

Work on the command line

command options arguments

ID	Command	Description	Example
1	cd	Change directory to ...	cd tempdir ; cd .. ;cd ~
2	history	Lists commands you've done recently !! : run last command ! chown: run last command start with 'chown' phrase CTRL+R: search C: clear	History -c
3	logout (exit)	How to quit a UNIX shell.	Logout or exit
4	man	Online manual about command 1.shell commands(man) 2.System calls 3.Library calls(sin) 4.Special files(in /dev) 5.File formats (/etc/passwd) 6.Games 7.Miscellaneous (ASCII) 8.System administration commands(usually only for root) 9.Kernel routines(PING)	Man date(u,R) (/ n ?)
5	echo	display a line of text ": show anything \(: disable interpretation of backslash n: do not output the trailing newline e: disable interpretation of backslash escapes \n: new line	echo -e "a\nb" echo \$tab
6	read	allows scripts to catch information entered by users interactively t: timeout n: nchar s: secure p:prompt	read -s -n 4 -p "please enter"
7	ls	list directory contents l: long listing format	ls -alh

		<p>h: human-readable i: inode a: all S: sort by file size t: sort by modification time</p> <p>File Type # of Hard Links File size</p> <pre>-rwxr-x--- 1 walbert support 0 Oct 31 11:06 test</pre>	
8	ln	<p>similar to shortcuts in Windows(ln [options] source link) s: soft link</p>	<pre>ln old_name new_name ln -s old_name new_name</pre>
9	pipe	<p>Postfix delivery to external command <i>first</i> <i>second</i> <i>third</i> <i>fourth</i> <i>fifth</i> <i>sixth</i> [...]</p>	man cd less
10	uname	<p>print system information a: all r: kernel release</p>	uname -a
11	shutdown	<p>power-off or reboot the machine -c; cancel -r, --reboot</p>	<pre>shutdown -h now shutdown -h 16:30 & shutdown -c shutdown -r now</pre>
12	poweroff	halt, poweroff, reboot – Halt, power-off or reboot the machine	
13	reboot	halt, poweroff, reboot – Halt, power-off or reboot the machine	
14	df	<p>report file system disk space usage h: human-readable T: file system type</p>	df -h
15	du	<p>estimate file space usage -s: summarize -h: human-readable (1k =1000) -b: byte -k: kilobyte</p>	du -h -d 1 /root

		--max-depth 1 : show only 1 directory further	
Meta characters	<pre>=> (& ; () < > * && & ; ; () echo line 1;echo line 2; echo line 3 echo line 1&&echo line 2&&echo line 3 echo line 1 echo line 2; echo line 3</pre>		

Manage users and groups(7)

ID	Command	Description	Example
1	groupadd	create a new group g: group's ID	groupadd -g 501 oinstall
2	groupdel	delete a group	groupdel oinstall
3	groupmod	modify a group definition on the system n: new-name	groupmod -n oracle1 oracle2
4	useradd	create a new user g: The group name -d, --home-dir -u, --uid -c, --comment	<pre>useradd -u 501 -g oinstall grid useradd -d /u01 oracle useradd -c "usef" usef</pre>
5	userdel	delete a user account and related files r: Files in the user's home directory will be removed	userdel -r oracle
6	usermod	modify a user account L: lock user u: unlock user l: change username aG: add to more groups	<pre>usermod -l oracle usermod -l oracle oracle2</pre>
7	passwd	update users authentication tokens -d, --delete -S, --status(PS = password set ,LK = password locked ,NP = no password) -e, --expire(during the next login) -l, --lock -u, --unlock	Passwd -d root

		-i, --inactive DAYS(set the number of days which will pass before an expired password)	
8	chage	change user password expiry information -m, --mindays -M, --maxdays l;list	chage -m 2 oracle chage -l oracle
9	id	print real and effective user and group IDs G: groups	id -G
files	<p>/etc/passwd =>User :Pass :UID :GID :Comment :Home Directory :Default Shell</p> <p>/etc/shadow=>user :pass :lastchg(Last password set/changed date) :min(chage -m) :max(chage -M) :warn(passwd -w) :inactive(passwd -i) :expire(Account inactive) :flag(Time since account is disabled)</p> <p>/etc/group=>group name :password :GID :list of users</p> <p>/etc/skel</p>		

shell environment(5)

	Command	Description	Example
1	env	run a program in a modified environment	env grep SSH_CONNECTION
2	export	Set export attribute for shell variables p : display a list of all exported variables	Export NAME=usef ksh echo \$NAME
3	unset	remove the corresponding variable	unset NAME
4	set	Set or unset values of shell options -t: Exit after executing one command. -e: Exit after first error	set -e
5	function	Define shell function.	z() > { > date > }

6	alias	Define or display aliases	alias alias a='date +%Y'
7	unalias	Remove each NAME from the list of defined aliases	unalias a
8	source	Execute commands from a file in the current shell	Source grid_var

Files:	<p style="text-align: center;">login vs non-login shell</p> <p>--in login shell(login with password):</p> <p>1- /etc/profile 2- /etc/profile.d/* 3- /home/USERNAME/.bash_profile(if exist else run 2)</p> <p>OR</p> <p>4- /home/USERNAME/.bash_login(if exist else run 3)</p> <p>OR</p> <p>5- /home/USERNAME/.profile</p> <p>--in non-login shell</p> <p>1. /etc/bash.bashrc (or in some systems /etc/bashrc) 2. /home/USERNAME/.bashrc</p> <p>--run any way</p> <p>~/bashrc OR ~bash_profile</p> <p>/etc/skel .bash_logout</p>
---------------	---

shell variables

	Command	Description	Example
1	USER	The name of the logged-in user	Echo \$USER
2	UID	The numeric user id of the logged-in user	echo \$UID
3	HOME	The user's home directory	echo \$HOME

4	PWD	The current working directory	echo \$PWD
5	\$	The process id (or PID) of the running bash shell (or other) process	echo \$\$
6	?	The exit code of the last command	echo ?
7	PPID	The process id of the process that started this process	Echo PPID
8	BASH_VERSION	Holds the version of this instance of bash.	echo \$BASH_VERSION
9	HOSTNAME	The name of the your computer.	echo \$HOSTNAME
10	HISTFILE	The name of the file in which command history is saved.	echo \$HISTFILE
11	HISTSIZE	The number of commands to remember in the command history. The default value is 500.	echo \$HISTSIZE
12	IFS	The Internal Field Separator that is used for word splitting after expansion and to split lines into words with	IFS=: Read X Y echo \$IFS
13	PATH	The search path for commands. It is a colon-separated list of directories in which the shell looks for commands.	echo \$PATH
14	PS1	Your prompt settings. \t : the current time in 24-hour HH:MM:SS format \d : the date in "Weekday Month Date" format	echo \$PS1
15	SHELL	Set path to login shell.	echo \$SHELL

File Management Commands(3)

Vi command

mode

Command	is where you go around the file, search, delete text, copy paste, replace, ... and give other commands to the vi. Some commands start with a : and some are only a keypress.
Insert	is where what you type, goes into the file at the cursors position.

