CENG 111

Middle East Technical University
Department of Computer Engineering

Linux Cheat-Sheet

File Commands

ls – directory listing
ls -al – formatted listing with hidden files
cd *dir* - change directory to *dir*
cd – change to home
pwd – show current directory
mkdir *dir* – create a directory *dir*
rm *file* – delete *file*
rm -r *dir* – delete directory *dir*
rm -f *file* – force remove *file*
rm -rf *dir* – force remove directory *dir* *
cp *file1 file2* – copy *file1* to *file2*
cp -r *dir1 dir2* – copy *dir1* to *dir2*; create *dir2* if not exists
mv *file1 file2* – rename or move *file1* to *file2*
if *file2* is an existing directory, moves *file1* into *file2*
ln -s *file link* – create symbolic link *link* to *file*
stat *file* – display *file* attributes
touch *file* – create or update *file*
cat > *file* – places standard input into *file*
more *file* – output the contents of *file*
head *file* – output the first 10 lines of *file*
tail *file* – output the last 10 lines of *file*
tail -f *file* – output the contents of *file* as it grows, starting with the last 10 lines
chmod *octal file* – change the permissions of *file* to *octal*, which can be found separately for user, group, and world by adding:

- 4 – read (r)
- 2 – write (w)
- 1 – execute (x)

E.g.:
chmod 777 – read, write, execute for all
chmod 755 – rwx for owner, rx for group and world
For more options, see **man chmod**
chown *accountname file* – change the owner of the file called *file* to *accountname* user

Process Management

ps – display your currently active processes
pstree – display your currently active processes in hierarchical order from parent child
top – display all running processes
kill *pid* – kill process id *pid*
killall *proc* – kill all processes named *proc* *
bg – lists stopped or background jobs; resume a stopped job in the background
fg – brings the most recent job to foreground
fg *n* – brings job *n* to the foreground
fuser *file* – show processes using *file*

Network

ping *host* – check if *host* is reachable
Example: **ping www.ceng.metu.edu.tr**
traceroute *host* – display the route to *host*
netstat – print network connections, routing tables and interface statistics
whois *domain* – get whois information for *domain*
dig *domain* – get DNS information for *domain,* similar to **host *domain***
dig -x *host* – reverse lookup *host*
hostname – print the system's hostname
wget *file* – download *file*
wget -c *file* – continue a stopped download
ifconfig – list IP addresses for all devices on the machine
ifup eth0 – bring up network interface *eth0*
ifdown eth0 – bring down network interface *eth0*
iptables – administration tool for packet filtering and NAT
ipchains – IP firewall administration
route – show / manipulate the IP routing table
lynx – text based web browser
pine – e-mail and news reader
tin – text based news reader

SSH

ssh *user@host* – connect to *host* as *user*
ssh -p *port user@host* – connect to *host* on port *port* as *user*
ssh-copy-id *user@host* – add your key to *host* for *user* to enable a keyed or passwordless login
ssh -L localport:remotehost:remoteport user@host – create a tunnel to connect to *remotehost*'s *remoteport* from *localport*
E.g.: **ssh -L 8080:www.ceng.metu.edu.tr:80 e1XXXXXX@login.ceng.metu.edu.tr**
point web browser to http://localhost:8080/ to connect to www.ceng.metu.edu.tr
sftp – used for interactive file transmission
put *file* – transfer *file* from local computer to the remote computer
get *file* – transfer *file* from the remote computer to local computer

Searching

grep *pattern files* – search for *pattern* in *files*
grep -r *pattern dir* – search recursively for *pattern* in *dir*
command | **grep *pattern*** – search for *pattern* in the output of *command*
updatedb – create or update the database of files on all file systems attached to the linux root directory
locate *file* – find all instances of *file* using database index.

