-bg5K-O9xi-hzqS-Q43a-H9bR-oNQki0
```

Step 3) Create a logical volume

Syntax:-

```
[root@localhost ~]#  lvcreate –L <size> <volume group name> -n <logical volume name>
```

Example:- To create a logical volume named backupdata from the volme group data of size 450MB

```
[root@localhost ~]# lvcreate -L  450mb  data   -n  backupdata
  Rounding up size to full physical extent 452.00 MB
  Logical volume "backup data" created
```

To see the logical volume create

```
[root@localhost ~]# lvdisplay
  --- Logical volume ---
  LV Name                /dev/data/backupdata
  VG Name                data
  LV UUID                DJnxGa-Vs5q-xkPA-dj6m-CHXM-MTTy-WBeO71
  LV Write Access        read/write
  LV Status              available
  # open                 0
  LV Size                452.00 MB
  Current LE             113
  Segments               2
  Allocation             inherit
  Read ahead sectors     0
  Block device           253:0
```

Step 4) Formatting the logical volume and mounting it

Example:-

```
[root@localhost ~]# mkfs.ext3     /dev/data/backupdata
[root@localhost ~]# mkdir   /backup
[root@localhost ~]# mount   /dev/data/backupdata    /backup
[root@localhost ~]# cd   /backup
```

1. **The size of the logical volume is to be increased by 400MB.**
2. **The volume group does not have sufficient free space. So first, extend the volume group.**

Step 5) Extending the volume group

Syntax:-

```
[root@localhost ~]#  vgextend <volume group name> <physical volume name>
```

Example:- To extend the volume group data by adding the physical volume /dev/hda11

```
[root@localhost ~]# vgextend data /dev/hda11
 Volume group "data" successfully extended
```

Step 6) Resizing the logical volume

Syntax:-

```
[root@localhost ~]#  lvresize  –L  <± size>    <logical volume name>
```

Example:- To extend the logical volume by 400MB

```
[root@localhost ~]# lvresize  –L   +400M   /dev/data/backupdata
 Extending logical volume backupdata to 852.00 MB
 Logical volume backupdata successfully resized
```

Resizing the filesystem

```
[root@localhost ~]# resize2fs   /dev/data/backupdata
resize2fs 1.39 (29-May-2006)
Filesystem at /dev/data/backupdata is mounted on /mnt/mountpoint; on-line resizing required
Performing an on-line resize of /dev/data/backupdata to 872448 (1k) blocks.
The filesystem on /dev/data/backupdata is now 872448 blocks long.
```

To see if the logical volume size has increased

```
[root@localhost ~]# lvdisplay

  --- Logical volume ---
  LV Name                /dev/data/backupdata
  VG Name                data
  LV UUID                DJnxGa-Vs5q-xkPA-dj6m-CHXM-MTTy-WBeO71
  LV Write Access        read/write
  LV Status              available
  # open                 1
  LV Size                852.00 MB
  Current LE             213
  Segments               3
  Allocation             inherit
  Read ahead sectors     0
  Block device           253:0
```

Step 7) Removing the logical volume

Syntax:-

```
[root@localhost ~]#  lvremove   <logical volume name>
```

Example:- To remove the logical volume /dev/data/backupdata

```
[root@localhost ~]# cd
[root@localhost ~]# umount  /backup
[root@localhost ~]# lvremove /dev/data/backup
  Do you really want to remove active logical volume "backupdata"? [y/n]: y
  Logical volume "backupdata" successfully removed
```

Disk Quotas

1. **Create 4 users as below**
    a. **Ravi with the default properties**
    b. **Sunil whose primary group is sales**
    c. **Tom whose primary group is sales**
    d. **Rani whose secondary group is sales**
2. **Create a partition and mount it with users and group quotas enabled.**
3. **Apply quotas to the user Ravi and the group sales and check.**

Create a group

Example:- To create a group called as sales

```
[root@localhost ~]# groupadd  sales
```

Create the users

Example:- Create users and add some to sales group

```
[root@localhost ~]# useradd ravi
[root@localhost ~]# useradd -g sales sunil
[root@localhost ~]# useradd –g sales tom
[root@localhost ~]# useradd –G sales rani
```

Create partition using fdisk

Command:-

[root@localhost ~]# fdisk /dev/hda

```
The number of cylinders for this disk is set to 9729.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)
Command (m for help): n
First cylinder (3169-4865, default 3169):
Using default value 3169
Last cylinder or +size or +sizeM or +sizeK (3169-4865, default 4865): +200M
```

Check if the new partition has been created

Command (m for help): p

Disk /dev/hda: 40.0 GB, 40020664320 bytes
255 heads, 63 sectors/track, 4865 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/hda1	*	1	13	104391	83	Linux
/dev/hda2		14	778	6144862+	83	Linux
/dev/hda3		779	1415	5116702+	83	Linux
/dev/hda4		1416	4865	27712125	5	Extended
/dev/hda5		1416	2052	5116671	83	Linux
/dev/hda6		2053	2307	2048256	83	Linux
/dev/hda7		2308	2438	1052226	82	Linux swap / Solaris
/dev/hda8		2439	3168	5863693+	83	Linux
/dev/hda9		3169	3193	200781	83	Linux

Saving the partitions

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.

To update the kernel without restarting the system

Command:-

[root@localhost ~]# partprobe /dev/hda

Format the partition

Example:- To format the 9th partition with ext3

[root@localhost ~]# mkfs.ext3 /dev/hda9

Mounting the partition with user and group quotas enabled

Syntax:-

[root@localhost ~]# mount <option> <arguments> <partition name> <mount point dir>

Example:- **To mount the 9th partition on a directory /mntpoint with user and group quotas enabled**

```
[root@localhost ~]# mkdir /mntpoint
[root@localhost ~]# mount -o usrquota,grpquota /dev/hda9 /mntpoint
```

To view the mounted partitions

Command:-

```
[root@localhost ~]# mount
/dev/hda5 on / type ext3 (rw)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devpts on /dev/pts type devpts (rw,gid=5,mode=620)
/dev/hda1 on /boot type ext3 (rw)
tmpfs on /dev/shm type tmpfs (rw)
/dev/hda6 on /home type ext3 (rw)
/dev/hda3 on /usr type ext3 (rw)
/dev/hda2 on /var type ext3 (rw)
/dev/hda8 on /var/dump type ext3 (rw)
none on /proc/sys/fs/binfmt_misc type binfmt_misc (rw)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw)
nfsd on /proc/fs/nfsd type nfsd (rw)
/dev/hda9 on /mntpoint type ext3 (rw,usrquota,grpquota)
```

Apply full permissions on the mount point

Example:-

```
[root@localhost ~]# chmod 777 /mntpoint
```

Create the quota database files

Syntax:-

```
[root@locaihost ~]# quotacheck <options> <mount point>
```

Options:

-c	create	-g	group
-u	user	-v	verbose

Example:-

```
[root@localhost ~]# quotacheck  -cugv  /mntpoint
```

Check if the quota database file aquota.group and aquota.user has been created

```
[root@localhost ~]# ls  /mntpoint
aquota.group  aquota.user  lost+found
```

Check the quota status

Syntax:-

```
[root@localhost ~]# quotaon  <options> <partition>
```

Example:-

```
[root@localhost ~]# quotaon  –p  /dev/hda9
group quota on /mntpoint (/dev/hda9) is off
user quota on /mntpoint (/dev/hda9) is off
```

Turn on quotas

Syntax:-

```
[root@localhost ~]# quotaon <partition>
```

Example:-

```
[root@localhost ~]# quotaon  /dev/hda9
```

To check the status

```
[root@localhost ~]# quotaon  -p  /dev/hda9
group quota on /mntpoint (/dev/hda9) is on
user quota on /mntpoint (/dev/hda9) is on
```

Apply quotas for the user ravi

Example:- User ravi can create 5 files or directories after which he gets a warning message and he should not be allowed to create more than 7 files or directories

```
[root@localhost ~]# eduquota –u ravi
Disk quotas for user ravi (uid 500):
Filesystem        blocks    soft    hard    inodes    soft    hard
/dev/hda9           0        0       0       0         5       7
:wq
```

To check

Example:-

```
[root@localhost ~]# su  - ravi
[ravi@localhost ~]$ cd /mntpoint
[ravi@localhost mntpoint]$ touch file1 file2 file3 file4 file5
[ravi@localhost mntpoint]$ touch file6
hda9: warning, user file quota exceeded.
[ravi@localhost mntpoint]$ ls
aquota.group   file1    file3    file5    lost+found
aquota.user    file2    file4    file6
[ravi@localhost mntpoint]$ touch file7
[ravi@localhost mntpoint]$ touch file8
hda9: write failed, user file limit reached.
touch: cannot create file`file8': Disk quota exceeded
```

Apply quotas for the sales group

Example:- The primary members of the group sales can collectively create 5 files or directories after which they get a warning message and they should not be allowed to create more than 7 files or diractories

```
[root@localhost ~]# edquota   –g   sales
Disk quotas for group sales (gid 500):
Filesystem        blocks    soft    hard   inodes   soft   hard
/dev/hda9          0         0       0       0       5      7
:wq
```

To check

```
Example:-
[root@localhost ~]# su  sunil
[sunil@localhost ~]$ cd /mntpoint
[sunil@localhost mntpoint]$ touch f1 f2 f3 f4
[sunil@localhost mntpoint]$ exit
[root@localhost mntpoint]# su tom
[tom@localhost mntpoint]$ touch f5
[tom@localhost mntpoint]$ touch f6
hda9: warning, user file quota exceeded.
[tom@localhost mntpoint]$ exit
[root@localhost mntpoint]# su sunil
[sunil@localhost mntpoint]$ touch f7
[sunil@localhost mntpoint]$ touch f8
hda9: write failed, user file limit reached.
touch: cannot create file`f8': Disk quota exceeded
[sunil@localhost mntpoint]$ exit
[root@localhost mntpoint]# su rani
[rani@localhost mntpoint]$ touch f8
[rani@localhost mntpoint]$ touch f9
```

Note: Group quotas are based only by the group-owner of a file or directory and hence will only be implemented on primary users in that group.

Access Control List

Create some users and groups

Example:-

```
[root@localhost ~]# useradd tom
[root@localhost ~]# useradd tom
[root@localhost ~]# groupadd salesgrp
[root@localhost ~]# groupadd fingrp
[root@localhost ~]# useradd  -g salesgrp sai
[root@localhost ~]# useradd  -g salesgrp ram
[root@localhost ~]# useradd  -G fingrp  prasad
[root@localhost ~]# useradd  -G fingrp  kumar
```

Note: ACL's are applied on both primary and secondary members of a group

Create a directory

Example:-

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

Create partition using fdisk

Command:-

[root@localhost ~]# fdisk /dev/hda

The number of cylinders for this disk is set to 9729.

There is nothing wrong with that, but this is larger than 1024,

and could in certain setups cause problems with:

1) software that runs at boot time (e.g., old versions of LILO)

2) booting and partitioning software from other OSs

(e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): n

First cylinder (3169-4865, default 3169):

Using default value 3169

Last cylinder or +size or +sizeM or +sizeK (3169-4865, default 4865): +200M

Check if the new partition has been created

Command (m for help): p

Disk /dev/hda: 40.0 GB, 40020664320 bytes
255 heads, 63 sectors/track, 4865 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/hda1	*	1	13	104391	83	Linux
/dev/hda2		14	778	6144862+	83	Linux
/dev/hda3		779	1415	5116702+	83	Linux
/dev/hda4		1416	4865	27712125	5	Extended
/dev/hda5		1416	2052	5116671	83	Linux
/dev/hda6		2053	2307	2048256	83	Linux
/dev/hda7		2308	2438	1052226	82	Linux swap / Solaris
/dev/hda8		2439	3168	5863693+	83	Linux
/dev/hda9		3169	3193	200781	83	Linux

Saving the partitions

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.

To update the kernel without restarting the system

Command:-

[root@localhost ~]# partprobe /dev/hda

Format the partition

Example:- To format the 9th partition with ext3

[root@localhost ~]# mkfs.ext3 /dev/hda9

Mounting the partition with ACL enabled

Syntax:-

[root@localhost ~]# mount <option> <arguments> <partition name> <mount point dir>

Example:- To mount the 9th partition on a directory /salesdept ACL enabled

```
[root@localhost ~]# mkdir   /salesdept
[root@localhost ~]# mount   -o  acl   /dev/hda9   /salesdept
```

To view the mounted partitions

Command:-

```
[root@localhost ~]# mount
/dev/hda5 on / type ext3 (rw)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devpts on /dev/pts type devpts (rw,gid=5,mode=620)
/dev/hda1 on /boot type ext3 (rw)
tmpfs on /dev/shm type tmpfs (rw)
/dev/hda6 on /home type ext3 (rw)
/dev/hda3 on /usr type ext3 (rw)
/dev/hda2 on /var type ext3 (rw)
/dev/hda8 on /var/dump type ext3 (rw)
none on /proc/sys/fs/binfmt_misc type binfmt_misc (rw)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw)
nfsd on /proc/fs/nfsd type nfsd (rw)
/dev/hda9 on /salesdept type ext3 (rw,acl)
```

Apply full permissions on the mount point

Example:-

```
[root@localhost ~]# chmod   777   /salesdept
```

Create a file in the ACL mounted partition

Example:-

