

Linux

Basic Command

- 1) To check the present working directory (PWD)

root@...: # pwd

Result = ... /root

- 2) To see the list of files and directories (The current directory by default)

(root@localhost ~) # ls

Result = ...

- 3) To see the long list (properties) of file and directory

ls -l (or) # ll.

Result = ...

- 4) To see the list of files/folders including hidden also.

ls -a.

- 5) To see a file starting from letter D

ls D*

- 6) To see a file or folder whose length is of 6 characters; where ? is used to match any single character.

ls -d ??????

"No real change in history has ever been achieved by discussions." —Subhash Chandra Bose

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7) To create a text file by using cat command
cat > file1

hi how are you, how is your linux session
ctrl+d (to save).

8) To see an existing file contents

cat file1

9) To append an existing file.

cat >> file1

They are good.

ctrl+d (to save)

Verification :- hi how are you

They are good.

10) To create file by using touch command

touch MCA cloud CCNA "IIHT jaipur"

verification :- creates multiple file at a time

11) Creating a single directory.

mkdir 80815 @ IIHT

12) Create multiple directories.

mkdir linux Redhat RHCE

13) To create nested directory along with child directories.

mkdir -P linux/redhat/IIHT/JCIPW/

"It is the prime responsibility of every citizen to feel that his country." — Sardar Vallabhbhai Patel

mkdir -P linux/tech/redhat/RHCE/RHCS

14) To see the tree structure

ls -R linuxtech @ linuxredhat.

15) To change a directory. (Navigation between directories)

cd linuxredhat/HT/Tajpur

Verification # pwd

[root@localhost HT]# pwd

16 To move 1 step back

cd ..

Verification # pwd

17 To move 2 step back.

cd ../../

18 To go directly to use home directory

cd ~

19 To go to last working directory.

cd -

20 To remove files

rm * HT Tajpur

rm Redhat cloud

21 To remove an empty directory

rmdir linux

22) To remove a directory along with all sub directories and files forcefully.

rm -rf /linux/redhat

23)

History of linux

In 1969 Four programmer Ken Thompson, Dennis Ritchie, Rudd Canady & Doug McElroy made a program in Bell labs which does not have any name in year 1960.

Brian Kernighan checked that program on 1st January 1970 (epoch time), First OS.

That time, program was written in Assembly language

In 1972 ; a programmer Dennis Ritchie started converting this program in C language

In 1973 Unix in C language.

1980 - Berkeley software Development (a part of research program of Berkeley University). Launched Open BSD (a small program written in a single floppy).

Paul Allen and Bill Gates are the employees of Bell labs.

In 1981 , they both started Microsoft with 9 more candidates and they gave a program named Xenix (1980) but it was flopped

In 1981 - Launched MS-DOS 1.0

On 1981 - Unix open source.

In 1985 - First Graphical Based OS win 1.0

In 1991 - Linus Benedict Torvalds; BTech
3rd year computer science, 23 year old.
Student of University of Helsinki.

(Finland) made kernel (25th August 1991)

In 1995 - Redhat (company (collection of
Linux sets) came into existence 99%
Servers of Linux till 2001.

Linux Principle

Everything is a file

Small, single purpose programmes

Ability captive user interface.

Configuration data stored in text.

Linux Directory Structure

/home - user home (All user folders)

/bin - Command (User Executable & Script)

/usr/bin (root)

/sbin root privileged command.

/usr/local/bin commands which we make
for our use.

/etc System Configuration files

/root root (Admin) Data (Home not dirs)

/mnt for mounting any external device

/dev devices (hdd, CD-Rom, Pendrive etc)

/var server data

"No real change in history has ever been achieved by discussions." — Subhash Chandra Bose

/var - store variable data file such as printer
Jobs, mail-box etc

/boot	- linux boot file
/sys	- system information
/lib	- library files stored
/proc	- virtual file system
/tmp	- temporary files
/var	- variable file (database logs)
/opt	- add on application software

linux Basic Commands

1) Directory Command

mkdir - For creating directory

cd - change Directory

cd .. - to come out from working Dir

rmdir - remove Directory

2) File commands

touch <filename> - Create a blank file

cat > filename - Create a file and

for saving file (ctrl+D)

cat - To see content of the file

cat file1 >> file2 - to move file1 matter in file2

cat -n filename - to see how many lines are written in that file.

3) Command for deleting

rm filename - delete a file

rm -i - delete file/folder interactive mode

rm -r - delete Directory

rm -f - delete file/folders forcefully

"It is the prime responsibility of every citizen to feel that his country." —Sardar Vallabhbhai Patel

rm -rf - delete including sub-directories

rmdir - delete an empty directory

d) Help commands

whatis <command>

man <command>

info <command>

<command> --help

which <command>

cd /usr/share/doc

e) Rename and move

~~rename~~ mv <oldfile> <newfile>~~move~~ mv <filename> <where we have to move to the file>.

f) listing Commands

ls listed files/folder

ls -l long list

ls -a hidden also

ls ?? 3-character

ls m* started with letter m.

ls -R from all sub-directories

g) Copy

cp -(s) (d) copying file from S to D

cp -i (s) (d) .. marking mode

cp -it (dest) all data to destination

cp -r (directory name) (dest)

8) Editor in linux

nano

vi

Vim

gvim

gedit

Emacs

Some Basic Command

Power off -f

halt -n -p These commands are used to turn off computer.

init 0

init 6 → restart computer

reboot

startx . Switch from command to graphic mode

init 5 Restart system from command mode to graphic mode

history . history of recent command

history -c . clear the history . " "

cat > /etc/issue . To create logoff script

cat > /etc/motd . To create login script

cal YYYY or mm YYYY . to see calendar

bc . starts basic calculator.

who am i or # w . User we logged on.

adduser <username> . To create user

Whoami

passwd <username> give password to user
 # userdel <username> delete user
 # usermod -L <username> lock a user account
 # usermod -U <username> unlock ,,,
 # passwd -d <username> remove password.
 # cd ~ Switch directly to user's home directory
 # head <filename> To see top 10 line of file
 # head-n16 <filename> top 16 line of file.
 # tail <filename> bottom 10 line of file
 # tail-n16 <filename> bottom 16 line of file.
 # evince <filename.pdf> To open a pdf file
 (only on graphical terminal)
 # sort <filename> sort file in a-z format
 # sort -d <filenames> sort file in directory format.
 # sort -r <filenames> sort file in z-a format
 # sort -t: -k 3 3 -n/r/u <filename>
 Sort the file according to given delimiter
 (n=numeric ; r=descending , u=removes duplicates)



A Linux system is basically divided in three major components. File System (F.S) shell and kernel.

Kernel is the core program which manages system hardware devices.
Shell provides user interface to run the commands.

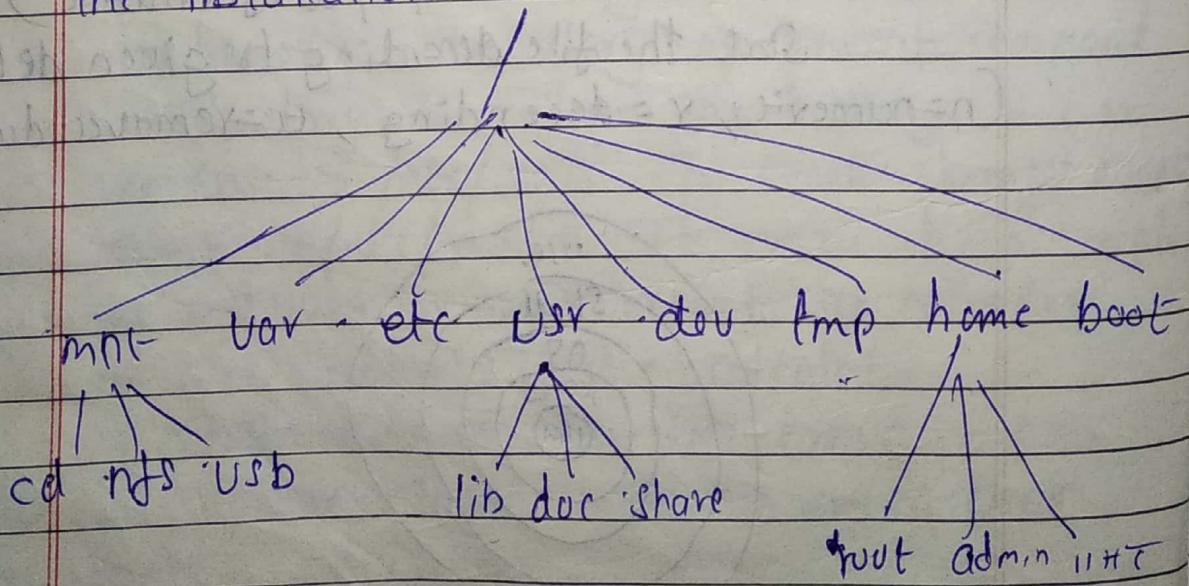
①

Linux File System (F.S)

Linux access every object as file.
Linux starts file system with root directory (/).

