Linux Command Line Cheat Sheet

by SathyaNarayanan (Sathyanarayanan) via cheatography.com/136085/cs/29006/

shell prompt

#	Super User
$	normal user

simple commands

date	display current date and time
cal	display current month calendar
df	displays disk usages
free	display memory usage

Navigation

cd	change the current diretcory
ls	list the directory

cd - : change to previous working directory
cd ~username : change to home directory

Exploring Filesystem

file	Determine file type
less	view file contents

ls
-l diplay in long format
-h human readable
-a list all files even those hidden,
-d directory
-F option will append an indictor charactor to the end of listed names
-r display result in reverse order
-S sort by file Size
-t modification time

Manipulating Files and Directories

cp	copy the files
mv	move the files from one folder to other
mkdir	creates a directory
rm	remove files and directories

Manipulating Files and Directories (cont)

ln	create Hard and symbolic link

* any character
? any single character
[character] any character that is a member of character
[! character] any character that is not a member of character
[[:class:]] any character that is a member of class

command Options : cp, mv

i	interactive	same in mv
a	copy files and directories of all attributes, ownership and permission	-
r	recursively copies directories and contents	same in mv
u	copy the files that don't exists	same in mv
v	verbose, informative message	same in mv

Command Substitution

echo $(ls)

ls -l $(which cp)	new method
ls -l `which cp`	back tick, old method

Process

ps	reports snap shot of current process
top	diskplays task
jobs	list active jobs
bg	place a job in the background
fg	place a job in the foreground
kill	send a signal to process

Process (cont)

killall	kill process by name

top commands
1 → show per-CPU stats.
t → cycle task/CPU display.
P → sort processes by CPU usage.
T → sort by time.
q → quit.

Process commands

ps aux	BSD style ouptut
fg %1	jobs
kill -1 13456	kill process id 13456
ps -eo pid,comm,-cmd,start,etime	to get process elapsed time

SIGNALS: HUP, INT, KILL, TERM,C-ONT,STOP,QUIT, SEGV, TSTP. WINCH

Find command

cmin	match attributes/files/dir modified, n minutes
cnewer	match file/dir whose content or attribute were last modified n*24 ago
ctime n	match file or direct whose content or attribute were modified n*24 hrs ago
empty	match empty files and directories
group name	match files or direc belonging to group name
iname	pattern like the iname test but case insensitive
inum n	match files with inode number

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Published 19th October, 2021.
Last updated 24th September, 2025.

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Find command (cont)

mmin n	match files or dir whose content were modified n minutes ago
mtime n	match files or dir whose content were modified n*24 hours ago
name pattern	match files and dir with specified wildcard pattern
nouser	match files and dir that don't belong to valid user
nogroup	match files and dir that don't belong to valid group
perm mode	match files and directories set to specified mode
samefile name	matches files that share the same inode number as file name
size n	match file size of n
type c	match file type of c
user	match file and directories belong to user

```
find %test %action %options
find ~
find ~ | wc -l
find ~ -type d | wc -l
----------------------------

b block
c character special device
d directory
f regular file
l symbolic link
```

Find Logical Operator

and
or
not

```
find ~ \( -type f -not -perm 0600 \) -or \( -type d -not -perm -700 \)
```

find -actions

delete
ls
print
quite

```
find ~ -type f -name '*.BAR] -print
find ~ -type f -and -name '*.BAR -and -print

Userdefined actions
-exec comman{}

find ~ -type f -name 'foo*' -exec ls -l '{}' +
find ~ -type f -name 'foo*' -exec ls -l '{}' ';'
```

Find Options - scope

depth	to process a directory files before the dir itself
maxdepth	max num of level that find will descend into a directory when performing test and action
mindepth	min num of level that find will descend into a directory when performing test and action
mount	direct find not to traverse directories that mounter on other filesystem

Tricks

clear	clears the screen
history	stores the history
script file	capture all command execution in a file

```
history: CTRL + {R, P }
!!number : command history number
!! : last command
!?string : history containing last string
!string : history containing last string
export HISTCONTROL=ignoredups
export HISTSIZE=10000
```

Working With Commands

type	Indicate how command name is interpreted
which	display which executable program will be executed
man	Display manual page
apropos	Display appropriate command
info	Display command Info entry
whatis	Display brief description of command
alias	create an alias for command

system commands

dmidecode	provides valueable inisights into system hardware config-uration
lscpu	provides detailed information about cpu

man page options

1	User commands
2	Programming interface for system calls
3	Programming interface for C Library
4	Special files such devies nodes and drivers
5	file formats
6	Games and screen savers
7	misc
8	system administrator commands

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Redirection

cat	concatenates files
sort	sort the file
uniq	report or omit repeated lines
grep	print lines matching pattern
head	prints first few lines of file
tail	prints las few lines of file
tee	reads stdin and send output to stdout and file
wc	count number of line, words, and bytes