```
[root@localhost ~]# cd   /salesdept
[root@localhost salesdept]# touch fabc.txt
[root@localhost salesdept]# chmod 640 fabc.txt
```

1. The following permissions to be applied
    a. Tom should have read and write permission
    b. The members of the group salesgrp should have read write permission
    c. The members of the group fingrp should have read only permission
    d. Others should have no permission

To apply the permissions

Syntax:-

```
[root@localhost ~]# setfacl  -m u:<username>:<permission>,g:<groupname>:<permission>,
                    o:<permission>        <filename/foldername>
```

Example:-

```
[root@localhost salesdept]# cd  /salesdept
[root@localhost salesdept]# setfacl  -m u:tom:rw,g:salesgrp:rw,g:fingrp:r,o:---  fabc.txt
```

To view the acls applied on the file

Example:-

```
[root@localhost salesdept]# getfacl  fabc.txt
```

Output:-

```
# file: fabc.txt
# owner: root
# group: root
user::rw-
user:tom:rw-
group::r- -
group:salesgrp:rw-
group:fingrp:r- -
mask::rw-
other::---
```

To check login as different users and try reading the file as well try to add some data to the file created above.

Redundant Array of Independent Disks

(RAID)

1. **Create 4 partitions of size 200MB each.**
2. **Combine the first three partitions into a raid 5 array.**
3. **Make one of the partitions as faulty.**
4. **Remove the faulty partition from the raid array.**
5. **Add the fourth partition to the raid array.**

Create partition using fdisk

Command:-

[root@localhost ~]# fdisk /dev/hda

The number of cylinders for this disk is set to 9729.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
(e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): n

First cylinder (2439-4865, default 2439):

Using default value 2439

Last cylinder or +size or +sizeM or +sizeK (2439-4865, default 4865): +200M

Command (m for help): n

First cylinder (3169-4865, default 3169):

Using default value 3169

Last cylinder or +size or +sizeM or +sizeK (3169-4865, default 4865): +200M

Command (m for help): n

First cylinder (3194-4865, default 3194):

Using default value 3194

Last cylinder or +size or +sizeM or +sizeK (3194-4865, default 4865): +200M

Command (m for help): n

First cylinder (3219-4865, default 3219):

Using default value 3219

Last cylinder or +size or +sizeM or +sizeK (3219-4865, default 4865): +200M

Check if the new partitions have been created

Command (m for help): p

Disk /dev/hda: 40.0 GB, 40020664320 bytes
255 heads, 63 sectors/track, 4865 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/hda1	*	1	13	104391	83	Linux
/dev/hda2		14	778	6144862+	83	Linux
/dev/hda3		779	1415	5116702+	83	Linux
/dev/hda4		1416	4865	27712125	5	Extended
/dev/hda5		1416	2052	5116671	83	Linux
/dev/hda6		2053	2307	2048256	83	Linux
/dev/hda7		2308	2438	1052226	82	Linux swap / Solaris
/dev/hda8		2439	3168	200781	83	Linux
/dev/hda9		3169	3193	200781	83	Linux
/dev/hda10		3194	3230	200781	83	Linux
/dev/hda11		3231	3280	200781	83	Linux

Saving the partitions

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.

To update the kernel without restarting the system

Command:-

[root@localhost ~]# partprobe /dev/nda

Create the raid device

Syntax:-

[root@localhost ~]# mdadm -C /dev/md0 –n<number of partitions> <partition1> <partition2> -l<raid level>

Example:- For raid level 5

[root@localhost ~]# mdadm -C /dev/md0 –n3 /dev/hda8 /dev/hda9 /dev/hda10 –l5

To view the information regarding the raid device

Command:-

[root@localhost ~]# mdadm -D /dev/md0

```
/dev/md0:
        Version : 00.90.03
  Creation Time : Tue Mar 30 05:27:08 2010
     Raid Level : raid5
     Array Size : 401408 (392.07 MiB 411.04 MB)
    Device Size : 200704 (196.03 MiB 205.52 MB)
   Raid Devices : 3
  Total Devices : 3
Preferred Minor : 0
    Persistence : Superblock is persistent
   Update Time : Tue Mar 30 05:27:08 2010
          State : clean
 Active Devices : 3
Working Devices : 3
 Failed Devices : 0
  Spare Devices : 0
         Layout : left-symmetric
     Chunk Size : 64K
           UUID : 8258c8fc:c6004c61:545b8b3f:6af77585
         Events : 0.1

   Number   Major   Minor   RaidDevice State
      0       8       8       0      active sync   /dev/hda8
      1       8       9       1      active sync   /dev/hda9
      3       8      10       2      active sync   /dev/hda10
```

Format the partition

Example:- To format the raid device

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

Mounting

Syntax:-

```
[root@localhost ~]# mount <option> <arguments> <partition name> <mount point dir>
```

Example:-

```
[root@localhost ~]# mount   /dev/md0  /mnt
```

Creating some data

Example:-

```
[root@localhost ~]# cd   /mnt
[root@localhost mnt]# touch file1 file2 file3 file4
[root@localhost mnt]#ls
file1     file2     file3     file4
```

Adding a spare

Syntax:-

```
[root@localhost ~]# mdadm  -a  /dev/md0  <new partition>
```

Example:-

```
[root@localhost ~]# mdadm  -a  /dev/md0  /dev/hda11
```

To view the information regarding the raid device

Command:-

[root@localhost ~]# mdadm -D /dev/md0

```
/dev/md0:
        Version : 00.90.03
  Creation Time : Tue Mar 30 05:27:08 2010
     Raid Level : raid5
     Array Size : 401408 (392.07 MiB 411.04 MB)
    Device Size : 200704 (196.03 MiB 205.52 MB)
   Raid Devices : 3
  Total Devices : 3
Preferred Minor : 0
    Persistence : Superblock is persistent
   Update Time : Tue Mar 30 05:27:08 2010
          State : clean
 Active Devices : 3
Working Devices : 3
 Failed Devices : 0
  Spare Devices : 0
        Layout : left-symmetric
    Chunk Size : 64K
          UUID : 8258c8fc:c6004c61:545b8b3f:6af77585
        Events : 0.1

   Number   Major   Minor   RaidDevice State
      0       8       8       0      active sync   /dev/sda8
      1       8       9       1      active sync   /dev/sda9
      2       8      10       2      active sync   /dev/sda10
      3       8      11       3      spare         /dev/sda11
```

To make a device as faulity

```
[root@client1 ~]# mdadm   -f   /dev/md0    /dev/hda8
mdadm: set  /dev/hda8  faulty  in /dev/md0
```

To see the detail information of /dev/md0

```
[root@client1 ~]# mdadm  -D   /dev/md0
```

To remove the faulty device

```
[root@client1 raid_dir]# mdadm   -r   /dev/md0  /dev/hda8
mdadm: hot removed /dev/hda8
[root@client1 raid_dir]# mdadm   -D   /dev/md0
```

To stop the raid first unmount the metadevice.

```
[root@client1 ~]# cd
[root@client1 ~]# umount   /dev/md0
[root@client1 ~]# mdadm   -S   /dev/md0
mdadm: stopped /dev/md0
```

To activate or assemble the raid metadevice

```
[root@client1 ~]# mdadm  -A   /dev/md0   /dev/hda9   /dev/hda10   /dev/hda11
mdadm: /dev/md0 has been started with 3 drives.
```

Backup and Recovery

Create a folder for eg /myfolder for practice.

```
[root@client24~]# mkdir   /myfolder
[root@client24 ~]# cd   /myfolder
```

Now create some files and folders inside it.

```
[root@client24 myfolder]# mkdir  dir1
[root@client24 myfolder]#touch  1  songs   tom_file
[root@client24 myfolder]# ls
1  dir1  songs  tom_file
```

Use the tar command to tape archive the folder.

```
[root@client24 ~]# tar    -cvf    /opt/myfolder.tar      /myfolder
```

```
########### OUTPUT ###########
tar: Removing leading `/' from member names
/myfoider/
/myfolder/dir1/
/myfolder/tom_file
/myfolder//songs
/myfolder/1
```

```
[root@client24 ~]# ls –l
```

To create a tar file with zip

```
[root@client24 ~]# tar  –cvzf  /opt/myfolder.tar.gz      /myfolder
```

```
#######Out put######
tar: Removing leading `/' from member names
/myfolder/
/myfolder/dir1/
/myfolder/tom_file
/myfolder//songs
/myfolder/1
```

```
[root@client24 ~]# ll  /opt
-rw-r--r-- 1 root root 251 Jul 13 03:09 myfolder.tar.gz
```

To view the contents of the tar file without extracting.

```
[root@client24 ~]# tar -tvzf  /opt/myfolder.tar.gz
```

```
drwxrwxrwx root/root          0 2008-07-13 01:31:34 myfolder/
drwxr-xr-x root/root          0 2008-07-13 01:28:39 myfolder/dir1/
-rw-r--r-- tom/joy           12 2008-07-13 01:29:51 myfolder/tom_file
-rw-rw-rw- root/root          0 2008-07-13 00:06:35 myfolder//songs
-rw-r--r-- tom/joy            0 2008-07-13 01:31:34 myfolder/1
```

To remove the folder

```
[root@client24 ~]# rm     –r     /myfolder
rm: descend into directory `/myfolder'? y
rm: remove directory `/myfolder/dir1'? y
rm: remove regular file `/myfolder/tom_file'? y
rm: remove regular empty file `/myfolder//songs'? y
rm: remove regular empty file `/myfolder/1'? y
rm: remove directory `/myfolder'? y
[root@client24 ~]# cd /
```

To extract the tar file. Or recovery the data

```
[root@client24 /]# tar    -xvzf    /opt/myfolder.tar.gz
myfolder/
myfolder/dir1/
myfolder/tom_file
myfolder//songs
myfolder/1
```

After extracting see the contents inside the folder.

```
[root@client24 /]# ls /myfolder/
1  dir1  /songs  tom_file
```

Installation of Packages using RPM or YUM

1) If you want to install from CD or DVD go to packages location generally in /media/CDROM/Server folder.

2) To install from network share folder i.e through NFS server where NFS server's IP is 192.168.0.250 and share folder is /var/ftp/pub/Server mount the share at client side .

For sharing over network at client side mount the share folder.

```
[root@client mnt]# mkdir /mnt/pkgs
[root@client mnt]# mount 192.168.0.250:/var/ftp/pub/Server /mnt/pkgs
[root@client mnt]# mount
[root@client mnt]# cd /mnt/pkgs
[root@client pkgs]# ls
```

Displays all rpm packages under /mnt/pkgs folder.

I) To install packages

To install packages with verbose, hash progress and forcefully.

```
[root@client pkgs]# rpm -ivh samba* vsftpd* --force
```

To only install packages & check the output.

```
[root@client pkgs]# rpm -i samba* vsftpd* --force
```

To install packages along with verbose option & check the output.

```
[root@client pkgs]# rpm -iv samba* vsftpd* --force
```

To install packages with verbose, hash progress and forcefully and check the output.

```
[root@client pkgs]# rpm -ivh samba* vsftpd* --force
```

To Upgrade packages with verbose, hash progress and forcefully and check the output.

```
[root@client pkgs]# rpm -Uvh samba* vsftpd* --force
```

II) To remove installed packages

Note: While removing a packages by rpm only use first field of packages i.e name of pkg.

To remove a single packages.

[root@client pkgs]# rpm -e vsftpd

To remove a packages if dependencies are their

[root@client pkgs]# rpm -e samba --nodeps

To remove multiple packages

[root@client pkgs]# rpm -e samba vsftpd bind --nodeps

III) Quering the packages.

To query all installed packages.

[root@client pkgs]# rpm -qa

To query a particular packages.

[root@client pkgs]# rpm -q samba

To view the documentation of any package.

[root@client pkgs]# rpm -qd vsftpd

To view the information of any package.

[root@client pkgs]# rpm -qi vsftpd

To view the configuration files of the packages.

[root@client pkgs]# rpm -qc vsftpd

To view the list of all files of particular package.

[root@client pkgs]# rpm -ql vsftpd

To view the status of the packages.

[root@client pkgs]# rpm -qs vsftpd

Installing through yum

Yum uses indexing method which is called as repository. Repository decrease the process of installation and to analyse dependencies.

Creating a repository at server side where all rpms are copied

Go to the location where all rpms are available.

[root@client ~]# cd /var/ftp/pub/Server

[root@client Server]# rpm -ivh createrepo-0.4.4-2.fc6.noarch.rpm --force

Remove the old repodata

[root@client Server]# rm -rf repodata/

Create a new repodata

[root@client Server]# createrepo -g /media/<1st cdrom>/Server/repodata/comps-rhel5-server-core.xml. /var/ftp/pub/Server

Now all package index will be created.

At client side edit the yum configuration file, provide the path of repository.

[root@client ~]# vi /etc/yum.repos.d/rhel-debuginfo.repo

```
[core]
name= Linux $releasever - $basearch - Debug
baseurl=ftp://192.168.0.250/pub/Server
enabled=1
gpgcheck=1
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-release

:wq!
```

Installing through yum

To see the list of packages in index i.e repository.

[root@client ~]# yum list

To see list of installed packages.

[root@client ~]# yum list installed

To see list of installed particular packages for example samba.

[root@client ~]# yum list installed samba*

To install packages.

[root@client ~]# yum install vsftpd* samba*

To remove packages.

[root@client ~]# yum remove vsftpd* samba*

To see the list of all groups of packages.

[root@client ~]# yum grouplist

To install a particular group of packages, note that these groupnames are case sensitive.

[root@client ~]# yum groupinstall "Mail Server"

To remove a particular group of packages.

[root@client ~]# yum groupremove "Mail Server"

Boot Process Practical

To view the default runlevel while booting the linux operating system.

[root@client24 ~]# vi /etc/inittab

id:5:initdefault: line no 18

Note: it means that os by default always boot to GUI mode.

To view the current runlevel

[root@client24 ~]# runlevel

N 5

To switch to another runlevel and check the runlevel.

```
[root@client24 ~]# init 3
[root@client24 ~]# runlevel
5 3
[root@client24 ~]# init 2
[root@client24 ~]# runlevel
3 2
[root@client24 ~]# init 1
[root@client24 ~]# runlevel
1 S
[root@client24 ~]# init 6
```

To view the grub configuration file

[root@client24 ~]# cat /boot/grub/grub.conf

Usage of chkconfig command.

To view the status of the services in all runlevels.

[root@client24 ~]# chkconfig --list

To view the status of the particular services for example bluetooth.

[root@client24 ~]# chkconfig --list bluetooth

network 0:off 1:off 2:on 3:on 4:on 5:on 6:off

To put the service at all runlevel as on .

[root@client24 ~]# chkconfig bluetooth on

To view the status.

[root@client24 ~]# chkconfig --list bluetooth

bluetooth 0:off 1:off 2:on 3:on 4:on 5:on 6:off

To put the service at all runlevel as off .

[root@client24 ~]# chkconfig bluetooth off

To view the status.

[root@client24 ~]# chkconfig --list bluetooth

bluetooth 0:off 1:off 2:off 3:off 4:off 5:off 6:off

To manually stop the service.

[root@client24 ~]# service bluetooth stop

To manually start the service.

[root@client24 ~]# service bluetooth start

To manually restart the service.

[root@client24 ~]# service Bluetooth restart

Troubleshooting

1) To Recover Root Password

Restart the PC while restarting press any key to get Grub Screen.

press 'e'

Select kernel /vmlinuz-2.6.18-8.el5 ro root=LABEL=/1 kernel /

Again press 'e' to edit

Edit kernel /vmlinuz-2.6.18-8.el5 ro root=LABEL=/1 '1'

press enter

press b to boot

At shell prompt type the commands

sh-3.00# passwd

Now password is been changed.

2) Assinging Grub Password

[root@server ~]# grub-md5-crypt >> /boot/grub/grub.conf

type the passwd ## these two entries will be not visible

Retype the passwd

Now go to file and add encrypted password as following

[root@server ~]# vi /boot/grub/grub.conf

```
hiddenmenu
password --md5  < encryptedpasswd >          ## Add this line here
title  Linux Server (2.6.18-8.el5)

:wq
```

3) Recovering Root or Grub password if both are forgotten.

Boot from Bootable linux CD and type.

boot : linux rescue

select keyboard-> select language ->select networking -> continue -- Y/N

To change from ram o/s to harddisk o/s.

sh-3.00# chroot /mnt/sysimage

To check where os is mounted.

sh-3.00# mount

To remove GRUB password remove the encrypted password line from /boot/grub/grub.conf.

sh-3.00# vi /boot/grub/grub.conf

```
hiddenmenu
title Linux Server (2.6.18-8.el5)
:wq
```

sh-3.00# exit

To Configure printer

```
[root@server ~]# yum install cups* -y
[root@server ~]# service cups restart
[root@server ~]# system-config-printer &
```

To configure Modem

```
[root@server ~]# system-config-network &
Select Modem -> then type telephone number of the ISP provider
                -> ISP name -> then username & password
```

To check process id of any application, command etc.

[root@server ~]# ps -aux

To kill a process normally

[root@server ~]# kill <process_id>

To kill the the process forcefully use stamp value as 9.

[root@server ~]# kill -9 <process_id >

To see the cpu & process status

[root@server ~]# top

To see the open port number and service name

[root@server ~]# netstat -antp

To see the remote machine open port number

[root@server ~]# nmap -sT -A <remote_IP>

To view how long the system is running

[root@server ~]# uptime

To view Process, Resources and File systems

[root@server ~]# gnome-system-monitor &

To dump the traffic on the network

[root@server ~]# tcpdump -i eth0

To display or change Ethernet card settings

[root@server ~]# ethtool eth0

To view the traffic to the Ethernet card

[root@server ~]# iptraf

LINUX

Network Administration

Introduction to Networking

Assigning the hostname – temporarily

Syntax:-

[root@localhost ~]# hostname <computername>

Example:- To assign the hostname as server.galaxygroup.com

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

To check the hostname assigned

[root@localhost ~]# hostname

server.galaxygroup.com

Assigning the hostname – permanently

Edit the configuration file /etc/sysconfig/network

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

```
NETWORKING=yes
HOSTNAME=server.galaxygroup.com

:wq!
```

Assigning a static IP address – temporarily

Syntax:-

[root@localhost ~]# ifconfig <devicename> <IP address>

Example:- To assign the static IP address as 192.168.0.253

[root@localhost ~]# ifconfig eth0 192.168.0.253

To check the IP assigned

[root@localhost ~]# ifconfig

```
eth0      Link encap:Ethernet  HWaddr 00:13:20:B7:1D:44
          inet addr:192.168.0.253  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::213:20ff:feb7:1d44/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:48153 errors:4 dropped:0 overruns:0 frame:4
          TX packets:21992 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:39512670 (37.6 MiB)  TX bytes:1720318 (1.6 MiB)

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:1249 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1249 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1285258 (1.2 MiB)  TX bytes:1285258 (1.2 MiB)
```

Set permanent ip address

```
[root@localhost ~]# netconfig

[ ] Use dynamic IP configuration (BOOTP/DHCP)

IP address:                192.168.0.X2      # where X2 is any client IP
Netmask:                   255.255.255.0
Default gateway (IP):      192.168.0.254
Primary nameserver:        192.168.0.1

      OK            Back

[root@localhost ~]#
```

Restart the service to activate the new ip address.

```
[root@station9 ~]# service network restart
```

To check the new updated ip.

```
[root@station9 ~]# ifconfig
```

To assign virtual ips.

```
[root@station9 ~]# netconfig --device eth0:1
```

Start the service and check new updated ip

```
[root@station9 ~]# service network restart
[root@localhost ~]# ifconfig
```

To see the lan card i.e NIC card parameters.

```
[root@station9 ~]# ethtool    eth0
Settings for eth0:
        Supported ports: [ TP MII ]
        Supported link modes:   10baseT/Half 10baseT/Full
                                100baseT/Half 100baseT/Full
        Supports auto-negotiation: Yes
        Advertised link modes:  10baseT/Half 10baseT/Full
                                100baseT/Half 100baseT/Full
        Advertised auto-negotiation: Yes
        Speed: 100Mb/s
        Duplex: Full
        Port: MII
        PHYAD: 1
        Transceiver: internal
        Auto-negotiation: on
        Supports Wake-on: g
        Wake-on: g
        Current message level: 0x00000007 (7)
        Link detected: yes
```

To enable ip address.

```
[root@station9 ~]# ifup eth0
```

To disable ip address.

```
[root@station9 ~]# ifdown eth0
```

This is a file where ip address are stored.

```
[root@station9 ~]# cd /etc/sysconfig/network-scripts/
[root@station9 network-scripts]# cat ifcfg-eth0
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=static
IPADDR=192.168.0.9
NETMASK=255.255.255.0
GATEWAY=192.168.0.254
```

Configuration of NFS Server

NFS Server is used to share the folders between Linux/Unix to Linux/Unix operating systems. IN Linux/Unix, folders also represents mount points for CDROM/DVD, partitions, pendrives, or any storage media.

Practical steps to configure NFS server

Step 1) Check & Install Packages.

Check the packages are installed or not by rpm/yum.

```
[root@nfs ~]# rpm -qa | grep nfs
```

OR

```
[root@nfs ~]# yum list installed | grep nfs
```

Remove the packages.

```
[root@nfs ~]# yum remove nfs* -y
```

Install the Packages by method 1 or method 2.

Method 1) Through rpm by sharing.

```
[root@nfs ~]# mkdir /mnt/pkgs
[root@nfs ~]# mount 192.168.0.250:/var/ftp/pub/Server /mnt/pkgs
[root@nfs ~]# mount
[root@nfs ~]# cd /mnt/pkgs
[root@nfs pkgs]# ls
[root@nfs pkgs]# rpm -ivh nfs* --force
```

Method 2) Through yum

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

Step 2) Create the resources (Files/Folders) to be shared.

Create any folders to be shared for example.

```
[root@nfs ~]# mkdir /var/galaxy
[root@nfs ~]# mkdir /var/salesdept
```

Give basic full permissions so user can do read/write.

```
[root@nfs ~]# chmod 777 /var/galaxy
[root@nfs ~]# chmod 777 /var/salesdept
```

Create files and folders inside shared folders.

```
[root@nfs ~]# cd /var/galaxy/
[root@nfs galaxy]# touch zfa.txt  zfb.txt  zfc.txt
[root@nfs galaxy]# mkdir  zdira  zdirb  zdirc
[root@nfs galaxy]# ls
[root@nfs galaxy]# cd /var/salesdept
[root@nfs salesdept]# touch sfa.txt sfb.txt sfc.txt
[root@nfs salesdept]# mkdir  sda sdb sdc
[root@nfs salesdept]# ls  -l
```

Step 3) Add the entries of folders to be shared in /etc/exports file.

Edit the configuration file /etc/exports .

```
[root@nfs ~]# vi   /etc/exports
/var/galaxy          192.168.0.0/255.255.255.0(ro,async)
/var/salesdept   192.168.0.10(rw,sync)    192.168.0.20(rw,async)

:wq!
```

Step 4) Start the Services.

```
[root@nfs ~]# service   portmap   restart
[root@nfs ~]# service   nfs    restart
```

Step 5) Check the list of shares form NFS server.

Syntax:-

```
[root@nfs ~]#  showmount   -e   <nfs_server_name/ip>
```

Example

```
[root@nfs ~]# showmount -e 192.168.0.X
```

Where X is NFS server IP

Client Side Configuration

Now take any client PC by ssh or move to client macine.

[root@client ~]# ssh 192.168.0.Y

Where Y is any client PC IP

To see the list of shares from NFS server .

Syntax:-

[root@nfs~]# showmount -e <nfs_server_name/ip>

Example

[root@nfs ~]# showmount -e 192.168.0.X

Where X is NFS server

To share a folder in unix/linux create a folder and mount .

```
[root@client ~]# mkdir /mnt/nfs1 /mnt/nfs2
[root@client ~]# mount 192.168.0.X:/var/galaxy /mnt/nfs1
[root@client ~]# mount 192.168.0.X:/var/salesdept /mnt/nfs2
[root@client ~]# mount
```

To see the list of shared files/folders.

```
[root@client ~]# cd /mnt/nfs1
[root@client nfs1]# ls
[root@client ~]# cd /mnt/nfs2
[root@client nfs2]# ls
[root@client nfs2]# touch fabc f123.txt
[root@client nfs2]# ls
```

Configuration of FTP Server

Ftp server is designed for uploading and downloading the files, when ftp server users log's **in, they** get there home folder at client side, and if public/anonymous users log's in they **get data** stored in /var/ftp folder.

Practical steps to configure FTP server

Step 1) CHECK & INSTALL PACKAGES

Check the packages are installed or not by rpm/yum

```
[root@ftp ~]# rpm -qa | grep vsftpd
```

Remove the packages and old data if required

```
[root@ftp ~]# yum remove vsftpd* -y
[root@ftp ~]# rm -r /etc/vsftpd*
```

Install the packages

```
[root@ftp ~]# yum install vsftpd* -y
```

Step 2) Create the resources on ftp server (file/folders & users)

Create users and assign passwords to whom you want to allow logging through ftp.

```
[root@ftp ~]# useradd  tom
[root@ftp ~]# useradd  joy
[root@ftp ~]# passwd tom
[root@ftp ~]# passwd joy
```

Create or Copy some files inside /var/ftp/pub

```
[root@ftp ~]# cd /var/ftp/pub
[root@ftp pub]# touch   fa.txt   fb.txt   music.mp3
[root@ftp pub]# ls
```

Create a Upload folder for anonymous users and give full permission for read/write.

For example galaxyupload

```
[root@ftp pub]# mkdir   /var/ftp/galaxyupload
[root@ftp pub]# chmod  777 /var/ftp/galaxyupload
[root@ftp pub]#
```

Step 3) Edit the Main Configuration File

Edit the configuration file /etc/vsftpd/vsftpd.conf

```
[root@ftp ~]# vi   /etc/vsftpd/vsftpd.conf
12      anonymous_enable=YES
15      local_enable=YES
27      anon_upload_enable=YES
83      ftpd_banner=Welcome to Galaxy Linux.
:wq!
```

Step 4) To block the ftp server users (for eg:-- joy) write the user name in file /etc/vsftpd/ftpusers

```
[root@ftp ~]# vi /etc/vsftpd/ftpusers
# Users that are not allowed to login via ftp
root
bin
daemon
adm
lp
sync
shutdown
halt
mail
news
uucp
operator
games
nobody
joy
:wq!
```

Step 5) Start the service

```
[root@ftp ~]# service vsftpd restart
```

Client Side Configuration

Ftp Client side commands and applications for example :-

a) *ftp*

b) *gftp*

c) *Any Browser*

ftp command is used as client to login to ftp_server form any operating system like windows,linux, unix, macintosh :-

Type ftp on terminal with ftp_server's ip, here assuming ftp server ip is X

[root@client ~]# **ftp 192.168.0.X**

Name (192.168.0.253:root): **ftp** ***# type user name as ftp without password***

331 Please specify the password.

Password:

230 Login successful.

ftp> ls **# type *ls to see ftp server content***

```
drwxr-xr-x   3 0    0     4096 Jul 11 20:44 pub
drwxrwxrwx   2 0    0     4096 Jul 11 21:05 galaxyupload
```

To enter inside pub directory.

ftp> cd pub

ftp> ls

```
-rw-r--r--   1 0    0        0 Jul 11 20:42 fa.txt
-rw-r--r--   1 0    0        0 Jul 11 20:42 fb.txt
-rw-r--r--   1 0    0        0 Jul 11 20:42 music.mp3
```

To download use get/mget command.

ftp> mget <download file name>

To upload a single/multiple file use put/mput command

ftp> pwd

ftp> cd ..

ftp> cd galaxyupload

ftp> pwd

ftp> mput <upload file name>

ftp> ls

ftp> bye ***# to come out of ftp command prompt***

To access ftp in graphical mode either use download accelarators of 3RD party tools like DAP, cuteftp , in linux by default we have gftp, or use any Browser

```
[root@client ~]# gftp  192.168.0.X   &
OR
[root@client ~]# firefox  ftp:// 192.168.0.X   &
X is  ftp_server's ip
```

Configuration of Samba Server

Practical steps to configure Samba server

Samba server is used to share the files/folders between Linux/Unix to Windows and vice versa.

Step 1) Check & Install packages.

Check the packages are installed or not by rpm/yum

```
[root@smb ~]# rpm -qa | grep samba
```

OR

```
[root@smb ~]# yum list installed | grep samba
```

Remove the packages of samba by rpm and old data if required

```
[root@smb ~]# rpm -e samba samba-common samba-client --nodeps
[root@smb ~]# rm –rf /etc/samba*
```

Install the packages

```
[root@smb ~]# yum install samba* -y
```

Step 2) Create the resources on Samba server (files/folders & users)

Create users and assign passwords .

```
[root@smb ~]# useradd tom
[root@smb ~]# useradd joy
[root@smb ~]# passwd tom
[root@smb ~]# passwd joy
```

Create shared folder /var/galaxy with full permission , and some files inside it.

```
[root@smb ~]# mkdir /var/galaxy
[root@smb ~]# chmod 777 /var/galaxy
[root@smb ~]# cd /var/galaxy
[root@smb galaxy ]# touch fa.txt fb.txt music.mp3
[root@smb galaxy ]# ls
```

Step 3) Edit the Main Configuration File

Edit the configuration file /etc/samba/smb.conf

```
[root@smb ~]# vi /etc/samba/smb.conf
```

 # Go to end of file copy last 8 lines 8yy and press p to paste

```
[salesshare]
comment = This share is for sales dept
path = /var/galaxy
valid users = tom   joy
public = no
writable = yes
printable = no
create mask = 0765
:wq!
```

Step 4) Provide a separate samba password for samba users to get samba shares.

```
[root@smb ~]# smbpasswd  -a  tom
[root@smb ~]# smbpasswd  -a  joy
```

Step 5) Check the syntax of configuration file

```
[root@smb ~]# testparm
```

Step 6) Start the services

```
[root@smb ~]# service smb restart
```

Client Side Configuration

Scenario 1) Windows as client for Linux Samba Server.

Take any windows pc or Login to windows pc from Linux by using rdesktop command where windows ip is 192.168.0.Z and samba server's ip is 192.168.0.X

[root@smb ~]# rdesktop 192.168.0.X &

Provide username administrator

Provide password hyd

Login to windows machine

Click on start button

Run

open [\\ip\sharename]

eg. [\\192.168.0.100\sharename]

provide samba username & password

Scenario 2) Linux as client for Linux Samba Server

To see the list of linux Samba Server in network

```
[root@client ~]# findsmb
```

To see the list of Shares on Samba Server

```
[root@client ~]# smbclient    -L    //192.168.0.253
```

To get the shares by method 1 and method 2

Method 1) By mounting

```
[root@client ~]# mount  //192.168.0.253/salesshare    /mnt   -o    username=tom
Password:
[root@client ~]# mount
[root@client ~]# cd  /mnt
[root@client mnt]# ls
```

Method 2) By Ftp method

```
[root@client ~]# smbclient    //192.168.0.253/salesshare   -U   tom
Password:
Domain=[SMB] OS=[Unix] Server=[Samba 3.0.23c-2]
smb: \> ls
  .                   D        0  Sat Jul 12 03:29:30 2008
  ..                  D        0  Sat Jul 12 03:28:54 2008
  fa.txt               0  Sat Jul 12 03:29:30 2008
  music.mp3            0  Sat Jul 12 03:29:30 2008
  fb.txt               0  Sat Jul 12 03:29:30 2008

        61755 blocks of size 16384. 52294 blocks available
smb: \> get  <name of file to download>
smb: \> put <name of file to upload>
smb: \> exit
```

Scenario 3) Linux as client for Windows [IP=192.168.0.Z]

In windows the shared folders are windir1 windir2 and the users are winu1 winu2

Method 1) By mounting

```
[root@client ~]# mount    //192.168.0.16/windir1   /mnt    -o    username=winu1
Password:
[root@client ~]# mount
[root@client ~]# cd /mnt
[root@client mnt]# ls
```

Method 2) By smbclient method

```
[root@client ~]# smbclient    //192.168.0.16/windir2   -U   winu1
Password:
smb: \> ls
smb: \> help
smb: \> get <file_name>
smb: \> put <file_name>
smb: \> exit
```

Configuration of DNS Server

To configure Master & Slave Dns server, it is compulsory to have to separate operating system.

Practical steps to configure DNS server

Let us take Master DNS IP as 192.168.0.1 & Slave DNS IP as 192.168.0.2

Step 1) Check IP & Host Entries

Check and assign the ips

```
[root@client ~]# ifconfig
[root@client ~]# netconfig
[root@client ~]# service network restart
[root@client ~]# ping 192.168.0.0 -b
```

Check permanent name

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

```
NETWORKING=yes
HOSTNAME=masterdns.galaxy.com
:wq!
```

Check host names for local resolution

[root@client ~]# vi /etc/hosts

```
127.0.0.1     localhost.localdomain     localhost
192.168.0.1   masterdns.galaxy.com      masterdns
:wq!
```

Assigning name so no need to restart pc.

[root@client ~]# hostname masterdns.galaxy.com

Logoff and login

[root@client ~]# gdm-restart

Step 2) **Check & Install packages.**

Check the packages are installed or not by rpm/yum

```
[root@masterdns ~]# rpm -qa | egrep    "bind|caching"
```

Or

```
[root@masterdns ~]# yum list installed | egrep    "bind|caching"
```

Remove the packages and old data if required

```
[root@masterdns ~]# yum remove bind*  caching* -y
[root@masterdns ~]# rm  -r   /etc/named*
[root@masterdns ~]# rm  -rf  /var/named*
```

Install the packages

```
[root@masterdns ~]# yum  install  bind*  caching* -y
```

Step 3a) Edit Main Configuration first.

```
[root@masterdns ~]# vi   /etc/named.caching-nameserver.conf
```

Modify the following lines.

go to line no 15 -> :15

```
listen-on port 53  { 127.0.0.1;  192.168.0.1; };          ## line no 15
allow-query        { localhost;  192.168.0.0/24; };       ## line no 23
match-clients      { localhost;  192.168.0.0/24; };       ## line no 32
:wq!
```

Step 5b) Edit Main configuration ...

[root@masterdns ~]# vi /etc/named.rfc1912.zones

[redacted]

##Press "p" to paste the code here and make changes

```
zone "galaxy.com" IN {
type master;
file "galaxy.for";
allow-update { none; };
};

zone "0.168.192.in-addr.arpa" IN {
type master;
file "galaxy.rev";
allow-update { none; };
};
:wq!
```

Step 4) Copy a sample script to create forward & reverse zone files.

Go to Dns database localtion

```
[root@masterdns ~]# cd /var/named/chroot/var/named/
[root@masterdns named]# ls
```

Copy a sample script for forward zone file along with permission.

```
[root@masterdns named]# cp -p  localhost.zone  galaxy.for
```

Copy a sample script for reverse zone file along with permission.

```
[root@masterdns named]# cp -p  named.local   galaxy.rev
[root@masterdns named]# ll
```

Step 5) Edit Foward zone file and add all host names of your network.

```
[root@masterdns named]# vi galaxy.for
$TTL   86400
@          IN SOA  masterdns.galaxy.com.     root.galaxy.com.  (
                        42          ; serial (d. adams)
                        3H          ; refresh
                        15M          ; retry
                        1W          ; expiry
                        1D )        ; minimum
@                       IN NS       masterdns.galaxy.com.
@                       IN NS       slavedns.galaxy.com.
masterdns               IN A        192.168.0.1              # ip of master dns
slavedns                IN A        192.168.0.2              # ip if slave dns
nfs                     IN A        192.168.0.10             # ip of nfs  & ftp server
ftp                     IN A        192.168.0.11
mail                    IN A        192.168.0.15             # Ip of mail server with mx
@                       IN  MX  4   mail                     # record
web                     IN A        192.168.0.20             # ip of webserver with alias
www                     IN CNAME    web                      # or canonicle  name
sales1                  IN A        192.168.0.21
mark1                   IN  A       192.168.0.22
:wq!
```

Step 6) Edit Reverse zone file and add all IP's last octet of your network.

```
[root@masterdns named]# vi galaxy.rev

$TTL   86400
@      IN     SOA    masterdns.galaxy.com.        root.galaxy.com.  (
                      1997022700 ; Serial
                      28800      ; Refresh
                      14400      ; Retry
                      3600000    ; Expire
                      86400 )    ; Minimum
@              IN     NS     masterdns.galaxy.com.        #Don't forget to put dot at the end.
@              IN     NS     slavedns.galaxy.com.
1              IN     PTR    masterdns.galaxy.com.
2              IN     PTR    slavedns.galaxy.com.

10             IN     PTR    nfs.galaxy.com.
11             IN     PTR    ftp.galaxy.com.
15             IN     PTR    mail.galaxy.com.
20             IN     PTR    web.galaxy.com.
21             IN     PTR    sales1.galaxy.com.
22             IN     PTR    mark1.galaxy.com.
:wq!
```

Step 7) Check Syntax errors of Configuration file & Zone file

 # To check configuration file syntax errors

```
[root@localhost ~]# named-checkconf    /etc/named.caching-nameserver.conf

[root@localhost ~]# named-checkconf    /etc/named.rfc1912.zones
```

 # To check ZONE file syntax errors

```
[root@localhost ~]# named-checkzone    galaxy.com    /var/named/chroot/var/named/galaxy.for

[root@localhost ~]# named-checkzone    galaxy.com    /var/named/chroot/var/named/galaxy.rev
```

Step 8) Start the service

```
[root@masterdns named]# service named restart
```

Step 9) Provide the IP OF Master DNS

```
[root@masterdns named]# vi /etc/resolv.conf
nameserver 192.168.0.1
:wq!
```

Step 10) Check the resolution

```
[root@masterdns named]# dig masterdns.galaxy.com
[root@masterdns named]# dig slavedns.galaxy.com
[root@masterdns named]# dig nfs.galaxy.com
[root@masterdns named]# dig sales1.galaxy.com
[root@masterdns named]# dig    -x    192.168.0.1
[root@masterdns named]# dig    -x    192.168.0.2
[root@masterdns named]# dig    -x    192.168.0.3

[root@masterdns named]# ping   masterdns.galaxy.com
```

Similarly ping to other machines.

Configuration of Slave DNS server

Practical steps to configure Slave DNS server

Here Master DNS IP as 192.168.0.1 & Slave DNS IP as 192.168.0.2

Step 1) Check IP & Host Entries

Check and assign the ips

```
[root@client ~]# ifconfig
[root@client ~]# netconfig
[root@client ~]# service network restart
[root@client ~]# ping    192.168.0.0  -b
```

Check permanent name

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

```
NETWORKING=yes
HOSTNAME=slavedns.galaxy.com
:wq!
```

Check host names for local resolution

[root@client ~]# vi /etc/nosts

```
127.0.0.1     localhost.localdomain     localhost
192.168.0.2   slavedns.galaxy.com       slavedns
:wq!
```

Assigning name so no need to restart pc.

[root@client ~]# hostname slavedns.galaxy.com

Logoff and login

[root@client ~]# gdm-restart

Step 2) Check & Install packages.

Check the packages are installed or not by rpm/yum

```
[root@slavedns ~]# rpm -qa | egrep    "bind|caching"
```

Or

```
[root@slavedns ~]# yum list installed | egrep    "bind|caching"
```

Remove the packages and old data if required

```
[root@slavedns ~]# yum remove bind*  caching* -y
[root@slavedns ~]# rm  -r   /etc/named*
[root@slavedns ~]# rm  -rf  /var/named*
```

Install the packages

```
[root@slavedns ~]# yum  install  bind*  caching* -y
```

Step 3a) Edit Main Configuration first.

```
[root@slavedns ~]# vi   /etc/named.caching-nameserver.conf
```

Modify the following lines.

go to line no 15 -> :15

```
listen-on port 53  { 127.0.0.1;  192.168.0.2; };          ## line no 15
allow-query        { localhost;  192.168.0.0/24; };       ## line no 23
match-clients      { localhost;  192.168.0.0/24; };       ## line no 32
:wq!
```

Step 3b) Edit Main Configuration second

[root@slavedns ~]# vi /etc/named.rfc1912.zones

```
zone "localhost" IN {                    ## copy the highlighted line by pressing 12yy here
type master;
file "localhost.zone";
allow-update { none; };
};

zone "0.0.127.in-addr.arpa" IN {
type master;
file "named.local";
allow-update { none; };
};
```

##Press "p" to paste the code here and make changes

```
zone "galaxy.com" IN {
    type slave;
    file "slaves/fgalaxy";
    masters { 192.168.0.1; };     ## Master DNS IP
};

zone "0.168.192.in-addr.arpa" IN {
    type slave;
    file "slaves/rgalaxy";
    masters { 192.168.0.1; };     ## Master DNS IP
};
:wq!
```

Step 4) Provide the IP OF Master DNS

```
[root@slavedns named]# vi /etc/resolv.conf
nameserver 192.168.0.2
:wq!
```

Step 5) Go to the database location & start the service, automatically zones files are replicated at slave side from master dns.

```
[root@slavedns ~]# cd /var/named/chroot/var/named/slaves
[root@slavedns slaves]# ls
[root@slavedns slaves]# service named restart
[root@slavedns slaves]# ll
```

Step 6) Add an entry in forward zone file at master side and increase serial number then start service. Check the updates at slave dns.

```
[root@slavedns ~]#cd    /var/named/chroot/var/named/slaves
[root@slavedns ~]#ls
[root@slavedns ~]#cat   fgalaxy
```

Client Side Configuration

Step 1) Provide the IP of Master & Slave DNS at client machine.

```
[root@client ~]# vi  /etc/resolv.conf
nameserver 192.168.0.1
nameserver 192.168.0.2
:wq!
```

Note : /etc/resolv.conf supports maximun 3 DNS entries

Step 2) Check the resolution & ping.

```
[root@client ~]# dig masterdns.galaxy.com
[root@client ~]# dig slavedns.galaxy.com
[root@client ~]# dig nfs.galaxy.com
[root@client ~]# dig sales1.galaxy.com
[root@client ~]# dig  -x 192.168.0.1
[root@client ~]# dig  -x 192.168.0.2
[root@client ~]# dig  -x 192.168.0.3

[root@client ~]# ping masterdns.galaxy.com
[root@client ~]# ping slavedns.galaxy.com
```

Configuration of WEB Server

Apache Web Server

Practical steps to configure Apache Web Server

Part One: Hosting Single web site.

Hosting a Single Site with www.galaxy.com name at IP 192.168.0.X

Step 1) Check IP & Host Entries

Check permanent name

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

```
NETWORKING=yes
HOSTNAME=web.galaxy.com
:wq!
```

Check temperory name which is actually used by running server.

[root@server ~]#hostname web.galaxy.com

To Check the web server running locally over Server machine by name, add the entry in /etc/hosts file.

[root@server ~]# vi /etc/hosts

```
127.0.0.1     localhost.localdomain  localhost
192.168.0.X   web.galaxy.com
192.168.0.X   www.galaxy.com
:wq!
```

[root@server ~]# gdm-restart

Step 2) Check & Install Packages.

Check the packages are installed or not by rpm/yum

```
[root@web ~]# rpm -qa  | grep httpd
```

OR

```
[root@web ~]# yum list installed  | grep httpd
```

Remove the packages of httpd by rpm and old data if required

```
[root@web ~]# yum remove httpd*
[root@web ~]# rm  –rf  /etc/httpd*
```

Install the packages

```
[root@web ~]# yum install  httpd*  -y
```

Step 3) Edit the Main Configuration File

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

Go to line no 250 → :250

ServerAdmin	root@galaxy.com	***## 250 receives mail generated by apache server***
ServerName	www.galaxy.com:80	***## 264 name of web sit***
DocumentRoot	"/var/www/html"	***## 280 web pages folder***
DirectoryIndex	galaxy.html	***## 390 index or home pages***

:wq!

Step 4) Create the a sample html file.

Create index,main or home html file in DocumentRoot folder i.e /var/www/html

```
[root@web ~]# cd /var/www/html
[root@web ~]# vi   galaxy.html
<html>
        <body bgcolor=yellow>
                <marquee> <h1> THIS IS GALAXY TECHNOLOGIES </h1></marquee>
                        <h6> THIS IS GALAXY TECHNOLOGIES </h6>
        </body>
</html>
:wq!
```

Step 5) Start the service

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

Client side Configuration

[root@web ~]# hostname client.galaxy.com

Step 1) To Check the web server running at Server machine by name add the entry in client /etc/hosts file.

[root@client ~]# vi /etc/hosts

```
127.0.0.1      localhost.localdomain  localhost
192.168.0.Z    client.galaxy.com      client
192.168.0.X    www.galaxy.com
:wq!
```

Step 2) Open the Browser & type

[root@client ~]#firefox http://www.galaxy.com &

OR

[root@client ~]#firefox http://192.168.0.X &

Where X is web servers IP.

Part two : VIRTUAL WEB HOSTING

Configuration of multiple site on single Web server is called as Virtual hosting.

We are going to host four sites :-

www.galaxy.com

www.yahoo.com

www.google.com

www.rediff.com

1) **Name Based Virutal Hosting**. (Def) : Hosting multiple sites on single IP is called as named based virtual hosting.

2) **Port Based.** (Def) : Hosting sites other than default port (i.e 80) is called as port based hosting, for example we will configure www.google.com at port 5000.

3) **IP BASED.** (Def): Accessing a site on IP without using name is called as IP based hosting, for example we will host ip based on this ip 192.168.0.X2.

Step 1) Check IP & Host Entries

[root@web ~]# ifconfig

Assigning a Virtual IP

[root@web ~]# netconfig --device eth0:1

[ ] Use dynamic IP configuration (BOOTP/DHCP)

IP address:	192.168.0.X2
Netmask:	255.255.255.0
Default gateway (IP):	192.168.0.254
Primary nameserver:	192.168.0.1

OK Back

Where X2 is a virtual IP

[root@web ~]# service network restart

[root@web ~]# ifconfig

[root@web ~]# vi /etc/hosts

Add these entries for local resolution, so that we can check the web site from local web server.

```
127.0.0.1       localhost.localdomain  localhost
192.168.0.X1    www.galaxy.com         web.galaxy.com        web
192.168.0.X1    www.yahoo.com
192.168.0.X1    www.google.com
192.168.0.X2    www.rediff.com
:wq!
```

Where X1 is a real IP

Where X2 is a virtual IP

Step 3) Edit the Main Configuration File

```
[root@web ~]# vi /etc/httpd/conf/httpd.conf
############# NAME BASED #######################
NameVirtualHost 192.168.0.X1:80
<VirtualHost 192.168.0.X1:80>
   ServerAdmin        root@galaxy.com
   DocumentRoot       /var/www/html/galaxy
   ServerName         www.galaxy.com
   DirectoryIndex     galaxy.html
</VirtualHost>
<VirtualHost 192.168.0.X1:80>
   ServerAdmin        root@yahoo.com
   DocumentRoot       /var/www/html/yahoo
   ServerName         www.yahoo.com
   DirectoryIndex     yahoo.html
</VirtualHost>
############# PORT BASED #######################
Listen 5000
<VirtualHost 192.168.0.X1:5000>
   ServerAdmin        root@google.com
   DocumentRoot       /var/www/html/google
   ServerName         www.google.com
   DirectoryIndex     google.html
</VirtualHost>
############# NAME BASED #######################
############# IP BASED  #######################
<VirtualHost 192.168.0.X2:80>
   ServerAdmin        root@rediff.com
   DocumentRoot       /var/www/html/rediff
   ServerName         www.rediff.com
   DirectoryIndex     rediff.html
</VirtualHost>
:wq!
```

To Authenticate Web server i.e asking username & password for site www.yahoo.com add this code at the end of configuration file.

```
[root@web ~]# vi  /etc/httpd/httpd.conf
<Directory /var/www/html/yahoo>
        AuthName "galaxyauth"
        AuthUserFile /etc/httpd/conf/htpasswd
        AuthType Basic
        Require  valid-user
</Directory>
 :wq!
```

Step 4) Create index or home html file in DocumentRoot folder i.e /var/www/html

Create DocumentRoot folder for each site

```
[root@web ~]# cd   /var/www/html
[root@html  ~]# mkdir   galaxy   yahoo   google   rediff
[root@html  ~]# cd
```

Create index or home html file respectively in their DocumentRoot folder .

Similar to Step 4 of part one.

Step 5) Create a user & provide web password to access www.yahoo.com site

```
[root@web ~]# useradd tom
[root@web ~]# htpasswd  -c  /etc/httpd/conf/htpasswd  tom
```

Step 6) START THE SERVICES

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

Step 7) Open the Browser & type

http://www.galaxy.com

http://www.yahoo.com

http://www.google.com:5000

http://192.168.0.X2

Client Side Configuration

Add the entry in /etc/hosts files

Step 1) [root@client ~]# vi /etc/hosts

```
127.0.0.1      localhost.localdomain  localhost
192.168.0.X1   www.galaxy.com
192.168.0.X1   www.yahoo.com
192.168.0.X1   www.google.com
192.168.0.X2   www.rediff.com
:wq!
```

Step 2) Open the Browser & type

[root@client ~]#firefox

```
http://www.galaxy.com
http://www.yahoo.com
http://www.google.com:5000
http://192.168.0.X2
```

Configuration of PROXY SERVER

It is used to share single internet connection to several clients.

Practical steps to configure Proxy Server

Step 1 a) Check IP & Host Entries

Assign one ip to get internet connection from ISP i.e WAN network.

[root@proxy ~]# ifconfig

First assigning an ip to get internet from WAN network .

[root@proxy ~]# netconfig

```
[ ] Use dynamic IP configuration (BOOTP/DHCP)

IP address:                 200.200.200.X
Netmask:                    255.255.255.0
Default gateway (IP):       200.200.200.254
Primary nameserver:         200.200.200.200
        OK                      Back
```

Let us assume that 200.200.200.X is ISP WAN ip

Assigning another ip to connect to LAN network to share internet among all clients .

[root@proxy ~]# netconfig --device eth0:1

```
[ ] Use dynamic IP configuration (BOOTP/DHCP)

IP address:                 192.168.0.X
Netmask:                    255.255.255.0
Default gateway (IP):
Primary nameserver:
        OK                      Back
```

Note : Do not assign any gateway or DNS IP for Lan network over virtual IP.

[root@proxy ~]# service network restart

Now check the connectivity of Proxy server with all clients.

```
[root@proxy ~]# ping  192.168.0.0 -b
[root@proxy ~]# route  -nv                          # Check Gateway IP
[root@proxy ~]# cat  /etc/resolv.conf               # Check DNS   IP
[root@proxy ~]# vi  /etc/sysconfig/network
```

```
NETWORKING=yes
HOSTNAME=proxy.galaxy.com
:wq!
```

```
[root@proxy ~]# vi /etc/hosts
```

```
127.0.0.1      localhost.localdomain  localhost
192.168.0.X  proxy.galaxy.com     proxy
:wq!
```

Where X is an IP of Proxy Server for LAN network

```
[root@proxy ~]# hostname proxy.galaxy.com
```

Now logoff & login to sync all ip & hostnames

```
[root@proxy ~]#  gdm-restart
```

Step 1b) Now Open the Browser & Check Internet is comming on Proxy Server

Step 2 : Check & install the packages.

```
[root@proxy ~]# rpm -qa  squid*
                or
[root@proxy ~]# yum list installed  squid*
[root@proxy ~]# yum remove squid* -y
```

Now Install the packages

```
[root@proxy ~]# yum  install squid* -y
```

Step 3) Edit Main Configuration File

```
[root@proxy ~]# vi  /etc/squid/squid.conf
```

 # I) To Configure squid as Simple Proxy i.e Only For sharing

```
73      http_port 3128
2831 visible_hostname  GALAXYPROXY
```

 # II) To Configure squid as Caching Proxy i.e caching website in local harddisk

```
993  cache_dir ufs /var/spool/squid  100   16    256
```

 # III) To Configure squid as Proxy FireWall

 # syntax for the firewall rule

 # acl aclname acltype string1/file_name

#Now take the cursor to key word OWN and write rules below here

2517 # INSERT YOUR OWN RULE(S) HERE TO ALLOW ACCESS FROM YOUR CLIENTS

##

#create a rule for particular network

```
acl  galaxylinuxnetwork        src    192.168.0.0/24
```

#create a rule for blocking particular site say www.naukri.com

```
acl    jobsite            url_regex     www.naukri.com
```

#create a rule for time duration

```
acl    classtime          time        S M T W H F A  18:30-22:30
# http_access allow all
http_access deny  jobsite
http_access deny  classtime
http_access allow galaxylinuxnetwork

:wq!
```

Step 4) START THE SERVICE

```
[root@proxy ~]# service squid restart
```

Client Side Configuration

For proxy any Browser is a client, i.e a client can be on server or any other machine.

1) If a client is **Firefox**

```
Open Firefox
        -> Edit
            -> Preference
                -> General
                    -> Connection Setting
                        ->Manual Proxy configuration
                            >HTTP Proxy     192.168.0.X   Port   3128
```

Where X is the proxy servers IP

Now type the website names in location bar

2) If a client is **Internet Explorer**

```
Open Internet Explorer
        Tools
            ->Internet Options
                ->Connections
                -> LAN Setting
                    ->Proxy Server
                        -> Address        192.168.0.X     Port 3128
```

Configuration of MAIL Server

Mail server name is mail.galaxy.com whose IP is 192.168.0.X

Practical steps to configure MAIL Server

Step 1) Check IP & Host Entries

Check and assign ip

```
[root@client ~]# ifconfig
[root@client ~]# netconfig
[root@client ~]# service network restart
[root@client ~]# ping 192.168.0.0 –b
```

Assign permanent name

```
[root@client ~]# vi  /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=mail.galaxy.com
:wq!
```

Assign hostname for local resolution

```
[root@client ~]# vi /etc/hosts
127.0.0.1       mail.galaxy.com     mail        localhost.localdomain   localhost
:wq!

[root@client ~]# hostname mail.galaxy.com
[root@client ~]# gdm-restart
```

Note : Also confirm that DNS is configrured , and following resolution should occur.

```
[root@client ~]# dig  galaxy.com
[root@client ~]# dig  -t  mx  galaxy.com
```

Step 2) Check & Install the packages.

```
[root@mail ~]# rpm -qa | egrep "sendmail|m4"
OR
[root@mail ~]# yum list installed | egrep "sendmail|m4"
```

It is better to remove the packages by rpm so that dependies will not get removed.

```
[root@mail ~]# rpm -e sendmail sendmail-cf sendmail-doc sendmail-devel m4
                --nodeps
[root@mail ~]# rm -r /etc/mail*
```

Now Install the packages

```
[root@mail ~]# yum install sendmail* m4* -y
```

Step 3) Edit Main Configuration File

```
[root@mail ~]# vi /etc/mail/sendmail.mc
```

```
116 dnl # DAEMON_OPTIONS(`Port=smtp,Addr=127.0.0.1, Name=MTA')dnl
155 LOCAL_DOMAIN(`galaxy.com')dnl
:wq!
```

Step 4) Compile the macro configuration file.

```
[root@mail ~]# m4 /etc/mail/sendmail.mc > /etc/mail/sendmail.cf
```

Step 5) Start the service

```
[root@mail ~]# service sendmail restart
```

Step 6) Create users & test the mail at command prompt by mail client utility.

```
[root@mail ~]# useradd tom
[root@mail ~]# useradd joy
[root@mail ~]# passwd tom
[root@mail ~]# passwd joy
```

Switch to a user tom and sendmail a mail to joy

```
[root@mail ~]# su - tom
[tom@mail ~]$ mail  joy@galaxy.com
    Subject: test mail from tom
    he hello
    test mail from tom
    ail test 1
    .                    ## New row first column type dot (.) To end the message
    Cc: tom@galaxy.com

[tom@mail ~]$
[tom@mail ~]$ exit
```

Switch to a user joy & check the mails.

```
[root@mail ~]# su - joy
[joy@mail ~]$
```

Type mail and see the output as below

```
[joy@mail ~]$ mail

Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/joy": 1 message 1 new
>N  1 tom@mail.galaxy.com    Sat Jul 12 04:54  19/601   "test mail from tom"
& 1
Message 1:
From tom@mail.galaxy.com  Sat Jul 12 04:54:18 2008
Date: Sat, 12 Jul 2008 04:51:38 -0400
From: tom@mail.galaxy.com
To: joy@mail.galaxy.com
Subject: test mail from tom
Cc: tom@mail.galaxy.com

he hello
test mail from tom
mail test 1

& x
You have mail in /var/spool/mail/joy

[joy@mail ~]$ exit
```

Configuration of Squirrelmail

Squirrelmail is used to integrate sendmail with front end interface so that a user can logging through browser.

Install all require packages for squirrelmail along with there dependency.

```
[root@mail ~]# yum  install  httpd*  perl-5*  php* curl*  dovecot*  cyrus* squirrelmail*  -y
```

NOTE : If some packages files are missing it is better to reinstall the packages by rpm command forcefully.

```
[root@mail ~]# mount      192.168.0.250:/var/ftp/pub/Server  /mnt/pkgs
[root@mail ~]# mount
[root@mail ~]# cd /mnt/pkgs
[root@mail mnt]# ls
[root@mail pkgs]# rpm      -ivh      httpd*  perl-5*  php*  curl*  dovecot*  cyrus*
                                     squirrelmail*     --force
```

Now start all required services.

```
[root@mail ~]# service  sendmail        restart
[root@mail ~]# service  httpd           restart

[root@mail ~]# service  dovecot         restart
OR
[root@mail ~]# service  cyrus-imapd     restart

[root@mail ~]# service  saslauthd       restart
```

Note : Do not start dovecot and cyrus-imapd service at same time.

Client Side Configuration

Step 1) Provide the IP OF DNS.

```
[root@client ~]# vi /etc/resolv.conf
        nameserver  192.168.0.Z
        wq!
```

Where Z is an ip of your DNS.

Step 2) Open the Browser and provide the following url.

http://mail.galaxy.com/webmail

or

http://<ip_mailserver/webmail>

Provide UserName & Password

Name	testuser
Password	testuser

NIS (Network Information Service)

Practical steps to configure NIS Server

Current NIS server IP is 192.168.0.X

Step 1) Check IP & Host Entries

```
[root@server ~]# ifconfig
[root@server ~]# netconfig
[root@server ~]# service network restart
[root@server ~]# ping 192.168.0.0 -b
```

Check permanent name

```
[root@server ~]# vi /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=nisserver.galaxy.com
NISDOMAIN=galaxy.com
:wq!
```

```
[root@server ~]# vi /etc/hosts
127.0.0.1        localhost.localdomain        localhost
192.168.0.X      nisserver.galaxy.com         nisserver
:wq!
```

Check temperory name which is actually used by running server.

```
[root@server ~]# hostname nisserver.galaxy.com
[root@server ~]# nisdomainname galaxy.com
[root@server ~]# gdm-restart
```

Step 2) Check & Install Packages.

Check the packages are installed or not by rpm/yum

```
[root@nisserver ~]# rpm -qa  | grep yp
```

OR

```
[root@nisserver ~]# yum list installed  | grep yp
```

Remove the packages of yp by rpm and old data if required

```
[root@nisserver ~]# yum remove yp*
[root@nisserver ~]# rm  –rf  /var/yp*
```

Install the packages

```
[root@nisserver ~]# yum install  yp*  -y
```

Step 3) Edit Main Configuration File

```
[root@nisserver ~]# vi /var/yp/Makefile
NOPUSH=true                    ## 23
all:  passwd group hosts \     ## 109

:wq!
```

Step 4) Start the service

```
[root@nisserver ~]# service ypserv restart
```

Step 5) Create NIS maps i.e NIS database

```
[root@nisserver ~]# /usr/lib/yp/ypinit        -m                    ## -m --> master
```

NOTE : NIS database is stored in /var/yp

Step 6) Start the service so that NIS database get's Activated

```
[root@nisserver ~]# service yppasswdd  restart
[root@nisserver ~]# service ypserv  restart
```

Step 7) Create new users

```
[root@nisserver ~]# useradd tom
[root@nisserver ~]# useradd joy
[root@nisserver ~]# passwd tom
[root@nisserver ~]# passwd joy
```

Step 8) If a new user/group/password's are created or modified, then the NIS database has to be manually updated.

NOTE : Go to /var/yp & run a command make

```
[root@nisserver ~]# cd /var/yp
[root@nisserver yp]# ls
```

To update nis maps i.e nis database.

```
[root@nisserver yp]# make
```

NOTE : If a database contents are modified then again restart services

```
[root@nisserver ~]# service ypserv restart
[root@nisserver ~]# service yppasswdd restart
```

<u>Configuration of NFS with NIS</u>

Nfs is configured with NIS to provide users home directory in client machine when they loggin.

```
[root@nisserver ~]# yum install nfs* -y

[root@nisserver ~]# vi /etc/exports
/home        192.168.0.0/24(rw,sync)
:wq!

[root@nisserver ~]# service nfs restart
[root@nisserver ~]# showmount -e 192.168.0.X          ## X is NFS servers IP
```

CLIENT SIDE CONFIGURATION

Step 1) Check IP & Host Entries

```
[root@nisclient ~]# ifconfig
[root@nisclient ~]# netconfig
[root@nisclient ~]# service network restart
[root@nisclient ~]# ping 192.168.0.0 -b
```

Check permanent name

```
[root@nisclient ~]# vi /etc/sysconfig/network
```

```
NETWORKING=yes
HOSTNAME=nisclient.galaxy.com
NISDOMAIN=galaxy.com
:wq!
```

```
[root@nisclient ~]# vi /etc/hosts
```

```
127.0.0.1        localhost.localdomain        localhost
192.168.0.y      nisclient.galaxy.com         nisclient
:wq!
```

Check temperory name which is actually used by running server.

```
[root@nisclient ~]# hostname  nisclient.galaxy.com
[root@nisclient ~]# nisdomainname galaxy.com
[root@nisclient ~]# gdm-restart
```

Step 2) Make the client Machine as Member of NIS-Server

[root@nisclient ~]# authconfig-tui

Select [*] Use NIS

[OK]

Select

Domain => galaxy.com

Server => 192.168.0.100

To check communication between nisclient with nisserver

[root@nisclient ~]# ypwhich

nisserver.galaxy.com

[root@nisclient ~]# mount 192.168.0.20:/home /home

[root@nisclient ~]#mount

Now log in as a NIS server user

[root@nisclient ~]# su - tom

[tom@nisclient ~]$ pwd

[tom@nisclient ~]$ ls

Configuration of DHCP SERVER

Practical steps to configure DHCP Server

Step 1) Check & Install the packages.

Install the packages.

```
[root@dhcpserver ~]# rpm -qa  dhcp-*
```

or

```
[root@dhcpserver ~]# yum list installed  dhcp-*
```

Remove the packages

```
[root@dhcpserver ~]# yum remove dhcp-* -y
```

Now Install the packages

```
[root@dhcpserver ~]# yum  install dhcp-* -y
```

Step 2) Copy the sample file to create a configurartion file

```
[root@dhcpserver ~]#cp   /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample   /etc/dhcpd.conf
```

Step 3) Edit Main Configuration File

Edit configuration file and change all required parameters as following.

[root@dhcpserver ~]# vi /etc/dhcpd.conf

```
4  subnet 192.168.0.0          netmask 255.255.255.0 {        # Network ID
7  option routers              192.168.0.254;                 # GateWay or Router IP
8  option subnet-mask          255.255.255.0;
10 option nis-domain           "galaxy.com";                  # NIS DOMAIN
11 option domain-name          "galaxy.com";                  # DNS DOMAIN
12 option domain-name-servers     192.168.0.1;                # DNS IP

21 range dynamic-bootp 192.168.0.150 192.168.0.170;           # Pool of IP

31 host nfs     {                                             # reservation of IP
32              option host-name  "nfs.galaxy.com";           # OR
33              hardware ethernet   aa:ab:56:78:AB:CD;                # Mac binding
34              fixed-address       192.168.0.10;
35                }
36 host smb {
37        option host-name "smb.galaxy.com";
38        hardware ethernet ad:ab:56:78:AB:CD;
39        fixed-address 192.168.0.15;
40              }
:wq
```

Step 4) Start the service.

```
[root@dhcpserver ~]# service dhcpd restart
```

Step 5) To Check main configuration file syntax errors.

```
[root@dhcpserver ~]# dhcpd
```

CLIENT SIDE CONFIGURATION

Step 1) Select the DHCP

Method 1) To get IP from DHCP use netconfig command.

```
[root@client ~]# netconfig
        Select
        [*] Use dynamic IP Configuration ( BOOTP/DHCP)
[root@client ~]# service network restart
[root@client ~]# ifconfig
```

Method 2) To get IP from DHCP use dhclient command.

```
[root@client ~]# dhclient  -r                    # -r -> release
[root@client ~]# dhclient
[root@client ~]# ifconfig
```

Step 3) Now Check all the Entries which are provided by dhcp server to client.

```
[root@client ~]# ifconfig                  # to now IP
[root@client ~]# route -nv                 # to check GateWay
[root@client ~]# cat /etc/resolv.conf      # to check DNS entries
[root@client ~]# nisdomainname             # to check NisDomainName
[root@client ~]# hostname                  # to check hostname
```

NOTE : ***Remove the HOSTNAME entry from /etc/sysconfig/network file in order to get the ip from DHCP Server, otherwise this name will get overridden which is coming from Dhcp server.***

```
[root@client ~]# vi /etc/sysconfig/network
NETWORKING=yes
:wq!
```

<u>Now Reboot the machine and check the entries.</u>

Configuration OF Webmin

Webmin is a GUI based tool to configure Linux System & Network Administration

Download the file from internet or copy from any source media in side /opt directory

[root@server ~]# cd /opt

[root@server opt]# ls

webmin-1.360.tar.gz

Now extract the tar webmin package.

[root@server opt]# tar -xvzf webmin-1.360.tar.gz

[root@server opt]# ls

webmin-1.360 webmin-1.360.tar.gz

Now go to webmin folder and run setup command to install.

[root@server opt]# cd webmin-1.360

[root@server opt]# ls

[root@server opt]# ./setup.sh

Select the default options & provide your web admin password

Now Open the Browser

[root@server opt]# firefox http://localhost:10000 &

provide username & password and start configuration in GUI Mode

To Change the admin passwd after webmin installation

[root@server opt]# cd webmin-1.360

[root@server webmin-1.360]# ./changepass.pl /etc/webmin/ admin admin

TO UNINSTALL WEBMIN

[root@server opt]#. /etc/webmin/uninstall.sh

Note : Put dot before the path of script file

Configuration Of Kickstart File

Kickstart file is used to install the OS at client machine without providing the entries which are asked during Installation of OS. Kickstart File should be created in the location where os is copied and can be accessed over the network.

In our scenario the kickstart file is on machine 192.168.0.100 and copy of CD or DVD is inside /var/ftp/pub

Step 1) Copy all *.rpms from DVD/CD's in a folder /var/ftp/pub/Server/

Step 2) Configure your machine as NFS, FTP & DHCP server.

Copy all rpms from DVD/CD's in a folder /var/ftp/pub/Server

Now install following packages.

