The Codage Handbook

Linux

What is Linux ?

Linux is a free and open-source software that operates on its own operating system. The term 'Linux' stands for GNU + Linux. Initially developed by Linus Torvalds, it was created alongside the source code of Unix. While Linux is extensively utilized for various purposes, its applications are well-known to many.

Basic Linux Terminal Commands		
S.No.	**Linux Commands**	**Functions**
1	**ls**	Displays information about files in the current directory.
2	**pwd**	Displays the current working directory.
3	**mkdir**	Creates a directory.
4	**cd**	To navigate between different folders.
5	**rmdir**	Removes empty directories from the directory lists.
6	**cp**	Moves files from one directory to another.
7	**mv**	Rename and Replace the files
8	**rm**	Delete files
9	**uname**	Command to get basic information about the OS
10	**locate**	Find a file in the database.
11	**touch**	Create empty files
12	**ln**	Create shortcuts to other files
13	**cat**	Display file contents on

Basic Linux Terminal Commands		
		terminal
14	**clear**	Clear terminal
15	**ps**	Display the processes in terminal
16	**man**	Access manual for all Linux commands
17	**grep**	Search for a specific string in an output
18	**echo**	Display active processes on the terminal
19	**wget**	download files from the internet.
20	**whoami**	Create or update passwords for existing users
21	**sort**	sort the file content
22	**cal**	View Calendar in terminal
23	**whereis**	View the exact location of any command typed after this command
24	**df**	Check the details of the file system
25	**wc**	Check the lines, word count, and characters in a file using different options

Find

Search for files in the given directory, hierarchically starting at the parent directory and moving to sub-directories.

```
arrehman@codage:~# find -name *.sh



./Desktop/load.sh

./Desktop/test.sh

./Desktop/shutdown.sh

./Binary/firefox/run-mozilla.sh

./Downloads/kdewebdev-3.5.8/quanta/scripts/externalpreview.sh

./Downloads/kdewebdev-3.5.8/admin/doxygen.sh

./Downloads/kdewebdev-3.5.8/admin/cvs.sh

./Downloads/kdewebdev-3.5.8/admin/ltmain.sh

./Downloads/wheezy-nv-install.sh
```

Note: The `**-name**‘ option makes the search case sensitive. You can use the `**-iname**‘ option to find something regardless of case. (***** is a wildcard and searches all the file having extension ‘**.sh**‘ you can use filename or a part of file name to customise the output).

```
arrehman@codage:~# find -iname *.SH ( find -iname *.Sh /  find -
iname *.sH)



./Desktop/load.sh

./Desktop/test.sh
```

```
./Desktop/shutdown.sh

./Binary/firefox/run-mozilla.sh

./Downloads/kdewebdev-3.5.8/quanta/scripts/externalpreview.sh

./Downloads/kdewebdev-3.5.8/admin/doxygen.sh

./Downloads/kdewebdev-3.5.8/admin/cvs.sh

./Downloads/kdewebdev-3.5.8/admin/ltmain.sh

./Downloads/wheezy-nv-install.sh

arrehman@codage:~# find -name *.tar.gz



/var/www/modules/update/tests/aaa_update_test.tar.gz

./var/cache/flashplugin-
nonfree/install_flash_player_11_linux.i386.tar.gz

./home/server/Downloads/drupal-7.22.tar.gz

./home/server/Downloads/smtp-7.x-1.0.tar.gz

./home/server/Downloads/noreqnewpass-7.x-1.2.tar.gz

./usr/share/gettext/archive.git.tar.gz

./usr/share/doc/apg/php.tar.gz

./usr/share/doc/festival/examples/speech_pm_1.0.tar.gz

./usr/share/doc/argyll/examples/spyder2.tar.gz

./usr/share/usb_modeswitch/configPack.tar.gz
```

Note: The above command searches for all the file having extension '**tar.gz**' in root directory and all the sub-directories including mounted devices.

grep

The '**grep**' command searches the given file for lines containing a match to the given strings or words. Search '**/etc/passwd**' for '**tecmint**' user.

```
arrehman@codage:~# grep tecmint /etc/passwd



tecmint:x:1000:1000:Tecmint,,,:/home/tecmint:/bin/bash
```

Ignore word case and all other combination with '**-i**' option.

```
arrehman@codage:~# grep -i TECMINT /etc/passwd



tecmint:x:1000:1000:Tecmint,,,:/home/tecmint:/bin/bash
```

