

Ateneo de Manila University

Unix/Linux Basic Commands



Department of Information Systems and
Computer Science

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<http://sysads.ateneo.net/wyu/>

wyu@ateneo.edu

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Section I

Unix and Linux

UNIX and Linux

- ★ command in Unix and Linux are similar
- ★ there exists a number of behavioral and invocational differences
- ★ Linux commands tend to support for command line options and features
- ★ knowing the basic operations of UNIX or Linux provides the necessary information for operation on both systems

Section II

Filesystem

Filesystem

The Unix Filesystem

- ★ The filesystem is divided into many parts; usually along the lines of a root filesystem with /bin, /lib, /etc, /dev, and a few others
- ★ The Unix filesystem structure groups files according to purpose, i.e., all commands are in one place, all data files in another, documentation in a third, and so on.

Filesystem

The roles of the different parts of the directory tree:

- ★ The root filesystem – Contains the files that are necessary for booting the system up, and to bring it up to such a state that the other filesystems may be mounted.
- ★ The /usr filesystem – Contains all commands, libraries, manual pages, and other unchanging files needed.
- ★ The /var filesystem – Contains files that change, such as spool directories (for mail, news, printers, etc), log files, formatted manual pages, and temporary files.
- ★ The /home filesystem – Contains the users' home directories, i.e., all the real data on the system.

Filesystem

The root filesystem

- ★ Should generally be small.
- ★ Contains very critical files.
- ★ Infrequently modified filesystem has a better chance of not getting corrupted.

Filesystem

Subdirectories in the root filesystems:

Subdirectory	Description
/bin	Commands needed during bootup that might be used by normal users.
/sbin	Like /bin, but the commands are not intended for normal users, although they may use them if necessary and allowed.
/etc	Configuration files specific to the machine.
/root	The home directory for user root.
/lib	Shared libraries needed by the programs on the root filesystem.
/lib/modules	Loadable kernel modules, especially those that are needed to boot the system when recovering from disasters.
/dev	Device files.
/tmp	Temporary files.
/boot	Files used by the bootstrap loader, e.g., LILO.
/mnt	Mount point for temporary mounts by the system administrator.
/proc, /usr, /var, /home	Mount points for the other filesystems.

Filesystem

The /etc directory

- ★ The /etc directory contains a lot of files.
- ★ Many networking configuration files are in /etc as well.

Subdirectory	Description
/etc/rc or /etc/rc.d or /etc/rc?.d	Scripts or directories of scripts to run at startup or when changing the run level.
/etc/passwd	The user database, with fields giving the username, real name, home directory, encrypted password, and other information about each user.
/etc/fdprm	Floppy disk parameter table.

Filesystem

The /etc directory continued

Subdirectory	Description
/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 describes groups instead of users.
/etc/inittab	Configuration file for init.
/etc/issue	Output by getty before the login prompt.
/etc/magic	The configuration file for file.
/etc/motd	The message of the day, automatically output after a successful login.
/etc/mtab	List of currently mounted filesystems.
/etc/shadow	Shadow passwords move the encrypted password from /etc/passwd into /etc/shadow; the latter is not readable by anyone except root.

Filesystem

The /etc directory continued

Subdirectory	Description
/etc/login.defs	Configuration file for the login command.
/etc/printcap	Like /etc/termcap, but intended for printers.
/etc/profile, /etc/csh.login, /etc/csh.cshrc	Files executed at login or startup time by the Bourne or C shells.
/etc/securetty	Identifies secure terminals, i.e., the terminals from which root is allowed to log in.
/etc/shells	Lists trusted shells.
/etc/termcap	The terminal capability database. Describes by what “escape sequences” various terminals can be controlled.

Filesystem

The /dev directory

The /dev directory contains the special device files for all the devices.

Filesystem

The /usr filesystem

This filesystem is often large, since all programs are installed there.

Subdirectory	Description
/usr/X11R6	The X Window System, all files.
/usr/X386	Similar to /usr/X11R6, but for X11 Release 5.
/usr/bin	Almost all user commands. Some commands are in /bin or in /usr/local/bin.
/usr/sbin	System administration commands that are not needed on the root filesystem, e.g., most server programs.
/usr/man, /usr/info, /usr/doc	Manual pages, GNU Info documents, and miscellaneous other documentation files, respectively.
/usr/include	Header files for the C programming language.
/usr/lib	Unchanging data files for programs and subsystems, including some site-wide configuration files.
/usr/local	The place for locally installed software and other files.

