Unix 101

Unix 101: Basic Unix

Beware: almost everything about Unix is case-sensitive, including filenames and commands. Also, if the **BackSpace** key doesn't backspace, try the **Delete** key.

Files

Everything in Unix is a "file" -- real files, directories, device drivers, and so forth. This makes it easy to combine files and programs in many different and new ways.

Directories are special files that hold the names of other files or other directories. In this way, the Unix file system looks like a hierarchical tree, similar to DOS. Note that directories are separated by a forward slash (/

) not a backslash (\ ) as in DOS.

How much disk space are you allowed to use? See ACCC Online Disk Space Policy.

File Attributes

file name

A file name is a string of characters. Unix does not give special relevance to periods or other characters, although some programs expect specific types of filenames.

full path

The full path of a file specifies all directories, such as **/usr/local/bin/foo.bar**. The filename **foo.bar** can be used for this file when **/usr/local/bin** is the current directory.

file permissions

Each file has an associated owner and group. The owner is a logon account, and the group is a possibly empty group of logon accounts. The read, write, and execute permissions (which can be set by the owner) can be different for the owner, group, and public (other). Permissions apply to directories as well as files.

Enter **ls -l** to find the permissions on the files and subdirectories in the current directory. This returns lines that look something like the following:

```
drwx------ 2 bobg comp  512 Jun  7 09:49 mydir
-rwxr-xr-x 1 bobg comp  321 May 30 14:36 myscript
```

Each line describes one file. From left to right: the permissions, the number of links, the owner, the group owner, the size in bytes, the date and time of the last modification, and the file's name.

The first character of the permissions tells what kind of "file" it is; **d** for directory, hyphen (-) for regular file. The remaining nine characters are three triplets. The triplets give the read, write, and execute permissions for that file or directory for that file for, respectively, the file's owner, its group owner, and for the public (other). The **r** (read), **w** (write), and **x** (execute), indicate the presence of read, write and execute permissions; the hyphen (-) indicates their absence. For directories: **r** permission allows you to list the files in the directory, **w** permission allows you to create or remove files from the directory, and **x** permission allows you to **cd** to the directory.

Thus, in this example, both files are owned by *bobg* and have the group *comp* as group owner. *mydir* is a subdirectory in which only bobg can read, write, and execute; and *myscript* is a file in which bobg can read, write, execute, and everyone else, including those in group comp, can read and execute but not write.

The chmod command changes file permissions. For example **chmod u+x *file*** adds execute permission to *file* for the owner (user); use u-x to remove execute permission for the owner. **u** indicates the file's owner (user), **g** the owner's group, **o** the public (other), or **a** for all three; and **r** is read permission, **w** is write permission, and **x** is execute permission.

File Commands

ls	gives a list of filenames in the current directory; tigger (AIX) man page; icarus (Solaris) man page
mv	rename a file: **mv *oldfile newfile*** or **mv *oldfile newdi*r** tigger (AIX) man page; icarus (Solaris) man page
cp	copy a file: **cp *oldfile newfile*** or **cp *oldfile newdir*** tigger (AIX) man page; icarus (Solaris) man page
chmod	change permissions; see "File Attributes" above for examples tigger (AIX) man page; icarus (Solaris) man page
rm	remove a file; tigger (AIX) man page; icarus (Solaris) man page
cd	change directories; tigger (AIX) man page; icarus (Solaris) man page
lpr	print a file: **lpr -P *printer-name file*** (see Using Unix: Printing for a brief introduction to printing on Unix);

	tigger (AIX) man page; icarus (Solaris) man page
pwd	"print" working directory; returns the current directory tigger (AIX) man page; icarus (Solaris) man page
quota	to see how much disk space you've used (on icarus, use: **quota -v**) tigger (AIX) man page; icarus (Solaris) man page How much disk space are you allowed to use? See ACCC Online Disk Space Policy.
mkdir	create a new directory; tigger (AIX) man page; icarus (Solaris) man page
rmdir	remove a directory; tigger (AIX) man page; icarus (Solaris) man page
compress	compress a file into one with a **.Z** extension; **uncompress** reverses the process
tar	package a group of files into one file for moving or archiving; also extracts tar files tigger (AIX) man page; icarus (Solaris) man page

Processes

The shell is a command line interpreter (as well as programming language). The Korn shell, or ksh, is used by default on the ACCC Unix systems. The shell reads the command line, interprets any special characters, and then runs the specified command, usually as a new process (which itself can spawn new processes).

-- