Linux Files and Command Reference 0.8.0

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Introduction

This document briefly describes the Linux filesystem structure, Linux configuration files and how they are used, and Linux commands and programs used for various functions on the system. This document is divided into two sections. The first section describes the Linux filestructure, lists system configuration files, and describes the filestructure of some of these files. The second section lists all commands and briefly describes them. The commands are categorized according to system functionality. For further information, the reader is encouraged to refer to the "Linux User's Guide", the "How Linux Works" manual, and the various man and info pages for the various commands.

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
  - george
- **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.
  - **1** - A directory with info about process number 1. Each process has a directory below proc.
- **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.
  - **skel** - When a home directory is created it is initialized with files from this directory
  - **sysconfig** - Files that configure the linux system for devices.
- **var** - Contains files that change for mail, news, printers log files, man pages, temp files
  - **file**
  - **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.
  - **catman** - A cache for man pages that are formatted on demand
- **mnt** - Mount points for temporary mounts by the system administrator.
- **tmp** - Temporary files. Programs running after bootup should use /var/tmp.

Linux Configuration Files

profile	System wide environment and startup script program.
/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 e-mail.
/etc/bootptab	The configuration for the BOOTP server daemon.
/etc/crontab	Lists commands and times to run them for the cron deamon.
/etc/dhcpd.conf	The configuration file for the DHCP server daemon.
/etc/ethers	File for RARP mapping from hardware addresses to IP addresses. See the man page ethers(5).
/etc/exports	The file describing exported filesystems for NFS services.
/etc/fdprm	The floppy disk parameter table. Describes the formats of different floppy disks. Used by setfdprm.
/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.
/etc/fstab	Lists the filesystems mounted automatically at startup by the mount -a command (in /etc/rc or equivalent startup file).
/etc/group	Similar to /etc/passwd but for groups rather than users.
/etc/groups	May contain passwords that let a user join a group.
/etc/gshadow	Used to hold the group password and group administrator password information for shadow passwords.
/etc/host.conf	Specifies how host names are resolved.
/etc/hosts	List hosts for name lookup use that are locally required.

/etc/HOSTNAME	Shows the host name of this host. Used for support of older programs since the hostname is stored in the /etc/sysconfig/network file.
/etc/inittab	Configuration file for init, controls startup run levels, determines scripts to start with.
/etc/inetd.conf	Sets up the services that run under the inetd daemon.
/etc/issue	Output by getty before the login prompt. Description or welcoming message.
/etc/issue.net	Output for network logins with LINUX version
/etc/ld.so.conf	Configuration file for ld.so, the run time linker.
/etc/lilo.conf	Configuration file for LILO.
/etc/limits	Limits users resources when a system has shadow passwords installed.
/etc/localtime	In Debian the system time zone is determined by this link.
/etc/login.defs	Sets user login features on systems with shadow passwords.
/etc/logrotate.conf	Configures the logrotate program used for managing logfiles.
/etc/magic	The configuration file for file types. Contains the descriptions of various file formats for the file command.
/etc/motd	The message of the day, automatically output by a successful login.
/etc/mtab	A list of currently mounted file systems. Setup by boot scripts and updated by the mount command.
/etc/named.conf	Used for domain name servers.
/etc/networks	Lists names and addresses of your own and other networks, used by the route command.
/etc/nologin	If this file exists, non-root logins are disabled. Typically it is created when the system is shutting down.
/etc/nsswitch.conf	Name service switch configuration file.
/etc/passwd	The user database with fields giving the username, real name, home directory, encrypted password and other information about each user.
/etc/printcap	A configuration file for printers.