```
[root@server ~]# yum install nfs*  vsftpd*  dhcpd*  *kickstart*  -y
```

Now share the all os files/folders .

```
[root@server ~]# vi /etc/exports
/var/ftp/pub        192.168.0.0/24(ro,async)
:wq!
```

Start all services.

```
[root@server ~]# service nfs restart
[root@server ~]# service vsftpd restart
[root@server ~]# service dhcpd restart
```

Make all service permanent on.

```
[root@server ~]# chkconfig nfs on
[root@server ~]# chkconfig vsftpd on
[root@server ~]# chkconfig dhcpd on
```

Step 3) Create the Kickstart File by using the following command.

```
[root@server ~]# system-config-kickstart &
```

Kickstart wizard will be opened then select the following options

Basic Configuration

Default Language => *English (USA)*

Keyboard => *U.S.english*

Time Zone => *Asia/Calcutta*

Root Password => *abc123*

Confirm Password => *abc123*

Installation Method

Perform new installation

Select the install method

Ftp

ftp Server => 192.168.0.250

Ftp Directory => /pub

Or

Nfs

Nfs Server => 192.168.0.100

Nfs Directory => /var/ftp/pub

Boot Loader Option

Install new boot loader

Partition information

Create the required partition

/boot = 100 MB

/ = 2000 M3

/usr = 4000 MB

/var = 1000 MB

/home = 1000 Mb

swap = Double of RAM

continues ....

Network Configuration

Select DHCP

Authentication

* Use shadow Passwords
* Use Md5

Firewall Configuration

Select Security Level => *Disable firewall*

Select SeLinux => *Disable*

Display Configuration

Select Configuration the X windows System

Color Depth = 24 Resolution 1024x768

Package Selection **(Select the following entries)**

Desktop Environment

Gnome Desktop

Application

Editors

Graphical Internet

Text-based Internet

Base System

Select All packages

Save the file at /var/ftp/pub where the of linux o/s is copied.

And give the the name as

ksftp.cfg

or

ksnfs.cfg

Step 4) Go to /var/ftp/pub and give execute permission to kickstart file

```
[root@server ~]# cd /var/ftp/pub
[root@server ~]# chmod +x  *.cfg
```

Client Side configuration

Step 1)

Set the BIOS first Bootable Device as CDROM. Where X is an IP os nfs/ftp server

Step 2)

Take Linux operating Bootable CD and Boot.

Step 3)

Now at the Boot prompt Type following Commands.

boot : linux ks=nfs:192.168.0.X:/var/ftp/pub/ksnfs.cfg

OR

boot : linux ks=ftp://192.168.0.X/pub/ksftp.cfg

Step 4)

Once the installation Starts Remove the Bootable CD/DVD.

And wait till the insallation is over.

PXE server configuration

Practicle step to implement pxe server

Step 1) Install the packages on dhcp server.

install pxe boot packages.

[root@server ~]# yum install tftp* xinetd* system-config-netboot* -y

Run this netboot tool..

[root@server ~]# system-config-netboot &

Operating system identifier	**→ galaxyos**
Select protocol for installation	**→ ftp**
Kickstart	**→ ftp://192.168.0.x/pub/ks.cfg**
Server ip address	**→ 192.168.0.X**
Location	**→ /pub**

ok.

Step 2) Add this code to dhcp server in global section.

Edit configuration file and change all required parameters as following.

[root@dhcpserver ~]# vi /etc/dhcpd.conf

```
4  subnet 192.168.0.0          netmask 255.255.255.0 {          # Network ID
[redacted]
7  option routers              192.168.0.254;                   # GateWay or Router IP
8  option subnet-mask          255.255.255.0;
10 option nis-domain           "galaxy.com";                    # NIS DOMAIN
11 option domain-name          "galaxy.com";                    # DNS DOMAIN
12 option domain-name-servers  192.168.0.1;                     # DNS IP
21 range dynamic-bootp 192.168.0.150 192.168.0.170;             # Pool of IP
:wq
```

Step 3) Put on tftp service and dhcp service.

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

See that tftp is on under xinetd service.

```
[root@server ~]# chkconfig  --list
[root@server ~]# service  xinetd restart
[root@server ~]# service  dhcpd restart
```

Client Side configuration

Set the first bootable device in BIOS as network card and restart the pc.

Configuration of iptables (Linux Firewalls)

Step 1) Check & Install the package

```
[root@firewall ~]# rpm -qa iptables*
                    OR
[root@firewall ~]# yum list installed iptables*
[root@firewall ~]# yum remove iptables* -y
[root@firewall ~]# yum install iptables* -y
```

Step 2) Start the Services

```
[root@firewall ~]# service iptables restart
```

To see the list of Rules in Filter Chain

```
[root@firewall ~]# iptables   -L
```

Step 3) Create the Rules of filter Table

Note : All key words are Case Sensitive

Example 1) To block the ping from system 192.168.0.23 to 192.168.0.24

```
[root@firewall ~]# iptables  -I  INPUT  -p  icmp  -s  192.168.0.23  -d  192.168.0.24  -j REJECT
[root@firewall ~]# iptables -L
```

Note : REJECT will give the Acknowledgement

Example 2) To block icmp packets.

```
[root@client1 ~]# ping 192.168.0.24
PING 192.168.0.24 (192.168.0.24) 56(84) bytes of data.
From 192.168.0.24 icmp_seq=1 Destination Port Unreachable
From 192.168.0.24 icmp_seq=2 Destination Port Unreachable

[root@firewall ~]# iptables -I INPUT -p icmp -s 192.168.0.23 -d 192.168.0.24 -j DROP
```

Note : *DROP will not give the Acknowledgement*

```
[root@client1 ~]# ping 192.168.0.24
PING 192.168.0.24 (192.168.0.24) 56(84) bytes of data.
```

To clear all rules i.e to flush

```
[root@firewall ~]# iptables -F
```

Example 3) To block ftp service

```
[root@client23 ~]# ftp 192.168.0.24
Connected to 192.168.0.24.
220 (vsFTPd 2.0.5)
530 Please login with USER and PASS.
530 Please login with USER and PASS.
KERBEROS_V4 rejected as an authentication type
Name (192.168.0.24:root): ftp
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 (192,168,0,24,187,117)
150 Here comes the directory listing.
drwxr-xr-x    2 0        0            4096 Jan 17  2007 pub
226 Directory send OK.
ftp> bye
221 Goodbye.
```

To block the ftp client from system 192.168.0.23 to ftp server 192.168.0.24

```
[root@firewall ~]# iptables -I INPUT -p tcp -s 192.168.0.23 -d 192.168.0.24 --dport 21 -j
REJECT

[root@client23 ~]# ftp 192.168.0.24
ftp: connect: Connection refused
ftp> ls
Not connected.
ftp>
```

SELinux

Practicle steps to implement SElinux

Step 1) Install selinux packages

[root@ selinux ~]# yum install *selinux* -y

Step 2) Now keep the o/s in permissive mode.

[root@ selinux ~]# system-config-security &

Select permissive tag.

Step 3) Now reboot the machine while restarting it generates database of selinux policies.

[root@ selinux ~]# init 6

Step 4) After rebooting loging as root and run following commands.

To get the status of SELinux use getenforce.

```
[root@selinux ~]# getenforce

Enforcing
```

To change the status of SELinux use setenforce

```
[root@selinux ~]# setenforce

usage:  setenforce [ Enforcing | Permissive | 1 | 0 ]

[root@selinux ~]# setenforce Permissive

[root@selinux ~]# getenforce
Permissive
```

To view all the booleans

```
[root@selinux ~]# getsebool -a
```

To set a Booleans value

```
[root@selinux ~]# setsebool -P allow_ftpd_anon_write 1

-P overrides defaults.

[root@selinux ~]# getsebool -a |grep allow_ftpd_anon_write

allow_ftpd_anon_write --> on

[root@selinux ~]# setsebool -P allow_ftpd_anon_write 0

[root@selinux ~]# getsebool -a |grep allow_ftpd_anon_write

allow_ftpd_anon_write --> off
```

Enabling or disabling selinux at boot time

In kernel line while booting pass parameter

```
selinux=0 – disable
selinux=1 – enable
```

Checking the logs of denied programs

#sealert –b

Checking the status of curent policy

#seinfo

Configuration of Virtualization Server

Practicle steps to configure virtualization.

Step 1) Install the packages.

[root@virtualserver ~]# yum install xen* virt-manager* kernel-xen* -y

Step 2) Restart the machine and boot from Xen kernel option from the GRUB screen.

Step 3) After rebooting run this command to install virtual operating system.

[root@virtualserver ~]# virt-manager &

Select Xen host

Domain-0 Will be displayed on screen

Creating a new virtual system

forward

Naming your virtual system

System Name => vm1

Choosing a virtual method

(select) paravirtualized

Or

Full virtualization

Provide the path for installation server or media path

Install Media => ftp://192.168.0.250/pub

Forward

Kickstart URL => ftp://192.168.0.250/pub/ksftp.cfg

Select the storage space

Partition => /dev/hda12

forward

Allocate memory and Cpu

VM Max Memory (MB) => 200

VM Startup Memory (MB) => 200

Please enter the number of virtual CPU's this VM

VCPUs => 1

Read the Summary if correct procceed or repeat

finish

Choose the password for new keyring

Now the intallation will start & u will get the boot screen

Step 4) After Installation Start the Virtual machine.

To start the virtual machine execute the following command.

[root@virtualserver ~]# xm create vm1