Redirection Operator

ls -l /usr/bin >file	default stdout to file
ls -l /usr/bin 2>file	redirects stderr to file
ls -l /usr/bin > ls-output 2>&1	redirects stderr & stdout to file
ls -l /usr/bin &> ls-output	redirects stderr & stdout to file
ls -l /usr/bin 2> /dev/null	/dev/null bitbucket

Pipelines

|	pipelines
ls -l /usr/bin/ | tee out | sort	tee reads stdin and writes to files and stdout

view the world as SHELL viewed

echo *	expands all files in the path
echo D*	expands all files with starting D
$((expression))	Arithematic expression
echo $(($((5*2))3))	75
ls -l `which cp`	backtick instead of expression

Braces Expansion

echo Front-{A,-B,C}-Back	Front-A-Back, Front-B-Back, Front-C-Back
echo {Z..A}	Z Y X W V U .....A
mkdir {2009..20-11}-0{1..9} {2009..2011}-{1-0..12}	creates a directory for 12 months in 2009 to 2011

Environment

printenv	Print part of all of the enviro-nment
set	set shell options
export	export environment to subseq-uently executed programs
alias	create an alias for command

Login & Non Login Shell

Login Shells :
/etc/profile : global configuration
~/.bash_profile : personal startup efile
/.bash_login. : if /.bash_profile is not found, bash attempts to read this script

Login & Non Login Shell (cont)

/.profile : if neither /.bash_profile & ~/.bas-h_login bash reads this file
Non Login shells :
/etc/bash.bashrc : Global configuration
~/.bashrc : User configuration

Quoting

echo This is a test	This is a test; space is stripped
echo "This is a test"	This is a test
echo '$(echo foo) $((2+2))'	$(echo foo) $((2+2))
echo the total is $500.00	$5 is undefined variable so it supress the value, output will be like the total is 00.00

" " : all special character looses its meaning, exception ($, \, `)
' ' : all special character looses its meaning, and no exceptions

Searching For Files

locate	find files by name
find	search for files in a dir
xargs	build and exec cmd lines from stdin
touch	change the file times
stat	display file or filesystem status

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Networking

Ping	Send ICMP packets
traceroute	Print route packets to a network
netstat	print network connection, routing table, interface stats
ftp/lftp	Internet file transfer program
wget	Non Interactive network downloader
ssh	OpenSSH SSH Client (remote login program)
scp	secure copy
sftp	Secure File transfer program

OpenSSH package includes two programs that can make use of an SSH encrypted tunnel to copy file across the network.
a) scp
b) sftp

SFTP doesn't require ftp server to connect, it needs only SSH running in machines, any machine that has ssh running, we can able to transfer files to server

Archiving and Backup

gzip	Compress or expand files
bzip2	A block sorting file compressor
tap	tape archving utility
zip	Package and compress files
rsync	remote file and dir synchronization
unzip	Unzip the gzip files

compression algorithm: Lossy and Lossless

Hacks

Examples:
ssh remote-sys 'tar cf - Document' | tar xf -
find playground -name 'file-A' | tar czf playground.tgz -T -
find playground -name 'file-A' | tar cjf playground.tgz -T -
rsync -av --delete --rsh=ssh /etc /home /usr/local remote-sys:/backup
To copy ssh public to remote machine
ssh-copy-id -i xxxxx_ext_2023-08-22.pub username@hostname

- or Hyphen is the stdin and stdout

Text processing examples

cat -A $FILE	To find any CTRL character introduced
sort file1.txt file2.txt file3.txt > final_sorted_list.txt	sort all files once
ls - l | sort -nr -k 5	key field 5th column
sort --key=1,1 --key=2n distor.txt	key field 1,1 sort and second column sort by numeric
sort foo.txt | uniq -c	to find repetition
cut -f 3 distro.txt	cut column 3
cut -c 7-10	cut character 7 - 10
cut -d ':' -f 1 /etc/password	delimiter :
sort -k 3.7nbr -k 3.1nbr -k 3.4nbr distro.txt	3 rd field 7 the character, 3rd field 1 character

Text processing examples (cont)

paste file1.txt file2.txt > newfile.txt	merge two files
join file1.txt file2.txt	join on common two fields

Text processing

cat	concatenate files and print stdout
sort	sort lines of text files
uniq	report or omite repeated lines
cut	remove section from each line of files
paste	merge lines of files
join	join lines of two files on a common field
comm	compare two sorted files line by line
diff	compare files
patch	apply a diff file to original
tr	translate
sed	stream editor
aspel	interactive spell checker