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

/etc/sysconfig/mouse	This file is used to configure the mouse.
/etc/sysconfig/network-scripts/ifcfg-interface	Defines a network interface.
/etc/sysconfig/pcmcia	Used to configure pcmcia network cards.
/etc/sysconfig//routed	Sets up dynamic routing policies.
/etc/sysconfig/static-routes	Configures static routes on a network.
/etc/sysconfig/tape	Used for backup tape device configuration.
/etc/X11/XF86Config	The configuration file for the X server.
/etc/syslog.conf	Configuration file for the syslogd daemon.
/etc/termcap	The terminal capability database. Describes by what "escape sequences" various terminals can be controlled. See terminfo, termcap, curs_termcap man pages.
/etc/terminfo	Details for terminal I/O.
/etc/usertty	This file is used to impose special access restrictions on users.
$HOME/.bashrc	User aliases, path modifier, and functions.
$HOME/.bash_profile	Users environment stuff and startup programs.
$HOME/.bash_logout	User actions to be done at logout.
$HOME/.hushlogin	When this file exists in the user's home directory, it will prevent check for mail, printing of the last login time, and the message of the day when the user logs in.
$HOME/.inputrc	Contains keybindings and other bits.
$HOME/Xrootenv.0	Has networking and environment info.
/proc/cpuinfo	Information about the processor such as its type, make and performance.
/proc/devices	A list of devices configured into the currently running kernel.
/proc/dma	Shows which DMA channels are being used at the moment.
/proc/filesystems	Filesystems that are configured into the kernel. The file used to detect filesystems if the /etc/filesystems does not exist.
/proc/ioports	Shows which I/O ports are in use at the moment.
/proc/interrupts	Shows which interrupts are in use and how many of each there have been.
/proc/kcore	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/loadavg	The load average of the system.
/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/mtab
/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.
/tmp/fvwmrca01339	FVWM-M4 defines. Contains networking, Xwindows, other setup info.
/usr/lib/zoneinfo	Time zone datafiles are stored here on the Debian system
/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/root.hints	Used for domain name server. Placed here optionally, but this is the normal location.
/var/named/*	Files used by domain name server. Placed here optionally, but this is the normal location.
/var/log/btmp	Used to store information about failed logins. This file must be first created to activate it.
/var/log/lastlog	Contains information about the last time a login was done on the system. Works with lastb(1).
/var/log/maillog	The normal system mail log file.
/var/log/messages	The main system message log file.
var/log/secure	System tracking of user logins. Check this file periodically.
/var/spool/mail	Where mailboxes are usually stored.

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. Below is a detailed list of what is on each column.

1. The name of the device such as "/dev/hda1"
2. The mount point. Use "/" for root. Other typical mount points are "/dos" for DOS, "swap" or "none" for the swap partition, and "/mnt/floppy" for "/dev/fd0" (the floppy drive).
3. The type of filesystem. They are: mini, ext, ext2(linux native), xiafs, msdos, hpfs, ntfs, fat32, iso9660(CD-ROM), NFS, swap (for swap space).
4. The mount options for use with the filesystem. Each filesystem type has different mount options. Read the mount man page to see possible options. ro= read only, user- allows normal users to mount the device.
5. The frequency the filesystem needs to be dumped (backed up) by the dump command. For ext2, normally make it 1, for others make it 0. 0 or nothing means it is not dumped. If 1, it is backed up during a system backup.
6. A number telling the order in which the filesystems should be checked at reboot time by the fsck program. Your root should be 1, others are in ascending order or 0 to not be checked.

/etc/hosts

Sets up host address information for local use. The format is:

IPaddress name1 name2...

/etc/inetd.conf

Sets the services under the inetd daemon. The fields of this file are:

1. service name
2. socket type
3. protocol

4. wait or nowait
5. user
6. server program name
7. server program command line arguments

/etc/inittab

Sets the init configuration. An entry in the inittab file has the following format:

id:runlevels:action:process

/etc/lilo.conf

Tells LILO how to boot
The lilo.conf file below is for a system which has a Linux root partition on /dev/hda1 and a MS-DOS partition on /dev/hda2. See the "How Linux Works" guide and the "Linux User's Guidel" for more information.

```
boot = /dev/hda         # Tell LILO to install the boot loader on the /dev/hda disk boot record
vga = normal            # Set a normal video mode
delay = 60              # The time in tenths of seconds to press <SHIFT> to get the LILO prompt
                        # Equivalent would be "prompt" on one line, and "timeout=60" on
                        # another line.
default=msdos           # Sets the default boot to DOS, Without this line, the default is the first stanza
install = /boot/boot.b  # The file containing the boot sector to use
compact                 # Have LILO perform some optimization.
map = /boot/map         #Specifies the map file LILO creates when installed
                        # Section for Linux root partition on /dev/hda2.
image = /vmlinuz        # Location of kernel
label = linux           # Name of the OS that is displayed in the LILO boot menu
root = /dev/hda1        # Location of root partition, if this isn't here the kernel image must have
                        # this set using the rdev command
read-only               # Mount read only on startup, Can also be set by rdev
                        # Section for MSDOS partition on /dev/hda1.
other = /dev/hda2       # Location of partition
table = /dev/hda        # Location of partition table for /dev/hda2
label = msdos           # Name of OS (for boot menu)
```

if the command "vga= ask" is given, LILO will prompt the user for a video mode at boot time.

/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 gecos.
6. The user's home directory.
7. The user's login shell (program to run at login).

The format is explained in more detail on the passwd manual page.