Search recursively (**-r**) **i.e.** read all files under each directory for a string "**127.0.0.1**".

```
arrehman@codage:~# grep -r "127.0.0.1" /etc/



/etc/vlc/lua/http/.hosts:127.0.0.1

/etc/speech-dispatcher/modules/ivona.conf:#IvonaServerHost
"127.0.0.1"

/etc/mysql/my.cnf:bind-address           = 127.0.0.1

/etc/apache2/mods-available/status.conf:    Allow from 127.0.0.1
::1

/etc/apache2/mods-available/ldap.conf:    Allow from 127.0.0.1 ::1
```

```
/etc/apache2/mods-available/info.conf:    Allow from 127.0.0.1 ::1

/etc/apache2/mods-available/proxy_balancer.conf:#    Allow from
127.0.0.1 ::1

/etc/security/access.conf:#+ : root : 127.0.0.1

/etc/dhcp/dhclient.conf:#prepend domain-name-servers 127.0.0.1;

/etc/dhcp/dhclient.conf:#  option domain-name-servers 127.0.0.1;

/etc/init/network-interface.conf:  ifconfig lo 127.0.0.1 up ||
true

/etc/java-6-openjdk/net.properties:# localhost & 127.0.0.1).

/etc/java-6-openjdk/net.properties:#
http.nonProxyHosts=localhost|127.0.0.1

/etc/java-6-openjdk/net.properties:# localhost & 127.0.0.1).

/etc/java-6-openjdk/net.properties:#
ftp.nonProxyHosts=localhost|127.0.0.1

/etc/hosts:127.0.0.1    localhost
```

Note: You can use these following options along with **grep**.

1. **-w** for word (egrep -w '**word1|word2**' /path/to/file).
2. **-c** for count (i.e., total number of times the pattern matched) (grep -c '**word**' /path/to/file).
3. **–color** for coloured output (grep **–color** server /etc/passwd).

man

The '**man**' is the system's manual pager. Man provides online documentation for all the possible options with a command and its usages. Almost all the command comes with their corresponding manual pages. For example,

```
arrehman@codage:~# man man
```

```
MAN(1)
Manual pager utils
MAN(1)



NAME

       man - an interface to the on-line reference manuals



SYNOPSIS

       man  [-C  file]  [-d]  [-D]  [--warnings[=warnings]]  [-R
encoding]  [-L  locale]  [-m  system[,...]]  [-M  path]  [-S list]
[-e extension] [-i|-I]

       [--regex|--wildcard] [--names-only] [-a] [-u] [--no-
subpages] [-P pager] [-r prompt] [-7] [-E encoding] [--no-
hyphenation] [--no-justification]  [-p

       string] [-t] [-T[device]] [-H[browser]] [-X[dpi]] [-Z]
[[section] page ...] ...

       man -k [apropos options] regexp ...

       man -K [-w|-W] [-S list] [-i|-I] [--regex] [section] term
...

       man -f [whatis options] page ...

       man -l [-C file] [-d] [-D] [--warnings[=warnings]] [-R
encoding] [-L locale] [-P pager] [-r prompt] [-7] [-E encoding] [-p
string] [-t] [-T[device]]

       [-H[browser]] [-X[dpi]] [-Z] file ...

       man -w|-W [-C file] [-d] [-D] page ...

       man -c [-C file] [-d] [-D] page ...
```

```
       man [-hV]
```

Manual page for man page itself, similarly '**man cat**' (Manual page for cat command) and '**man ls**' (Manual page for command ls).

Note: man page is intended for command reference and learning.

ps

ps (**Process**) gives the status of running processes with a unique **Id** called **PID**.

```
arrehman@codage:~# ps


 PID TTY          TIME CMD

 4170 pts/1    00:00:00 bash

 9628 pts/1    00:00:00 ps
```

To list status of all the processes along with process **id** and **PID**, use option '**-A**'.

```
arrehman@codage:~# ps -A


 PID TTY          TIME CMD

    1 ?        00:00:01 init

    2 ?        00:00:00 kthreadd

    3 ?        00:00:01 ksoftirqd/0

    5 ?        00:00:00 kworker/0:0H

    7 ?        00:00:00 kworker/u:0H
```

```
    8 ?        00:00:00 migration/0

    9 ?        00:00:00 rcu_bh

....
```

ifconfig

ifconfig is used to configure the kernel-resident network interfaces. It is used at boot time to set up interfaces as necessary. After that, it is usually only needed when debugging or when system tuning is needed.