System Directories

System directories contain files, software applications, and scripts which are required to run and maintain the Linux. System directories are automatically created during the installation.



linux file naming convention.

A linux file name may have any characters or letter.

Maximum length for file name is 256 characters

File name can use space, underscore minus, period and comma.

File name cannot use question marks asterisks and slashes.

File extension is not compulsory.

To create a hidden file, start its name with dot

If file name has spaces, it need to be quoted before we can access it on command prompt

(2) Shell

shell is a command interpreter.

it take commands from user, execute them and display the results, shell supports .

I/O redirection which means it can read commands from non-standard sources such as scripts files, as well as it can also redirect output to any supportive device (such as printer) or data server.

Several shells are available in Linux such as korn, TCSH, Z shell, Bash etc

Bash (Bourne Again Shell) shell is the default shell in Redhat Linux

`cat ./etc/shells` All available shells

`chsh -l` " "

`echo $0` current shell name

`exec /bin/csh` To change current shell temporary, At next login default shell will be restored

`chsh -s /bin/csh` To change current shell permanently, (at next login)

To view the current shell

`# echo $0`

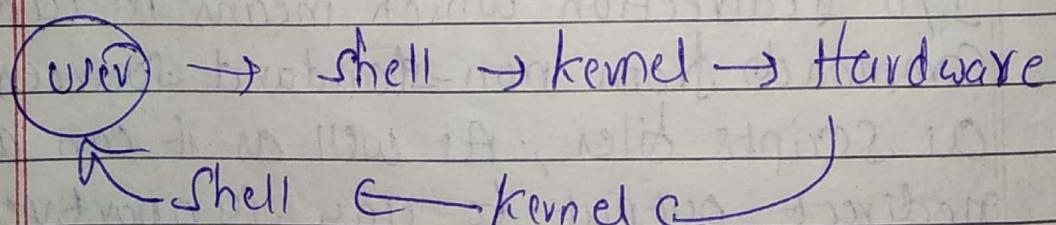
-bash (current shell)

`# cat ./etc/shells` → (available shells list)

`chsh -l`

3) kernel

kernel is the core application in linux OS, It communicates directly with system devices such as memory, CPU, CDROM etc



kernel name provides information about its version, kernel version number is built from four segments, : major, minor revision and security / bug fix

- a) Major number → This number reflects major changes in kernel.
- b) minor number → This number reflects a minor revision in kernel
- c) Revision number → This number reflects that new supporting features are added in kernel
- d) security/Bug number: This number reflects security or bug fix in kernel

kernel development is an ongoing process; Development versions will first available as release candidate (RC), RC are intended for developers, RC allows developers to test new features of kernel before final version is released.
example - kernel-2.6.22-rc3.

kernel is an open source project, Distributors are allowed to make changes in kernel. If distributor makes any changes in kernel, he will add a patch number in the end of the name, Beside patch number, distributors may add platform number.

`rpm -q kernel` kernel package is installed

~~uname -r~~ uname -r kernel version number

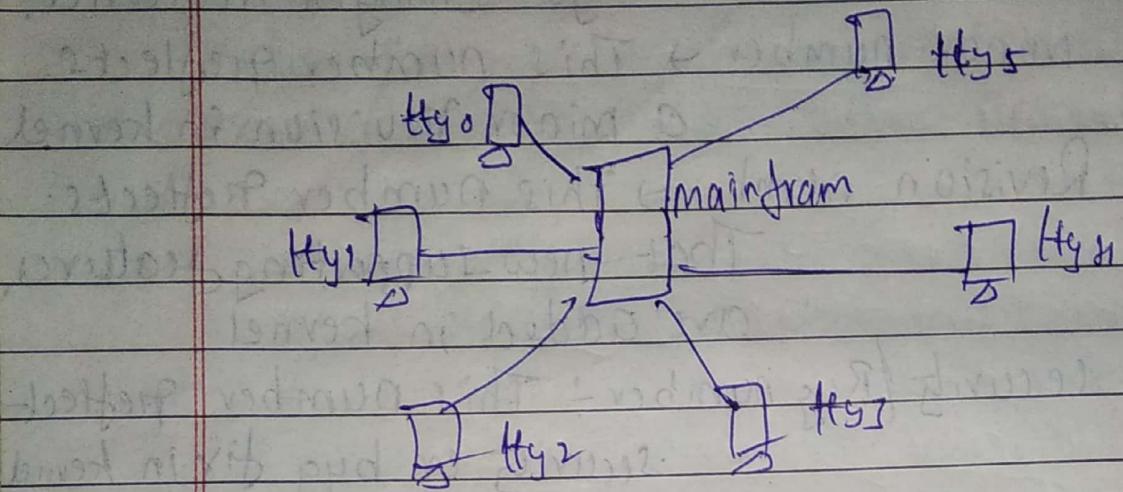
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5.10.0-327.e17.x86_64
major minor revision security/bug

Platform number added by distributor

linux virtual Console (Terminal)



Terminal connects with mainframe computer on serial console port. Once connected it uses all resources such as CPU, RAM and Harddisk from mainframe computer. The earliest terminal were also known as teletypes (TTY) → Tele Typewriter

Alt + ctrl + F1

Graphic mode

tty0

+ F2

Text-only

tty1

F3

tty2

F4

tty3

F5

tty4

F6

tty5

who .. who is logged in currently user name and mode display

Bash shell

Shell is the program which accept command from user, execute them in system and display the result back to the user. It provides command prompt and working environment in Linux. Default shell in RHEL is bash (GNU Bourne-Again Shell) which is the improved version of Bourne shell (sh).

regular user it ends with \$ character
Super user it ends with # character

Linux command type

When we types any command in shell prompt, before executing it shell determines what type of command.

Shell divides a command in following types,

Based on location

Internal: command which are integrated in shell

External: command which are stored in hard disk.

type -t pwd
built-in ← Internal command.

type -t cat
file ← External command.

which cat.

Chitra /bin/cat ← location where execution file of this command is stored
"No real change in history has been achieved by man." - Julian Assange

echo \$path ← search for executable files

Based on Privilege.

Non-privileged commands: These commands are available for both user accounts regular and root.

Privileged command: These commands are available only for root (super user) account.

Linux command syntax

Command

Command is the link of an executable file; When we hit enter key after entering any keyword at shell prompt; shell finds the associated executable file in specified location. If shell find the file, it will execute ~~the~~ otherwise it will return with an error message "Command not found"

Options

ls no option command only

ls -l : Single option

ls -l -a multiple option Separately

ls -la multiple option combinedly

ls -help Invalid option

ls -h Invalid option

ls --help Valid option

Argument

Argument is the keyword which specify the target where command will perform the action.