Inserting Text

i	Insert before cursor
I	Insert before line
a	Append after cursor
A	Append after line
o	Open a new line after current line
O	Open a new line before current line
r	Replace one character
R	Replace many characters

Quitting

:x	Exit, saving changes
:w	to save your file but not quit vi
:wq	Exit, saving changes
:q	Exit as long as there have been no changes
:q!	Exit and ignore any changes
ZZ	Exit and save changes if any have been made

Motion

h	Move left
j	Move down
k	Move up

l	Move right
w	Move to next word
W	Move to next blank delimited word
b	Move to the beginning of the word
B	Move to the beginning of blank delimited word
e	Move to the end of the word
E	Move to the end of Blank delimited word
(Move a sentence back
)	Move a sentence forward
O	Move to the begining of the line
\$	Move to the end of the line
1G	Move to the first line of the file
G	Move to the last line of the file
nG	Move to nth line of the file
H	Move to top of screen
M	Move to middle of screen
L	Move to botton of screen

Deleting Text

x	Delete character to the right of cursor
X	Delete character to the left of cursor
D	Delete to the end of the line
dd	Delete current line
1,200d	Delete from 1 to 200
:d	Delete current line
4dd,pp	Delete and paste

Copy Text

yy	Yank the current line
----	-----------------------

Replace

<code>:s/pattern/string/flags</code>	Replace <i>pattern</i> with <i>string</i> according to <i>flags</i> .
G	Flag - Replace all occurences of pattern

Files

<code>:w file</code>	Write to <i>file</i>
<code>:r file</code>	Read <i>file</i> in after line

:n	Go to next file
:set number	show line numbers

Other

~	Toggle upp and lower case
J	Join lines
u	Undo last change

Perform basic file management(3)

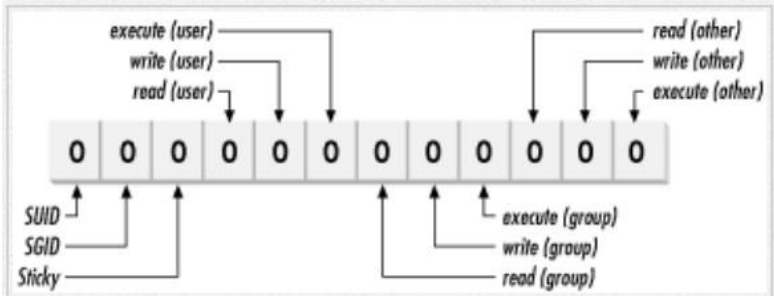
ID	Command	Description	Example
1	mkdir	make directories mkdir [options] directory-name(s) p: make parent directory m: mode(permission) -v, --verbose	mkdir -p /u01/oracle mkdir f1 f2 f3 mkdir -pv /folder1/{f1,f2,f3/{kk,ll}} mkdir -m000 newfolder1
2	rmdir	remove empty directories rmdir [options] directory-name(s) p: remove DIRECTORY(if empty)	rmdir /u01
3	rm	remove files or directories rm [options] files f: force i: prompt before every removal r: recursive v: verbose	Rm -rf /u01
4	touch	change file timestamps touch [options] files d: change date r: reference -c, --no-create t: use [[CC]YY]MMDDhhmm[.ss]	touch -d "yesterday 6m" f1 touch -r file1 file2 touch -t 200908121510.59 f3 touch -d 11am f4 touch -d "last fortnight" f5 touch -d "yesterday 6am" f6 touch -d "2 days ago 12:00" f7 touch -d "tomorrow 02:00" f8 touch -d "5 Nov" f9
5	cat	print on the standard output n: number all output lines b: number-nonblank -A, --show-all -E, --show-ends	cat -n myfile cat file1>file2 cat file3>>file4 cat > new_filename(ctrl+D) cat file1 - file2 >join_file
6	tac	concatenate and print files in reverse	tac file1

7	nl	number lines of files(same cat)	nl file1
8	od	dump files in octal and other formats(decimal, hexadecimal)	od file1 od -c file1
9	head	Display the first few lines of a file <i>head [options] [file(s)]</i> n: lines -c: output the last K bytes	Head -n5 .bash_history Head -c2 .bash_history
10	tail	Display the last few lines of a file f: follow n: lines	tail -n 1000 .bash_history
11	more	file perusal filter for crt viewing	more /u01/inventory.xml
12	less	quickly view any file and any section of a file	less /u01/inventory.xml
13	cp	copy files and directories <i>cp [options] source destination</i> -f, overwrite without prompting -R, -r, --recursive:copy directories recursively -i, --interactive -u: update only if the original is newer than the target or if the target doesn't exist -p will preserve the attributes.	cp [!1]* /e cp [1-4]* /e cp ?[!3]* /e cp -r myfolder /e cp -u file1 /e/file1
14	mv	move (rename) files <i>mv [options] source destination</i> -f, --force -u, --update -i, --interactive(prompt before overwrite) -n: do not overwrite an existing file	mv ?7* /e
15	file	determine file type	file file1
16	dd	convert and copy a file if: input file of: output file bs: block size count: count redo Conv: convert the file as per the comma separated symbol list	dd if=/u01/a1 of=/u02/b1 dd if=a of=b conv=ucase dd if=/dev/sr0 of=/grid/sr0

Wildcards and globbing	<p>* means any string</p> <p>? means any single character</p> <p>[ABC] matches A, B & C</p> <p>[a-k] matches a, b, c, ..., k (both lower-case and capital)</p> <p>[0-9a-z] matches all digits and numbers</p> <p>[!x] means NOT X.</p>
------------------------	---

File Permissions

chmod	<p>change file mode bits</p> <p>chmod [options] [mode[,mode...]] filename...</p> <p>R: recursive</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="width: 10%;">d</td> <td style="width: 10%;">r</td> <td style="width: 10%;">w</td> <td style="width: 10%;">x</td> <td style="width: 10%;">r</td> <td style="width: 10%;">-</td> <td style="width: 10%;">x</td> <td style="width: 10%;">r</td> <td style="width: 10%;">-</td> <td style="width: 10%;">-</td> </tr> <tr> <td></td> <td>read</td> <td>write</td> <td>exec</td> <td>read</td> <td>write</td> <td>exec</td> <td>read</td> <td>write</td> <td>exec</td> </tr> <tr> <td>File type</td> <td colspan="3">Owner permissions</td> <td colspan="3">Group permissions</td> <td colspan="3">User permissions</td> </tr> <tr> <td>(directory)</td> <td>4</td> <td>2</td> <td>1</td> <td>4</td> <td>2</td> <td>1</td> <td>4</td> <td>2</td> <td>1</td> </tr> <tr> <td></td> <td colspan="3">7</td> <td colspan="3">5</td> <td colspan="3">4</td> </tr> </table> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="width: 15%;">File Type Code</td> <td style="width: 25%;">Owner Permissions</td> <td style="width: 25%;">Group Permissions</td> <td style="width: 35%;">World Permissions</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">-</td> <td style="border: 1px solid black; text-align: center;">r w x</td> <td style="border: 1px solid black; text-align: center;">r - x</td> <td style="border: 1px solid black; text-align: center;">r - x</td> </tr> <tr> <td></td> <td>read write execute</td> <td>read write execute</td> <td>read write execute</td> </tr> </table>	d	r	w	x	r	-	x	r	-	-		read	write	exec	read	write	exec	read	write	exec	File type	Owner permissions			Group permissions			User permissions			(directory)	4	2	1	4	2	1	4	2	1		7			5			4			File Type Code	Owner Permissions	Group Permissions	World Permissions	-	r w x	r - x	r - x		read write execute	read write execute	read write execute	<pre> chmod u+x myfile chmod u-x myfile chmod ug-x myfile chmod o=r,g=r,u=rwx chmod 000 myfile </pre>
d	r	w	x	r	-	x	r	-	-																																																							
	read	write	exec	read	write	exec	read	write	exec																																																							
File type	Owner permissions			Group permissions			User permissions																																																									
(directory)	4	2	1	4	2	1	4	2	1																																																							
	7			5			4																																																									
File Type Code	Owner Permissions	Group Permissions	World Permissions																																																													
-	r w x	r - x	r - x																																																													
	read write execute	read write execute	read write execute																																																													
Chown	<p>change file owner and group</p> <p>chown [options] [newowner][:newgroup] filenames</p> <p>-R, --recursive</p>	<pre> chown oracle usef_file chown oracle usef_file usef_file2 chown oracle.oinstall usef_file usef_file2 chown 54325.54326 usef_file usef_file2 </pre>																																																														