/usr/X11R6/lib/X11/XF86Config

The main XFree86 configuration file. Type "man XF86Config"

- The first section is "Files"

  RgbPath Sets the path to the X11R6 RGB color database

  FontPath Sets the path to a directory containing X11 fonts
- The second section is "ServerFlags", all lines are commented out
- The third section is "Keyboard"
- The fourth section is "Pointer"

  Protocol Specifies the mouse protocol

  Device Specifies the device file by which the mouse can be accessed.
- The fifth section is "Monitor" which specifies the characteristics of your monitor

  ModeLine Specifies resolution modes for your monitor

  The file, VideoModes.doc describes in detail how to determine the ModeLine values for each resolution mode. Two files, modeDB.txt and Monitors,may have ModeLine information for your monitor. They are located in /usr/X11R6/lib/X11/doc.

- The sixth section is "Screen" describing the video/monitor card configuration for the particular server.
  The Driver line specifies the X server that you will be using. Valid Driver values are:

  _ Accel: For the XF86 S3, XF86 Mach32, XF86 Mach8, XF86 8514,

  XF86 P9000, XF86 AGX,and XF86 W32 servers;
  _ SVGA: For the XF86 SVGA server;
  _ VGA16: For the XF86 VGA16 server;

_ VGA2: For the XF86 Mono server;
_ Mono: For the non-VGA monochrome drivers in the XF86 Mono and XF86 VGA16 servers.
Be sure that /usr/X11R6/bin/X is a symbolic link to this server.
The Device line specifies the Identifier of the Device section that corresponds to the video card to use for this server. Above, we created a Device section with the line Identifier "#9 GXE 64" Therefore, we use "#9 GXE 64" on the Device line here. Similarly, the Monitor line specifies the name of the Monitor section to be used with this server. Here, "CTX 5468 NI" is the Identifier used in the Monitor section described above.

- Subsection "Display" defines several properties of the XFree86 server corre-sponding to your monitor/video card combination. The XF86Config file describes all of these options in detail. Most of them are not necessary to get the system working.
  The options that you should know about are:

  - _ Depth. Defines the number of color planes; that is, the number of bits per pixel. Usually, Depth is set to 16. For the VGA16 server, you would use a depth of 4, and for the monochrome server a depth of 1. If you use an accelerated video card with enough memory to support more bits per pixel, you can set Depth to 24, or 32.

  - _ Modes. This is the list of mode names that have been defined using the ModeLine directive(s) in the Monitor section. In the above section, we used ModeLines named "1024x768", "800x600",and "640x48"0. Therefore, we use a Modes line of

    Modes "1024x768" "800x600" "640x480"

    The first mode listed on this line is the default when XFree86 starts. After XFree86 is running, you can switch between the modes listed here using the keys Ctrl - Alt –Numeric + and Ctrl - Alt - Numeric - .
    It might be best, when you initially configure XFree86, to use lower resolution video modes like 640x480, which tend to work with most systems. Once you have the basic configuration working, you can modify XF86Config to support higher resolutions.

  - _ Virtual. Set the virtual desktop size. XFree86 can use additional memory on your video card to extend the size of the desktop. When you move the mouse pointer to the edge of the display, the desktop scrolls, bringing the additional space into view. Even if you run the server at a lower video resolution like 800x600, you can set Virtual to the total resolution that your video card can support. A 1-megabyte video card can support 1024x768 at a depth of 8 bits per pixel; a 2-megabyte card 1280x1024 at depth 8, or 1024x768 at depth 16. Of course, the entire area will not be visible at once, but it can still be used. The Virtual feature is rather limited. If you want to use a true virtual desktop, fvwm and similar window managers allow you to have large, virtual desktops by hiding windows and using other techniques, instead of storing the entire desktop in video

memory. See the manual pages for fvwm for more details about this. Some Linux systems use fvwm by default.

- _ ViewPort. If you are using the Virtual option that is described above, ViewPort sets the coordinates of the upper-left-hand corner of the virtual desktop when XFree86 starts up. Virtual 0 is often used. If this is unspecified, then the desktop is centered on the virtual desktop display, which may be undesirable to you.

