

159.00⁰

B.Ramesh

Page No.:

Date:

linux



- File management.
- permissions / umask
- ownership / Sbit
- link file.
- compression & archive.
- ACL /



- user management.

- creating user / deleting
- creating Group / deleting
- modifying user properties
- profile files
- sudoers entries



- disk management

- lvm
- disk quota.



- security

- selinux
- fire wall



- network management

- nmcli
- sysconfig



- process management

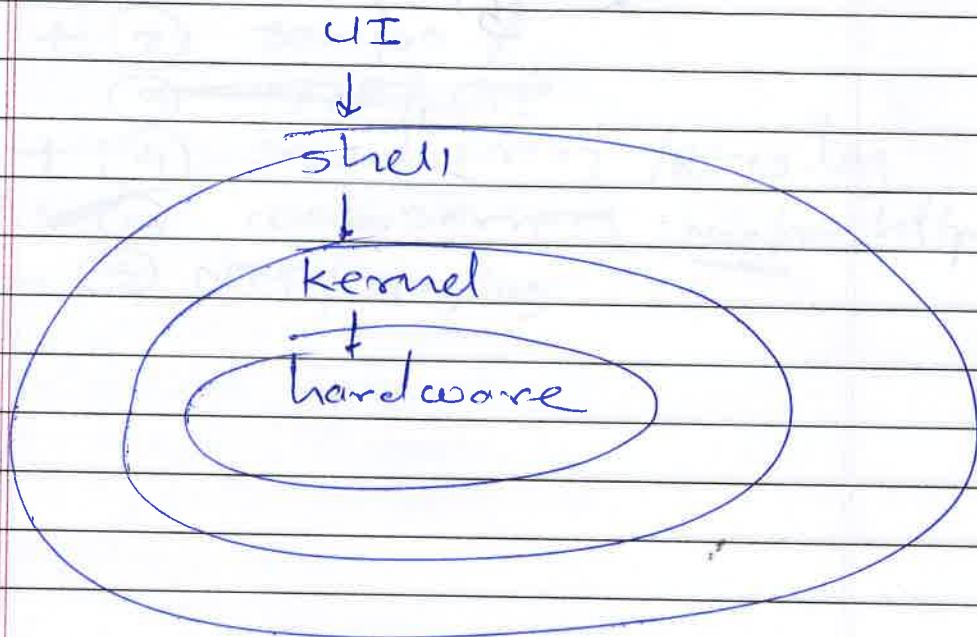


- Repo management.



- log management.

linux :- architecture



hardware :-

This contains peripheral devices.

kernel :- it is an core component of an operating system it reacts directly with hardware.

shell :- An interface to kernel

Takes command from user & executes kernel functions

in # → root privileges

\$ → normal priv.

directory structure :

/bin :- contains binary executable files

/ → root directory it contains lots of directories
/n

/boot :- contains static files required to boot system

/dev :- contains device nodes that either represent devices attached to it

/etc :- this directory is reserved for config file that are local to the machine no binaries are to be placed in.

/bin :- it contains the essential user programs that must be present when system is mounted in single user mode it contains system utilities such as bash shell

/sbin :- it contains essential binaries that are run by the root user for system admin

/lib & /lib64

contains the libraries needed by the binaries in the /usr/bin folder & located in /usr/lib.

/mnt :- it is used to mount temporary file system by admin

/opt :-

it contains subdirectories & may optional S/W packages

/proc :-

contains special files that represent system & process info

/run :-

used to store transient files they requires like socket & process ID

/sys :-

linux distributions includes a /sys directory as virtual file system which stores & allow modification of devices connected to the system. sysfs is used by program.

/usr : it contains applications & files used by user

/var

stands for variable

it contains the files

is expected to grow. This contains log, lock, spool, mail

/tmp :-

temporary directory

stores temporary files for user & system till next boot

Boot - process



POST



BIOS



MBR (Master Boot record)



Grub (bootloader)

↳ Initramfs

(verify sysfile & kernel)

kernel



systemd (Proc ID 1) Init

↳ target

(GUI, CLI)

Grub :- (Grand unified
Boot loader)

A program that load the
os into system memory
while booting

absolute path:-

An absolute path begins with the root directory & follow the tree branch by branch until the desired path completed.

relative path:-

it starts from the working directory

Navigation :-

change directory:-

cd - /path/to/dest

cd - /previous/directory

cd ~ /home/user/directory

ls (listing)

-a list all files.

-d list directories

-h display size in human-readable format

-l long list

-t sort by modification time

-i inode no

-Z Selinux context

Basic commands

date	touch	last
cal	whatis	rm
reboot	whoami	clear
mkdir	poweroff	whereis
ls	cd	unlockup
man	pwd	cat
dig	info	who
time	tree	command -
cd	cp	start
help	uptime	mv
wc	df	du

History :- HISTTIMEFORMAT =

"%d-%m-%Y %T"

{
 wget -o - to change output.
 wget - p - to change directory
 & download
 wget - i F.txt - create a file
 & add url
 wget - m C - to download on
 website.

* curl - o url - to download

In date command

-d is use to duplicate or
 convert date format.

27

File management

(Linux & Unix)

B.Ramesh

Page No.:

1/1

→ Inode

→ Soft & hard link

* use unlink (to unlink)

Inode :-

An inode is a uniquely existing number for all the files in linux & unix type system when file is created on a system a filename & inode no is assigned to it

link → it is used to create replica point on one or more

① soft link:

link can be created at any file & both directory

ln -s

different inode value

②

hard link →

ln /source /dest

hard link can be created for any file not for directory

ln

① same inode value

② within some mount point work

Rundlevels & targets

10

-> systemctl set-default

location

(etc/systemd/system)

systemctl set-default

* systemctl isolate (target or

runlevel)
Initialze without reboot.

Systemctl list-dependencies

graphical.target

Single user mode

init 1

location →

ls /lib/systemd/system/runlevel
* target -c

ctrl + c - terminate command.

ctrl + z - send command background

ctrl + d - delete command.

ctrl + r - search command.

runlevel 0 → poweroff.target

runlevel 1 → rescue.target

runlevel 2 → multiuser.target

" 3 → "

" 4 → "

" 5 → graphical.target

" 6 → reboot.target

File management

B.Ramesh

Page No.:

Date: / /

standardized I/p, O/p, error

- ① The standardized I/p (stdin) device is keyboard.
- ② The standardized o/p (stdout) devices is screen

File descriptor (sysno) Description

0	<	STDIN
1	>	STDOUT
2	>>	STDERR

standard error redirection

capture.txt & 2>&1

>
used for concate.

>>
used to append

File management

B.Ramesh
Page No.:
Date: / /

* Compressing & archiving

archiving //

tar - cvzf

To create an tar file.

- xyzf

To extract.

- uvf to update

- tf to view content of tar

① does not reduce any file size.

Compressing :

zip -r test.zip *

to zip multiple files.

-x used to exclude file.

-d used to delete file.

-f used to update file.

-i used to include file.

— — — — —

* creating file.

cat > filename

touch > filename. - emptyfile

vim filename.

echo " " > filename

/

command mode

dd - Delete current cursor pos

dsd / cldS - delete lines below cursor

x - delete single char

sx - delete s char

yy - copy line. (yank)

yyS - copy s lines

p - go pasted line above.

P - paste line below

dw - delete single word.

u - undo last action.

U - undo all

j - join line

. - redo

w - move to beginning of word

ctrl r to redo

%s to replace

creating files older than
x days

touch -amt ~~202204010909~~
File name.

* use date in reverse format
already with 0909

Grep :- Grep (Global regular expression)

gives us $\frac{1}{2} \sin^{-1}(x) + C$

~~and I said what - what~~

ANSWER: The answer is 1000.

~~ranked by global~~ - 3

growing as individuals - x p

(Drew) ~~is~~ ~~the~~ ~~best~~ ~~student~~ ~~in~~ ~~the~~ ~~class~~

10. *What is the best way to learn English?*

base a simulation on -

Fullerene and its derivatives

longitudinal subjects = 200

→ providing → also → if

The school is

www.english-test.net

10. *What is the best way to prevent the spread of COVID-19?*

the beginning of the year.

1. *What is the primary purpose of the study?*

Digitized by srujanika@gmail.com

— 1 —

Central California Coast

三月三十日 二十九岁

本章所用的“政治”一词，指的都是政治学意义上的政治。

For more information about the study, please contact Dr. John P. Morrissey at (212) 639-7330 or via email at jmorrissey@nyp.edu.

— *annandalei* — *annandalei*

1993-11-20 020

estas cifras posibl

Sed Commands

B.Ramesh
Page No. :
Date : 1 / 1

printing using sed

sed -n '1p' /etc/passwd
used to print 1 line at a time
passwd.

sed -n '1p;5p' /etc/passwd.
used to print from line
no 1 to 5

sed -n '1p,5p' /etc/passwd
print only lines no 1 & 5

File management

B.Ramesh
Page No.:
Date: 1/1

File permissions:

permissions & ownerships:

chmod

This command is used to change the permissions of a file but you have an root permission you can use command like.

chmod ugo+rwx

or

chmod 755 - for directory
644 - for files.

ownership:

chown -R owner:Group

This command is used to change the ownership of a particular file or directory.

" -R " is used to change recursively

Acl : (Access control list)

using acl you can also change the permissions of a file. For example.

To get list

getfacl File or directory
name.

To set acl.

Setfacl -m u:username:permis^{sion} Group perm^{ission}
∴ use G instead of u to change GP

To copy acl of other file.

∴ To remove permission use -rwx
getfacl file | setfacl -d -m
u: user : perm file.

suid, sgid, sbit.

These are the another kind of ownership changing commands b. you can set or change ownership permanently.

ex user 4 - uid = suid
Group - 2 - gid = sgid.
sticky bit - s = sbit.

Find :

This command is used to find a particular file or directory. You can use various methods with find command.

ex:-

To find file use.

`find /path/ -type f -name "*"`

- * use d instead of f to find directory

- * To find file with permission.

`find /path/ -type f -perm 0644`

- * To delete file or directory older than x days.

`find /path/ -type f -name "*"`

`-mtime +xdays -exec rm -f`

{ } ;

* (The curly brackets are used as loop)

To perform user & Group management
you have root privilege

B Ramesh

Page No.:

Date:

10

User management & Group.

* Adding user

```
useradd -u 1000 -gG -s /bin/bash  
-d /home/tck -c "___"  
user name.
```

-u = To set user id

-g = Primary group

-G = supplementary group

-s = login shell

-d = home directory

note : - to perform useradd.

you have root permissions

* modifying user properties

```
usermod -options username
```

-l - rename user (newname
oldname)

-L - lock user username

-U - unlock user. ↳ "

-d - change home dire. "

-s - change login shell "

-e - password aging "

-f - inactive account. "

*

-E 'date -d +xdays +%Y-%m-%d'

B.Ramesh
Page No.:
Date:

* password & account aging.

change command is used with various options to set password & account aging.

ex:- change user properties using "change cmd"

-d = set the no of day when the password is changed

-G = set expiry date

-I = set the no of days inactivity after a password has expire before account is locked.

-l = list account aging info

-m : a user changes their password at any time.

-M = max no of day password valid.

-W = warning before password change.



* -E 'date -d +xdays +%Y-%m-%d'

directory related with the group & users

1) /etc/skel

in this directory contains basic & some config directories which will assign to new user

② /etc/login.defs

This config file contains properties associated with users & groups.

③ /etc/passwd

This file contains user information.

/etc/group

This file contains group information.

* delete user

To delete user

userdel -r username.

* delete user with home directory

userdel -r username.

Group management

To add group

groupadd groupname.

modifying Group properties.

groupmod -p : to set password

-n : rename Group

(newname → old
name)

-g : change groupid

* gpasswd -A username Groupname

To make user admin of a
particular group.

gpasswd -m add multiple
users to particular group.

gpasswd -d user Group.

To delete user.

gpasswd -c user Group.

To add user.

cat

cat /dev/zero > file.

Page No.:
Date:

B.Ramesh

(LVM (Logical volume manager))

In computer storage LVM provide a method of allocating space on mass storage device that is device that is more flexible than conventional partitioning scheme to store volume.

steps to create LVM is

① use the fdisk utility to create partition.

ex :-

fdisk /dev/da0p1

② scan lvm

for i in {0..5}; do

i

echo "----" >

/sys/class/bsci-host/

host\${i}/scan

done ;

③ create physical volume

physical volumes are the collection of disk partition used to store server data.

ex :-

pvcreate /dev/sd1

* use pvdisk or pvs to get info

③ volume group :-

volume groups are the collection of different physical volumes.

ex:-

vg create /dev/sdb1
 & use vgs or vg display
 to get info

④ lv create :-

now we create logical volumes out of any physical volume

ex:-

i) lvcreate -l 100%FREE
 -n name vgname
 create partition by using
 This cmd to utilize all
 space

ii) lvcreate -L size -n name
 vg name.

now lvm is created now it's time to create file system.

