

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.

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

- captainfo 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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