Linux Filesystem Management

badblocks	Used to search a disk or partition for badblocks.
cfdisk	Similar to fdisk but with a nicer interface.
debugfs	Allows direct access to filesystems data structure.
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. Ex: dumpe2fs /dev/hda2
e2fsck	Check a Linux second extended filesystem.
e2label	Change the label on an ext2 filesystem.
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.
rdump	Same as dump.
rmt	Remote magtape protocol module.
restore	Used to restore an ext2 filesystem.
setfdprm	Set floppy drive parameters.
swapoff(8)	Used to de-activate a swap partition.
swapon(8)	Used to activate a swap partition.
sync	Forces all unwritten blocks in the buffer cache to be written to disk.
tune2fs	Adjust tunable filesystem parameters on second extended filesystems.
umount	Unmounts a filesystem. Complement is mount.

Linux File Management and Viewing

File and Directory management

apropos	Search the whatis database for files containing specific strings.
bdflush	Kernel daemon that saves dirty buffers in memory to the disk.
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 — Effect: change the file permission to rwx for owner, re for group Ex: chmod go=+r myfile — Effect: Add read permission for the owner and the group character meanings u-user, g-group, o-other, + add permission, - remove, r-read, w-write,x-exe Ex: chmod a +rwx myfile — Effect: Allow all users to read, write or execute myfile Ex: chmod go -r myfile — Effect: Remove read permission from the group and others chmod +s myfile - Setuid bit on the file which allows the program to run with user or group privileges of the file. chmod {a,u,g,o}{+,-}{r,w,x} (filenames) - The syntax of the chmod command.
chown	chown <owner1> <filename> Effect: Change ownership of a file to owner1.
chgrp	chgrp <group1> <filename> Effect: Change group.
cksum	Perform a checksum and count bytes in a file.
cp	cp <source> <destination> Copy a file from one location to another.
dd	Convert and copy a file formatting according to the options. Disk or data duplication.
dir	List directory contents.
dircolors	Set colors up for ls.
file	Determines file type. Also can tell type of library (a.out or ELF).

find	Ex: find $Home –name readme Print search for readme starting at home and output full path. How to find files quickly using the find command: Ex: find ~ -name report3 –print • "~" = Search starting at the home directory and proceed through all its subdirectories • "-name report3" = Search for a file named report3 • "-print" = Output the full path to that file
install	Copy multiple files and set attributes.
ln	Make links between files.
locate	File locating program that uses the slocate database.
losetup	Loopback device setup.
ls	List files. Option -a, lists all, see man page "man ls" Ex: "ls Docum Projects/Linux" - The contents of the directories Docum and Projects/Linux are listed. To list the contents of every subdirectory using the ls command: 1. Change to your home directory. 2. Type: ls -R
mkdir	Make a directory.
mknod	Make a block or character special file.
mktemp	Make temporary filename.
mv	Move or rename a file. Syntax: mv <source> <destination> Ex: mv filename directoryname/newfilename
pathchk	Check whether filenames are valid or portable.
pwd	Print or list the working directory with full path (present working directory).
rm	Ex: "rm .*" - Effect: Delete system files (Remove files) –i is interactive option.
rmdir	rmdir <directory> - Remove a directory. The directory must be empty.
slocate	Provides a secure way to index files and search for them. It builds a database of files on the system.
stat(1u)	Used to print out inode information on a file.
sum	Checksum and count the blocks in a file.
test	Check file types and compare values.
touch	Change file timestamps to the current time. Make the file if it doesn't exist.
update	Kernel daemon to flush dirty buffers back to disk.

vdir	List directory contents.
whatis	Search the whatis database for complete words.
wheris	Locate the binary, source and man page files for a command.
which	Show full path of commands where given commands reside.

File viewing and editing

ed	Editor
emacs	Full screen editor.
gitview	A hexadecimal or ASC file viewer.
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

ar	Create modify and extract from archives.
bunzip2	Newer file decompression program.
bzcat	Decompress files to stdout.
bzip2	Newer file compression program.
bzip2recover	Recovers data from damaged bzip2 files.
compress	Compress data.
cpio	Can store files on tapes. to/from archives.
dump	Reads the filesystem directly.
gunzip	unzip <file> - unzip a gz file.
gzexe	Compress executable files in place.
gzip	gzip <file> - zip a file to a gz file.
mt	Control magnetic tape drive operation.