		<code>chown -R oracle.install /u01/</code>
Chgrp	changes a file's group <code>chgrp [options] newgroup filenames</code> -R, --recursive	<code>chgrp oinstall p</code>
Umask	default ownership and permissions Umask Created files Created directories 000 666 (rw-rw-rw-) 777 (rwxrwxrwx) 002 664 (rw-rw-r--) 775 (rwxrwxr-x) 022 644 (rw-r--r--) 755 (rwxr-xr-x) 027 640 (rw-r-----) 750 (rwxr-x---) 077 600 (rw-----) 700 (rwx-----) 277 400 (r-----) 500 (r-x-----) -S: Display readline key sequences bound to macros and the strings they output.	<code>umask 000</code> <code>touch vf3</code>
Lsattr	list file attributes on a Linux second extended file system	<code>lsattr file1</code>
Chattr	Change Attribute chattr [operator] [flags] [filename] +i: won't be able to delete +a: can only be open in append mode for writing. in windows: attrib +h d:\test.txt attrib -h d:\test.txt	<code>chattr -R +i tetsi/</code> <code>chattr +a usef.txt</code> <code>cat - >> usef.txt</code>
SUID(Set User ID)	used in conjunction with executable files, and it tells Linux to run the program with the permissions of whoever owns the file rather than with the permissions of the user who runs the program. 	<code>chmod +s testfile</code> <code>chmod 4777 testfile</code> <code>passwd</code> 4755/-rwsr-xr-x <code>chmod 4755 /sbin/fdisk</code>

Working with SUID, SGID, and Sticky Bit				
Permission	Numerical Value	Relative Value	On Files	On Directories
SUID	4	u+s	User executes file with permissions of file owner.	No meaning.
SGID	2	g+s	User executes file with permissions of group owner.	File created in directory gets the same group owner.
Sticky bit	1	+t	No meaning.	Users are prevented from deleting files from other users.

4	2	1	4	2	1	4	2	1
rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwx
		SUID						
		↓		↓			↓	
rws	rwx		rwx	rwx	rwx	rwx	rwx	rwx
		USER						

sgid	User execute file with permissions of group owner.	Chmod 2777 file1
------	--	------------------

4	2	1	4	2	1	4	2	1
rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwx
			SGID					
		↓		↓			↓	
rwx	rws		rwx	rwx	rwx	rwx	rwx	rwx
			GROUP					

Sticky BIT	other users cannot delete or rename the files (or subdirectories) within that directory	/tmp find / -perm +1000
------------	---	----------------------------

4	2	1	4	2	1	4	2	1
rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwx
					StickyBit			
		↓		↓			↓	
rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwx	rwt
								OTHERS

Stat	display file or file system status	stat file1
------	------------------------------------	------------

Locating Files(3)

ID	Command	Description	Example
1	find	search for files in a directory hierarchy	find / -iname '*.jpg'

		<p>-name: Base of file name</p> <p>-iname: case insensitive(ignore)</p> <p>-empty: File and folder is empty</p> <p>-type: f,d,l</p> <p>-maxdepth</p> <table border="1"> <thead> <tr> <th>switch</th> <th>meanint</th> </tr> </thead> <tbody> <tr> <td>atime(day) amin(min)</td> <td>file was last accessed</td> </tr> <tr> <td>ctime(day) mtime(min)</td> <td>(for example, change owner or group)file was changed</td> </tr> <tr> <td>mtime(day) mmin(min)</td> <td>file <i>content</i> modification</td> </tr> </tbody> </table>	switch	meanint	atime(day) amin(min)	file was last accessed	ctime(day) mtime(min)	(for example, change owner or group)file was changed	mtime(day) mmin(min)	file <i>content</i> modification	<p>find /u01 -empty</p> <p>find /u01 -type d -iname myfolder1</p> <p>find / -size +10M</p> <p>find /home -user exampleuser -mtime 7 -iname ".db"</p> <p>find ~ -type f -name "*.BAK" -delete</p> <p>find /root -name usef.txt -exec rm -rf {} \;</p> <p>find / ! -user root</p>
switch	meanint										
atime(day) amin(min)	file was last accessed										
ctime(day) mtime(min)	(for example, change owner or group)file was changed										
mtime(day) mmin(min)	file <i>content</i> modification										
2	Locate, updatedb	<p>search only on filenames</p> <p>/var/lib/mlocate/mlocate.db</p> <p>-S, --statistics</p> <p>-e, --existing(don't show any deleted files)</p> <p>-l, --limit; Exit successfully after finding LIMIT entries</p>	<p>locate -S</p> <p>locate -e myfile</p> <p>locate -l 5 myfile</p>								
3	which	<p>lists the complete path(PATH) to the first match it finds</p> <p>-a: search for all matches</p>	<p>Which date</p> <p>Which -a date</p>								
4	whereis	<p>searches for files in a restricted set of locations, such as standard binary file directories, library directories, and man page directories.</p>	<p>whereis man</p>								

text streams using filters(3)

	Command	Description	Example
1	cut	<p>remove sections from each line of files</p> <p>f: fields</p> <p>d: delimiter(default is TAB)</p> <p>c: select only these characters</p>	<p>cut -f2 -d" " file1</p> <p>cut -c1-2,5-7,9- file1</p>
2	sort	<p>sort lines of text files</p> <p>r: reverse</p> <p>n: compare according to string numerical value</p> <p>u: unique</p>	<p>sort -n file1</p> <p>sort -n -u -r -k2 file1</p>

		k: start a key at POS1	
3	uniq	report or omit repeated lines -d: only print duplicate lines -u: only print unique lines -c, --count	sort -n file1 uniq sort -n file1 uniq -u sort -n file1 uniq -d sort -n file1 uniq -c
4	tr	translate or delete characters	cat file1 tr '21' '-*'
5	sed	stream editor for filtering and transforming text g: all	sed 's/usef/vahid/g' file1
6	split	split a file into pieces b: bytes l: lines d: use numeric suffixes instead of alphabetic n: generate CHUNKS output files e: do not generate empty output files with '-n'	split -b10MB file f_ split -n2 -e file f_
7	wc	print newline, word, and byte counts for each file l: print the newline counts	cat fff wc -l wc fff
Out&in	<p>stdin is the standard input stream, which provides input to commands. stdout is the standard output stream, which displays output from commands. stderr is the standard error stream, which displays error output from commands.</p>		

Archive and ZIP

	Command	Description	Example
1	zip	package and compress (archive) files	Zip arc_file1 file1
2	unzip	extract compressed files in a ZIP archive	Unzip arc_file1
3	gzip	compress or expand files -gzip preserves time -gzip creates the new compressed file with the same name but with .gz ending -gzip removes the original files after creating the compressed file	gzip -v arc_diag gzip -d arc_diag.gz gzip -r /myfolder

		-v: Verbose -d –decompress -r –recursive -t: Check the compressed file integrity	
4	gunzip	compress or expand files -v --verbose	gunzip -v arc_diag.gz
5	bzip2	a block-sorting file compressor -d --decompress	bzip2 fff bzip2 -d fff.bz2
6	bunzip2	decompresses files	bunzip2 fff.bz2
7	xz	Compress or decompress	xz file1 xz -d file1
8	tar	saves many files together -c, create a new archive -v, --verbose -f, --file -x, --extract -t, --list(verify) -r, --append -j, --bzip2 z, --gzip or --ungzip	tar cvf acrivh_myfolder /myfolder tar tvf acrivh_myfolder tar xvf acrivh_myfolder tar rvf acrivh_myfolder 9 tar xvf acrivh_myfolder 9 tar cvfj arc_diag /oracle/diag
9	cpio	copy files to and from archives -o:archive a file or directory v:verbose -l:Extracting data from an uncompressed cpio archive -t: (test;verify) d: Create leading directories where needed.	find f* cpio -ov>test_arc.cpio ls cpio -o gzip > /f.cpio.gz cpio -id</root/test_arc.cpio cpio -i f1 < test_arc.cpio find f1 f2 cpio -o >arc.cpio cpio -tv < arc.cpio

Search text files(3)

	Command	Description	Example
1	grep	can search inside the files -c, --count -v, --invert-match -n, --line-number -L, --files-without-match -l, --files-with-matches -E, --extended-regexp	grep "oracle" /etc/passwd grep -c "oracle" /etc/passwd grep -v "oracle" /etc/passwd grep -n "oracle" /etc/passwd grep -l "TEMPFILE" /oracle/* grep -E "^[a-z].*f\$" /alert.log grep -E "*" a