This assumes *updatedb* has already been used
find *dir* -name *fname* – starting with the directory called *dir*, look for the file called *fname*
Example:
find / -name ceng111.pdf – starting with the root directory, look for the file called ceng111.pdf

System Info

date – show the current date and time
cal – show this month's calendar
uptime – show the system load
which *commandname* – show which program is executed by a given *commandname*
w – display who is online
whoami – who you are logged in as
who – list the login name, terminal name and login time for each logged in user
finger – display the list of the users on the system
finger *user* – display information about *user* on the system
uname -a – show kernel information
cat /proc/cpuinfo – cpu information
cat /proc/meminfo – memory information
lshw – list all hardware components
lsof – display list of open files
man *command* – show the manual for *command*
man -k *subject* – list manual pages for *subject* similar to **apropos *subject***
df – show disk usage
du – show directory space usage
quota – manage disk quota
free – show memory and swap usage
whereis *app* – show possible locations of *app*
which *app* – show which *app* will be run by default
env – display, set or remove environment variables
set – manipulate shell variables and functions

Compression

tar -cf *file.tar files* – create a tar named *file.tar* containing *files*
tar -xf *file.tar* – extract the files from *file.tar*
tar -czf *file.tar.gz files* – create a tar with Gzip compression
tar -xzf *file.tar.gz* – extract a tar using Gzip
tar -cjf *file.tar.bz2* – create a tar with Bzip2 compression
tar -xjf *file.tar.bz2* – extract a tar using Bzip2
gzip *file* – compress *file* and renames it to *file.gz*
gzip -d *file.gz* – decompress *file.gz* back to *file*
bzip2 -k *file* – compress *file* as *file.bz2* and keep the original *file*
bunzip2 *file.bz2* – decompress *file.bz2* back to *file*

Installation

install from source:
./configure
make
make install
dpkg -i *pkg.deb* – install a package (Debian)
see also *apt-get*
rpm -Uvh *pkg.rpm* – install a package (RPM)
apt-get install *pkg* – install a package (Debian)
this is a higher level tool compared to *dpkg*
E.g.: **apt-get install gcc** – install gnu c compiler
aptitude search *pattern* – search for packages matching *pattern*
synaptic –graphical management of software packages

Starting & Stopping

shutdown -h now – shutdown the system now and do not reboot
halt – stop all processes **-** same as above
shutdown -r 5 – shutdown the system in 5 minutes and reboot
shutdown -r now – shutdown the system now and reboot
reboot – stop all processes and then reboot **–** same as above
startx – start the X system

User Administration

adduser *accountname* – create a new user called *accountname*
passwd *accountname* – give *accountname* a new password
login *accountname* – login user called *accountname* after a signoff or to change the current user
su – log in as superuser from current login
sudo – allow a permitted user to execute a *command* as the superuser or another user
exit – log out of current session. use after *su* to relinquish superuser rights

Mounting

mount -t iso9660 /dev/cdrom /mnt/cdrom – mount the device cdrom and call it cdrom under the /mnt directory
mount -t vfat /dev/hda1 /mnt/cdrive – mount hard disk "a" as a VFAT file system and call it cdrive under the /mnt
mount -t ntfs /dev/hda1 /mnt/windows – mount hard disk "a" as a NTFS file system and call it windows under /mnt
umount /mnt/cdrom – unmount the cdrom

Miscellaneous

wc -[b/w/l] – count [c]bytes / [w]ords / [l]ines
sort *file* – sort *file*
cmp *file1 file2* – compare *file*s byte to byte
comm *file1 file2* – compare sorted *file*s
diff *file1 file2* – compare *file*s line by line
md5sum *file* – compute md5 checksum of *file*
unix2dos – convert text files from/to linux format
echo – display output
E.g.: **echo $HOME** – displays user's home directory path
history – display the list of commands executed previously
clear – clear the terminal screen
sleep *time* – delay for a specified amount of *time* in seconds
***command* &** – execute *command* in background
Example: **sleep 2 &**
***command* --help** – used as a switch to any command to display its help page
E.g.: **ls –help**
fdisk – modify the partition table
grub – GRand Unified Bootloader, boot loader program

