

# Linux Command Reference Manual

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## SECTION –1

### 1.Linux File Structure

In the Linux file structure files are grouped according to purpose. Ex: commands, data files, documentation. Parts of a Unix directory tree are listed below. All directories are grouped under the root entry "/". That part of the directory tree is left out of the below diagram. See the FSSTND standard(Filesystem standard).

- **root** - The home directory for the root user
- **home** - Contains the user's home directories along with directories for services
  - ftp
  - HTTP
  - samba
- **bin** - Commands needed during bootup that might be needed by normal users
- **sbin** - Like bin but commands are not intended for normal users. Commands run by LINUX.
- **proc** - This filesystem is not on a disk. It is a virtual filesystem that exists in the kernels imagination, which is memory.
- **usr** - Contains all commands, libraries, man pages, games and static files for normal operation
  - **bin** - Almost all user commands. some commands are in /bin or /usr/local/bin.
  - **sbin** - System admin commands not needed on the root filesystem. e.g., most server programs.
  - **include** - Header files for the C programming language. Should be below /user/lib for consistency.
  - **lib** - Unchanging data files for programs and subsystems
  - **local** - The place for locally installed software and other files.
  - **man** - Manual pages
  - **info** - Info documents
  - **doc** - Documentation
  - **tmp**
  - **X11R6** - The X windows system files. There is a directory similar to usr below this directory.
  - **X386** - Like X11R6 but for X11 release 5
  - **boot** - Files used by the bootstrap loader, LILO. Kernel images are often kept here.
  - **lib** - Shared libraries needed by the programs on the root filesystem

- **modules** - Loadable kernel modules, especially those needed to boot the system after disasters.
- **dev** - Device files
- **etc** - Configuration files specific to the machine.
  - **sysconfig** - Files that configure the linux system for devices.
- **var** - Contains files that change for mail, news, printers log files, man pages, temp files
  - **lib** - Files that change while the system is running normally
  - **local** - Variable data for programs installed in /usr/local.
  - **lock** - Lock files. Used by a program to indicate it is using a particular device or file
  - **log** - Log files from programs such as login and syslog which logs all logins and logouts.
  - **run** - Files that contain information about the system that is valid until the system is next booted.
  - **spool** - Directories for mail, printer spools, news and other spooled work.
  - **tmp** - Temporary files that are large or need to exist for longer than they should in /tmp.
- **mnt** - Mount points for temporary mounts by the system administrator.
- **tmp** - Temporary files. Programs running after bootup should use /var/tmp.

## 2.Linux Configuration Files

/dev/MAKEDEV	The /dev/MAKEDEV file is a script written by the system administrator that creates local only device files or links such as device files for a non-standard device driver.
/etc/aliases	Where the user's name is matched to a nickname for email.
/etc/crontab	Lists commands and times to run them for the cron daemon.
/etc/filesystems	Can be used to set the filesystem probe order when filesystems are mounted with the auto option. The nodev parameter is specified for filesystems that are not really locally mounted systems such as proc, devpts, and nfs systems.

<code>/etc/fstab</code>	Lists the filesystems mounted automatically at startup by the <code>mount -a</code> command (in <code>/etc/rc</code> or equivalent startup file).
<code>/etc/group</code>	Similar to <code>/etc/passwd</code> but for groups rather than users. <code>/etc/groups</code> May contain passwords that let a user join a group.
<code>/etc/gshadow</code>	Used to hold the group password and group Administrator password information for shadow passwords.
<code>/etc/host.conf</code>	Specifies how host names are resolved.
<code>/etc/hosts</code>	List hosts for name lookup use that are locally required.
<code>/etc/inittab</code>	Configuration file for <code>init</code> , controls startup run levels, determines scripts to start with.
<code>/etc/issue</code>	Output by <code>getty</code> before the login prompt. Description or welcoming message.
<code>/etc/issue.net</code>	Output for network logins with LINUX version
<code>/etc/login.defs</code>	Sets user login features on systems with shadow passwords.
<code>/etc/logrotate.conf</code>	Configures the <code>logrotate</code> program used for managing logfiles.
<code>/etc/mtab</code>	A list of currently mounted file systems. Setup by <code>boot</code> scripts and updated by the <code>mount</code> command.
<code>/etc/named.conf</code>	Used for domain name servers.
<code>/etc/nsswitch.conf</code>	Name service switch configuration file.
<code>/etc/passwd</code>	The user database with fields giving the username, real name, home directory, encrypted password and other information about each user.
<code>/etc/printcap</code>	A configuration files for printers.