Check Active Network Interfaces

```
[arrehman@codage~]$ ifconfig



eth0      Link encap:Ethernet  HWaddr 40:2C:F4:EA:CF:0E

          inet addr:192.168.1.3  Bcast:192.168.1.255
Mask:255.255.255.0

          inet6 addr: fe80::422c:f4ff:feea:cf0e/64 Scope:Link

          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

          RX packets:163843 errors:0 dropped:0 overruns:0 frame:0

          TX packets:124990 errors:0 dropped:0 overruns:0 carrier:0

          collisions:0 txqueuelen:1000

          RX bytes:154389832 (147.2 MiB)  TX bytes:65085817 (62.0
MiB)

          Interrupt:20 Memory:f7100000-f7120000
```

```
lo        Link encap:Local Loopback

          inet addr:127.0.0.1  Mask:255.0.0.0

          inet6 addr: ::1/128 Scope:Host

          UP LOOPBACK RUNNING  MTU:16436  Metric:1

          RX packets:78 errors:0 dropped:0 overruns:0 frame:0

          TX packets:78 errors:0 dropped:0 overruns:0 carrier:0

          collisions:0 txqueuelen:0

          RX bytes:4186 (4.0 KiB)  TX bytes:4186 (4.0 KiB)
```

Check All Network Interfaces

Display details of All interfaces including disabled interfaces using "**-a**" argument.

```
[arrehman@codage~]$ ifconfig -a



eth0      Link encap:Ethernet  HWaddr 40:2C:F4:EA:CF:0E

          inet addr:192.168.1.3  Bcast:192.168.1.255
Mask:255.255.255.0

          inet6 addr: fe80::422c:f4ff:feea:cf0e/64 Scope:Link

          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

          RX packets:163843 errors:0 dropped:0 overruns:0 frame:0

          TX packets:124990 errors:0 dropped:0 overruns:0 carrier:0

          collisions:0 txqueuelen:1000
```

```
          RX bytes:154389832 (147.2 MiB)  TX bytes:65085817 (62.0
MiB)

          Interrupt:20 Memory:f7100000-f7120000



lo        Link encap:Local Loopback

          inet addr:127.0.0.1  Mask:255.0.0.0

          inet6 addr: ::1/128 Scope:Host

          UP LOOPBACK RUNNING  MTU:16436  Metric:1

          RX packets:78 errors:0 dropped:0 overruns:0 frame:0

          TX packets:78 errors:0 dropped:0 overruns:0 carrier:0

          collisions:0 txqueuelen:0

          RX bytes:4186 (4.0 KiB)  TX bytes:4186 (4.0 KiB)



virbr0    Link encap:Ethernet  HWaddr 0e:30:a3:3a:bf:03

          inet addr:192.168.122.1  Bcast:192.168.122.255
Mask:255.255.255.0

          UP BROADCAST MULTICAST  MTU:1500  Metric:1

          RX packets:0 errors:0 dropped:0 overruns:0 frame:0

          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0

          collisions:0 txqueuelen:0

          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

Disable an Interface

```
[arrehman@codage~]$ ifconfig eth0 down
```

Enable an Interface

```
[arrehman@codage~]$ ifconfig eth0 up
```

Assign IP Address to an Interface

Assign “192.168.1.12” as the IP address for the interface eth0.

```
[arrehman@codage~]$ ifconfig eth0 192.168.1.12
```

Change Subnet Mask of Interface eth0

```
[arrehman@codage~]$ ifconfig eth0 netmask 255.255.255.
```

Change Broadcast Address of Interface eth0

```
[arrehman@codage~]$ ifconfig eth0 broadcast 192.168.1.255
```

Assign IP Address, Netmask and Broadcast to Interface eth0

```
[arrehman@codage~]$ ifconfig eth0 192.168.1.12 netmask
255.255.255.0 broadcast 192.168.1.255
```

Note: If using a wireless network you need to use command “**iwconfig**“. For more “**ifconfig**” command examples and usage, read 15 Useful “ifconfig” Commands.

netstat

netstat command displays various network related information such as network connections, routing tables, interface statistics, masquerade connections, multicast memberships etc..,

List All Network Ports

```
[arrehman@codage~]$ netstat -a



Active UNIX domain sockets (servers and established)