Filesystem

The /var filesystem

The /var contains data that is changed when the system is running normally. It is specific for each system, i.e., not shared over the network with other computers.

Subdirectory	Description
/var/catman	A cache for man pages that are formatted on demand.
/var/lib	Files that change while the system is running normally.
/var/local	Variable data for programs that are installed in /usr/local (i.e., programs that have been installed by the system administrator).

Filesystem

The /var filesystem continued

Subdirectory	Description
/var/lock	Lock files.
/var/log	Log files from various programs, especially login (/var/log/wtmp, which logs all logins and logouts into the system) and syslog (/var/log/messages, where all kernel and system program message are usually stored).
/var/run	Files that contain information about the system that is valid until the system is next booted.
/var/spool	Directories for mail, news, printer queues, and other queued work.
/var/tmp	Temporary files that are large or that need to exist for a longer time than what is allowed for /tmp.

Filesystem

The /proc filesystem

this filesystem contains a illusionary filesystem

is the memory footprint of your system

varies from UNIX implementation

Subdirectory	Description
/proc/1	A directory with information about process number 1.
/proc/cpuinfo	Information about the processor, such as its type, make, model, and performance.
/proc/devices	List of device drivers configured into the currently running kernel.
/proc/dma	Shows which DMA channels are being used at the moment.
/proc/filesystems	Filesystems configured into the kernel.
/proc/interrupts	Shows which interrupts are in use, and how many of each there have been.
/proc/ioports	Which I/O ports are in use at the moment.
/proc/kcore	An image of the physical memory of the system.
/proc/kmsg	Messages output by the kernel.
/proc/ksyms	Symbol table for the kernel.

Filesystem

The /proc filesystem continued

Subdirectory	Description
/proc/loadavg	The 'load average' of the system; three meaningless indicators of how much work the system has to do at the moment.
/proc/meminfo	Information about memory usage, both physical and swap.
/proc/modules	Which kernel modules are loaded at the moment.
/proc/net	Status information about network protocols.
/proc/self	A symbolic link to the process directory of the program that is looking at /proc.
/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.

Filesystem

Important Linux Files

File	Description
/boot/vmlinuz*	Linux kernel
/etc/conf.modules	Aliases and options for loadable kernel modules
/etc/fstab	Filesystems mounted or available for mounting
/etc/group	Group information
/etc/hosts	Map of IP numbers to hostnames
/etc/hosts.allow	Hosts allowed to access Internet services
/etc/hosts.deny	Hosts forbidden to access Internet services
/etc/passwd	Default User Password File
/etc/shadow	Default Shadow File

Filesystem

Important Linux Files continued

File	Description
/etc/inetd.conf and /etc/xinetd.d	Configuration for the inetd daemon, which controls access to Internet services
/etc/inittab	Configuration for the init daemon, which controls executing processes
/etc/issue	Terminal Display Screen
/etc/lilo.conf	Boot Loader Configuration File
/etc/login.defs	Options for useradd and related commands
/etc/mtab	Mounted filesystems
/etc/printcap	Printer options and capabilities
/etc/profile	Default environment for users of BASH shell

Filesystem

Important Linux Files continued

File	Description
/etc/rc*.d	Scripts for system and process startup and shutdown
/etc/rc.boot	Scripts for system boot
/etc/skel	Skeleton files used to establish new user accounts
/etc/terminfo	Terminal capabilities and options
/etc/X11/XF86Config	X configuration file
/var/log/messages	System log
/var/spool/cron	Directory for at and cron configuration files

Section III

Basic Commands

Starting & Stopping

- Unix and Linux commands are similar
- uses the tool philosophy
- when doubt use the **man** commands:

Command	Description
man [command]	get more information about the [command]
man -k [keyword]	returns the first man page with matches [keyword]

Starting & Stopping

Command	Description
shutdown -h now	Shutdown the system now and do not reboot
halt	Stop all processes - same as above
shutdown -r 5	Shutdown the system in 5 minutes and reboot
shutdown -r now	Shutdown the system now and reboot
reboot	Stop all processes and then reboot - same as above
startx	Start the X system
exit	Logout of the system

Manipulating Files

Command	Description
pwd	displays the path of the current directory
ls [directory]	displays the contents of the specified directory
cd [directory]	changes the current directory
cp [source] [dest]	copies a file from [source] to [dest]
mv [source] [dest]	moves a file from [source] to [dest]
rm [source]	deletes a file from the [source]
cat [file]	displays the contents of [file]
less [file]	similar to cat but prompts when the display is filled
head [file]	display the first few lines of [file]
tail [file]	display the last few lines of [file]
mkdir [directory]	creates a directory
rmdir [directory]	removes a directory