<code>/etc/protocols</code>	Describes DARPA internet protocols available from the TCP/IP subsystem. Maps protocol ID numbers to protocol names.
<code>/etc/rc</code> or <code>/etc/rc.d</code> or <code>/etc/rc?.d</code>	Scripts or directories of scripts to run at startup or when changing run level.
<code>/etc/rc.d/rc0.d</code>	Contains files used to control run level 0. Usually these files are softlink files.
<code>/etc/rc.d/rc1.d</code>	Contains files to control run level 1. Scripts beginning with an S are for start, K for kill.
<code>/etc/rc.d/rc.sysinit</code>	Init runs this when it starts.
<code>/etc/resolv.conf</code>	configures the name resolver, specifying the address of your name server and your domain name.
<code>/etc/securetty</code>	Identifies secure terminals from which root is allowed to log in.
<code>/etc/services</code>	Lists the network services that the system supports.
<code>/etc/shadow</code>	Shadow password file on systems with shadow password software installed. Shadow passwords move the encrypted password files from <code>/etc/passwd</code> to <code>/etc/shadow</code> which can only be read by root.
<code>/etc/shells</code>	Lists trusted shells. The <code>chsh</code> command allows users to change their login shell to shells listed only in this file.
<code>/etc/skel/.profile</code>	can be used by administrator to set the editor Environment variable to some editor that is friendly to new users.
<code>/etc/sudoers</code>	A list of users with special privileges along with the Commands they can execute.
<code>/etc/sysconfig/amd</code>	Used to configure the auto mount daemon.
<code>/etc/sysconfig/clock</code>	Used to configure the system clock to Universal or local time and set some other clock parameters.
<code>/etc/sysconfig/i18n</code>	Controls the system font settings.

<code>/etc/sysconfig/init</code>	This file is used to set some terminal characteristics and environment variables.
<code>/etc/sysconfig/keyboard</code>	Used to configure the keyboard.
<code>/etc/sysconfig/mouse</code>	This file is used to configure the mouse.
<code>/etc/sysconfig/network-scripts/ifcfg-interface</code>	Defines a network interface.
<code>/etc/sysconfig/pcmcia</code>	Used to configure pcmcia network cards.
<code>/etc/X11/XF86Config</code>	The configuration file for the X server.
<code>/etc/syslog.conf</code>	Configuration file for the syslogd daemon.
<code>/etc/termcap</code>	The terminal capability database. Describes by what "escape sequences" various terminals can be controlled. See terminfo, termcap, curs_termcap man pages.
<code>\$HOME/.bashrc</code>	User aliases, path modifier, and functions.
<code>\$HOME/.bash_profile</code>	Users environment stuff and startup programs.
<code>\$HOME/.bash_</code>	logout User actions to be done at logout.
<code>/proc/cpuinfo</code>	Information about the processor such as its type, make and performance.
<code>/proc/devices</code>	A list of devices configured into the currently running kernel.
<code>/proc/dma</code>	Shows which DMA channels are being used at the moment.
<code>/proc/filesystems</code>	Files systems that are configured into the kernel. The file used to detect filesystems if the <code>/etc/filesystems</code> does not exist.
<code>/proc/ioports</code>	Shows which I/O ports are in use at the moment.
<code>/proc/interrupts</code>	Shows which interrupts are in use and how many of each there have been.
<code>/proc/kcore</code>	An image of the physical memory of the system.

<code>/proc/kmsg</code>	Messages output by the kernel. These are also routed to syslog.
<code>/proc/ksyms</code>	Symbol table for the kernel.
<code>/proc/meminfo</code>	Information about memory usage, both physical and swap.
<code>/proc/modules</code>	Which kernel modules are currently loaded.
<code>/proc/mounts</code>	Contains information on filesystems currently mounted, similar to <code>/etc/mntab</code>
<code>/proc/net</code>	Contains status information about network protocols.
<code>/proc/self</code>	A symbolic link to the process directory of the program that is looking at <code>/proc</code> . When 2 process look at <code>proc</code> , they get different links.
<code>/proc/stat</code>	Various statistics about the system such as the number of page faults since the system was booted.
<code>/proc/uptime</code>	The time the system has been up.
<code>/proc/version</code>	The kernel version.
<code>/var/log/lastlog</code>	Used by <code>finger</code> to tell when a user was last logged in.
<code>/var/log/wtmp</code>	Binary info on users that have been logged on. The last command uses this info.
<code>/var/run/utmp</code>	Contains information about users currently logged in. <code>Who</code> and <code>w</code> commands use this file.
<code>/var/named/*</code>	Files used by domain name server. Placed here optionally, but this is the normal location.
<code>/var/log/lastlog</code>	Contains information about the last time a login was done on the system. Works with <code>lastb(1)</code> .
<code>/var/log/messages</code>	The main system message log file.
<code>/var/spool/mail</code>	Where mailboxes are usually stored.