① ext4 :- extended file system 4

② xfs

* creating File system .

D) `mkfs -t /dev/sdb1 ext4`
To make file system at ext4.

② `mkfs -t xfs /dev/sdb1`
To make xfs file system.

③ `partprobe` .
This cmd TO refresh partition
table -

D) format filesystem.

`mkfs -t ext4 /dev/vg/lv`

`mkfs -t xfs /dev/vg/lv`

i) now create an directory

ii) edit fstab (`/etc/fstab`)

`/dev/mapper/vg/lv /dir`.

ext 4 default o o

iii) no mount

`mount -a`.
check using `df -Th`

Resize LVM (ext4 filesystem)

① umount dir.

umount -v /dir.

②

→ e2fsck -cF /dev/mapper/vg-lv

To check errors in
file system.

③ resize2fs /dev/mapper/vg-lv size

④ lvreduce /dev/vg-lv
-L size

Then check errors

and mount it again

mount -av

You can also extend
using

lvextend command.

XFS file system

incose - ab XFS file system
is an. newest type of filesystem
provide much better features
Than ext4.

to create XFS file system,

mkfs -f xfs /dev/dervname
To createal XFS file system

Then check errors.

xfs_repair .

To extend xfs use.

xfs_growfs /dev/mapper/

Selinux:

security enhanced linux adds mandatory access control to the linux kernel and is enabled by default in fedora it provides strong separation of applications that permits the safe execution of untrusted applications it's an ability to permit or limit the privileges associated with executing process limit the scope of potential damage than can result from exploitation of vulnerabilities in applications & services.

Targeted policy

① combined processes:

Almost every service that listen on a network such as sshd, httpd also most process that run as the root user & perform tasks for user such as password are combined when the processes are combined it run in its own domain such as the httpd process running in the httpd domain.

unconfined Processes :

unconfined processes runs in the unconfined domain for eg.
unconfined services executed by init end up running in the unconfined_domain
unconfined services executed by kernel end up running in the kernel_domain and unconfined services executed unconfined linux users end up running in the unconfined domain (unconfined-t)

Selinux Context

processes & files are labeled with an selinux context that contains additional information such as selinux user, role, type & optionally a level when running selinux all of the information is used to make access control decisions context is an combination of Role-based Access Control, Type enforcement & optionally multilevel security

duke install setools-console -y

seintes -r (available roles)

semanage ~~role~~ -l

boolean (selinux)

semanage boolean -l

setboolean

getsebool -a

setsebool -P boolean name

setsebool (display all expression)

selinux packages

selinux packages are installed by debain

- ① policycoreutils
- ② ① restorecon
- ② secon
- ③ setfiles
- ④ semodule
- ⑤ load_policy
- ⑥ setselinux

For operating & managing selinux

selinux context :: (labeling)

on system running selinux,

all processes & files are labeled in a way that represent security relevant info. This called context.

temp changes →

chcon -f context file

The chcon command changes the selinux context for file.

However changes made with

The chcon do not survive a file system relabel or execution of the restorecon

com selinux policy control whether user are able to modify the selinux context for any given file.

To restore context

restorecon for filename

Permanent change.

The semanage fcontext is used to change the selinux context of file.

Semanage fcontext -at context file name.

-d = remove context.

restorecon -v /filename.

linux networking management

Host only network:

The vm will be assigned one ip but it only accessible by the box vm is running on no other computer can access it.

Not :-

The vm will be assigned in separate subnet like xxx - xxx - x - x (ip) is your host computer & vm is xxx - xxx - x - x (ip) Then your vm can access outside network like your host but not outside access to your vm directly it's protected.

bridge:- your vm will be in the same network as your host if your host ip is xxx - xxx - x - x then your vm will be like xxx - xxx - x - 2 it can be accessed by all computer in your host network.