Proto RefCnt Flags       Type       State         I-Node   Path

unix  2      [ ACC ]     STREAM     LISTENING     741379
/run/user/user1/keyring-I5cn1c/gpg

unix  2      [ ACC ]     STREAM     LISTENING     8965
/var/run/acpid.socket

unix  2      [ ACC ]     STREAM     LISTENING     18584
/tmp/.X11-unix/X0

unix  2      [ ACC ]     STREAM     LISTENING     741385
/run/user/user1/keyring-I5cn1c/ssh

unix  2      [ ACC ]     STREAM     LISTENING     741387
/run/user/user1/keyring-I5cn1c/pkcs11

unix  2      [ ACC ]     STREAM     LISTENING     20242
@/tmp/dbus-ghtTjuPN46

unix  2      [ ACC ]     STREAM     LISTENING     13332
/var/run/samba/winbindd_privileged/pipe

unix  2      [ ACC ]     STREAM     LISTENING     13331
/tmp/.winbindd/pipe

unix  2      [ ACC ]     STREAM     LISTENING     11030
/var/run/mysqld/mysqld.sock

unix  2      [ ACC ]     STREAM     LISTENING     19308
/tmp/ssh-qnZadSgJAbqd/agent.3221
```

```
unix  2      [ ACC ]     STREAM     LISTENING     436781
/tmp/HotShots

unix  2      [ ACC ]     STREAM     LISTENING     46110
/run/user/ravisaive/pulse/native

unix  2      [ ACC ]     STREAM     LISTENING     19310
/tmp/gpg-zfE9YT/S.gpg-agent

....
```

List All TCP Ports

```
[arrehman@codage~]$ netstat -at



Active Internet connections (servers and established)

Proto Recv-Q Send-Q Local Address           Foreign Address
State

tcp        0      0 localhost:mysql         *:*
LISTEN

tcp        0      0 *:5901                  *:*
LISTEN

tcp        0      0 *:5902                  *:*
LISTEN

tcp        0      0 *:x11-1                 *:*
LISTEN

tcp        0      0 *:x11-2                 *:*
LISTEN

tcp        0      0 *:5938                  *:*
LISTEN

tcp        0      0 localhost:5940          *:*
LISTEN
```

```
tcp        0      0 ravisaive-OptiPl:domain *:*
LISTEN

tcp        0      0 ravisaive-OptiPl:domain *:*
LISTEN

tcp        0      0 localhost:ipp           *:*
LISTEN

tcp        0      0 ravisaive-OptiPle:48270 ec2-23-21-236-70.c:http
ESTABLISHED

tcp        0      0 ravisaive-OptiPle:48272 ec2-23-21-236-70.c:http
TIME_WAIT

tcp        0      0 ravisaive-OptiPle:48421 bom03s01-in-f22.1:https
ESTABLISHED

tcp        0      0 ravisaive-OptiPle:48269 ec2-23-21-236-70.c:http
ESTABLISHED

tcp        0      0 ravisaive-OptiPle:39084 channel-ecmp-06-f:https
ESTABLISHED

...
```

Show Statistics for All Ports

```
[arrehman@codage~]$ netstat -s



Ip:

    4994239 total packets received

    0 forwarded

    0 incoming packets discarded

    4165741 incoming packets delivered
```

```
    3248924 requests sent out
    8 outgoing packets dropped
Icmp:
    29460 ICMP messages received
    566 input ICMP message failed.
    ICMP input histogram:
        destination unreachable: 98
        redirects: 29362
    2918 ICMP messages sent
    0 ICMP messages failed
    ICMP output histogram:
        destination unreachable: 2918
IcmpMsg:
        InType3: 98
        InType5: 29362
        OutType3: 2918
Tcp:
    94533 active connections openings
    23 passive connection openings
    5870 failed connection attempts
    7194 connection resets received
```

```
....
```

OK! For some reason if you want not to resolve host, port and user name as a output of netstat.

```
[arrehman@codage~]$ netstat -an
```

Fine, you may need to get the output of netstat continuously till interrupt instruction is passed (**ctrl+c**).

```
[arrehman@codage~]$ netstat -c
```

For more "**netstat**" command examples and usage, see the article 20 Netstat Command Examples.

nslookup

A network utility program used to obtain information about Internet servers. As its name suggests, the utility finds name server information for domains by querying **DNS**.