		-R, -r, --recursive I:case insensitive	grep -E "(a x)" a grep -r "usef" /oracle grep -v -r "useful\$" /oracle
2	egrep	extended grep print lines matching a pattern (grep -E)	egrep "(a b d)" /alert.log egrep -l "(kk pp)" /oracle/* egrep "(a x)" a b egrep "[]" a b
3	fgrep	Fixed grep print lines matching a pattern (grep -F)	fgrep -r "LLIBMM=\$" /oracle grep -r -F "LLIBMM=\$" /oracle
Repeating		* => 0 or more =>c*o + => 1 or more =>b+a ? => zero or one repeats	

streams and redirects(3)

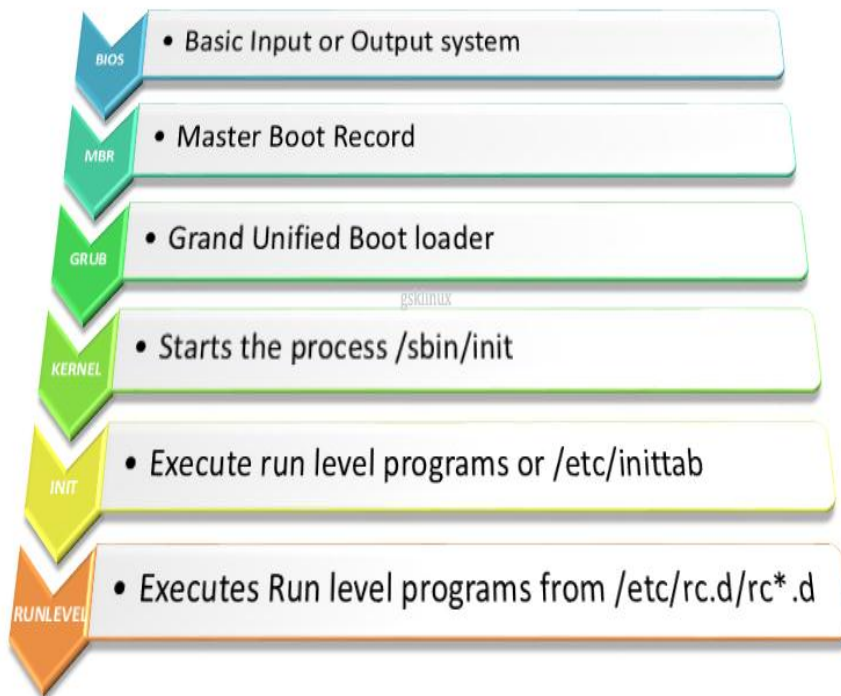
	Command	Description	Example
1	xargs	build and execute command lines from standard input -l ; INPUT --max-args	ls xargs echo find /oracle/* -type f -size +200M xargs ls xargs du -sh sort -n find /test/* -iname "[0-9]*" xargs -l VORODY mv VORODY /test2/ ls xargs -l myfolders cp -r myfolders /test ls xargs --max-args 1 echo
2	tee	read from standard input and write to standard output and files. a: append	ls tee myfile cat /etc/passwd tee -a myfile
concept	standard input → file descriptor 0 → sed 's/UNDOTBS1/usef/g'<C.Ora standard output → file descriptor 1 → ls -l m* a* 1>outfile		

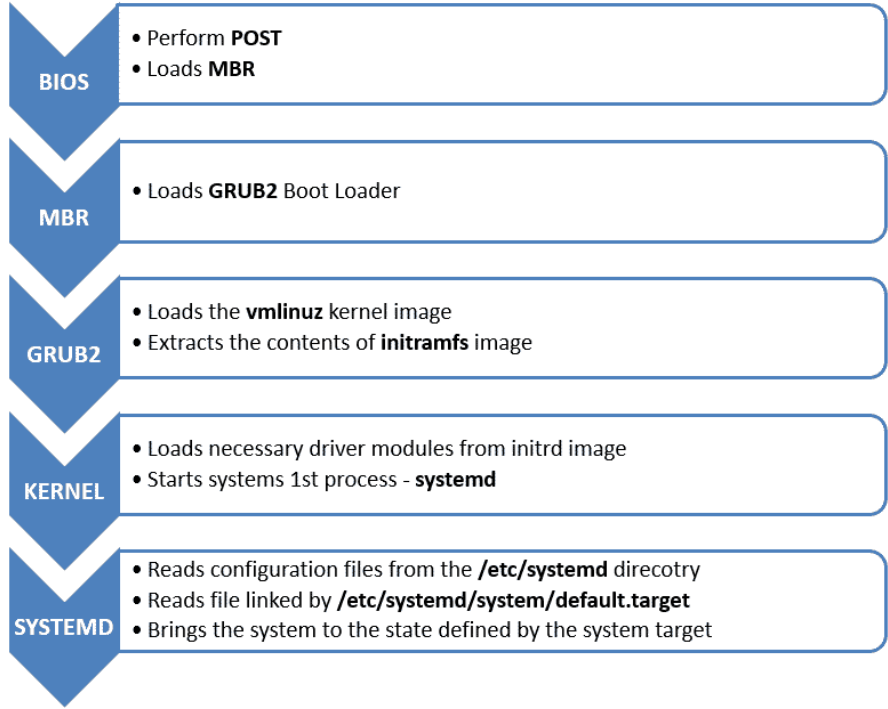
```
standard error → file descriptor 2 → ls -l m* a* 1>outfile 2>errorfile  
cat </etc/group >t1  
> , >> , &> , &>> , 2>&1 , /dev/null
```

Boot the system(1)

concept

Boot Process
in Linux(init)



<p>Boot Process in Linux(systemd)</p>	 <ul style="list-style-type: none"> BIOS <ul style="list-style-type: none"> • Perform POST • Loads MBR MBR <ul style="list-style-type: none"> • Loads GRUB2 Boot Loader GRUB2 <ul style="list-style-type: none"> • Loads the vmlinuz kernel image • Extracts the contents of initramfs image KERNEL <ul style="list-style-type: none"> • Loads necessary driver modules from initrd image • Starts systems 1st process - systemd SYSTEMD <ul style="list-style-type: none"> • Reads configuration files from the /etc/systemd directory • Reads file linked by /etc/systemd/system/default.target • Brings the system to the state defined by the system target
<p>BIOS (Basic Input/Output System)</p>	<p>--The first code run when a PC is powered on.</p> <p>--POST(Power On Self Test) and decides which hardware should boot the system</p> <p>--Identify the boot device</p>
<p>MBR (Master Boot Record)</p>	<p>(sector 0 hard disk) is the 512-byte boot sector that is the information stored in the first sector of any hard disk, floppy, USB drive which identifies where an os is located in the memory.</p> <p>446 + 64 + 2 = 512 bytes</p> <p>446 bytes – Bootstrap.</p> <p>64 bytes – Partition table.</p> <p>2 bytes – Signature.</p> <pre>dd if=/dev/sda of=/dev/sdb bs=512 count=1</pre>
	<p>GRUB (1&2) or LILO(linux loader)(/etc/lilo.conf ,/boot/grub/grub.cfg, /boot/grub/menu.lst)</p> <pre>cat /boot/grub2/grub.cfg</pre> <pre>,msdos1'</pre>