```
Using config file "/etc/xen/vm1".
Going to boot Linux Server (2.6.18-8.el5xen)
kernel: /vmlinuz-2.6.18-8.el5xen
initrd: /initrd-2.6.18-8.el5xen.img
Started domain vm1
```

Step 5) To see the status use this GUI tool

[root@virtualserver ~]# virt-manager &

Step 6) To shutdown virtual machine

[root@virtualserver ~]# xm shutdown vm1

Comparison Between Fedora and Ubuntu Linux.

It is easy to apply your existing knowledge of Fedora to Ubuntu. The key differences between them are covered in this article.

Operating System	**Fedora**	**Ubuntu**
Minimum Hardware Requirement	i386, ppc, x86_64, Sparc (via Aurora Project), alpha (via AlphaCore)	AMD64, i386
Supported architecture	For text mode: 200 MHz Pentium-class, 64MB RAM, 620MB HDD For graphical mode: 400 MHz Pentium-class, 192MB RAM, 620MB HDD	For text-mode: 192 MB RAM, 4 MB hard dr For graphical-mode: 256 MB RA preferable at least 2 GB HDD
Basic Commands & Vi	Same	Same
User & group Administration	UPG scheme Uid=Min_uid and group uid=500 Home_dir=Automatically get's created "/home/username"	UPG scheme Uid=Min_uid and group uid=1000 "-m" option is used to Create user's home dir
useradd, usermod, userdel, groupadd, groupmod, groupdel	Same	Same
User's & Group database File **/etc/passwd** **/etc/shadow** **/etc/group**	Same	Same

Basic File Permission **chmod, chown, chgrp**	Same	Same
Partition **Default file system** **ext2,ext3,vfat,swap** **fdisk** **/etc/fstab** **Mount**	Same	Same
ACL	Same	Same
Quota	Same	Same
Suid **sgid** **Sticky bit**	Same	Same
Links	Same	Same
Raid mdadm	Same	Same
LVM	Same	Same
Backup & Recovery **tar, cpio & dump**	Same	Same
Package Administration **Repository**	rpm Yum /etc/yum.repo/core	rpm Apt-get /etc/apt/source.list

Install a package file	yum install *package.rpm* rpm -i *package.rpm*	dpkg --install *package.deb*
Remove a package	rpm -e *package_name*	apt-get remove *package_name*
Show available packages	yum list available	apt-cache dumpavail
List all installed packages	yum list installed rpm -qa	dpkg –list
List files in a package file	rpm -qpl *package.rpm*	dpkg --contents *package.deb*
service	chkconfig <service> start/stop/restart	/etc/init.d/<service> tart/stop/restart

Fedora & Ubuntu Network Administration

	Fedora	Ubuntu
Assigning IP Address		
ifconfig	Same	Same
Permanent	netconfig	vi /etc/network/interface auto eth0 iface eth0 inet dhcp address 192.168.0.x netmask 255.255.255.0 gateway 192.168.0.x :wq
1.NFS Server		
1)Required Package	nfs*	nfs*
2)Configuration file	/etc/exports	/etc/exports
3)service	Nfs	nfs-kernel-server
2.FTP Server		
1)Required Package	vsftpd*	vsftpd*
2)Configuration file	/etc/vsftpd/vsftpd.conf	/etc/vsftpd.conf
3)service	vsftpd	vsftpd /home/ftp/pub
3.SAMBA Server		
1)Required Package	samba*	samba*
2)Configuration file	/etc/samba/smb.conf	/etc/samba/smb.conf
3)service	smb	samba
4.DNS Server		
1)Required Package	bind* cach*	bind9*
2)Configuration file	/etc/named.caching-	/etc/bind/named.conf
3)service	nameserver	

	/etc/named.rfc1912.zones /var/named/chroot/var/named localhost.zone named.local named	 /etc/bind Db.O Db.127 bind9
5.Web Server **1)Required Package** **2)Configuration file** **3)service**	 httpd* /etc/httpd/conf/httpd.conf httpd	 apache2* /etc/apache2/apache2.conf apache2
6.Mail Server **1)Required Package** **2)Configuration file** **3)service**	 sendmail* /etc/mail/sendmail.mc /etc/mail/sendmail.cf sendmail	 postfix* To configure run command dpkg-reconfigure postfix /etc/postfix/main.mc postfix
7.Squid Server **1)Required Package** **2)Configuration file** **3)service**	 squid* /etc/squid/squid.conf squid	 squid* /etc/squid/squid.conf Squid
8.Nis Server **1)Required Package** **2)Configuration file**	 yp* /var/yp/Makefile	 nis* /var/yp/Makefile

3)service	Ypserv yppasswdd	nis
9.DHCP Server **1)Required Package** **2)Configuration file** **3)service**	 dhcp* /etc/dhcpd.conf dhcpd	 dhcp* /etc/dhcp3/dhcpd.conf dhcp3-server

Comparison Between Fedora and Suse Linux

System Administration

Apply your existing knowledge of Fedora to suse. The key differences between them are covered in this article.

Operating System	Fedora	Suse Linux
Minimum Hardware Requirement	For text mode: 200 MHz Pentium-class, 64MB RAM, 620MB HDD For graphical mode: 400 MHz Pentium-class, 192MB RAM, 620MB HDD	For text mode: 200 MHz Pentium-class, 64MB RAM, 620MB HDD For graphical mode: 400 MHz Pentium-class, 192MB RAM, 620MB HDD
Supported architecture	i386, ppc, x86_64, sparc (via Aurora Project), alpha (via AlphaCore	i586, x86_64, ppc
Basic Commands & Vi	Same	Same
User & group Administration	UPG scheme Uid=Min_uid and group uid=500 Home_dir=Automatically get's created "/home/username"	General Linux scheme Min uid & gid starts from 1000 "-m" option is used to create user's home dir
Useradd,usermod,userdel,groupadd Groupmod,groupdel	Same	Same Same

User's & Group database File **/etc/passwd** **/etc/shadow** **/etc/group**	Same	
Basic File Permission **chmod, chown, chgrp**	Same	Same
Partition **Default file system** **ext2, ext3, vfat, swap** **fdisk** **/etc/fstab** **Mount**	ext3 Same	reiserfs Same
ACL	Same	Same
Quota	Same	Same
suid, sgid **Sticky bit**	Same	Same
Links	Same	Same
Raid	Same	Same

LVM	Same	Same
Backup & Recovery	Same	Same
Package Administration RPM	Same Yum	Same yast2

FEDORA AND SUSE NETWORK ADMINISTRATION

		Suse
Assigning ip Address		
ifconfig	Same	Same
Permanent	netconfig	Yast2 lan &
1.NFS Server		
1)Required Package	nfs*	nfs*
2)Configuration file	/etc/exports	/etc/exports
3)service	Nfs	nfsserver
2.FTP Server		
1)Required Package	vsftpd*	vsftpd*
2)Configuration file	/etc/vsftpd/vsftpd.conf	/etc/vsftpd.conf
3)service	vsftpd	vsftpd /srv/ftp/pub
3.SAMBA Server		
1)Required Package	samba*	samba*
2)Configuration file	/etc/samba/smb.conf	/etc/samba/smb.conf
3)service	smb	smb
4.DNS Server		
1)Required Package	bind* cach*	bind*
2)Configuration file	/etc/named.caching-nameserver	/etc/named.conf
3)service	/etc/named.rfc1912.zones /var/named/chroot/var/named localhost.zone named.local	/var/lib/named localhost.zone 127.0.0.zone

5.Web Server **1)Required Package** **2)Configuration file** **3)service**	 httpd* /etc/httpd/conf/httpd.conf httpd	 apache2* /etc/apache2/httpd.conf apache2
6.Mail Server **1)Required Package** **2)Configuration file** **3)service**	 sendmail* /etc/mail/sendmail.mc /etc/mail/sendmail.cf	 sendmail* /etc/mail/linux.mc /etc/sendmail.cf
7.Squid Server **1)Required Package** **2)Configuration file** **3)service**	 squid* /etc/squid/squid.conf squid	 squid* /etc/squid/squid.conf squid
8.NIS Server **1)Required Package** **2)Configuration file** **3)service**	 yp* /var/yp/Makefile ypserv yppasswdd	 yp* /var/yp/Makefile ypserv
9.DHCP Server **1)Required Package** **2)Configuration file** **3)service**	 dhcp* /etc/dhcpd.conf dhcpd	 dhcp* /etc/dhcpd.conf dhcpd

Comparison Between Fedora And Solaris .

SYSTEM ADMINISTRATION

Apply your existing knowledge of Fedora on Solaris. The key differences between them are covered in this article.

Operating System	**Fedora**	**Solaris**
Basic Command	Same	Same
User & Group Administration	**'UPG'** scheme is there for normal user. **'UID'** Min_uid=500 **'GID'** Min_gid=500 **HOME_DIR** /home/username	General SOE scheme is followed. **'UID'** Min_uid=100 **'GID'** Min_gid=100 **'-m'** Option is used for Creating user's home directory. Default Location = **/export/home**
useradd,usermod & userdel. **groupadd,groupmod & groupdel.**	Same.	Same.
User's & group's database file's. **➔ /etc/passwd.** **➔ /etc/shadow.** **➔ /etc/group.**	Same.	Same
Basic File Permissions, & Commands **chown,chmod** & chgrp.	Same.	Same.

Partitioning Commands	fdisk & parted.	Format.
Default file systems	ext2 ext3 vfat & swap.	ufs lofs hsfs & swap.
Permenent mounting file's	➔ /etc/fstab ➔ /etc/mtab	➔ /etc/vfstab ➔ /etc/mnttab
Mount	Same.	Same.
Acl	setfacl. getfacl	setfacl. getfacl
Quotas **Commands** **Quotacheck, quotaon,** **Quotaoff & edquota**	Support should be given while mounting. Same.	Touch a file with 'quotas' Under the same file system. Same.
Advanced file permission's **Sticky bit, SUID, SGID**	Same.	Same.
Links	Same.	Same.
RAID	mdadm.	Metainit metaattach metadb & metadetach.
LVM	Lvm.	growfs & svm
Backup & Restore		

tar, cpio	Same. dump.	Same. ufsdump.
Package Administration.	Commands. rpm yum	Commands. pkgadd. → to install pgkrm. → to remove a package . pkginfo → to get info of packages. pkgchk. →to check the packages
To check & start the Service's	chkconfig --list service named restart chkconfig named on	ls /etc/init.d or svcs svcadm enable/disable svc:/network/dns/server.default

Comparision Between Fedora And Solaris

Network Administration

Apply your existing knowledge of fedora Linux and Solaris.

The key differences between them are covered in this article.

Operating System	**Fedora Linux**	**Solaris**
Assigning ip-address **ifconfig** **Database files** **/etc/host** **Hostname**	 Same. Same. /etc/sysconfig/network	 Same. Same. /etc/nodenames
1.NFS Server **1)Required Package** **2)Configuration file** **3)service**	 nfs-utils,portmap. /etc/exports. nfs & portmap.	 Defaulty it comes with 'SOE'. /etc/dfs/dfstab. /etc/inet.d/nfs.server
2.FTP Server **1)Required Package** **2)Configuration file** **3)service**	vsftpd /etc/vsftpd/vsftpd.conf vsftpd	SUNWftpr, SUNWftpu SUNWftpur /etc/ftpd/ftpaccess ftp.default
3.SAMBA Server **1)Required Package** **2)Configuration file** **3)service**	 Samba, samba-common, samba-client , samba-client /etc/samba/smb.conf Smb	 SUNWsmbaS, SUNWsmbac SUNWsmbau, SUNWsmbar /etc/sfw/smb.conf samba

4.DNS Server	bind*	SUNWbind, SUNWbindr
1)Required Package	caching*	SUNWbindS, SUNWbinutils SUNWbinutilsS.
2)Configuration file	/etc/named.caching- nameserver.conf /etc/named-rfc1912.zones	/etc/named.conf
Zone files	/var/named/chroot/var/named	/var/named
3)service	named	server.dns server.client
5.WEB Server		
1)Required Package	httpd, httpd-devel, httpd-manual	SUNWapchs, SUNWapchd SUNWapchr, SUNWapcu
2)Configuration file	/etc/httpd/httpd.conf /var/www/html	/etc/apache/httpd.conf
DataBase files		/var/apache/htdocs
3)service	httpd	apache
6.MAIL Server		
1)Required Package	sendmail, sendmail-devel sendmail-cf, sendmail-doc	Defaultly get installed by Operating system
2)Configuration file	/etc/mail/sendmail.mc /etc/mail/sendmail.cf	/etc/mail/main.mc /etc/mail/sendmail.cf
3) Service	sendmail	sendmail
7.DHCP Server		
1)Required Package	dhcpd, dhcpd-devel	SUNWdhcm, SUNWdhcsb SUNWdhcsr, SUNWdhcsu
2)Configuration file	/etc/dhcpd.conf	Gui-Tool svm & dhcpmgr
3)service	dhcpd	dhcp

Oracle 10g Installation

Oracle 10g Installation guide for Red Hat Enterprise Linux ES/AS 5 (x86)

Changing the Red Hat Release

As RHEL5 has been released after Oracle 10g was, Oracle 10g does not support RHEL5 logically. The latest version 10g supports in RHEL4. So we have to get round it by changing the release configuration file:

```
echo "rhel4" > /etc/redhat-release
```

Disk Partitions

100MB	ext3	/boot
9GB	ext3	/
6GB	ext3	/var
6GB	ext3	/usr
6GB	ext3	/home
1GB	Swap Partition	

The following packages (or higher versions) must be installed

gcc-3.2.3-2 or higher

make-3.79

binutils-2.11

openmotif-2.2.2-16

setarch-1.3-1

compat-db-4.0.14.5

compat-gcc-7.3-2.96.122

compat-gcc-c++-7.3-2.96.122

compat-libstdc++-7.3-2.96.122

compat-libstdc++-devel-7.3-2.96.122

Create the Oracle user and groups

groupadd oinstall

groupadd dba

useradd -g oinstall -G dba oracle

passwd oracle

Creat Directories

mkdir -p /u01/app/oracle

chown -R oracle:oinstall /u01/app/oracle

Change the directory permission to 775

chmod -R 775 /u01/app/oracle

Specify the values in the /etc/sysctl.conf file, they persist when you reboot the system

kernel.shmall = 2097152

kernel.shmmax = 2147483648

kernel.shmmni = 4096

kernel.sem = 250 32000 100 128

fs.file-max = 65536

net.ipv4.ip_local_port_range = 1024 65000

Increase the shell limits

Add the following lines to /etc/security/limits.conf file:

```
*        soft   nproc   2047
*        hard   nproc   16384
*        soft   nofile  1024
*        hard   nofile  65536
```

Add the following line to the file /etc/pam.d/login , if it does not exist:

```
session   required    /lib/security/pam_limits.so
```

Add these lines to export path in the file /etc/profile

export ORACLE_BASE=/u01/app/oracle

export ORACLE_SID=dba

export ORACLE_HOME=/u01/app/oracle/product/10.1.0/db_1

export
LD_LIBRARY_PATH=$ORACLE_HOME/lib:$ORACLE_HOME/perl/lib/5.6.1:$ORACLE_HOME/ctx/lib

export
PATH=:$ORACLE_HOME/bin:$ORACLE_HOME/perl/bin:$ORACLE_HOME/perl/lib/5.6.1:$ORACLE_HOME/ldap/odi/bin:$ORACLE_HOME/opmn/bin:$ORACLE_HOME/dcm/bin:/usr/local/bin:/usr/openwin/bin:/usr/local/j2sdk1.4.2/bin:$PATH

Now login as oracle user and issue the commands to start installation.

$ ORACLE_BASE=/u01/app/oracle

$ ORACLE_SID=dba

$ export ORACLE_BASE ORACLE_SID

$ unset ORACLE_HOME

$ unset TNS_ADMIN

$ /mnt/cdrom/./runInstaller

To enable communication between oracle server and client, sample tnsnames.ors file

```
# TNSNAMES.ORA Network Configuration File

# Generated by Oracle configuration tools.

galaxy =

(DESCRIPTION =

(ADDRESS_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = station12)(PORT = 1521))

)

(CONNECT_DATA =

(SID = dba)

(SERVER = DEDICATED)

)

)

server1 =

(DESCRIPTION =

(ADDRESS_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1)(PORT = 1521))

)

(CONNECT_DATA =

(SERVER = DEDICATED)
```

```
(SERVICE_NAME = dba2)

)

)

INST1_HTTP =

(DESCRIPTION =

(ADDRESS_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = station12)(PORT = 1521))

)

(CONNECT_DATA =

(SERVER = SHARED)

(SERVICE_NAME = MODOSE)

(PRESENTATION = http://HRService)

)

)

EXTPROC_CONNECTION_DATA =

(DESCRIPTION =

(ADDRESS_LIST =

(ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC0))

)

(CONNECT_DATA =

(SID = PLSExtProc)
```