```
[arrehman@codage~]$ nslookup tecmint.com



Server:           192.168.1.1

Address:    192.168.1.1#53



Non-authoritative answer:

Name: tecmint.com

Address: 50.16.67.239
```

Query Mail Exchanger Record

```
[arrehman@codage~]$ nslookup -query=mx tecmint.com

Server:           192.168.1.1

Address:    192.168.1.1#53

Non-authoritative answer:

tecmint.com mail exchanger = 0 smtp.secureserver.net.

tecmint.com mail exchanger = 10 mailstore1.secureserver.net.

Authoritative answers can be found from:
```

Query Name Server

```
[arrehman@codage~]$ nslookup -type=ns tecmint.com

Server:           192.168.1.1

Address:    192.168.1.1#53

Non-authoritative answer:

tecmint.com nameserver = ns3404.com.

tecmint.com nameserver = ns3403.com.
```

```
Authoritative answers can be found from:
```

Query DNS Record

```
[arrehman@codage~]$ nslookup -type=any tecmint.com

Server:           192.168.1.1
Address:    192.168.1.1#53

Non-authoritative answer:
tecmint.com mail exchanger = 10 mailstore1.secureserver.net.
tecmint.com mail exchanger = 0 smtp.secureserver.net.
tecmint.com nameserver = ns06.domaincontrol.com.
tecmint.com nameserver = ns3404.com.
tecmint.com nameserver = ns3403.com.
tecmint.com nameserver = ns05.domaincontrol.com.

Authoritative answers can be found from:
```

Query Start of Authority

```
[arrehman@codage~]$ nslookup -type=soa tecmint.com
```

```
Server:           192.168.1.1

Address:    192.168.1.1#53



Non-authoritative answer:

tecmint.com

      origin = ns3403.hostgator.com

      mail addr = dnsadmin.gator1702.hostgator.com

      serial = 2012081102

      refresh = 86400

      retry = 7200

      expire = 3600000

      minimum = 86400



Authoritative answers can be found from:
```

Query Port Number

Change the port number using which you want to connect

```
[arrehman@codage~]$ nslookup -port 56 tecmint.com



Server:           tecmint.com
```

```
Address:    50.16.76.239#53



Name: 56

Address: 14.13.253.12
```

Read Also : 8 Nslookup Commands

dig

dig is a tool for querying **DNS** nameservers for information about host addresses, mail exchanges, nameservers, and related information. This tool can be used from any Linux (**Unix**) or **Macintosh OS X** operating system. The most typical use of **dig** is to simply query a single host.

```
[arrehman@codage~]$ dig tecmint.com



; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6 <<>> tecmint.com

;; global options: +cmd

;; Got answer:

;; ->>HEADER<
```

Turn Off Comment Lines

```
[arrehman@codage~]$ dig tecmint.com +nocomments



; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6 <<>> tecmint.com
+nocomments
```

```
;; global options: +cmd

;tecmint.com.                   IN    A

tecmint.com.            14400 IN    A     40.216.66.239

;; Query time: 418 msec

;; SERVER: 192.168.1.1#53(192.168.1.1)

;; WHEN: Sat Jun 29 13:53:22 2013

;; MSG SIZE  rcvd: 45
```

Turn Off Authority Section

```
[arrehman@codage~]$ dig tecmint.com +noauthority



; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6 <<>> tecmint.com
+noauthority

;; global options: +cmd

;; Got answer:

;; ->>HEADER<
```

Turn Off Additional Section

```
[arrehman@codage~]$ dig  tecmint.com +noadditional



; <<>> DiG 9.9.2-P1 <<>> tecmint.com +noadditional

;; global options: +cmd
```

```
;; Got answer:

;; ->>HEADER<
```

Turn Off Stats Section

```
~]$ dig tecmint.com +nostats



; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6 <<>> tecmint.com
+nostats

;; global options: +cmd

;; Got answer:

;; ->>HEADER<
```

Turn Off Answer Section

```
~]$ dig tecmint.com +noanswer



; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6 <<>> tecmint.com
+noanswer

;; global options: +cmd

;; Got answer:

;; ->>HEADER<
```

Disable All Section at Once

```
~]$ dig tecmint.com +noall
```

```
; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6 <<>> tecmint.com
+noall

;; global options: +cmd
```

uptime

You have just connected to your **Linux Server Machine** and founds Something unusual or malicious, what you will do? Guessing…. NO, definitely not you could run **uptime** to verify what happened actually when the server was unattended.