<p>bootloader</p>	<p><code>linux16 /vmlinuz-0-rescue-98e8f7fa91d544279b39af16b0151c75 root=/dev/mapper/ol-root ro crashkernel=auto rd.lvm.lv=ol/root rd.lvm.lv=ol/swap rhgb quiet</code></p> <p><code>insmod</code> => loads the driver modules.</p> <p><code>set root</code> => identifies the partition from which the kernel and initial RAM disk are read</p> <p><code>linux16</code> => identifies a Linux kernel and sets the options that are passed to it.</p> <p>➔ Grub 2:</p> <p><code>/etc/default/grub</code></p> <p>delete <code>rhgb quiet</code>=> If you like to full detailed boot messages..</p>
<p>kernel</p>	<p>The kernel's job is to talk to the hardware and software, and to manage the system's resources as best as possible.</p> <div data-bbox="583 726 1260 1094" data-label="Diagram"> </div>
<p>INIT (initramfs init SysVinit system)</p>	<p>When the kernel finishes loading.</p> <p>it usually starts <code>/sbin/init</code>.</p> <p>This program remains running until the system is shut down.</p> <p>It is always assigned process ID 1</p>
<p>RUNLEVEL</p>	<p>Depending on your default init level setting, the system will execute the programs from one of the following directories.</p> <ul style="list-style-type: none"> ▪ Run level 0 – <code>/etc/rc.d/rc0.d/</code> ▪ Run level 1 – <code>/etc/rc.d/rc1.d/</code> ▪ Run level 2 – <code>/etc/rc.d/rc2.d/</code> ▪ Run level 3 – <code>/etc/rc.d/rc3.d/</code> ▪ Run level 4 – <code>/etc/rc.d/rc4.d/</code> ▪ Run level 5 – <code>/etc/rc.d/rc5.d/</code> ▪ Run level 6 – <code>/etc/rc.d/rc6.d/</code>
	<p style="text-align: center;">-- Change default kernel</p> <p>1. which kernel now?</p> <pre>cat /etc/default/grub GRUB_DEFAULT=saved</pre>

Grub2	<pre>##### cat /boot/grub2/grubenv # GRUB Environment Block saved_entry=Red Hat Enterprise Linux Server (3.10.0-327.10.1.el7.x86_64) 7.2 (Maipo) ##### 2.find and set default kernel awk -F' /^menuentry/{print\$2} /etc/grub2.cfg grub2-set-default 1 ##### 3.Verify the new default kernel cat /boot/grub2/grubenv grep saved saved_entry=1 ##### 4.Rebuild GRUB2 grub2-mkconfig -o /boot/grub2/grub.cfg</pre>
Dmesg	<p>cat /var/log/dmesg → will show only the data during the boot.</p> <p>dmesg command → show the full data from kernel ring buffer up to know. messages related to the operation of the kernel</p>
/var/log/messages	<p>Kernel is still logging its own messages in dmesg in some systems it might be called /var/log/syslog</p>

Runlevel(1)

	Command	Description	Example												
1	runlevel	find the current and previous system runlevel. <u>Current status for linux</u>	runlevel												
2	telinit	process control initialization	telinit 5												
RUNLEVEL	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #70ad47; color: white;"> <th data-bbox="435 1598 548 1640">Run Level</th> <th data-bbox="548 1598 813 1640">Mode</th> <th data-bbox="813 1598 1393 1640">Action</th> </tr> </thead> <tbody> <tr> <td data-bbox="435 1640 548 1692">0</td> <td data-bbox="548 1640 813 1692">Halt</td> <td data-bbox="813 1640 1393 1692">Shuts down system</td> </tr> <tr> <td data-bbox="435 1692 548 1766">1</td> <td data-bbox="548 1692 813 1766">Single-User Mode</td> <td data-bbox="813 1692 1393 1766">Does not configure network interfaces, start daemons, or allow non-root logins</td> </tr> <tr> <td data-bbox="435 1766 548 1881">2</td> <td data-bbox="548 1766 813 1881">Multi-User Mode</td> <td data-bbox="813 1766 1393 1881">Does not configure network interfaces or start daemons. Debian/Ubuntu</td> </tr> </tbody> </table>			Run Level	Mode	Action	0	Halt	Shuts down system	1	Single-User Mode	Does not configure network interfaces, start daemons, or allow non-root logins	2	Multi-User Mode	Does not configure network interfaces or start daemons. Debian/Ubuntu
Run Level	Mode	Action													
0	Halt	Shuts down system													
1	Single-User Mode	Does not configure network interfaces, start daemons, or allow non-root logins													
2	Multi-User Mode	Does not configure network interfaces or start daemons. Debian/Ubuntu													

	<table border="1"> <tr> <td>3</td> <td>Multi-User Mode with Networking</td> <td>Starts the system normally. Fedora/SUSE</td> </tr> <tr> <td>4</td> <td>Undefined</td> <td>Not used/User-definable</td> </tr> <tr> <td>5</td> <td>X11</td> <td>As runlevel 3 + display manager(X) RHEL/Fedora/SUSE</td> </tr> <tr> <td>6</td> <td>Reboot</td> <td>Reboots the system</td> </tr> </table>	3	Multi-User Mode with Networking	Starts the system normally. Fedora/SUSE	4	Undefined	Not used/User-definable	5	X11	As runlevel 3 + display manager(X) RHEL/Fedora/SUSE	6	Reboot	Reboots the system						
3	Multi-User Mode with Networking	Starts the system normally. Fedora/SUSE																	
4	Undefined	Not used/User-definable																	
5	X11	As runlevel 3 + display manager(X) RHEL/Fedora/SUSE																	
6	Reboot	Reboots the system																	
/etc/inittab	<p>id:runlevels:action:process</p> <p>action: respawn, wait, once, initdefault (default run level as seen above), ctrlaltdel (what to do with crrl+alt+delete)</p> <p>ca::ctrlaltdel:/sbin/shutdown -t3 -r now → reboot on all runlevel</p> <p>id:5:initdefault: → default runlevel</p>																		
/etc/init.d/	<p>chkconfig –list - chkconfig --level 35 sshd on</p> <p>systemctl list-unit-files sshd.service - systemctl disable sshd.service</p> <p>systemctl list-units --type service</p> <p>service service_name stop - service service_name start - service service_name restart</p> <p>systemctl yum stop - systemctl yum start - systemctl yum restart</p> <p>/etc/rc[0-6] → S=start , K=kill</p>																		
RUNLEVEL in SYSTEMD	<table border="1"> <thead> <tr> <th>Run Level</th> <th>Target Units</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>runlevel0.target, poweroff.target</td> <td>Shut down and power off</td> </tr> <tr> <td>1</td> <td>runlevel1.target, rescue.target</td> <td>Set up a rescue shell</td> </tr> <tr> <td>2,3,4</td> <td>runlevel[234].target, multi- user.target</td> <td>Set up a nongraphical multi-user shell</td> </tr> <tr> <td>5</td> <td>runlevel5.target, graphical.target</td> <td>Set up a graphical multi-user shell</td> </tr> <tr> <td>6</td> <td>runlevel6.target, reboot.target</td> <td>Shut down and reboot the system</td> </tr> </tbody> </table> <p>/etc/systemd/system/default.target → /etc/inittab</p> <p>systemctl get-default → View run level in systemd</p> <p>systemctl isolate graphical.target → Change the target (runlevel)</p> <p>systemctl isolate runlevel1.target → Change the target (runlevel)</p> <p>ls /lib/systemd/system/runlevel*target -l → list out the files in the systemd directory</p> <p>systemctl default → change the current target unit to default without reboot</p>	Run Level	Target Units	Description	0	runlevel0.target, poweroff.target	Shut down and power off	1	runlevel1.target, rescue.target	Set up a rescue shell	2,3,4	runlevel[234].target, multi- user.target	Set up a nongraphical multi-user shell	5	runlevel5.target, graphical.target	Set up a graphical multi-user shell	6	runlevel6.target, reboot.target	Shut down and reboot the system
Run Level	Target Units	Description																	
0	runlevel0.target, poweroff.target	Shut down and power off																	
1	runlevel1.target, rescue.target	Set up a rescue shell																	
2,3,4	runlevel[234].target, multi- user.target	Set up a nongraphical multi-user shell																	
5	runlevel5.target, graphical.target	Set up a graphical multi-user shell																	
6	runlevel6.target, reboot.target	Shut down and reboot the system																	

	<p>systemctl isolate default.target → change the current target unit to default without reboot</p> <p>systemctl set-default graphical.target → Change the default run level</p>
INIT	in older linux systems, the first process to run that starts and manages other processes and services during the boot process
systemd	<p>--first process to load on boot</p> <p>--manages all other daemons and services on the system</p> <p>--Parallel service startup</p> <p>--system initialization in Fedora, Centos 7, Red Hat 7, Debian 7, Ubuntu 15, and Arch Linux.</p>

Manage shared libraries(2)