Permissions

id	display user identity
chmod	change's file mode
umask	set the default file permission
su	Run a shell as another user
sudo	Execute command as another user
chown	changes file's owner
chgrp	change file groups owner

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Permissions (cont)

passwd	change a user password

Read,Write, Execute

- | rwx | rw- | r--	type | owner | group | world

type
- regular file
d directory
l symbolic link
c character device
b block device

File Mode [Octal]

000	---
001	--x
010	-w-
011	-wx
100	r--
101	r-x
110	rw-
111	rwx

chmod 0600 file [rw- is set for owner]

Mode symbolic notation

ugo	user, group, others
u+x	giving exeute permission for user
u=rw,o=x	giveing user read write and others execute perm

chmod u=rw,o=x file.txt

Packaging Ssystem

Debian Style (.dep)	Debain, ubuntu, xandros, Linspire
RedHat style(.rpm)	Fedora, CentOS, Redhat Enterprise, OpenSUSE, Mandriva, PCLinuxOS

Install from Repo

debian	apt-get install package_name
redhat	yum install package_name

Operation on Package File

Debian :
dpkg --install packagefile
apt-get remove package_name
apt-get update
dpkg --list
dpkg --status package_name
apt-cache show package_name (info about package)
dpkg --search file_name (finding which package installed)
Redhat :
rpm -i packagefile
yum erase package_name
yum update
rpm -u packagefile
rpm -qa. (list)
rpm -q package_name (check package installed)
yum info package_name
rpm -qf file_name (finding which package installed)

storage media

mount	mount a filesystem
ummount	unmount a file system
fdisk	partition table manipulator
fsck	check and repair filesystem
fdformat	format floppy disk
mkfs	create a file system
dd	write a block oriented data directly to a device

storage media (cont)

geniso-image	create an ISO 9660 image file
wodim	Write data to optical storage device
md5sum	calculate md5sum

dd if=/dev/cdrom of=ubuntu.iso (create image file)
fsck /dev/sdb1 (check file system)
mkfs -t ext3 /dev/sdb1 (create ext3 file system)
unmount /dev/sdb1 (unmount the file system, before changing the partition table)
fdisk /dev/sdb (create a partition table)
Generate 1GB file using uurandom
dd if=/dev/urandom of=sample.txt bs=64M count=16

POSIX charcter class

character class
alnum, word , alpha blank, cntrl, digit, graph,lowe, punct, print, space, upper, xdigit
format: [:alnum:]

echo $LANG
export LANG=POSIX

grep Options

i	ignore case
v	invert match
c	print number of matches
l	print the name of each file that contain matches
L	print only the names of files that don't match
n	print match line with the number
h	for multiple output supress the output of filename

grep [options] regex [file....]

metacharacters : ^ $. [ ] {} - ? * + ( ) | \

grep examples

grep -h '.zip' file.list	. is any character
grep -h '^zip' file.list	starts with zip
grep -h 'zip$' file.list	ends with zip
grep -h '^zip$' file.list	containing only zip
grep -h '[^bz]zip' file.list	not containing b and z
grep -h '^[A-Za-z0-9]' file.list	file containing any valid names

grep Quantifiers

?	match element zero or one time
*	match an element zero or more times
+	Match an element one or more times
{}	match an element specfic number of times

It always match the preceding element
{n} match the preceding element occurs n times
{n,m} match the preceding element occurs at least n times, but no more than m times
{n,} match the preceding element if it occurs n or more times
{,m} match the preceding element if it occurs no more than m times

grep hacks

```
grep -E '^\([0-9]{3}\).[0-9]{3}.[0-9]{3}$' phone.txt
locate --regex 'bin/(bz|gz|zip)'
```

```
for i in {1..10}; do echo "(${RANDOM:0:3})-${RANDOM:0:3}-${RANDOM:0:3}"; done >>phone.txt
```

Text Processing Hacks

diff -c	context format
diff -u	unified format
diff -Naur oldfile newfile > diff_file	write the diff to diff file
patch < diff_file	applied to oldfile directly.
echo "secret text" | tr a-zA-Z n-za-mN-ZA-M	frperg grkg | ROT13 Encoding
echo "frperg grkg" | tr a-zA-Z n-za-mN-ZA-M	secret text | ROT13 Decoding

-, +, ! : deleted, added, line changes.

```
$diff -Naur file1.txt file2.txt > diff_file.txt
$patch < diff_file.txt
patching file file1.txt
```

rotate by 13 places (ROT13)

Inode cheats

Backup of superblock	dumpe2fs /dev/sdX | grep -i superblock
Restore of superblock	fsck -b 32768 /dev/sdX
dumps ext2/ext3/ext4 filesystem info including inode locations	dumpe2fs /dev/sdX
interactive tool to inspect inodes	debugfs /dev/sdX
shows inode number and metadata	stat filename