A command may accept single, multiple or no argument.

ls • Command without any argument

ls / • Command with argument

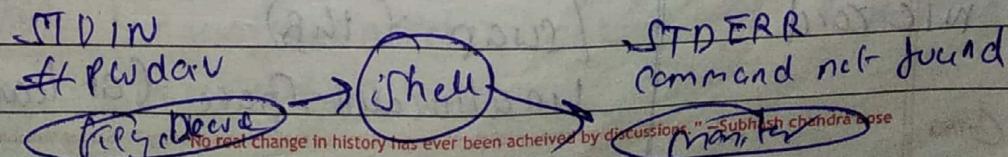
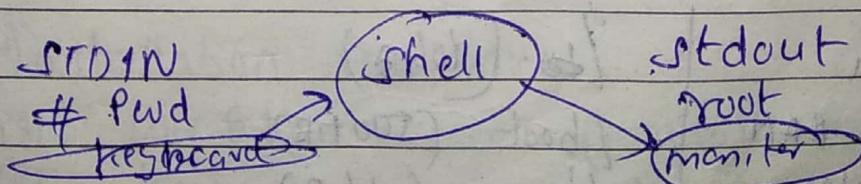
ls -l / • Command with single option and argument

ls --hide=bin / • Command with word option and argument

ls --hide=bin -l / • Command with single letter option, word and argument

Input/output argument (I/O)

File Desc	Name	Dataflow	Default Device
0	STDIN (// in .)	<	keyboard
1	STDOUT (// out.)	>	monitor
2	STDERR (standard error)	>	monitor



```

# ls           STDIN
# ls > test    STDIN (create file)
# cat test     STDIN
STDIN          # echo "this text will overwrite existing"
STDIN          # echo "This text will overwrite existing" > test
STDIN          # cat cat test
STDIN          # echo "This text will append" >> test
STDIN          # cat < test STDIN except content from file

```

Pipes in Linux

Pipes make I/O redirection more flexible
 It allows us to redirect the output of one command to other command as input
 Shell allows us to combine multiple commands using pipes. To combine command use Pipe(|) sign between them.

```

# cat test - without pipe
# cat test | wc - with pipe.

```

minimum

512 MB RAM

8 GB HDD

NIC card

/root (10GB)

/boot (500MB)

/home (1GB)

/swap (1GB)

Unallocated Space (at least 2GB)

Install RHEL 7

a)

On First screen we have three option.

- 1) Install Red Hat Enterprise Linux 7-x
 - 2) Test this media & install Redhat Enterprise Linux
 - (1) Troubleshooting = This option contain four sub
- a) Install Redhat Enterprise Linux 7 in basic graphic mode
 - b) Rescue a Redhat Ent Linux System.
(Repair the existing RHEL system)
 - c) Run a memory test
 - d) Boot from local drive

kernel boot option: By default this option is not listed here, to get this option we have to press the Tab key.

RHEL User Anaconda installer program.
~~for installation.~~

b)

language and keyboard setting.

c)

Installation summary.

- | | |
|--------------------------|------------------------|
| (i) Date & time | (v) Software Selection |
| (ii) Keyboard | (vi) Installation Path |
| (iii) Language Support | (vii) M/w & Hostname |
| (iv) Installation Source | |

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Begin Installation

Once clicked Installation process will start immediately.

while Installation process is going on, Installer program will prompt us for setting up password for Root User. Root is the default administrator account in linux system, click root password click reboot button

After rebooting final part of installation will begin, It contain only two steps, Accept the license agreement and register the system with Red hat network

Once we accept the license, Finish configuration button will be highlighted, Click it to access the graphical login prompt login with the user account that we have created during the installation.

Absolute path and Relative path in Linux

Linux file system is built from files and directories. Files are used to store the data. Directories are used to keep the file system hierarchical. Root directory (/) is the main directory in Linux. All directories and files are created and managed under this Directory. We can access a file or directory in two ways —

Absolute Path

Relative Path

Absolute Path starts from root directory and goes up to the actual object (file or directory). Since Absolute Path is the complete path.

To know the absolute path of current location we can use pwd command

Relative path starts from current location and goes up to the actual object

mkdir test new directory

cd test relative path

cd .. move in parent directory

pwd

cd /home/iiit/test using absolute path

Viewing a file

To view a file we have three basic command, cat, more and less.

cat -> display all contents from file without any scroll facility

more -> display all contents from file with down scroll facility

(q) less -> display all contents from file

→ output with up and down scroll facility

wildcard and brace expansion example

cp test/* data/ copy all files and directory

ls /etc/*

ls ?est

touch {1,2,3} create three files

touch {1,2,3}-{a,b,c} create nine files

touch {1..3}-{a..c} create nine files

mkdiv -p div2/div-a/div-b/div-c

↓
directory tree

Basic Linux System Admin Commands

- 1) ~~#~~ : Currently logged in user.
~~# who~~
- 2) : Only about the user who execute it
~~# who am i~~
- 3) : Currently logged in user more details
~~# w~~
- 4) : Current terminal number
~~# tty~~
- 5) To know the system uptime
~~# uptime~~ (cr) ~~# w~~
- 6) The last login attempts

/var/run/utmp Active user session
Command - who, whoami, whoami

/var/log/wtmp Last user session
Command — ~~#last~~ ~~#last reboot~~)

/var/los/btmp recent user session ~~#lastlog~~

/var/log/btmp Failed login attempt ~~#lastb~~

7) To view operating system name

uname

uname -a

Uname option

-s kernel name

-n node name

-r kernel release

-v kernel build date

-m hardware name

-p Processor type

-i hardware platform

-o OS name

-a all above information

8) Hostname change

To view Hostname

hostname

(or) # hostnamectl

To change Hostname

~~hostname~~

hostnamectl - Set-hostname Server.example.com

hostname

9) To view or set date and time

date - - View

@ # timedatectl - View

timedatectl set-time 2017-07-10

timedatectl set-time 09:30

(or)
date --set "2017-07-10 09:30:00"

10) To find command location.

which date

11) To count line, word and characters in a file.

wc <filename> ex: #wc test

12) To view running process.

ps -ef | grep firefox

kill 12978

ps -ef | grep firefox

13) To view the real time hardware usage status.

top

14) To view hardware information

lsusb

lsblk

lscpu

Ianic command

- 1) To copy file data from one file to another
`# cp asdf file1`
- 2) To verify that the data has been copied.
`# cat file1`
- 3) To copy folders
`# cp -rvf Redhat/Desktop`
 - r (recursive)
 - v (Verbuse)
 - p (permissions)
- 4) To rename directory and file
`# mv tech marketing`
- 5) To move directory and file
`# mv /root/redhat /opt`
- 6) To filter the single word from a file
`# grep root /etc/passwd`
- 7) To see the type of file.
`# file *`
- 8) To view the calender for complete year.
`# cat 2017 | less`
- 9) `# cat 2017 | more`
`(q) optim quit from screen`

"It is the prime responsibility of every citizen to feel that his country." —Sardar Vallabhai Patel

9) To get help on a particular command with man

man mkdir

10) To find the location of an object

find

Visual Interface (vi Editor)

1) Modify the file by using vi command

vi file

2) Command to go from command mode to insert mode

i insert the text at current cursor.

I insert the text at beginning of line

a append the text after current cursor

A append the text at end of line

o insert a line below current cursor

O insert a line above current cursor

r replace a single char at current cursor

3) Command in execute mode

:q quit without saving

:q! quit forcefully without saving

:w save

"No real change in history has ever been achieved by discussions." —Subhash Chandra Bose

:wq	Save and quit
:wq!	Save and quit <u>forcefully</u>
:x	Save and quit
:sh	provided temporary shell
:setnu	Setting line numbers
:se nou	Removing line number.
:8H	Press enter goes to line
capital X	:X Encrypt the File (Pauward)
4)	<u>To Find and replace word</u>

↖ To start the search at from 1st line

\$ End of file

s Substitute

g → global

c → confirmation

5) Commands in command mode

.dd Delete a line

2dd Delete 2 lines

4y Copy a line

24y Copy 2 lines

p Put (Paste)

u Undo

ctrl+r Redo

6n Move cursor to last line of file

5G move " " 5th line of file

Shift+z Save and quit

6) Moving within a file

- k Moves the cursor up one line
- j Moves the cursor down one line
- h Moves the cursor to the left one character
- l Moves the cursor to the right one character

7) Deleting characters

- x - Deletes the character under the cursor.
- X - Deletes the character before the cursor.
- dw - Deletes from the current cursor location to the next word
- d^ - Deletes from the current cursor position to the beginning of the line
- d\$ - Deletes from the current cursor position to the end of line
- D - Deletes from the cursor position to the end of the current line
- dd - Deletes the line the cursor is on
- 2x - delete two character
- 2dd - delete two lines

8) change command

- cc - Removes the contents of the line
- cw - Changes the word the cursor is on from the cursor to the lowercase 'w'-end of the word

Y - replaces the character under the cursor
 R - Overwrites multiple characters
 S - Deletes the line the cursor is on and replaces it with the new text

Word and character Searching

- / Command searcher forwards
- ? Command searcher backwards
- ^ Searcher at the beginning of the line
- Matches a single character
- * Matches zero or more of the previous character
- \$ End of the line
- [Starts a set of matching or non-matching
- >
- <
- f = Search Forward
- b = Search backward

Set Command

:set ic

Ignore the case when searching

:set ai

Set autoindent

:set noai

Unset autoindent

:set nu

↳ Displays line with line number on
The left side.