tar	Can store files on tapes. Usage: tar cvf <destination> <files/directories> - Archive copy groups of files Ex: tar /dev/fdo temp Effect: Copy temp to drive A:
uncompress	Expand data.
unzip	unzip <file> - unzip a zip file. Files ending in ".gz" or ".zip" are compressed.
zcat	Used to restore compressed files.
zcmp	Compare compressed files.
zdiff	Compare compressed files.
zforce	Force a .gz extension on all gzip files.
zgrep	Search possibly compressed files for a regular expression.
zmore	File filter for crt viewing of compressed text.
znew	Recompress .z files to .gz 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.
colrm	Remove columns from a file.
column	Columnate lists.
comm	Ex: comm file1 file2 --- Effect compare the contents of file1 and file2 produces 3 columns of output. Lines in the first file, lines in second file, lines in both files.
csplit	Split a file into sections determined by context lines.
cut	Remove sections from each line of files.
diff	Show the differences between files. Ex: diff file1 file2
diff3	Find differences between 3 files.
dirname	Strip the non-directory suffix from a filename.
echo	Display a line of text.
egrep	Similar to grep -E, compatible with UNIX egrep.
expand	Convert tabs to spaces.
expr	Evaluate expressions.
false	Do nothing. Exit with a status indicating failure.
fgrep	Same as grep -F.
fold	Wrap each input line to fit in specified width.

join	Join lines of two files in a common field.
grep	grep pattern filename. Ex: grep " R " --- Effect: Search for R with a space on each side Ex: ls –a |grep R --- Effect: List all files with an R in them or their info listing.
hexdump	asc, decimal, hex, octal dump.
logname	Print user's login name.
look	Display lines beginning with a given string.
mkfifo	Create named pipes with the given names.
nl	Write each file to standard output with line numbers added.
od	Dump files in octal and other formats.
patch	Apply a diff file to an original.
paste	Combines from 2 or more files. Ex: paste file1 file 2
printf	Print and format data.
rev	Reverses lines in a file.
script	Make a typescript of a terminal session.
sdiff	Find differences between 2 files and merge interactively.
sed	A stream editor. Used to perform transformations on an input stream.
sleep	Delay for a specified amount ot time.
sort	Sort a file alphabetically.
split	Split a file into pieces.
strings	Print the strings of printable characters in files.
tac	Concatenate and print files in reverse.
tee	Read from standard input and write to standard output and files.
tr	Translate or delete characters.
true	Do nothing. Exit with a status indicating success.
tsort	Perform topological sort.
ul	Do underlining.
unexpand	Convert tabs to spaces.
uniq	Remove duplicate lines from a sorted file.
uudecode	Used to transform files encoded by uuencode into their original form.
uuencode	Encode a binary file to be sent over a medium that doesn't support non-ASC data.
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.

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
manpath	Determine user's searchpath for manpages.
info	Documentation on Linux commands and programs similar to the man pages but navigation is organized different.

Linux Job Management

at	Similar to cron but run only once.
atq	Lists the user's pending jobs. If the user is the superuser, everybody's jobs are listed.
atrm	Deletes at jobs.
atrun	Run jobs queued for later execution
batch	Executes commands when system load levels drop below 0.8 or value specified in atrun invocation.
cron	A deamon used to set commands to be run at specific times. Starts the commands in the crontab file. Used to clean up temporary files periodically in the /var/tmp and /tmp directories.
nice	Run a program with modified scheduling priority.
nohup	Run a command immune to hangups, with output to a non-tty.
watch	Execute a program periodically showing output full screen.

Linux Process management

bg	Starts a suspended process in the background

fg	Starts a suspended process in the foreground
gitps	A graphical process viewer and killer program.
jobs	Lists the jobs running
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: • u (more info) • a (see all) • -l (technical info) Meanings: • PPID-parent process ID • PID-process ID ps ax |more to see all processes including daemons
pstree	Display the tree of running processes.
sa	Generates a summary of information about users' processes that are stored in the /var/log/pacct file.
skill	Report process status.
snice	Report process status.
top	Display the processes that are using the most CPU resources.
CTRL-C	Kills the current job.
&	At the end of the command makes it run in the background.

Linux Network Management

Names

dnsdomainname	Show the systems DNS domain name
domainname	Show or set the systems domain name
hostname	Used to show or set the name of your machine for networking
nisdomainname	Show or set systems NIS/YP domain name
nodename	Show or set the systems DECnet node 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.
dig(1)	Send domain name query packets to name servers for debugging or testing.
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.
pftp	Same as ftp.
ping	Send ICMP ECHO_REQUEST packets to network hosts.
portmap	DARPA port to RPC program number mapper. Must be running to make RPC calls.
rarp	Manipulate the system's RARP table.
rcp	Remote file copy. Copies files between two machines.