Accessing & Un/mounting File Systems

Command	Description
<code>mount -t iso9660 /dev/cdrom /mnt/cdrom</code>	Mount the device cdrom and call it cdrom under the /mnt directory
<code>mount -t msdos /dev/hdd /mnt/ddrive</code>	Mount hard disk "d" as a msdos file system and call it ddrive under the /mnt directory
<code>mount -t vfat /dev/hda1 /mnt/cdrive</code>	Mount hard disk "a" as a VFAT file system and call it cdrive under the /mnt directory
<code>umount /mnt/cdrom</code>	Unmount the cdrom

Searching

Command	Description
find / -name [fname]	Starting with the / directory, look for the file called [fname]
find / -name "*"fname*"	Starting with the / directory, look for the file containing the string fname
locate [fname]	Find a file called [fname]
which [command]	Show the subdirectory containing [command]
grep [regex] [path]	Search through the [path] directory or file for a matching [regex]

X Window System

Command	Description
Xvidtune	Run the X graphics tuning utility
XF86Setup	Run the X configuration menu
xf86config	Run a text based X configuration menu

Installing software for RPM-based Linux Distributions

Command	Description
<code>rpm -ivh name.rpm</code>	Install the rpm package called name
<code>rpm -Uvh name.rpm</code>	Upgrade the rpm package called name
<code>rpm -e package</code>	Delete the rpm package called package
<code>rpm -l package</code>	List the files in the package called package
<code>rpm -ql package</code>	List the files and state the installed version of the package called package
<code>rpm -i --force package</code>	Reinstall the rpm package deleted parts of it (not deleting using rpm -e)
<code>tar -zxvf archive.tar.gz</code>	Decompress the files contained in the gzipped and tarred archive called archive

User Administration

Command	Description
adduser [accountname]	Create a new user call [accountname]
userdel [accountname]	Remove a user from the system
passwd [accountname]	Give [accountname] a new password
su	Log in as superuser from current login

Process Control

Command	Description
ps	List current processes
kill [pid]	Kill a specific process with process id [pid]
killall [name]	Kills all processes with the name [name]
CTRL-Z	Sends the process to the background
fg [process]	Returns to the process in the background

File Permissions

are represented by a string of three groups - eg. drwxr-x-x

the first character is the directory bit

the next three characters are the owner permissions

the next three characters are the group permissions

the next three characters are the world permissions

Command	Description
Read = 4, Write = 2, Execute = 1	File permissions are altered by giving the chmod command and the appropriate octal code for each user type. Eg.
chmod 7 6 4 filename	will make the file called filename r+w+x for the owner, r+w for the group and r for others.
chmod 7 5 5	Full permission for the owner, read and execute access for the group and others.
chmod +x filename	Make the file called filename executable to all users.

X Keystrokes

Command	Description
Control — Alt + or -	Increase or decrease the screen resolution. eg. from 640x480 to 800x600
Control — Alt — Backspace	Terminates X session
Alt — F[n]	moves to number [n] virtual desktop
Alt — escape	Display list of active windows
Shift—Control F8	Resize the selected window
Right click on desktop background	Display menu
Shift—Control Altr	Refresh the screen
Shift—Control Altx	Start an xterm session

Printing

Command	Description
lpq	Display jobs in print queue
lprm	Remove jobs from queue
lpr	Print a file
lpc	Printer control tool
printtool	Start X printer setup interface

Text Editors

- ★ **vim** is a text editor that is upwards compatible to Vi. It can be used to edit any ASCII text. It is especially useful for editing source code.
- ★ **emacs** is a full screen text editor that is built on top of the lisp interpreter. One comment about emacs is it is "everything but the kitchen sink".
- ★ **joe** is a powerful ASCII-text screen editor. It has a "mode-less" user interface which is similar to many user-friendly PC editors. Users of Micro-Pro's WordStar or Borland's "Turbo" languages will feel at home. JOE is a full featured UNIX screen-editor though, and has many features for editing programs and text.
- ★ **jed** is a programmer's text editor that provides color syntax highlighting. Emulation of Emacs, EDT, Wordstar, and Brief editors. Extensible in a language resembling C. Completely customizable. Editing TeX files with AUC-TeX style editing (BiBTeX support too). Folding support, and much

more...

- ★ **ed** is a line-oriented text editor. It is used to create, display, modify and otherwise manipulate text files.

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