	Command	Description	Example
1	ldd	print shared library dependencies	ldd /bin/date which ldconfig /sbin/ldconfig
2	ldconfig	This command creates ld.so.cache to locate files that are to be dynamically loaded and linked. p Print the lists of directories and candidate libraries stored in the current cache.	ldconfig -p
Linking	<p>Static linking is when you add this library to your executable program.</p> <p>Dynamic linking is when you just say in your program "We need this and that library to run this program".</p>		
ld.so.conf	/etc/ld.so.conf => text config file		
ld.so.cache	/etc/ld.so.cache		
LD_LIBRARY_PATH	Sometimes you need to override the original installed libraries and use your own or a specific library.		
directory	/lib - /usr/lib - /lib64		

processes(3)

	Command	Description	Example
1	sleep	delay for a specified amount of time	sleep 100 sleep 100&
2	bg	Move jobs to the background	bg 2
3	jobs	Display status of jobs -l lists process IDs in addition to the normal information	Jobs -l
4	fg	Move job to the foreground	Fg 2 Ctrl+z
5	ps	report a snapshot of the current processes -e Select all processes -f Do full-format listing -l long	Ps ps -al ps -ef grep sleep ps -C oracle -o user,pid,time,comm
6	Kill	terminate a process -l Print a list of signal names. SIGTERM(15) :Kill running process gracefully (default signal). SIGKILL(9) : forcefully kills the process SIGHUP(1) :Use this to reload server after updating its config files.	Kill -l Kill -9 4525
7	killall	kill processes by name -u user	killall -9 sleep killall -9 -u oracle
8	nohup	run a command immune to hangups	echo \$\$ echo \$PPID nohup sleep 10000 ps -eaf grep sleep kill -9 \$PPID
9	top	display Linux tasks -c : show full commands -u : Monitor by user as: -u somebody s: Change delay	top -c top -u oracle

		<p>k: kill after asking pid and signal r:renice NI – is the nice value, which is a user-space concept, while PR or PRI – is the process’s actual priority, as seen by the Linux kernel.</p>	
10	nice	<p>run a program with modified scheduling priority ##### Niceness values range from -20 (most favorable to the process) to 19 (least favorable to the process). ((Default is 10))</p>	<p>nice -n-19 top ps -l limit.conf: oracle hard priority -19 oracle soft priority -19</p>
11	renice	alter priority of running processes	<p>renice -n 0 -p 1 Top → r</p>
12	uptime	<p>Tell how long the system has been running. -- load average of 1, 5 & 15 minutes.</p>	
13	free	<p>Display amount of free and used memory in the system -s update every [delay] seconds -c update [count] times -g show output in GB</p>	Free -g -s 1 -c 100

Scheduling Jobs(7)

	Command	Description	Example
1	crontab	<p>maintain crontab files for individual users -l: The current crontab will be displayed -e: edit the current crontab using -u: user -r: The current crontab will be removed. * * * * * command Minute (0-59) - Hour (0-23) - Day of Month (1-31) - Month (1-12 or Jan-Dec) - Day of Week (0-6 or Sun-Sat) Command</p>	<p>Crontab -u -e Vi job cp a bkp_`date +%y%m%d_%H%M%S` * 7,8,9 * * * /job */2 * * * * /kill * */5 * * * 0,7 are sunday</p>

2	at	queue, examine or delete jobs for later execution	at 1706 at> touch /ora/job at> <EOT> at> ctrl+D
3	atq	Examine queue jobs	atq
4	atrm	delete jobs	atrm 3
Files:	/etc/cron.{d,daily,hourly,monthly,weekly} /etc/at.deny - /etc/at.allow /etc/crontab /etc/cron.allow - /etc/cron.deny - /var/spool/cron/*		
services	systemctl crond status - /var/run/crond.pid systemctl atd status-/var/run/atd.pid		

RPM and YUM(2)

	Command	Description	Example
1	rpm	RPM Package Manager -i : install a package -v : verbose for a nicer display -h: print hash marks -U: upgrade -e: erase -a: Query all installed packages. -q : Query a package -l: List files in package. -f: Query package owning FILE -V: verify --last Orders the package listing by install time	find /dvd/ -name firefox* rpm -ivh /dvd/Packages/firefox-52.2.0-2.0.1.el7.x86_64.rpm rpm -e firefox-52.2.0-2.0.1.el7.x86_64 rpm -ql chrony-2.1.1-1.el6.x86_64 rpm -qa grep firefox rpm -V chrony-2.1.1-1.el6.x86_64 rpm -qf /bin/date rpm -Va rpm -qpR chrony-2.1.1-1.el6.x86_64.rpm rpm -qa --last rpm -qi firefox

		-i, --info	
2	yum	Yellowdog Updater Modified -y: Assume yes	Yum -y install firefox Yum -y remove firefox yum update firefox yum clean all yum repolist all yum install --downloadonly -- downloadaddir=/tmp <package-name> yum groupinstall "GNOME Desktop" "Graphical Administration Tools" "Server with GUI"
3	/etc/yum.conf /etc/yum.repos.d/ /var/lib/rpm		
example	vi /etc/yum.repos.d/usef.repo [usef] name=usef baseurl=file:///cd/ gpgcheck=0 enabled=1		

Security(10)

	Command	Description	Example
1	ssh	remote login program -p; port	ssh -p 2333 root@10.33.13.24
2	lsof	list open files u; user	lsof lsof wc -l lsof -u usef
3	nmap	port scanner	nmap 10.33.10.20
4	sudo	execute a command as another user	sudo useradd ali visudo oracle ALL=/usr/sbin/useradd
5	su	run a command with substitute user and group ID	su su - su - oracle

6	ulimit	Modify shell resource limits -a all current limits are reported	ulimit -a ulimit -f 1
7	who	show who is logged on -r, --runlevel -u, --users -b, --boot	who -r who -u who -b
8	w	Show who is logged on and what they are doing -i, --ip-addr	w w -i
9	last	show listing of last logged in users /var/log/wtmp /var/log/btmp	
10	/etc/sudoers /etc/nologin /etc/hosts.allow /etc/hosts.deny		
11	/etc/ssh/sshd_config Port 22 AllowUsers root oracle PermitEmptyPasswords yes systemctl restart sshd		

partitions and filesystems(4)

	Command	Description	Example
1	fdisk	Partition table manipulator for Linux -l; List the partition tables Boot: bootable Id , Sy stem : partition type HEXA decimal d delete a partition n add a new partition w write table to disk and exit p print the partition table q quit without saving changes l list known partition types t change a partition's system id	fdisk -l /dev/sda fdisk /dev/sde Command (m for help): n Select (default p): p Partition number (1-4, default 1): 1 First sector (2048-692223, default 2048): Last sector, +sectors or +size{K,M,G} (2048-692223, default 692223): +10M Command (m for help): w

2	parted	<p>a partition manipulation program</p> <p>-l, --list</p> <p>(parted)print: Display the partition table.</p> <p>(parted)quit: Exit from parted</p> <p>(parted)select: Choose device</p> <p>(parted)mklablel: Create a new disklabel</p> <p>(parted)mkpart: Make a part-type</p> <p>(parted)rm: Delete partition</p> <p>(parted) set: Change the state of the flag on partition to state</p>	<p>parted -l</p> <p>parted /dev/sdd mklablel msdos mkpart primary "1 -1" -s</p> <p>-----</p> <p>parted /dev/sdf</p> <p>(parted) print</p> <p>(parted) help mklablel</p> <p>(parted) mklablel msdos</p> <p>(parted) mkpart</p> <p>Partition type? primary/extended? primary</p> <p>File system type? [ext2]? ext4</p> <p>Start? 0</p> <p>End? 50M</p>
1	gdisk	Interactive GUID partition table (GPT) manipulator	gdisk -l /dev/sda
2	mkfs	build a Linux file system	mkfs -t ext3 /dev/sdb1
3	mke2fs	create an ext2/ext3/ext4 filesystem	mke2fs -t ext3 /dev/sde1
4	blkid	command-line utility to locate/print block device attributes	blkid /dev/sda1
5	mkswap	set up a Linux swap area	<p>dd if=/dev/zero of=/swapfile bs=1024 count=524288</p> <p>mkswap /swapfile</p> <p>swapon /swapfile</p> <p>/swapfile swap swap defaults 0 0</p>
6	swapon	enable devices and files for paging and swapping	swapon -s
7	swapoff	disable devices and files for paging and swapping	swapoff /dev/sde1
8	fsck	<p>check and repair a Linux file system(CHKDSK IN WINDOWS)</p> <p>t: Specifies the type</p> <p>a:Automatically repair the filesystem without any questions</p> <p>r: Interactively repair the filesystem</p>	fsck -a -t ext3 /dev/sdb1