rexec	Remote execution client for an exec server. The host uses the rexecd server.
ripquery	Query RIP gateways. Request all routes known by an RIP gateway by sending an RIP request.
rlogin	Starts a terminal session on a remote host.
route	Show or manipulate the IP routing table.
rsh	Executes command on remote host.
rup	Displays summary of current system status of a remote host or all hosts on the network.
ruptime	Show host status of local machines.
rwhod	System status server, maintains database used by rwho and ruptime.
showmount	Show mount information for an NFS server.
tcpd	Access control facility for internet services. Can be set up to monitor requests for Telnet, finger, ftp, exec, rsh, rlogin, tftp, talk, comsat. It filters access for these requests.
tcpdchk	Tcp wrapper configuration checker.
tcpdump	Dump traffic on a network. Prints out headers of packets that match the boolean expression.
tcpdmatch	Predicts how the tcp wrapper will handle a specific request for a service.
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.
ipx_configure	Tool to setup Netware access.
ncpmount	Netware filesystem mounting program.
nprint	Novell print command.
pqlist	Netware printer list for a given server.
pserver	Netware print server.
slist	Netware server list.

Communications commands (includes mail)

biff	Notifies the system if mail arrives and who it is from.
comsat	Biff server to receive reports of incoming mail.
expire	Used to purge old news articles.
elm	Electronic mail.
ftp	File transfer protocol.
mailx	Berkley mail program.
metasend	Interface for sending non-text mail.

nn	Net news.
pine	Program for internet news and e-mail, Can send documents, graphics, local & remote messages.
sendmail	A popular Unix, Linux mail message transfer agent.
smail	A popular mail message transfer agent which is easier to set up than sendmail.
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).

Linux System Management

Environment

env	Show all environment variables.
export	Set the value of a variable so it is visible to all subprocesses that belong to the current shell.
printenv	Print all or part of environment.
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.
trace	Same as ltrace.

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.
genksyms	Generate symbol version information.
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.
init	Process control initialization.

initscript	Script that executes inittab commands.
logout	Log the user off the system.
poweroff	Brings the system down.
reboot	Reboot the system.
runlevel	List the current and previous runlevel.
setsid	Run a program in a new session.
shutdown	If your system has many users, use the command "shutdown -h +time message", where time is the time in minutes until the system is halted, and message is a short explanation of why the system is shutting down. # shutdown -h +10 'We will install a new disk. System should be back on-line in three hours.'
telinit	By requesting run level 1 a system can be taken to single user mode.

System Configuration tools

ctrlaltdel	Set the function of the ctrl alt del combination.
isapnp	Configure ISA plug and play devices.
kbdconf	A Redhat Linux tool which configures the /etc/sysconfig/keyboard file which specifies the location of the keyboard map file. This is a GUI based tool.
kbdrate	Set the keyboard repeat rate and delay time.
kernelcfg	A Redhat GUI kernel configuration tool, Start X, then run it from a console session.
linuxconf	Redhat's GUI linux system configuration tool.
lspci	List all pci devices.
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.
ndc	Script file used to restart, stop, start the DNS server.
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.
samba	Script file used to stop, start, restart samba services when not run using inetd.
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.
timeconfig	A Redhat Linux tool used to configure the /etc/sysconfig/clock file. This is a GUI tool used to set timezone and whether or not the clock is set to GMT time.
tset	Used to initialize terminals.

System Information

arch	Print machine architecture.
df	Shows disk free space.
du	Shows disk usage.
free	Display used and free memory on the system.
ipcrm	Provide information on ipc facilities.
ipcs	Same as ipcrm.
lsdev	Display information about installed hardware via files in the /proc directory.
lsof	List open files.
lspci	List PCI devices .
pnpdump	Lists ISA plug and play devices resource information.
procinfo	Display system status gathered from proc.
pstree	Display a tree of processes.
runlevel	Find the current and previous system runlevel.
strace	Trace ssytem calls and signals for a binary program.
stty	Change and print terminal line settings.
tload	Prints a graphic representation of the system load average.
tty	Print the filename of the terminal connected to standard input.
uname	Print system information, Prints Linux.
vmstat	Report virtual memory statistics.
xcpustate	Displays CPU states (idle, nice, system, kernel) statistics. Runs in X?

System Logging

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

sysklogd	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.
hwclock	Set or read the hardware CMOS clock.
timed	Time server daemon to synchronize the host's time with other machines, normally invoked at boot time from the rc(8) file.
timedc	Timed control program.
tzset	Used to change the users private time zone by setting the TZ environment variable.
uptime	Reports how long the system has been running.
zdump	Prints the current time in each zonename named on the command line.
zic	Reads text from files named on the command line and creates time conversion files.