~~etc/sysconfig~~
location of network config
etc/sysconfig/network-script

nmcli

nmcli dev status

use to get status all devices

nmcli dev show

nmcli con show -a

connection permission. username
use , to add multiple
user to connection.

connection permission user:

username

To reload connection

nmcli con reload.

To edit with interactive mode

nmcli con edit conname.

use '—' to remove any
parameter from nmcli

To create new connection use

nmcli con add con-name xyz
type ethernet ifname devname.

IPv4.address xxx.xxx.x.x

nic teaming :

In computer networking the term link aggregation refers to various method of combining multiple network connection in parallel order to increase throughput beyond what a single connection could sustain & provides redundancy in case of one of the link should fail.

* team0 - utility (Clement)
team0ct1 (utility)

runner mode ;

round robin, load balancing,
broadcast & active backup
creating nic teaming.

nmcli con add type team
con-name master ifname team0
config '{ "runner": { "name":

"activebackup" }}

→ adding slave to master

nmcli con add type team-slave
con-name team0-slave ifname
ens256 master team0

Repo management :-

what is repository :-

it is an collection of software, packages & document stored on centralized server local server

Package manager

Rhel/SRPM = redhat package manager
centos/yum = yellow dog update manager (fedora based)

apt = aptitude
(debain based)

dpkg : debain, Ubuntu

apt (advance package tool)

dpkg :

dpkg is an debain based package management utility used to install packages without any dependency

dpkg -l to list packages.

* (dpkg -l package name)
installation info.

dpkg -S package name.

(use with file path also)

package location, /var/cache/apt/archive for debien
B.Ramesh

dpkg -L packagename info about dependencies.

dpkg -i packagename.
To install package manually.

dpkg -r packagename
To remove.

apt (advance package tool)

To clean cache

use

apt clean cache.

To update cache.

apt update cache.

To search package downloaded.

apt-cache search packagename.

| grep :

To install package.

apt install packagename.

To uninstall package use.
with configuration file.

apt purge packagename.

apt auto-remove package
name.

use safe
to reduce failing
chances.

apt repo location,

/etc/apt/source.list
(ubuntu)

to add repo
use.

① add-apt-repository url-
of your repo

② appropose apt url

Fedora based package management.

RPM : redhat package manager.

To list installed packages.

`rpm -q package name`.

To list the info of installed packages.

`rpm -qi package name`.

To install package

`rpm -ivh package name`.

To remove package

`rpm -evh package name`.

To list files inside RPM & install or extract

`rpm2cpio package name | cpio -i`

`rpm2cpio package name | cpio`

`-i file path`.

Yum (Yellowdog update modifier)

To list the packages available inside your repository use.

yum list | grep 'pkgn'

To search search package.

yum search packagename.

To list installed packages.

yum yum list installed.

Yum group

it is an collection of multiple package used to install a single package depends on it.

To list group use

yum group list all | grep.

To install group

yum group install "groupname"

To remove group use
yum groupremove "group"

package conversion.

use alien utility for conversion

alien --to-deb packagename
for deb.

alien --to-rpm packagename

To install repo

yum repolist all
Creating repo

[Reponame]

name = anyname

metadata_expire = + or never

gpgcheck = 1

enabled = 1

baseurl = url of repo

gpgkey = file:///etc/pki/rpm-gpg

/RPM-GPG-KEY-redhat-
release

source Not in square map

erase
disables subscription -
manager - msg.

vim /etc/yum/pluginconf.d/
subscription-manager.conf

enable = 0 & save .

global yum conf

/etc/yum.conf

yum config-manager
--add-repo = repourl

To enable Repo

yum - config - manager
--enable Reponame

to disable use
-- disable instead of
enable .

log management :-

The system log daemon is responsible for logging the system messages generated by application or kernel.

log location

/var/log/

Log files

• cron -> cron.log

• user & operators - -

(1) user & operators -

• cron -

• messages -> message.log

• user & operators - -

• kernel -

• auth -> auth.log

• system -> system.log

• security -> security.log

kernel management

Boot parameters defined in

↳ /proc/cmdline
/proc/module

kernel.org → (available all kernels on website)

kernel source code

/usr/src/kernel

kernel modules

/lib/modules/kernel version
lsmod

To load module use .

modprobe module name

(s mod → to list .

rmmod - to remove .