```
~]$ uptime



14:37:10 up  4:21,  2 users,  load average: 0.00, 0.00, 0.04
```

wall

one of the most important command for administrator, **wall** sends a message to everybody logged in with their **mesg** permission set to "**yes**". The message can be given as an argument to **wall**, or it can be sent to wall's standard input.

```
[~]$ wall "we will be going down for maintenance for one hour
sharply at 03:30 pm"



Broadcast message from root@localhost.localdomain (pts/0) (Sat Jun
29 14:44:02 2013):



we will be going down for maintenance for one hour sharply at 03:30
pm
```

mesg

Lets you control if people can use the “**write**” command, to send text to you over the screen.

```
mesg [n|y]

n - prevents the message from others popping up on the screen.

y – Allows messages to appear on your screen.
```

write

Let you send text directly to the screen of another Linux machine if ‘**mesg**’ is ‘**y**’.

```
[~]$ write ravisaive
```

talk

An enhancement to **write** command, **talk** command lets you talk to the logged in users.

```
[ ~]$ talk ravisaive
```

Note: If **talk** command is not installed, you can always **apt** or **yum** the required packages.

```
[ ~]$ yum install talk

OR

 ~]$ apt-get install talk
```

w

what command ‘**w**’ seems you funny? But actually it is not. t’s a command, even if it’s just one letter long! The command “**w**” is a combination of **uptime** and **who** commands given one immediately after the other, in that order.

```
$ w
```

```
15:05:42 up  4:49,  3 users,  load average: 0.02, 0.01, 0.00

USER     TTY      FROM              LOGIN@   IDLE   JCPU   PCPU
WHAT

server   tty7     :0                14:06    4:43m  1:42   0.08s
pam: gdm-passwo

server   pts/0    :0.0              14:18    0.00s  0.23s  1.65s
gnome-terminal

server   pts/1    :0.0              14:47    4:43   0.01s  0.01s
bash
```

rename

As the name suggests, this command rename files. rename will rename the specified files by replacing the first occurrence from the file name.

```
Give the file names a1, a2, a3, a4.....1213
```

Just type the command.

```
 rename a1 a0 a?

 rename a1 a0 a??
```

top

Displays the processes of **CPU**. This command refresh automatically, by default and continues to show **CPU** processes unless interrupt-instruction is given.