X Management and programs

SuperProbe	Probe video hardware.
Xconfigurator	The Redhat tool used during system setup to configure X.
xconsole	Displays messages usually sent to /dev/console.
xf86config	Older version of XF86Setup.
XF86Setup	A newer X configuration program with a GUI interface which modifies the "/etc/X11/XF86Config" configuration file.
xvidtune	This program will test video modes on the fly without modification to your X configuration. Read the usr/X11R6/lib/X11/doc/VideoModes.doc file before running this program.

Linux User Management

ac	Print statistics about users' connect time.
accton	Turn on accounting of processes. To turn it on type "accton /var/log/pacct".
adduser	Ex: adduser mark - Effect: Adds a user to the system named mark
chage	Used to change the time the user's password will expire.
chfn	Change the user full name field finger information
chgrp	Changes the group ownership of files.
chown	Change the owner of file(s) to another user.
chpasswd	Update password file in batch.
chroot	Run command or interactive shell with special root directory.
chsh	Change the login shell.
edquota	Used to edit user or group quotas. This program uses the vi editor to edit the quota.user and quota.group files. If the environment variable EDITOR is set to emacs, the emacs editor will be used. Type "export EDITOR=emacs" to set that variable.
faillog	Examine faillog and set login failure limits.
finger	See what users are running on a system.
gpasswd	Administer the /etc/group file.
groupadd	Create a new group.
grpck	Verify the integrity of group files.
grpconv	Creates /etc/gshadow from the file /etc/group which converts to shadow passwords.
grpunconv	Uses the files /etc/passwd and /etc/shadow to create /etc/passwd, then deletes /etc/shadow which converts from shadow passwords.
groupdel	Delete a group.
groupmod	Modify a group.
groups	Print the groups a user is in
id	Print real and effective user id and group ids.
last	Display the last users logged on and how long.
lastb	Shows failed login attempts. This command requires the file /var/log/btmp to exist in order to work. Type "touch /var/log/btmp" to begin logging to this file.
lastcomm	Display information about previous commands in reverse order. Works only if process accounting is on.
lastlog	Formats and prints the contents of the last login.

logname	Print user's login name.
newgrp	Lets a suer log in to a new group.
newusers	Update and create newusers in batch.
passwd	Set a user's pass word.
pwck	Verify integrity of password files.
pwconv	Convert to and from shadow passwords and groups.
quota	Display users' limits and current disk usage.
quotaoff	Turns system quotas off.
quotaon	Turns system quotas on.
quotacheck	Used to check a filesystem for usage, and update the quota.user file.
repquota	Lists a summary of quota information on filesystems.
sa	Generates a summary of information about users' processes that are stored in the /var/log/pacct file.
smbclient	Works similar to an ftp client enabling the user to transfer files to and from a windows based computer.
smbmount	Allows a shared directory on a windows machine to be mounted on the Linux machine.
smbpasswd	Program to change users passwords for samba.
su	Ex: su mark - Effect: changes the user to mark, If not root will need marks password.
sulogin	Single user login.
ulimit	A bash builtin command for setting the processes a user can run.
useradd	Create a new user or update default new user information.
userdel	Delete a user account and related files.
usermod	Modify a user account.
users	Print the user names of users currently logged in.
utmpdump	Used for debugging.
vigr	Edit the password or group files.
vipw	Edit the password or group files.
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.

Linux Printing and Programming

Linux Printing

banner	Print a large banner on printer.
lpr	Print, submits a job to the printer. Ex: lpr -Pdest filename. Dest is the destination printer. the name of the file to print is filename.
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.
tunelp	Set various parameters for the lp device.

Linux Programming

as86	Assembler
awk	C programming language - allows finding of lines with specific characters.
bc	A precision calculator language.
cproto	Reads in c source files and generates function prototypes for all the functions.
ctags	Generate tag (index) files for source code.
dialog	Display dialog boxes from shell scripts.
egcs	GNU project C and C++ compiler.
f2c	Converts fortran code to c code.
gawk	Pattern scanning and processing language. GNU's implementation of awk.
gcc	GNU c and c++ compiler. -g Produce debugging information. -pg Generate profile info that will allow the gprof program to display timing info.
gdb	Debugging program.
gprof	In /usr/bin, allows you to tell where most of the execution time is spent in a program.
igawk	Gawk with include files.

indent	Reformats c source code for consistent indenting and opening and closing brackets consistent.
ld	The GNU linker.
ld86	Linker for as86.
make	GNU make utility to maintain a group of programs.
nm	Lists symbols from object files.
objcopy	Copy and translate object files.
objdump	Display information from object files.
p2c	Converts pascal code to c code.
prompt	set prompt = "waldo" (in C shell) ps1 = 'waldo' (in BOURNE shell) PS1="[\u@\h \w]\\$ " makes prompt = [username@hostname current directory] see the BASH or your shell's man page for more information.
size	List section sizes and total size.
strip	Discard symbols from object files.
xxgdb	X windows based graphical user interface to gdb.