9	e2fsck	is a file system check utility that check the file systems for bad sectors , I/O errors related to HDD -p: Automatically repair -f: Force checking even if the file system seems clean	umount /test e2fsck -pf /dev/hdXX
10	dumpe2fs	(print superblock)dump ext2/ext3/ext4 filesystem information	dumpe2fs /dev/sde1 less Last mounted on: /folder1 Filesystem state: clean Errors behavior: Continue Filesystem OS type: Linux Inode count: 86344 Block count: 345088 Filesystem created:Tue Jan 16 20:50:36 2018
11	tune2fs	adjust tunable filesystem parameters on ext2/ext3/ext4 filesystems(convert filesystem from ext3 to ext4) -O: Set or clear the indicated filesystem features	umount /test 2->3 tune2fs -j /dev/sde1 2->4 tune2fs -O dir_index, has_journal, uninit_bg /dev/sde1 3->4 tune2fs -O extents,uninit_bg,dir_index /dev/sde1
12	mount	mount a filesystem -a: mount all filesystems -r, --read-only	mount /dev/sde1 /test mount -a mount grep /grid
13	umount	unmounts file systems -l Detach the filesystem from the filesystem hierarchy now, and cleanup all references	umount /test umount -l /test
Files:	/etc/fstab file system: Label, UUID, device mount point: swap or none for swap type: can be auto options: defaults, rw / ro, noauto, exec / noexec dump: do dump command backup this? mostly 0 pass: Non-zero values of pass specify the order of checking filesystems at boot time example: /dev/sde1 /folder1 ext4 ro,noexec 0 0		
Comparison : ext2 vs ext3 vs ext4 vs FAT32 vs NTFS			

<p style="text-align: center;">File system</p>	<p>FAT32:</p> <ul style="list-style-type: none"> • Maximum number of files: 268,173,300 • Maximum number of files per directory: $2^{16} - 1$ (65,535) • Maximum file size: 2 GiB - 1 without LFS, 4 GiB - 1 with <p>NTFS:</p> <ul style="list-style-type: none"> • Maximum number of files: $2^{32} - 1$ (4,294,967,295) • Maximum file size <ul style="list-style-type: none"> • Implementation: $2^{44} - 2^6$ bytes (16 TiB - 64 KiB) • Theoretical: $2^{64} - 2^6$ bytes (16 EiB - 64 KiB) • Maximum volume size <ul style="list-style-type: none"> • Implementation: $2^{32} - 1$ clusters (256 TiB - 64 KiB) • Theoretical: $2^{64} - 1$ clusters <p>ext2:</p> <ul style="list-style-type: none"> • Maximum number of files: 10^{18} • Maximum number of files per directory: $\sim 1.3 \times 10^{20}$ (performance issues past 10,000) • Maximum file size <ul style="list-style-type: none"> • 16 GiB (block size of 1 KiB) • 256 GiB (block size of 2 KiB) • 2 TiB (block size of 4 KiB) • 2 TiB (block size of 8 KiB) • Maximum volume size <ul style="list-style-type: none"> • 4 TiB (block size of 1 KiB) • 8 TiB (block size of 2 KiB) • 16 TiB (block size of 4 KiB) • 32 TiB (block size of 8 KiB) <p>ext3:</p> <ul style="list-style-type: none"> • Maximum number of files: $\min(\text{volumeSize} / 213, \text{numberOfBlocks})$ • Maximum file size: <i>same as ext2</i> • Maximum volume size: <i>same as ext2</i> <p>ext4:</p> <ul style="list-style-type: none"> • Maximum number of files: $2^{32} - 1$ (4,294,967,295) • Maximum number of files per directory: unlimited • Maximum file size: $2^{44} - 1$ bytes (16 TiB - 1) • Maximum volume size: $2^{48} - 1$ bytes (256 TiB - 1)
<p style="text-align: center;">B&C device</p>	<p>These both files are related to writing data and reading data from one place to other place.</p> <p>Character file: A char file is a hardware file which reads/write data in character by character fashion. Some classic examples are keyboard, mouse, serial printer.</p>

(device driver)	<p>Block file: A block file is a hardware file which read/write data in blocks instead of character by character. All our disks such as HDD, USB and CDROMs are block devices. This is the reason when we are formatting we consider block size.</p> <p>mknod namyeshgar c 20 5</p>
------------------------	--

Manage disk quota(4)

	Command	Description	Example
1	edquota	edit user quotas -u Edit the user quota. This is the default. -g Edit the group quota.	edquota -u grid
2	repquota	summarize quotas for a filesystem -a, Report on all filesystems -u, --user	repquota oracle repquota -a -u
3	quotaon	turn filesystem quotas on a All automatically mounted non-NFS filesystems in /etc/fstab with quotas will have their quotas turned on.	quotaon -a quotaon /grid
4	quotaoff	turn filesystem quotas off -a Force all filesystems in /etc/fstab to have their quotas disabled.	quotaoff -a quotaoff /grid
5	quotacheck	scan a filesystem for disk usage, create, check and repair quota files -a Check all mounted non-NFS filesystems in /etc/mtab	quotacheck -a
example	<pre>vi /etc/fstab /dev/sdb1 /grid ext4 defaults,usrquota 0 0 umount -l /grid mount /grid quotaon /grid quotacheck -a quotaon /grid edquota -u grid</pre>		

configure X11(6)

	Command	Description	Example
X		The X Window System is a network transparent window system which runs on a wide range of computing and graphics machines; X11Forwarding yes	
DISPLAY	[oracle@test6 ~]\$ export DISPLAY=10.32.5.4:1 --login in 10.32.5.4 [oracle@test4 ~]\$dbca		
1	xhost	server access control program for X(graphic and host connect together with tcp/ip protocol) ssh -X	xhost + xhost - xhost +192.168.1.20 xhost -192.168.1.20
2	xwininfo	cursor information	xwininfo
3	xdpyinfo	display information utility for X	xdpyinfo

SQL Data Management(5)

	Command	Description	Example
1	insert	It adds a new row to a table.	insert into tbl1 values(1);
2	update	It changes row.	update tbl1 set id=1;
3	select	selects from a table	Select * from tbl1;
4	delete	This will DELETE from a table	delete tbl1;
5	where	You can add conditions to your SQL queries using WHERE	Select * from tbl1 where id=1
6	group by	This will group the output	Select * from tbl1 group by score
7	order by	This is used if you want to sort the data based on one field.	Select * from tbl1 order by 1

8	join	join will join/mix two tables	Select * from tbl1 p,tbl2 j where p.id=j.id
Install mysql	<pre>yum -y install mariadb-server mariadb systemctl start mariadb service mysqld start mysql</pre>		
Mysql management	<pre>MariaDB [(none)]> create database db1; MariaDB [(none)]> show databases; --connect to DB MariaDB [(none)]> use db1 MariaDB [db1]> show tables; MariaDB [db1]> CREATE TABLE person (name VARCHAR(20), lastname VARCHAR(20) , sex CHAR(1)); MariaDB [db1]> describe person ; MariaDB [db1]> insert into person(name,lastname,sex) values('ali','alavi','1'); MariaDB [db1]> select * from person;</pre>		

Networking Fundamentals(9)

	Command	Description	Example
1	ping	send ICMP ECHO_REQUEST to network hosts -c; count -s; packetsize	ping 192.168.1.20 ping rac1 -c 2 ping rac1 -s 65507
2	ifconfig	configure a network interface -a; display all interfaces	ifconfig -a ifconfig eth0 ifconfig eth0:1 192.168.1.22
3	ifup	bring a network interface up	ifup eth0
4	ifdown	take a network interface down	ifdown eth0