### 3.Linux File Formats

#### **/etc/crontab**

The syntax of each line in this file is: [minute](#), [hour](#), [day of month](#), [Month](#), [day of week](#), [\(user name\)](#), [command](#)

#### **/etc/fstab**

Columns are: device file to mount, directory to mount on, filesystem type, options, backup frequency, and fsck pass number (To specify the order in which filesystems should be checked on boot; 0 means no check.) The noauto option stops this mount from being done automatically on boot.

#### **/etc/hosts**

Sets up host address information for local use. The format is: [IPaddress](#) [name1](#) [name2](#)...

#### **/etc/inittab**

Sets the init configuration. An entry in the inittab file has the following format: [id](#): [runlevels](#): [action](#): [process](#)

#### **/etc/passwd**

The file has one line per username, and is divided into seven colon-delimited fields:

1. Username.
2. Password, in an encrypted form.
3. Numeric user id.
4. Numeric group id.
5. Full name or other description of account. This is called gecost.
6. The user's home directory.
7. The user's login shell (program to run at login).

#### **/usr/X11R6/lib/X11/XF86Config**

The main XFree86 configuration file.

## Section-2

### 4.Linux File system Management

badblocks	Used to search a disk or partition for badblocks.
df	Shows the disk free space on one or more filesystems.
dosfsck	Check and repair MS-Dos filesystems.
du	Shows how much disk space a directory and all its files contain.
dump	Used to back up an ext2 filesystem. Complement is restore.
dumpe2fs	Dump filesystem superblock and blocks group information.
exportfs	Used to set up filesystems to export for nfs (network file sharing).
fdisk	Used to fix or create partitions on a hard drive.
fdformat	Formats a floppy disk.
fsck	Used to add new blocks to a filesystem. Must not be run on a mounted file system.
hdparm	Get/set hard disk geometry parameters, cylinders, heads, sectors.
mkfs	Initializes a Linux filesystem. This is a front end that runs a separate program depending on the filesystem's type.
mke2fs	Create a Linux second extended filesystem.
mkswap	Sets up a Linux swap area on a device or file.
mount	Used to mount a filesystem. Complement is umount.
rdev	Query/set image root device, swap device, RAM disk size of video mode. What this does is code the device containing the root filesystem into the kernel image specified.

restore      Used to restore an ext2 filesystem.

sync         Forces all unwritten blocks in the buffer cache to be written to disk.

umount      Unmounts a filesystem. Complement is mount.

## 5.Linux File Management and Viewing

### File and Directory management

apropos      Search the whatis database for files containing specific strings.

cd            Change the current directory. With no arguments "cd" changes to the users home directory.

chmod        chmod<specification> <filename> - Effect: Change the file permissions.  
Ex: chmod 751 myfile

chown        chown <owner1> <filename> Effect: Change ownership of a file to owner1.

chgrp        chgrp <group1> <filename> Effect: Change group.

cp            cp <source> <destination> Copy a file from one location to another.

dir           List directory contents.

Find         Ex: find \$Home -name readme Print search for readme starting at home and output full path.

install      Copy multiple files and set attributes.

locate       File locating program that uses the slocate database.

ls            List files. Option -a, lists all, see man page "man ls"

mkdir        Make a directory.

mv            Move or rename a file.

pwd          Print or list the working directory with full path

rm            Delete system files

rmdir rmdir <directory> - Remove a directory.

touch Change file timestamps to the current time. Make the file if it doesn't exist.

whereis Locate the binary, source and man page files for a command.

### **File viewing and editing**

ed Editor

emacs Full screen editor.

head head linuxdoc.txt - Look at the first 10 lines of linuxdoc.txt.

jed Editor

joe Editor

less q-mandatory to exit, Used to view files.

more b-back q-quit h-help, Used to view files.

pico Simple text editor.

tail tail linuxdoc.txt - Look at the last 10 lines of linuxdoc.txt.

vi Editor with a command mode and text mode. Starts in command mode.

### **File compression, backing up and restoring**

tar Create modify and extract from archives.

bunzip2 Newer file decompression program.

bzcat Decompress files to stdout.

bzip2 Newer file compression program.

compress Compress data.

gunzip unzip <file> - unzip a gz file.

gzexe        Compress executable files in place.  
gzip         gzip <file> - zip a file to a gz file.  
uncompress   Expand data.  
unzip        unzip a zip file.  
zcat         Used to restore compressed files.  
zcmp         Compare compressed files.  
zdiff        Compare compressed files.  
zip         zip <file> - make a zip file.

### **Extra control and piping for files and other outputs**

basename    Strip directory and suffix information from filenames.  
cat Ex: cat < filename --- Effect: put keyboard input into the file.  
CTRL-D to exit (end).  
cmp         Compare two files.  
column      Columnate lists.  
csplit      Split a file into sections determined by context lines.  
diff        Show the differences between files. Ex: diff file1 file2  
echo        Display a line of text.  
Grep        grep pattern filename.  
patch       Apply a diff file to an original.  
sed         A stream editor. Used to perform transformations on an input stream.  
sleep       Delay for a specified amount of time.  
sort        Sort a file alphabetically.  
split       Split a file into pieces.  
tsort       Perform topological sort.

wc	Count lines, words, characters in a file. Ex: wc filename.
xargs	Build and execute command lines from standard input.
yes	Output the string "y" until killed.

## 6.Linux Job Management, Process Management, and Help

### Linux Help Commands

Apropos	apropos keyword - Show all commands with the keyword in their description. The same as the "man -k" command.
Help	Bash shell help for the bash builtin command list. The help command gets help for a particular command.
man	Get help from the manual for a command.man man -k keyword - Show all commands with the keyword in their description "man 2 kill" - Display page 2 of the kill command
info	Documentation on Linux commands and programs similar to the man pages but navigation is organized different.

### Linux Job Management

batch	Executes commands when system load levels drop below 0.8 or value specified in atrun invocation.
nice	Run a program with modified scheduling priority.
watch	Execute a program periodically showing output full screen.

### Linux Process management

kill	Ex: "kill 34" - Effect: Kill or stop the process with the process ID number 34.
killall	Kill processes by name. Can check for and restart processes.
pidof	Find the process ID of a running program
ps	Get the status of one or more processes. Options:
top	Display the processes that are using the most CPU resources.

## 7.Linux Network Management

dnsdomainname	Show the systems DNS domain name
hostname	Used to show or set the name of your machine for networking
nisdomainname	Show or set systems NIS/YP domain name
ypdomainname	Show or set the system's NIS/YP domain name

### Network setup and commands

arp	This program lets the user read or modify their arp cache.
finger	Display information about the system users.
ftp	File transfer program.
ifconfig	Configure a network interface.
ifdown	Shutdown a network interface.
ifup	Brings a network interface up. Ex: ifup eth0
ipchains	IP firewall administration used to set input, forward, and output rules.
netconf	A GUI interactive program to let you configure a network on Redhat systems.
netconfig	Another GUI step by step network configuration program.
netstat	Displays information about the systems network connections, including port connections, routing tables, and more. The command "netstar -r" will display the routing table.
nslookup	Used to query DNS servers for information about hosts.
ping	Send ICMP ECHO_REQUEST packets to network hosts.
rexec	Remote execution client for an exec server. The host uses the rexecd server.

rlogin	Starts a terminal session on a remote host.
route	Show or manipulate the IP routing table.
rsh	Executes command on remote host.
tcpdump	Dump traffic on a network. Prints out headers of packets that match the Boolean expression. Telnet User interface to the TELNET protocol, setting up a remote console session.
traceroute	Print the route that packets take to the specified network host.

### **Communications commands (includes mail)**

ftp	File transfer protocol.
Pine	Program for internet news and e-mail, Can send documents, graphics, local & remote messages. sendmail A popular Unix, Linux mail message transfer agent.
talk	Lets two parties talk simultaneously.
telnet	Allows a user to have a login session across a network on a remote host.
tin	Net news reader.
write	Allows users to directly interact with other users via terminal number (one way at a time).

## **8.Linux System Management**

### **Environment**

export	Set the value of a variable so it is visible to all subprocesses that belong to the current shell.
reset	Restores runtime parameters for session to default values.
set	Shows how the environment is set up. This is a builtin bash command.

### **Library management**

ldconfig      Updates the necessary links for the run time link bindings.  
ldd            Tells what libraries a given program needs to run.  
ltrace        A library call tracer.