:set sw.

Set the width of a software tabstop
example = :set sw = 1.

:set ws

If wrapscan is set and the word
is not found at the bottom of the file

:set wm.

If this option has a value greater
than zero, the editor will automatically
'word wrap'.

e.g = :set wm = 2.

:set ro

change file type to "read only"

:set term

Prints terminal type

:set bf

Discard control characters from input

Replacing Text

:s/ enable you to quickly replace.

:s/search/replace/g.

g stand for globally

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Moving the cursor

0 (zero) → Move cursor to start of current line

\$ → move cursor to end of current line

w → " " beginning of next word

b → " " back to beginning of word

:0 (zero) or 1h → " ", first line in file

:n or nh → " ", to line n

:\$ or G → move cursor to last line in file

Screen Manipulation

^f → move forward one screen

^b " backward "

^d → move down one half screen

^u " up "

^l → redraws the screen

^r → redraws the screen, removing deleted line

Determining line Numbers

:=

return line number of current line at bottom of screen

:=

return the total number of lines at bottom of screen

User Account

- 1) # echo \$USER → Username
- 2) # whoami → command tells your username
- 3) # who am i → line pointing to your current session
- 4) # who → will give you information about who is logged on the system
- 5) w → who is logged on and what they are doing
- 6) id → your user id, primary group id and a list of the groups that you belong to
- 7) su → su to become root, when you know the root password
- 8) su -user
The root user can become any existing user without knowing that user's password
- 9) su user
By default the su command maintains the same shell environment. To become another user and also get the target user's environment.

9) SU -

when no username is provided to su or su - , The command will assume root is the target

User-management

1)

The local user database on Linux (and on most Unixes) is /etc/passwd

tail /etc/passwd

vi /etc/passwd

vim /etc/passwd

2) More information

man 5 passwd

3) root user

The root user also called the super-user is the most powerful account on your Linux system.

The root user always has userid 0

head -1 /etc/passwd

root:x:0:0:root:/root:/bin/bash

r - - rwx r-x

Date _____

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Users and Groups

① # ls -l

drwxr-xr-x 2 user user 1096 2017-09-17 9:00
| | | | | |
| | | | owner group size date time
| | | |
File Type | | hard link
User permission | |
group permission | |
other permission | |

data



Filename
directory

② # tail -1 /etc/passwd

user:x:1000:10:user:jainprv:/home/user:/bin/bash
			User information
			Group ID
			Home directory
User ID			

Encrypted password
(X means password is stored in etc/shadow)
User name

③ # vi /etc/shadow

username Day before password can be changed.

user:!!:15670:0:99999:7:::

user created since
unix epoch time

Day before the password expire.

Password placeholder

Forever lasting account.

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4) # cat /etc/group

Users : 20 : root,gama

Group Name	Group ID	Group List
		group password

5)

GID
bin:x:1:root, bin, daemon.

Group Name	Member Accounts
	1

group password.

6) Useradd

```
# useradd -m -d /home/user2 -c "User211HT" -U user2,
# tail -1 /etc/pam.d.
```

7) default user profile. /etc/default/useradd

```
# useradd -D
```

8) Userdel → delete the user account

```
# userdel -v user2
```

9) Useradd : simple command

```
{ # useradd user3 } Create a username
{ # passwd user3 } assign password
```

10) # To Filter single user properties.

```
# grep user3 /etc/passwd
```

11) To check last 10 lines of /etc/passwd

```
# tail /etc/passwd
```

12) To check first 10 line of /etc/passwd

```
# head /etc/passwd
```

Date _____

- 13) To check password properties of user3

grep user3 /etc/shadow

14) Usermod

usermod <option> <argument> <username>

- u 2001 (changing user id)
- c "manager of sales dept" (comment)
- d /salesdept (changing new directory)
- s /bin/csh (changing an user shell)
- l /bin/csh (changing an user login name)
- L /bin/csh (To lock a user account)
- U /bin/csh (To unlock a user account)

- 2) changing uid of an existing user

usermod -u 2001 user3

grep user3 /etc/passwd

(or)

su - user3

id

- 3) changing comment of an existing user

usermod -c "manger of sales dept"

4) changing home directory.

```
# mkdir -p /salesdept/user3
# usermod -d /salesdept/user3 user3
```

Copying bash file from default directory
into user home directory

```
# cp -r /etc/skel/. /salesdept/user3
# grep user3 /etc/passwd
```

```
# su - user3
```

```
$ pwd
/salesdept/user3
```

5) Changing an existing user shell

```
# usermod -s /bin/csh user3
```

```
# su - user3
```

```
$ echo $shell
```

6) changing an existing user's login name

```
# usermod -l xyz xyz user3
```

7) To lock user account

```
# usermod -L xyz
```

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locked
grep xyz /etc/shadow (!)

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8) To unlock the Account

usermod -U x423

1) To add new user with all new properties.

useradd -u 2002 -c "userhi" -d /salaldept/userhi -s /bin/csh .userhi

grep userhi /etc/pam.d

2) To delete user x423 without deleting his home directory

userdel x423

verifia

ls /home

grep x423 /etc/pam.d

3) To delete user along with his home directory

userdel -r .userhi

1) /etc/shell/

When using useradd the -m option
The /etc/shell/ directory is copied to the
newly created home directory.

The /etc/shell/ directory contains
some (usually hidden) file that contain
profile setting and default values
for application.

```
# ls -la /etc/shell/
```

2) deleting home directory

```
# ls -ld /home/user1/  
# userdel -r user1  
# ls -ld /home/user1/
```

3) login shell

The /etc/passwd file specifies the login
shell for the user.

```
# usermod -s /bin/bash users  
# tail -1 /etc/passwd
```

4) chsh

Users can change their login shell with the chsh command.

~~Userchange~~ # chsh -l
 # chsh -s /bin/ksh

- 5) Create a file name .welcome.txt . and make sure every new user will see this file in their home directory

echo Hello > /etc/skel/.welcome.txt

- 6) To change password

passwd

- 7) Encryption with passwd

useradd -m user7

passwd user7 (Simple password)

openssl passwd -user7

8) To Create a user with Password

useradd -m -p \$(openssl passwd user8)
user8
hunter2

9) /etc/login.defs

grep ^pass /etc/login.defs.

grep pass /etc/login.defs.

The ./etc/login.defs file contains some default setting for user passwords like password aging and length setting.

10) change

-E Expiration date

-m minimum

-M Maximum

-d digest

Example → change -l user1

11)

Disabling a password.

grep user2 /etc/shadow | cut -c1-70
 o/p → \$

usermod -L user2.

④ # grep user2 /etc/shadow | cut -c1-70
 o/p → !

Unlock user account

usermod -U user2

12)

Vipw

The vipw tool will do proper locking
of file

vipw /etc/pawd. (or) /etc/shadow

13)

grep disable .(erase the password)

grep user3 /etc/shadow | cut -c1-70

Pawd -d user3

grep user3 /etc/shadow.

Group

1) To add new group

groupadd <groupname>

groupadd <groupname>

grep <groupname> /etc/group

2) To assign password to group

gpasswd <groupname>

3) Verification:

grep <groupname> /etc/gshadow

3) Changing the name of an existing group

groupmod -n <newname> <oldname>

groupmod -n <newname> <oldname>

Verify # grep <newname> /etc/group

4) To add single user in group

useradd arya

gpasswd -a arya /etc/group

Verify # grep /etc/group

5) To add multiple user in a group

useradd x421

useradd x422

gpasswd -M arya, x421, x422 /etc/group

Verify # grep /etc/group

6) To add user in group as a secondary member.

useradd x423

usermod -G /etc/group x423

Verify # grep /etc/group

7) To add user in a group as a primary member

useradd x424

usermod -g /etc/group x424

su x424

id

8) Removing user from group

gpasswd -d X423 \$IIHTJP

verif # grep IIHTJP /etc/group

9) Deleting a group

groupdel IIHTJP

verif # grep IIHTJP /etc/group

standard file permissions

1) User owner and group owner

ls -lh.