```
[ ~]$ top
```

```
top - 14:06:45 up 10 days, 20:57,  2 users,  load average: 0.10,
0.16, 0.21

Tasks: 240 total,   1 running, 235 sleeping,   0 stopped,   4
zombie

%Cpu(s):  2.0 us,  0.5 sy,  0.0 ni, 97.5 id,  0.0 wa,  0.0 hi,  0.0
si,  0.0 st

KiB Mem:   2028240 total,  1777848 used,   250392 free,    81804
buffers

KiB Swap:  3905532 total,   156748 used,  3748784 free,   381456
cached



  PID USER      PR  NI  VIRT  RES  SHR S  %CPU %MEM    TIME+
COMMAND

23768 ravisaiv  20   0 1428m 571m  41m S   2.3 28.9  14:27.52
firefox

24182 ravisaiv  20   0  511m 132m  25m S   1.7  6.7   2:45.94
plugin-containe

26929 ravisaiv  20   0  5344 1432  972 R   0.7  0.1   0:00.07 top

24875 ravisaiv  20   0  263m  14m  10m S   0.3  0.7   0:02.76
lxterminal

    1 root      20   0  3896 1928 1228 S   0.0  0.1   0:01.62 init

    2 root      20   0     0    0    0 S   0.0  0.0   0:00.06
kthreadd

    3 root      20   0     0    0    0 S   0.0  0.0   0:17.28
ksoftirqd/0

    5 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
kworker/0:0H
```

```
    7 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
kworker/u:0H

    8 root      rt   0     0    0    0 S   0.0  0.0   0:00.12
migration/0

    9 root      20   0     0    0    0 S   0.0  0.0   0:00.00
rcu_bh

   10 root      20   0     0    0    0 S   0.0  0.0   0:26.94
rcu_sched

   11 root      rt   0     0    0    0 S   0.0  0.0   0:01.95
watchdog/0

   12 root      rt   0     0    0    0 S   0.0  0.0   0:02.00
watchdog/1

   13 root      20   0     0    0    0 S   0.0  0.0   0:17.80
ksoftirqd/1

   14 root      rt   0     0    0    0 S   0.0  0.0   0:00.12
migration/1

   16 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
kworker/1:0H

   17 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
cpuset

   18 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
khelper

   19 root      20   0     0    0    0 S   0.0  0.0   0:00.00
kdevtmpfs

   20 root       0 -20     0    0    0 S   0.0  0.0   0:00.00 netns

   21 root      20   0     0    0    0 S   0.0  0.0   0:00.04 bdi-
default

   22 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
kintegrityd
```

```
   23 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
kblockd

   24 root       0 -20     0    0    0 S   0.0  0.0   0:00.00
ata_sff
```

mkfs.ext4

This command create a new **ext4** file system on the specified device, if wrong device is followed after this command, the whole block will be wiped and formatted, hence it is suggested not to run this command unless and until you understand what you are doing.

```
Mkfs.ext4 /dev/sda1 (sda1 block will be formatted)

mkfs.ext4 /dev/sdb1 (sdb1 block will be formatted)
```

vi/emacs/nano

vi (visual), **emacs**, **nano** are some of the most commonly used editors in Linux. They are used oftenly to edit text, configuration,… files. A quick guide to work around vi and nano is, emacs is a.

vi-editor

```
[ ~]$ touch a.txt (creates a text file a.txt)

[ ~]$ vi a.txt (open a.txt with vi editor)
```

[press ‘**i**’ to enter insert mode, or you won’t be able to type-in anything]

```
echo "Hello"  (your text here for the file)
```

1. **alt+x** (exit insert mode, remember to keep some space between the last letter.
2. **ctrl+x** command or your last word will be deleted).
3. **:wq!** (saves the file, with the current text, remember ‘!’ is to override).

nano editor

```
[ ~]$ nano a.txt (open a.txt file to be edited with nano)

edit, with the content, required
```

ctrl +x (to close the editor). It will show output as:

```
Save modified buffer (ANSWERING "No" WILL DESTROY CHANGES) ?

 Y Yes

 N No           ^C Cancel
```

Click '**y**' to yes and enter file name, and you are done.

rsync

Rsync copies files and has a **-P** switch for a progress bar. So if you have rsync installed, you could use a simple alias.

```
alias cp='rsync -aP'
```

Now try to copy a large file in terminal and see the output with remaining items, similar to a progress bar.

Moreover, Keeping and Maintaining backup is one of the most important and boring work a system administrator, needs to perform. Rsync is a very nice tool (there exists, several other) to create and maintain backup, in terminal.

```
[ ~]$ rsync -zvr IMG_5267\ copy\=33\ copy\=ok.jpg ~/Desktop/



sending incremental file list

IMG_5267 copy=33 copy=ok.jpg
```

```
sent 2883830 bytes  received 31 bytes  5767722.00 bytes/sec

total size is 2882771  speedup is 1.00
```

Note: **-z** for compression, -v for verbose and -r for recursive.

free

Keeping track of memory and resources is as much important, as any other task performed by an administrator, and '**free**' command comes to rescue here.

Current Usage Status of Memory

```
[ ~]$ free

             total       used       free     shared    buffers
cached

Mem:       2028240    1788272     239968          0      69468
363716

-/+ buffers/cache:    1355088     673152

Swap:      3905532     157076    3748456
```

Tuned Output in KB, or MB, or GB

```
[ ~]$ free -b

             total       used       free     shared    buffers
cached
```

```
Mem:    2076917760 1838272512  238645248          0   71348224
372670464

-/+ buffers/cache: 1394253824  682663936

Swap:   3999264768  160845824 3838418944

[ ~]$ free -k



             total       used       free     shared    buffers
cached

Mem:       2028240    1801484     226756          0      69948
363704

-/+ buffers/cache:    1367832     660408

Swap:      3905532     157076    3748456

[~]$ free -m



             total       used       free     shared    buffers
cached

Mem:          1980       1762        218          0         68
355

-/+ buffers/cache:       1338        641

Swap:         3813        153       3660

[ ~]$ free -g



             total       used       free     shared    buffers
cached
```

```
Mem:             1          1          0          0          0
0

-/+ buffers/cache:          1          0

Swap:            3          0          3
```

Check Current Usage in Human Readable Format

```
[ ~]$ free -h



             total       used       free     shared    buffers
cached

Mem:          1.9G       1.7G       208M         0B        68M
355M

-/+ buffers/cache:       1.3G       632M

Swap:         3.7G       153M       3.6G
```

Check Status Contineously After Regular Interval