5	hostname	show or set the system's host name -l; ip address	hostname hostname -i
6	netstat	Print network connections, routing tables, interface status -n, Show numerical addresses -l, Show only listening sockets. -t, Show only tcp -u, Show only udp -p, Show the PID and name of the program to which each socket belongs --statistics -s	netstat -i netstat -nltp grep vnc netstat -s
7	tracert	print the route packets trace to network host	tracert rac1
hosts	static table lookup for hostnames vi /etc/hosts 127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4 ::1 localhost localhost.localdomain localhost6 localhost6.localdomain6 192.168.1.20 rac1 mylinux		
resolv.conf	nameserver 208.67.220.220 nameserver 208.67.222.222		
nsswitch.conf	passwd: files shadow: files group: files hosts: files dns myhostname		

Configure hardware settings(1)

	Command	Description	Example
1	lsmod	program to show the status of modules in the Linux Kernel	lsmod grep cd
2	modprobe	add and remove modules from the Linux Kernel -r, --remove	modprobe sr_mod modprobe -r sr_mod

3	lsusb	list USB devices	lsusb -v
4	lspci	list all PCI devices	lspci
/proc	Contains information about system process.		
/dev	Linux has created device nodes as conventional files in the /dev directory tree.		

Customize or write simple scripts(5)

	Command	Description	Example
1	Command substitution	have a variable with the result of something to a variable.	r=\$(date) r=`date` echo \$r
2	seq	print a sequence of numbers	seq 6 10 seq 6 2 80 → increment 2
3	read	allows scripts to catch information entered by users interactively t: timeout n: nchar s: secure p:prompt	read -s -n 4 -p "please enter" AAA B G
4	let	Shell variables are allowed as operands.	a=0 a=a+1 echo \$a b=0 let b=b+1 echo \$b
5	if	if [condition] then do something do another thing else do new things even funnier things fi	#!/bin/bash read -p "please enter your password: " pass if [\$pass = 'ali'] then echo OK, WELCOME else echo not OK, try again fi
6	for	for VARIABLE in 1 2 3 4 5 .. N	Example1:

		<pre>do command1 command2 commandN done</pre>	<pre>for i in 1 2 3 4; do echo hi done Example2: a=1 for i in `seq 1 50`; do echo \$a let a=a+1 done Example3: for file in \$(ls); do echo `du -sh \$file` done</pre>
7	while	<pre>while [condition] do do something do anohter thing done</pre>	<pre>read a while [\$a -gt 42] do echo \$a let a=a-10 done</pre>

conditions	what is means
"a" = "b"	if two strings are equal (here it will return False)
"a" != "b"	string a is not equal to string b
4 -lt 40	if 4 is lower than 40 (True)
5 -gt 15	if 5 is greater than 15 (False)
5 -ge 5	if 5 is greater or equal 5
5 -le 3	if 5 is lower or equal to 3
9 -ne 2	9 is not equal with 2 (True)
-f FILENAME	if file FILENAME exists
-s FILENAME	if file exists and its size is more than 0
-x FILENAME	file exists and is executable

Localization and internationalization(7)

	Command	Description	Example
1	tzselect	--select a timezone(only offer) --changed timezone only per user	TZ='Asia/Tehran'; export TZ (set in the .bash_profile)
2	timedatectl	Control the system time and date	timedatectl set-timezone Asia/Tehran

3	cal	display a calendar -y, --year	Cal 2017 cal -y 2017
4	locale	get locale-specific information	export LC_ALL='fa_IR.utf8' export LC_ALL='en_GB.utf8' export LC_ALL='en_US.utf8' unset LC_ALL
/usr/share/zoneinfo/	Timezone files are located in /usr/share/zoneinfo/		
/etc/localtime	ls -lhr /etc/localtime cp /usr/share/zoneinfo/Asia/Tehran /etc/localtime unlink /etc/localtime ln -s /usr/share/zoneinfo/Asia/Tehran /etc/localtime		
Time Zone configuration	3 Methods: 1. using timedatectl 2. Using tzselect 3. change /etc/localtime: <i>a) cp /usr/share/zoneinfo/America/Chicago /etc/localtime</i> <i>b) unlink /etc/localtime</i> <i>ln -s /usr/share/zoneinfo/America/Chicago /etc/localtime</i>		

Maintain system time(8)

	Command	Description	Example
1	date	query and set the system clock(only once read the hardware clock during startup)	date +"%Y/%m/%d - %H:%M:%S" date -s "1500"
2	hwclock	query and set the hardware clock	hwclock --localtime --set --date="02/01/2017 20:09:00" hwclock -u -w
3	ntpd	Network Time Protocol (NTP) daemon /etc/ntp.conf	systemctl start ntp
4	ntpq	queries the ntp service	ntpq -p
5	ntpdate	set the date and time via NTP	ntpdate pool.ntp.org

UTC	Universal Time = standard time(use for set the local time)
------------	--

System logging(8)

	Command	Description	Example
concept		<p>facilities: auth, user, kern, cron, daemon, mail, user, local1, local2, ...</p> <p>priorities: emerg/panic, alert, crit, err/error, warn/warning, notice, info, debug</p> <p>actons: filename, username, @ip</p> <p>EXAMPLE:</p> <pre> facilities.priorities actons kern.panic @192.168.50.20 *.* /var/log/messages *.* username </pre>	
rsyslog.conf		<p>/etc/rsyslog.conf</p> <pre> #cron.* /var/log/cron.log →(all level) kern.* -/var/log/kern.log →(- write in disk with delay) Kern.info /var/log/kern.log →(log in info level and high) Kern.=info /var/log/kern.log →(= exactly) </pre>	
rsyslog listener		<p>/etc/default/rsyslog</p> <pre> RSYSLOGD_OPTIONS="-r" systemctl restart rsyslog </pre>	
logrotate		<p>/etc/logrotate.conf</p> <pre> /var/log/btmp { missingok monthly size 1k create 0600 root utmp rotate 4} </pre> <p>vi /etc/logrotate.d/test</p>	

```

/test/*.log {
    monthly
    create 0644 oracle oinstall
    size 1k
    prerotate
    touch /test/bkp_`date +%Y-%m-%d_%H-%M%S`
    endscrip
    rotate 4
}

```

logrotate -f -v /etc/logrotate.d/test

weekly, monthly, yearly	rotate logs weekly, monthly, yearly
rotate 2	keep the latest 2 log
size	specify a file size for logrotate
missingok	it is fine if there is no log for this week
compress	compress the logs
create 0644 oracle oinstall	create the files with this access and owners
prerotate	Run before log rotating begins
postrotate	Scripts to run after rotating is done.

	logger	a shell command interface to the syslog	logger i am usef
	Journalctl [shift + g]	Query the systemd journal <i>(systemd keeps its logs as binary files and the user should use the journalctl to access them)</i> <u>/etc/systemd/journald.conf</u>	Journalctl journalctl -n -f →tail -f

Mail Transfer Agent(8)

	Command	Description	Example
1	mail	send and receive Internet mail d; delete q; quit	mail mail oracle(ctrl+d) d 1-10
2	A selection of MTA relies on many aspects such as followings <ul style="list-style-type: none"> A good protection record 		

	<ul style="list-style-type: none">• Efficiency with good performance on high load• Versatile and clear understandable files• Quality documentation of third-party is available
sendmail	difficult to configure - oldest options available <ul style="list-style-type: none">• Security purpose: Not better but still better from the past all versions• Performance Level: Ok for many• Since: 1982• Community: Large
postfix	uses easy to understand configuration – encryption <ul style="list-style-type: none">• Security purpose: Good record.• Performance Level: Excellent• Since: 1997• Community: Medium-sized
exim	general and flexible mailer <ul style="list-style-type: none">• Security purpose: Quite good• Performance Level: Very good• Since: 1995• Community: Large
qmail	ultra secure MTA -popular mail agent it is simple, reliable, efficient and offers extensive security features hence a secure MTA package
Files:	/etc/aliases =>(oracle:root) if there is a message for oracle it will sent to the root user. .forward=> forward your emails for other user.