2) listing user accounts

cut -d: -f1 /etc/passwd | column

3) change the group owner of a file

ls -l file1

chgrp users file1

ls -l file1

4) The user owner of a file can be changed

ls -l file2

chown user1 file2

ls -l file2.

List of special file

-	normal file
d	directory
l	Symbolic Link
p	named Pipe
b	block device
c	character device
s	Socket

ls -ld /dev/console /dev/sda

ls -ld /etc /etc/hosts /etc/motd

Permissions

Permission	On a file	On a directory
r(read)	read file content (cat)	(lc) read dir
w(write)	change file content (vi)	create file (touch)
x(execute)	execute the file	enter the dir (cd)

Three sets of rwx

ls -l

starts with ten characters for each file :

Position	Character	Function
1	-	regular file
2-3	rwx	User owner
4-5	r-x	group owner
6-7	r--	others

Permission examples

ls -lh

Setting permissions

ls -l file3

chmod u+x file3 (add)

ls -l file3

chmod g-r file3 (remove)

ls -l file3

chmod o-r file3 (remove)

ls -l file3

chmod a+x file3 } (all add)

(cr) # chmod +g file3 }

chmod u=rw file3

chmod u=rw, g=rw, o=r file3

chmod u=rwx, ug+rwx, o=r file3

Setting octal permission.

binary	Octal	Permission
<u>000</u>	0	- - -
001	1	- - x
010	2	- w -
011	3	- wx
100	4	r - -
101	5	r - x
110	6	r w -
111	7	rwx

chmod 777 file7

ls -l file7

chmod 664 file7

ls -l file7

chmod 6750 file8

ls -l file8

umask

When creating a file or directory, a set of default permissions are applied. These default permissions are determined by the umask.

umask

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Date _____

Folder

Umask

0002

touch test

ls -l test

* When creating directories with mkdir you can use the -m option to set the mode.

mkdir -m 700 newdir

mkdir -m 777 iHTdiv

ls -ld newdir/ iHTdiv/

Practice

1) Adding a new directory

mkdir ./myfolder

cd ./myfolder

2) Adding new file in directory

touch 123

3) To check working username

whoami

4) To check an existing file/dir default permission

ls -ld 123

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5) Set write permission to the group level only by using symbolic mode.

chmod g+w 123

ls -ld 123

6) Remove read permission to the group level by using symbolic mode.

chmod o-r 123

ls -ld 123

7) Assign read, write and execute permission to other only by using symbolic mode

chmod o=rwx 123

ls -ld 123

8) Assign execute permission to owner, group and others by using symbolic mode

chmod +x 123

ls -ld 123

9) remove write and execute permission from group and other also

chmod g-wx, o-wx 123

ls -ld 123

10 Assign write permission to Others by using Absolute Mode (Numeric mode)

chmod 6416 123file
ls -ld 123file

reboot

reboot
systemctl reboot
shutdown -r now
init 6
telinit 6

Shutdown

halt
systemctl halt
shutdown -h now
init 0
telinit 0

To switch off the system

poweroff
systemctl poweroff

Access control lists

1) Create some users P@R1 --- P@R5

2) Find the properties of the newly created users

tail -5 /etc/passwd

3) Create a new group

groupadd ACL

4) To add users into group

gpasswd -M P@R1,---P@R5 ACL

grep ACL /etc/group

5) Create a file by using CAT command.

cat > manu

6) To apply ACL permission for file/folder for individual users

setfacl -m u:P@R1:rw manu

setfacl -m u:P@R2:r manu

setfacl -m u:P@R3:@ manu

~~check ok~~

7) To apply ACL permission for file/folder for group

setfacl -m g:ACL:rwx /etc/group
manu

8) To check the list of ACL permission of file/folder.

getfacl manu

9) To exclude user P&R2 from ACL list

setfacl -x u:P&R2 manu

Verification # getfacl manu

10) To check the output by logging in as a user P&R1

su - P&R1

\$ cd /root (to enter into root dir)

cat manu

cat >> manu

Partitions

- 1) To check the existing partitions on the hard disk

Fdisk -l

- 2) Enter the hard disk by using Fdisk command

Fdisk /dev/sda (m)

To create new partition prcs (n)

To print a new changes prcu (p)

To save and quit prcu (w)

- 3) Update new changes to kernel

Partprobe /dev/sda

- 4) Make File system i.e Format partition.

mkfs.ext4 /dev/sda1

mkfs.vfat /dev/sda2

- 5) To check file system type of partition

blkid /dev/sda1

6) Create a folder and mount the partition to use

```
# mkdir ./mnt/linux
```

```
# mount /dev/sda8 ./mnt/linux
```

7) To check the mounted partition.

```
# mount | grep ./mnt/linux
```

8) To write the data on the partition.

```
# cd ./mnt/linux
```

```
# touch myfile & m1 m2 m3
```

```
# mkdir dir1 dir2 dir3
```

```
# ls
```

Swap partition

- 1) To check The RAM Size

```
#Free -m
```

- 2) Create a new partition twice the size of RAM

```
#fdisk /dev/sda n
```

```
+2GB
```

```
t (to change The partition ID)
```

```
82 (assigning swap code value)
```

```
w (Save)
```

- 3) Update new partition changes to kernel.

```
#partprobe /dev/sda
```

```
#fdisk -l
```

- 4) #! mkswap /dev/sda@ (Format)

- 5) Turn on The swap partition

```
#swapon /dev/sda@
```

6) To see the swap partition status

swapon -s

7) Check the newly added swap partition size

free -m

8) To turn off the swap partition.

swapoff /dev/sda8

9) # swapon /dev/sda8

Disk Label

1) # To Assign label name on partition.

e2label /dev/sda8 RHCE

2) To check label name of partition.

e2label /dev/sda8

3) Mounting the partition with label name

Mkdir /mydir

mount -l /RHCE /mydir

4) To check mount point with label.

mount -l | grep RHCE /mydir

5) Permanently mounting the partition with label name

vi /etc/fstab

label = /RHCE /mydir ext4 defaults 0 0

Wq:

6) To see the utilization of disk space

df -h

7) To see the block size.

blockdev --getbsz /dev/sda

Disk quotas

- 1) Create the required partition for disk quotas.

Fdisk -l

- 2) Add the new partition.

Fdisk /dev/sda

+100M

w (Save)

- 3) Update the new changes to kernel

partprobe /dev/sda

- 4) View the newly added partition

Fdisk -l

- 5) Format the partition by using Filesystem

mkfs.ext4 /dev/sda8

- 6) Create a new directory to mount the quota partition

~~# mkdir /dev/satedept~~

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7) Mount the partition with user and group quota parameters

mount -o userquota,grpquota

/dev/sda8 /saldept

8) Check only mount point of quota partition

mount | grep /saldept

9) Give Full permission on quota partition,

chmod 777 /saldept

ls -ld /saldept

10) Create the quota Database on partition,

quotacheck -cugv /saldept

ls /saldept

11) To check the quota status

quotaon -p /saldept

12) Enable the quota on partition.

quotaon /saledept

quotaon -f /saledept

13) Create users and group

useradd user1 user2 user3

groupadd gpi

groupadd gp2

14) Add users as a primary member in groups

useradd -g gpi user2

useradd -g gpi user3

15) Apply quota on a user.

edquota -u user1

:wq (Save and quit)

16) To check result, login a user user1

(A) Apply quota on a group gpi which has user2 and user3 as primary member

edquota -g gpi

:lwg! (leave and quit)

logical volume manager (LVM)

- 1) To view hard disk details and list of partition.

fdisk -l

- 2) Create partition of required size; for example two partitions of 300MB each.

fdisk /dev/sda

- 3) Update newly created partitions to kernel without restarting.

partprobe /dev/sda

- 4) The list of newly created partitions.

fdisk -l

- 5) Create Physical Volume

pvcreate /dev/sda^X /dev/sda^Y

6) View the list of Physical Volumes

PVdisplay

7) Create Volume group

vgcreate PVGP2 /dev/sda8 /dev/sda9

8) Display volume group information.

vgdisplay

9) Create logical Volume in Volume group

lvcreate -PVGP2 -L +300M -n LVI

10) View logical Volume details

lvdisplay

11) Format filesystem for the logical volume

mkfs.ext4 /dev/PVGP2/LVI

12) Create a folder and mount the logical volume

mkdir /mylvm

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mount /dev/PVGP2/LVI/mylvm

13) To check LVM mounted partition

#mount | grep /mylum.