### **Module and kernel management**

depmod       Handle loadable modules automatically. Creates a makefile-like dependency file.  
dmesg        Print or control the kernel ring buffer. This shows the last kernel startup messages.  
insmod       Install loadable kernel module.  
lsmod        List currently installed kernel modules.  
modprobe    Used to load a set of modules that are marked with a specified tag.  
rmmod        Unload loadable modules.

### **Runtime level management**

exit         Terminates the shell.  
halt         Stop the system.  
reboot       Reboot the system.  
Shutdown    Shut down system.

### **System Configuration tools**

mesg         Control write access to your terminal.  
mouseconfig A Redhat Linux tool used to configure the /etc/sysconfig.mouse file. This is a GUI tool.  
printtool    Redhat's GUI printer configuration tool.  
quota        Display disk usage and limits.  
quotacheck   Scan a filesystem for disk usages.

quotaoff	Turn file system quotas off.
quotaon	Turn file system quotas on.
setpci	Configure pci devices.
setserial	Set/get serial port information.
setterm	Set terminal attributes.
setup	Set up devices and file systems.
stty	Used to configure and print the console devices.
swapon	Enable devices and files for paging and swapping.
swapoff	Disable devices and files for paging and swapping.

### **System Information**

arch	Print machine architecture.
df	Shows disk free space.
du	Shows disk usage.
free	Display used and free memory on the system.
lsof	List open files.
lspci	List PCI devices .
procinfo	Display system status gathered from proc.
pstree	Display a tree of processes.
tty	Print the filename of the terminal connected to standard input.
uname	Print system information, Prints Linux.

### **System Logging**

klogd	Kernel log daemon which intercepts and logs Linux kernel messages.
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logger        Make entries in the system log.

syslogd      Linux system logging utilities.

## **System Security**

### **System time**

cal            Calendar.

clock         Used to change or get current time. The command "clock --w" sets the hardware clock.

date          Print or set the system date and time.

uptime        Reports how long the system has been running.

### **X Management and programs**

xconsole     Displays messages usually sent to /dev/console.

## **9.Linux User Management**

ac            Print statistics about users' connect time.

adduser      Ex: adduser mark - Effect: Adds a user to the system named mark

chown        Change the owner of file(s ) to another user.

finger       See what users are running on a system.

groupadd     Create a new group.

groupdel     Delete a group.

groupmod     Modify a group.

last          Display the last users logged on and how long.

lastlog      Formats and prints the contents of the last login.

logname      Print user's login name.

passwd       Set a user's pass word.

useradd	Create a new user or update default new user information.
userdel	Delete a user account and related files.
usermod	Modify a user account.
w	Display users logged in and what they are doing.
wall	Send a message to everybody's terminal.
who	Display the users logged in.
whoami	Print effective user id.

## 10. Linux Printing and Programming

### Linux Printing

- lpr Print, submits a job to the printer.
- lpc Lets you check the status of the printer and set its state.
- lpq Shows the contents of a spool directory for a given printer.
- lprm Removes a job from the printer queue.
- gs Ghostscript - A PostScript interpreter.
- pr Print a file. Ex: pr filename |pg.

### Linux Programming

- 1.awk C programming language - allows finding of lines with specific characters.
  - 2.gawk Pattern scanning and processing language. GNU's implementation of awk.
  - 3.Gcc GNU c and c++ compiler.
1. gdb Debugging program.

- 5. make            GNU make utility to maintain a group of programs.
- 6. strip            Discard symbols from object files.

## Scripting Languages

- Perl    A command interpreter for the Practical Extraction and Report Language (perl).
- Python A report language.

## 11. Linux Document Preparation

- 1. TeX            Used to format professionally typeset documents (Chapters, Headings, and paragraphs).
- 2. yacc            A parser generator.

## 12. Miscellaneous Linux Commands

### Keys and keycodes and console

- dumpkeys    Dump keyboard translation tables.
- getkeycodes Print kernel scancode-to-keycode mapping table.
- lesskey      Specify key bindings for less.
- loadkeys    Load keyboard translation tables.

### Ncurses functions

- captinfo    Convert a termcap description into a terminfo description.
- clear        Clear the terminal screen.
- reset        Restore run-time parameters for session to default values.

### Other

- cvs            Concurrent Versions System.
- history        Show commands listed in the shell history (last n).
- lilo            Boot management program.
- mc             Visual shell for Unix like system. A file manager.

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