Scripting Languages

Perl	A command interpreter for the Practical Extraction and Report Language (perl).
Python	A report language.
Tcl	Tool command language shell. Enter by typing tclsh.
info	Return information about the state of the Tcl interpreter.
Tk	A graphical user extension to Tcl based on X windows. Commands are same as Tcl.

Linux Document Preparation

addftinfo	Add information to troff font files for use with groff.
afmtodit	Create font files for use with groff.
colcrt	Filter nroff output for CRT previewing.
enscript	Convert text files to postscript.
eqn	Format equations for troff. Compiles descriptions of equations embedded in troff.
geqn	Used to print special symbols and complex equations. Not user friendly.
git	GNU interactive tools.
gitaction	Per file type action script.
gitkeys	Display key sequence utility.
gitmount	Allows any block device to be mounted.
gitps	A graphical process viewer and killer program.
gitrgrep	A recursive grep program.
gitunpack	Used to unpack archive files in a given directory.
gitview	A hexadecimal or ASC file viewer.
grodvi	Convert Groff output to TeX dvi format, normally run by groff.
groff	Used as a front end for the groff document formatting system.
grops	Postscript driver for groff. invoked by groff.
gtbl	Used to prepare charts, multicolumn lists and tabular formats.
hpftodit	Create font description files for use with groff.
indxbib	Make inverted index for bibliographic databases.
lookbib	Search bibliographic databases.
nroff	Emulate nroff command with groff.
pfbtops	Translate a postscript font in .pbf format to ASCII.
pic	Compile pictures for troff or Tex.
psbb	Extract bounding box from postscript document.
refer	Preprocess bibliographic references for groff.
rpm2html	Make an html database from rpm repository.
soelim	Interpret .so requests in groff input.
tbl	Format tables for groff.
TeX	Used to format professionally typeset documents (Chapters, Headings, and paragraphs).

texi2html	Texinfo to html converter.
tfmtodit	Create font files for use with groff.
troff	Formats documents as part of the groff document formatting system.
yacc	A parser generator.

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.
psfaddtable	Add a unicode character table to a console font.
psfgettable	Extract the embedded Unicode character table from a console font.
psfstriptable	Remove the embedded Unicode character table from a console font.
resizecons	Change kernel idea of the console size.
setkeycodes	Load kernel scancode-to-keycode mapping table.

Ncurses functions

captoinfo	Convert a termcap description into a terminfo description.
clear	Clear the terminal screen.
infocmp	Compare or print out terminfo descriptions.
reset	Restore run-time parameters for session to default values.
tie	Merge or apply WEB change files.
toe	Table of terminfo entries.
tput	Initialize a terminal or query terminfo database.
tset	Terminal initialization.

CD programs

cdparanoia	An audio CD reading utility.
cdrecord	Record audio or data compact Disks from a master.

Other

alias	Ex:: alias dir='ls -a' - Effect: Makes dir list all files (no spaces next to the = sign).
bison	GNU project parser generator.
chvt	Change foreground virtual terminal.
crack	Program used to find bad passwords or crack security.
cvs	Concurrent Versions System.
deallocvt	Gets rid of unused virtual terminals.
dumpkeys	Dump keyboard translation tables.
fc	Fix command. Used to edit the commands in the current history list.
gdbm	The GNU database manager.
gpm	A cut and paste mouse server.
history	Show commands listed in the shell history (last n).
lilo	Boot management program.
mc	Visual shell for Unix like system. A file manager.
nc	A file manager.
pdksh	Public domain Korn shell.
pilot	Filesystem browser.
PS1="Please enter a command"	Set Bash level 1 response.
PS2="I need more information"	Set Bash level 2 response.
rcs	Recision Control system. Change RCS file attributes.
sash	Standalone shell with built in commands.
screen	Screen manager with VT100 terminal emulation.
sleep	Ex: "sleep 2" - wait 2 seconds.
tcsh	C shell with filename completion and command line editing.
unalias	Ex: "unalias dir" - Effect: Removes the alias dir.
units	Unit conversion program.
variables	• set - Ex: set t=/temp • unset - Ex: unset t • echo - Ex: echo $t
zsh	The Z shell.
ttysnoop	A program that comes with some systems that lets the administrator to snoop on the user's terminals.

Sound

Credits

Document:

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Author:

Mark Allen