14) To resize the logical volume

#lvmresize -L +100M -n /dev/pvgrp2/lv1

15) To check newly created logical volume

lvdisplay # ls

16) Now check partition size

df -h

17) We still find the same partition size
so update the kernel, Resize the logical
volume at os level to update kernel

#resizes /dev/pvgrp2/lv1

df -h

18) Now create some files and folder on
logical volume

touch

mkdir

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ls

19) To extend the volume group, create a new partition and add to volume group

fdisk /dev/sda
(+300M)
/dev/sda(2)

20) Now update kernel

partprobe /dev/sda

21) To view the list of partition.

fdisk -l

pvcREATE /dev/sda(2)

22) To extend the volume group

vgextend pvgp2 /dev/sda(2)

23) To verify

vgdisplay

24) To remove logical volume

cd

umount /mylum

fremove /dev/pvgp2/lv1

vgremove /dev/pvgp2

Chitra "It is the prime responsibility of every citizen to feel that his country." —Sardar Vallabhai Patel
pvrEMOVE /dev/sda~~x~~
/dev/sda~~1~~ sda2

RAID

Redundant Array of Independent Disk

- 1) To view list of all created partition.

Fdisk -l

- 2) Add partition

Fdisk /dev/sda
sda4 s, 6 7
(+10G M x 4)

- 3) Update the newly added partition to kernel

partprobe /dev/sda

- 4) Check new added partition

Fdisk -l

- 5) Create metro disk by adding partition, or disk

mdadm -C /dev/md0 -n 3 /dev/sda4
/dev/sda5 /dev/sda6 -l5

6) To see the detailed information of meta disk

mdadm -D /dev/md0

7) Format the RAID meta disk

~~mkfs.ext4~~ /dev/md0

8) Add a folder to mount the meta disk

mkdir /raid

9) Mount the meta disk on directory /uuk

mount /dev/md0 /raid

10) Enter into RAID mounted directory to add data

cd /raid

touch

mkdir

ls

cat > note

ls -l

11) To make the device faulty in RAID Array

mdadm /dev/md0 -f /dev/sda6

12) To see the detailed information of /dev/md0

mdadm -D /dev/md0

13) To remove the fault device

mdadm /dev/md0 -r /dev/sda6

14) To view the status of meta disk

mdadm -D /dev/md0

15) To add new device into RAID

mdadm -a /dev/md0 /dev/sda7

16) Unmount the meta-device before you stop the RAID

umount /dev/md0

17) To stop and activate the RAID

mdadm -S /dev/md0

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mdadm -A /dev/md0 /dev/sda5 7

Backup and Restore Using TAR and Filter the archive through GZIP (-z)

- 1) Create a folder along with some directory

```
# mkdir (/backup)
```

```
# cd
```

```
# touch
```

```
# mkdir.
```

```
# cd .. (/root directory)
```

- 2) To Take a backup and compress the file

```
# tar -cvzf backup.tar.gz /backup
```

```
# ls -ld backup.tar.gz
```

- 3) To view the contents of the backup file.

```
# tar -tvzf backup.tar.gz
```

- 4) To test the backup delete the source folder data

```
# rm -r /backup
```

- 5) To restore the data

```
# tar -xvzf /root/backup.tar.gz -c
```

Backup and restore using TAR and filter the Archive through BZIP (-J)

1) To backup data

tar -cvjf /mnt/etc.tar.bzip2 /etc

2) To check the backup data

tar -tvjf /mnt/etc.tar.bzip2 ~~(etc.)~~

3) To restore data if it is lost

tar -xvJf /mnt/etc.tar.bzip2 -C /opt

4) To check the original data and backup file size.

du -sh /etc

Backup and restore using CPIO

- 1) Enter into source directory:

```
# cd /backup
```

- 2) To take backup of filtered output

```
# ls -d | cpio -ov > /mnt/new.cpio
```

- 3) To view content of backup file

```
# cpio -tf /mnt/new.cpio
```

- 4) To test backup file by removing the original folder data

```
# rm -r *
```

- 5) To restore

```
# cpio -iv /mnt/new.cpio
```

```
# ls
```

Network Configuration - IP address

1) To see the hostname temporarily

hostname sys1-linux.com

2) To view the hostname

hostname

3) To see hostname permanently add in the following file

vi /etc/hostname

sys1-linux.com

:wq!

4) To map ip and hostname locally add in following file

vi /etc/hosts

192.168.10.1 sys1-linux.com sys1

:wq!

5) Set IP address temporarily

ifconfig eth0 192.168.10.1 netmask 255.255.255.0

6) View the interface details

ifconfig

7) To set permanent IP address.

nmcli

8) Restart the service to activate

service network restart

(or)

systemctl enable network

9) To view new ip address

ifconfig

10) To enable the NIC card / disable NIC

ifup eth0

ifdown eth0

1) To remove an IP address, remove the configuration file.

```
# cd /etc/sysconfig/network-scripts/  
# ls  
# cat ifcfg-eth0  
# rm -rf ifcfg-eth0
```

```
# service network restart cr  
# systemctl restart network
```

Root Password change / forgot

- 1) Press shift key during Boot
- 2) Select recovery mode and enter
- 3) Select the Drop to root shell prompt
- 4) mount -rw -o remount /
- 5) passwd root

Package Management (RPM)

To Install packages from DVD

- 1) To query whether package is installed or NOT

yum -q BIP

- 2) Insert DVD and mount it on dir

mount /dev/sr0 /media

- 3) To Verify mount point of DVD

mount

- 4) Go to DVD mount points to install packages (.rpm)

cd /media/Packages

ls

- 5) To install, to view verbose output and to check the progress of Installation of packages with hash sign

rpm -ivh zip *.rpm

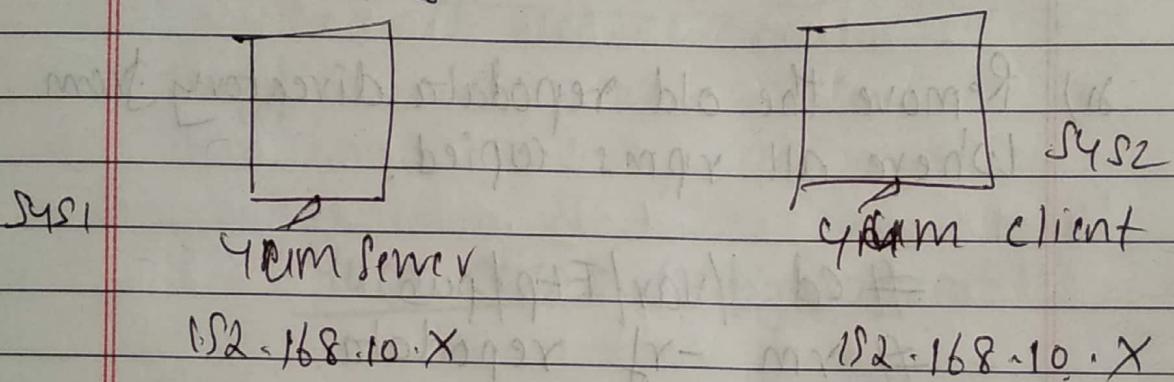
8) To remove the installed package

rpm -e zip --nodeps.

rpm -q zip

Package management (Yum command)

- Provide the yum server.



Yum server configuration

- Install FTP application by using the Linux OS DVD

mount /dev/sr0 /media.

cd /media/packages.

ls

rpm -ivh usftpd* --Force

rpm -ivh ^{deletarpm*}

rpm -ivh ^{python-deletarpm*}

- Copy DVD's complete data into FTP Dir

cp -rv /media/* /var/ftp/pub

Date: / /

3) Create a repository at side where all rpms are copied.

cd /var/ftp/pub/packages.

rpm -ivh createrepo* deltarpm*
--Force --nodeps

4) Remove the old repodata directory from where all rpms copied.

cd /var/ftp/pub

rm -rf repodata

5) Create a new repodata (Repositories)

createrepo -g /media/packages/repo/
/repomd.xml /
/var/ftp/pub/packages.