Shortcuts

Ctrl+C – halt the current command
Ctrl+Z – stop the current command, resume with *fg* in the foreground or *bg* in the background
Ctrl+D – log out of current session, similar to **exit**
Ctrl+W – erase one word in the current line
Ctrl+U – erase the whole line
Ctrl+R – bring up a recent command
!! - repeats the last command
Tab – auto complete the command if there is only one option, or else show all the available options
Shift+PgUp – scroll the command history (press **Enter** to execute a historical command)
Shift+PgDown – scroll the command history back
Alt+Tab – walk through windows (**Alt+Shift+Tab** to walk backwards)
Ctrl+Tab – walk through desktops (**Ctrl+Shift+Tab** to walk backwards)
Ctrl+Alt+Backspace – stop X server (some systems use Ctrl+Alt+Esc)
Ctrl+Alt+F1 – switch to text mode console 1
Ctrl+Alt+F*n* – switch to text mode console *n* (*n*=1..6)
Ctrl+Alt+F7 – switch back to graphic terminal 1
Ctrl+Alt+F*n* – switch back to graphic terminal *n* (*n*=7..12)
MiddleMouseButton – paste the highlighted text

Important Directories

. – refers to current directory
.. – refers to parent directory
~ – refers to current user's home directory
/ – the root of the file system, all other files and directories use this as a starting point
/bin/ – binaries directory - contains common executables for system operation
/boot/ – directory containing persistent boot information and executables, such as kernel, and initrd, grub.conf
/dev/ – devices directory
/dev/fd0 – block device that refers to the first floppy drive
/dev/sda – block device that refers to the first hard drive
/dev/lp0 – block device that refers to the first parallel port (LPT1 in Windows)
/etc/ – configuration files directory
/home/ – the mount point or directory where user's personal data is stored
/lib/ – library files directory
/mnt/ – mount point directory
/media/ – mount point directory
/proc/ – kernel process information directory
/root/ – root user's home directory
/sbin/ – system binaries directory
/tmp/ – temporary directory
/usr/ – this directory is used as a system resource. many times, libraries, applications, and source code are installed in this folder. kernel compiling usually takes place in the */usr/src/linux/* subdirectory
/var/ – log files are generally stored in this directory or *log* subdirectory