```
[~]$ free -s 3



             total       used       free     shared    buffers
cached

Mem:       2028240    1824096     204144          0      70708
364180

-/+ buffers/cache:    1389208     639032

Swap:      3905532     157076    3748456
```

```
             total       used       free     shared    buffers
cached

Mem:       2028240    1824192     204048          0      70716
364212

-/+ buffers/cache:    1389264     638976

Swap:      3905532     157076    3748456
```

Read Also : 10 Examples of Free Command

mysqldump

Ok till now you would have understood what this command actually stands for, from the name of this command.**mysqldump** commands dumps (backups) all or a particular database data into a given a file.For example,

```
[ ~]$ mysqldump -u root -p --all-databases >
/home/server/Desktop/backupfile.sql
```

Note: **mysqldump** requires mysql to be running and correct password for authorisation. We have covered some useful "**mysqldump**" commands at Database Backup with mysqldump Command

mkpasswd

Make a hard-to-guess, random password of the length as specified.

```
$ mkpasswd -l 10



zI4+Ybqfx9

$ mkpasswd -l 20
```

```
w0Pr7aqKk&hmbmqdrlmk
```

Note: **-l 10** generates a random password of **10** characters while **-l 20** generates a password of character **20**, it could be set to anything to get desired result. This command is very useful and implemented in scripting language oftenly to generate random passwords. You might need to **yum** or **apt** the 'expect' package to use this command.

```
[root@~]# yum install expect

OR

[root@root~]# apt-get install expect
```

paste

Merge two or more text files on lines using. Example. If the content of file1 was:

```
1

2

3



and file2 was:



a

b

c

d

the resulting file3 would be:
```

```
1    a

2    b

3    c

     d
```

lsof

lsof stands for "**list open files**" and displays all the files that your system has currently opened. It's very useful to figure out which processes uses a certain file, or to display all the files for a single process. Some useful 10 lsof Command examples, you might be interested in reading.

```
[~]$ lsof



COMMAND     PID   TID             USER   FD      TYPE     DEVICE
SIZE/OFF       NODE NAME

init          1                 root  cwd       DIR        8,1
4096          2 /

init          1                 root  rtd       DIR        8,1
4096          2 /

init          1                 root  txt       REG        8,1
227432     395571 /sbin/init

init          1                 root  mem       REG        8,1
47080     263023 /lib/i386-linux-gnu/libnss_files-2.17.so

init          1                 root  mem       REG        8,1
42672     270178 /lib/i386-linux-gnu/libnss_nis-2.17.so

init          1                 root  mem       REG        8,1
87940     270187 /lib/i386-linux-gnu/libnsl-2.17.so
```

```
init          1                  root  mem       REG        8,1
30560     263021 /lib/i386-linux-gnu/libnss_compat-2.17.so

init          1                  root  mem       REG        8,1
124637     270176 /lib/i386-linux-gnu/libpthread-2.17.so

init          1                  root  mem       REG        8,1
1770984     266166 /lib/i386-linux-gnu/libc-2.17.so

init          1                  root  mem       REG        8,1
30696     262824 /lib/i386-linux-gnu/librt-2.17.so

init          1                  root  mem       REG        8,1
34392     262867 /lib/i386-linux-gnu/libjson.so.0.1.0

init          1                  root  mem       REG        8,1
296792     262889 /lib/i386-linux-gnu/libdbus-1.so.3.7.2

init          1                  root  mem       REG        8,1
34168     262840 /lib/i386-linux-gnu/libnih-dbus.so.1.0.0

init          1                  root  mem       REG        8,1
95616     262848 /lib/i386-linux-gnu/libnih.so.1.0.0

init          1                  root  mem       REG        8,1
134376     270186 /lib/i386-linux-gnu/ld-2.17.so

init          1                  root    0u      CHR        1,3
0t0       1035 /dev/null

init          1                  root    1u      CHR        1,3
0t0       1035 /dev/null

init          1                  root    2u      CHR        1,3
0t0       1035 /dev/null

init          1                  root    3r     FIFO        0,8
0t0       1714 pipe

init          1                  root    4w     FIFO        0,8
0t0       1714 pipe

init          1                  root    5r     0000        0,9
0       6245 anon_inode
```

```
init          1                  root    6r      0000        0,9
0        6245 anon_inode

init          1                  root    7u      unix 0xf5e91f80
0t0         8192 @/com/ubuntu/upstart

init          1                  root    8w       REG        8,1
39
```

More coming soon