6) Start FTP service

service vsftpd restart

systemctl enable vsftpd

- 7) Edit the yum configuration file by providing the path of repository and IP-address.

```
# vi /etc/yum.repos.d/centos-Base.repo
```

Baseurl=FTP://192.168.10.x/pub/packages.

:wq!

Yum client configuration

- 7) Edit the yum configuration file by providing the path of repository and server IP-address

```
# vi /etc/yum.repos.d/centos-Base.repo
```

Baseurl=FTP://192.168.10.x/pub/packages.

:wq!

```
# yum install -Firefox* -y.
```

gpg key = File:///etc/pki/rpm-gpg/RPM-HASH-KEY

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-redhat-release

Date ___/___/___

- 2) To see the list of packages available in repository i.e on yum server.

yum list samba*

- 3) To install packages

yum install samba* -y

- 4) To see the list of installed packages in the local system.

yum list installed samba*

7

8

DHCP server

9) 1) DHCP server configuration, check whether
 10 the packages are installed or not

11

12

rpm -qa | grep dhcp

13

14

15 2) If packages are installed, remove them

16

17

rpm -e dhcp-libs dhcp-common dhcp
 18 --nodeps

19

20

21 3) To Install the packages

yum install dhcp-* -y

4) Copy the sample dhcp configuration file

cp -rv /usr/share/doc/dhcp-3.2.5/
 22 dhcpcd.conf.example /etc/dhcp/
 23 /etc/dhcp/dhcpcd.conf

5) Edit the main configuration file

vi /etc/dhcpcd.conf

f) Start the service

service dhcpcd restart
systemctl enable dhcpcd

DCHP client configuration

Select DHCP in nmcli command

1) # nmcli

2) To view DORA process and also get
DHCP (Dynamic - IP address)

dhclient -v

3) Start the service

service network restart
systemctl enable network

4) To verify IP-address

ifconfig

5) To check gateway or router IP

route -nv

6) To check DNS IP

cat /etc/resolv.conf

FTP Server

- 1) Check whether the FTP package exists and install the application

```
# rpm -q vsftpd.
```

- 2) remove the package

```
# rpm -e vsftpd
```

- 3) Install FTP packages

```
# yum install vsftpd* -y
```

- 4) Add some files to the FTP default directory

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

```
# touch linux redhat windows
```

```
# ls.
```

- 5) Start the service

```
# service vsftpd restart
```

```
# systemctl enable vsftpd
```

FTP client

1) Connect to FTP server to download file

FTP 192.168.10.x

FTP > ls

FTP > cd pub

FTP > mget linux Redhat

FTP > bye

2) To check downloaded files, move to client home directory.

ls /root or

FTP server configuration for uploading file

1) # mkdir /var/ftp/upload
chmod 777 /var/ftp/upload.

ls -ld /var/ftp/upload

2) Edit the FTP directory

vi /etc/vsftpd/vsftpd.conf.

12 anonymous_enable=yes
16 local_enable=yes
29 anon_upload_enable=yes
37 dirmessage_enable=yes
86 Ftpd-banner=welcome to HHT linux
:wq!

3) Restart the FTP service

service vsftpd restart

(Q)

systemctl enable vsftpd

Date _____ / _____ / _____

FTP client configuration

FTP 192-168-10-X

FTP > ls

FTP > pwd

FTP > cd /var/FTP/upload

FTP > pwd

FTP > mput initial-setup-ks.cfg

FTP > bye

NFS Server

- 1) Install NFS application

```
# yum install nfs* -y
# yum -y install nfs*
```

- 2) Add a directory to share.

```
# mkdir /nfs
# cat /nfs/new.txt
```

- 3) List the share directory data

```
# ls /nfs
```

- 4) Give full permission on share directory

```
# chmod 777 /nfs
# ls -ld /nfs
```

- 5) Provide share directory name in NFS configuration file and give share permission

```
# vi /etc/exports
```

```
/nfs 192.168.10.0/255.255.255.0 (rw,sync)
```

Chitra : wq!

"No real change in history has ever been achieved by discussions." —Subhash Chandra Bose

d) Start NFS service

#1 Sewile NFS Prestart

? CR

systemctl enable nfs

7) Verify list of exports

```
# showmount -e 192.168.10.10
```

NFS client configuration

1) mount the shared directory

mount 192.168.10.X:/IHT /mnt

~~fl~~ mount

~~cd /mnt/intg: test with~~

15

Left almissa probaris grade short. (2
millions) grade up has slab undulations

~~2 tropics~~ ~~1 subt~~ ~~int~~

Yum Server (Only for local server)

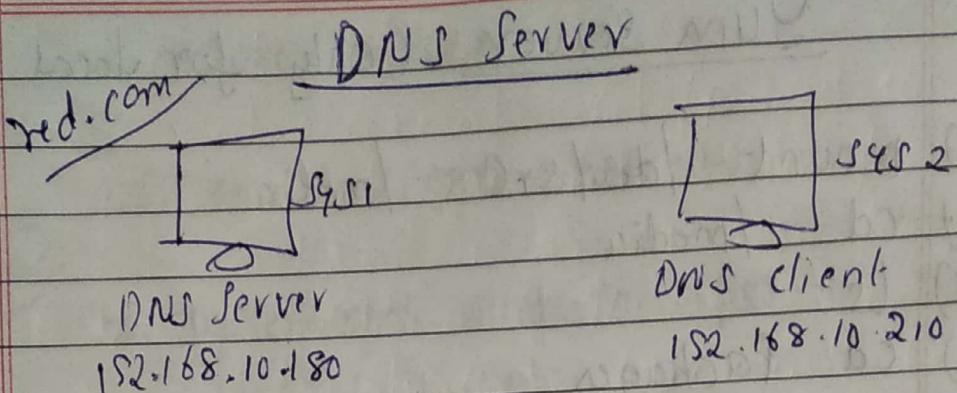
- 1) mount /dev/sr0 /media
- 2) cd /media
- 3) ls
- 4) cd Packages
- 5) rpm -ivh vsftpd*
- 6) rpm -ivh deltarpm*
- 7) rpm -ivh python-deltarpm*
- 8) rpm -ivh createrepo*
- 9) cd /
- 10) mkdir repo
- 11) cd media
- 12) cp -rvf Packages/ /repo/RPM-HPP-KEY-redhat-release
- 13) createrepo --database /repo/Packages
- 14) cd /
- 15) vi /etc/yum-repos.d/myyumserver.repo
 [Myyumserver]
 Name = My Local Repository
 baseurl = file:///repo/packages
 enable = 1
 gpgcheck = 1
 gpgkey = File:///repo/RPM-HPP-KEY-redhat-release
 :wq File:///pub/
- 16) yum /repo
- 17) yum /repolist
- 18) yum install kdebase -y
- 19) cd ..
- 20) cp -rvf Packages/ /var/FTP/Pub

"No real change in history has ever been achieved by discussions." —Subhash Chandra Bose

BIND (Berkeley Internet Name Domain)

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- 1) Nmtui (DNS IP address 192.168.10.180)
- 2) Systemctl restart Network
- 3) ifconfig
- 4) Hostname sys1.red.com
- 5) Vi /etc/hosts
192.168.10.180 sys1.red.com sys1
:wq
- 6) Vi /etc/hostname (Permanent)
sys1.red.com
- 7) Ypm -qa bind*
- 8) Yum remove bind* -y
- 9) Yum install bind*
- 10) Systemctl status firewalld
- 11) getenforce
- 12) Vi /etc/named.conf
⑪ listen-on Port 53 {127.0.0.1; 192.168.10.180; }
⑫ allow-query \$localhost; any; ;
:wq
- 13) Vi /etc/named.rfc1912.zones
Zone "red.com" IN {
Type master;
File "f.zone";
allow-update {none};
}

"It is the prime responsibility of every citizen to feel that his country." —Sardar Vallabhbhai Patel

Chitra

31

Zone "10.168.192.in-addr.apna" in S

Type master

File "r.zone";

allow-update {none};

- 16) cd /var/named
- 17) ls
- 18) cp named.localhost - f.zone
- 19) cp named.loopback - r.zone
- 20) vi f.zone
- IN SOA red.com. root.red.com. {
 NS red.com
 red.com A 192.168.10.180
 };wg

- 21) vi r.zone
- IN SOA red.com. root.red.com. {
 NS red.com.
- 22) PTR red.com.
- };wg

- 23) chmod 644 f.zone r.zone
- 24) vim /etc/resolve.conf
- search red.com

- 25) nameserver 192.168.10.180
- 26) NMTUI
- 27) systemctl enable network
- 28) systemctl restart network
- 29) nslookup red.com.