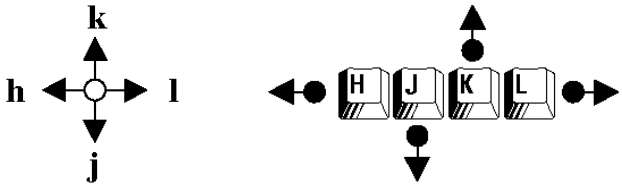
Configuration Files

$HOME/.bash_profile – bash system wide and per user init files
$HOME/.bashrc –user init files
/etc/bash.bashrc – shell variables
/etc/bash.bashrc.local – overrides */etc/bash.bashrc*
/etc/bashrc – bash system wide and per user init files
/etc/default – default for certain commands
/etc/cron.* – there are 4 directories that automatically execute all scripts within the directory at intervals of hour, day, week or month
/etc/exports – NFS server export list
/etc/fstab – list of devices and their associated mount points. edit this file to add cdroms, DOS partitions and floppy drives at startup
/etc/group – group listing, passwords and member lists
/etc/host.allow – TCP wrapper host control files
/etc/host.config – host name information look up order
/etc/host.deny – TCP wrapper host control files
/etc/HOSTNAME – contains full hostname including domain
/etc/hosts – a list of all know host names and IP addresses on the machine
/etc/init.d/ – directory containing run level scripts for system startup
/etc/inittab – control file that determines how the system boots
/etc/motd – message of the day broadcast to all users at login
/etc/networks – file that contains network ranges and their associated names
/etc/nsswitch.conf – configuration file that defines the order in which look up hostnames/dns names occurs
/etc/passwd – file that has information that defines user accounts on the server their shell, UID, default group, home directory and either a hash for their password or a marker indicating that it is in the shadow password file
/etc/profile – system wide environment variables for all users
/etc/profile.local – change to your global variables should be made here
/etc/protocols – this file contains protocol IDs and their names. useful for determining network traffic problems
/etc/rc.d/rc.inet1 – IP address, network mask, default gateway are in these files
/etc/rc.d/rc.local – bash script that is executed at the end of login process. similar to *autoexec.bat* in DOS
/etc/resolv.conf – defines IP addresses of DNS servers
/etc/services –TCP/IP services and ports mapping
/etc/shadow – read-only to root access processes, used to avoid theft of user password
/etc/shells – serves as the list of valid shells that may be loaded
/etc/smb.conf – config file for the SAMBA server. allows file and print sharing with Microsoft clients
/etc/sysconfig/ – a directory containing system configuration files
/etc/sysconfig/network – the networking configuration file, specifies network interfaces, IP addresses and other protocols
/etc/X11/xorg.conf – configuration file for X Server

VI REFERENCE

MOVEMENT

By Character



By Line	
***n*G**	to line *n*
0, $	first, last position on line
^ or _	first non-whitespace char on line
+, -	first character on next, previous line

By Screen	
^F, ^B	scroll forward, back one full screen
^D, ^U	scroll forward, back half a screen
^E, ^Y	show one more line at bottom, top
L	go to the bottom of the screen
z↵	position line with cursor at top
z.	position line with cursor at middle
z-	position line with cursor at

Marking Position on Screen	
m*p*	mark current position as *p* (a..z)
`*p*	move to mark position *p*
'*p*	move to first non-whitespace on line w/mark *p*

Miscellaneous Movement	
f*m*	forward to character *m*
F*m*	backward to character *m*
t*m*	forward to character before *m*
T*m*	backward to character after *m*
w	move to next word (stops at punctuation)
W	move to next word (skips punctuation)
b	move to previous word (stops at punctuation)
B	move to previous word (skips punctuation)
e	end of word (punctuation not part of word)
E	end of word (punctuation part of word)
), (	next, previous sentence
]], [[	next, previous section
}, {	next, previous paragraph
%	goto matching parenthesis () {} []

VI REFERENCE

EDITING

Entering Text	
a	append after cursor
A or $a	append at end of line
i	insert before cursor
I or _i	insert at beginning of line
o	open line below cursor
O	open line above cursor
c*m*	change text (*m* is movement)

Cut, Copy, Paste (Working w/Buffers)	
d*m*	delete (*m* is movement)
dd	delete line
D or d$	delete to end of line
x	delete char under cursor
X	delete char before cursor
y*m*	yank to buffer (*m* is movement)
yy or Y	yank to buffer current line
p	paste from buffer after cursor
P	paste from buffer before cursor
"*b*dd	cut line into named buffer *b* (a..z)
"*b*p	paste from named buffer *b*

Searching and Replacing	
/*w*	search forward for *w*
?*w*	search backward for *w*
/*w*/+*n*	search forward for *w* and move down *n* lines
n	repeat search (forward)
N	repeat search (backward)
:s/*old*/*new*	replace next occurence of *old* with *new*
:s/*old*/*new*/g	replace all occurences on the line
:*x*,*y*s/*old*/*new*/g	replace all ocurrences from line *x* to *y*
:%s/*old*/*new*/g	replace all occurrences in file
:%s/*old*/*new*/gc	same as above, with confirmation

Miscellaneous	
n*>*m	indent *n* lines (*m* is movement)
n*<*m	un-indent left *n* lines (*m* is movement)
.	repeat last command
U	undo changes on current line
u	undo last command
J	join end of line with next line (at <cr>)
:r*f*	insert text from external file *f*
^G	show status