Check dns

- 26) ~~named-checkconf /etc/named.conf~~
- 27) named-checkzone red.com /var/named/F-zone
- 28) named-checkzone 192.168.10.180 /var/named/F-zone
- 29) Provide IP address of the DNS server.
vi /etc/resolv.conf (nameserver 192.168.10.180)
- 30) systemctl restart named
- 31) systemctl enable named
- 32) dig red.com
- 33) dig -x 192.168.10.180

Postfix mail

- 1) ifconfig
- 2) ifconfig + grep inet
- 3) ~~nmtui~~
- 4) systemctl enable network
- 5) systemctl restart network
- 6) hostname sys1.red.com
- 7) vi /etc/hostname
- 8) vi /etc/hosts
- 9) hostname
- 10) rpm -qa postfix*
- 11) ~~yum install postfix* -y~~
- 12) vi /etc/postfix/main.cf
 - 75 myhostname = sys1.red.com
 - 83 mydomain = red.com
- 13) systemctl restart postfix
- 14) systemctl enable postfix
- 15) Useradd user1
- 16) Useradd user2
- 17) pwuid user1
- 18) pwuid user2
- 19) su - user1
- 20) mail user2@sys1.red.com

dut(.) To end the message
- 21) exit
- 22) su - user2
- 23) mail

Apache Server (Simple)

Point

- a) Create DNS entry to resolve
- b) web browsers to access the web server

- 1) NMTU
- 2) systemctl enable network
- 3) systemctl restart network
- 4) ifconfig | grep inet
- 5) vi /etc/hosts
- 6) 192.168.10.180 www.ara.com
- 7) yum install httpd* -y
- 8) systemctl enable HTTPD*
- 9) systemctl restart HTTPD*
- 10) firewall-cmd --permanent --add-service=HTTP
- 11) firewall-cmd --permanent --add-service=HTTPs
- 12) Firewall-cmd --permanent --add-port=80/TCP
--add-port=80/UDP
--add-port=443/TCP
--add-port=443/UDP
- 13) vim /etc/httpd/conf.d/main.conf
- VirtualHost *:80
- ServerAdmin root@ara.com
- ServerName www.ara.com
- DocumentRoot /var/www/html
- </VirtualHost>

```
<Directory "/var/www/html/">
    AllowOverride none
    Require all granted
</Directory>
```

- 14) systemctl enable httpd*
- 15) systemctl restart httpd*
- 16) systemctl status httpd*
- 17) apachectl configtest
- 18) Vim ./var/www/html/index.html

IP address Apache Server

- 1) ~~nmcli~~ (Add IP address) ②
- 2) systemctl restart Network
- 3) ip addr show / ifconfig | grep inet
- 4) Vim /etc/hosts
192.168.10.181 www.kumar.com
- 5) Vim /etc/httpd/conf.d/main.conf
<VirtualHost 192.168.10.181:80>
<Directory Root> /var/www/html/kumar
- 6) systemctl restart httpd *
- 7) cd /var/www/html
- 8) ls
- 9) mkdir kumar
- 10) cd kumar
- 11) Vim index.html
- 12) systemctl restart httpd *

Apache server (httpd) - secure

- 1) yum install httpd -y
- 2) rpm -qa | grep httpd
- 3) cd /etc/httpd/conf
- 4) cp httpd.conf httpd.conf.backup
- 5) ls
- 6) Vim /etc/hosts
192.168.10.182 www.IIHT.com
- 7) ~~nmcli~~ (add ip address) (3)
192.168.10.182/24
- 8) systemctl restart network
- 9) ip addr show
- 10) Vim /etc/httpd/conf/httpd.conf

```
# # VirtualHosts # #
NameVirtualHost 192.168.10.182:80
<VirtualHost 192.168.10.182:80>
ServerAdmin Webmaster@IIHT.com
DocumentRoot /var/www/html/IIHT
ServerName www.IIHT.com
ErrorLog logs/www.IIHT.com-error.log
CustomLog logs/www.IIHT.com-access.log
common
</VirtualHost>
```
- 11) httpd -t
- 12) systemctl enable Httpd
- 13) systemctl list-unit-files HTTPd
- 14) http://www.IIHT.com

Install required packages
 openssl and
 mod-ssl

15) yum -y install openssl mod-ssl

generate self-signed certificate

16) openssl genrsa -out iihT.key 2048

17) openssl req -new -key iihT.key
 -out iihT.csr

I N	iiHT education
Rajasthan	iiHT.com
Jaipur	admin@iiHT.com
iiHT	

18) openssl x509 -req -days 1095 -in

iiHT.csr -signkey iihT.key -out iihT.crt

Copy three certificate files

19) cp iihT.crt /etc/pki/tls/certs/

20) ls /etc/pki/tls/certs

21) cp iihT.key /etc/pki/tls/private/

22) cp iihT.csr /etc/pki/tls/private/

23) ls /etc/pki/tls/~~certs~~ private

Configure ssl.conf

24) Vim /etc/httpd/conf.d/ssl.conf

105 SSLCertificateFile /etc/pki/tls/certs/iiHT.crt

107 SSLCertificateFile /etc/pki/tls/private/iiHT.key

SSL configuration for virtual Host

- 25) Vim /etc/httpd/conf/httpd.conf
· NameVirtualHost 192.168.10.182:8083
<VirtualHost 192.168.10.182:8083>
· SSLEngine On.
SSLCertificateFile /etc/pki/tls/certs/IIHT.crt
SSLCertificateKeyFile /etc/pki/tls/private/IIHT.key
ServerAdmin webmaster@IIHT.com
;iwa
- 26) systemctl enable HTTPd
- 27) systemctl restart HTTPd.
- 28) https://www.IIHT.com

~~HTTP~~ HTTP port number change

- 1) Vim /etc/httpd/conf.d/main.conf
listen 8080
<VirtualHost 192.168.10.181:8080>
- 2) systemctl restart httpd

HTTP Authentication

- 1) systemctl stop httpd
- 2) which htpasswd
- 3) htpasswd -c /etc/httpd/conf/.htpasswd / -htpasswd user10
- 4) vim /etc/httpd/conf.d/mod-auth-basic.conf
<Directory /var/www/html/>
Options +ExecCGI
AddHandler cgi-script .cgi
AuthType Basic
AuthName 'Private scripts'
AuthUserFile '/etc/httpd/conf/.htpasswd'
Require Valid-User
</Directory>
- 5) systemctl restart httpd.

Webmin

- 1) Download Webmin*.rpm
- 2) yum -y install perl perl-Net-SSLeay
openssl perl-IO-Tty perl-Encode-
-~~Protect-Detect~~
- 3) rpm -ivh webmin*.rpm --nodeps
- 4) http://192.168.1.10000
username root
password 11HT123?

VNC Server

Make the Desktop packages. (cli-HUI)

- 1) Yum groupinstall "GNOME Desktop"
"Graphical Administrator Tools"
- 2) Yum install tigerVNC-server
Xorg-x11-fonts-Type1
- 3) CP /lib/systemd/system/vncserver@.service
/etc/systemd/system/vncserver@.service
- 4) Vi /etc/systemd/system/vncserver@.service
add username
- 5) Firewall-cmd --permanent --zone=public
--add-port=5903/tcp
- 6) Firewall-cmd --reload
- 7) Su - user8
- 8) VNCserver ~~open~~
password
verify.
- 9) systemctl daemon-reload
- 10) systemctl enable vncserver@:5.service
- 11) systemctl restart vncserver@:5.service

client side

192.168.10.X:5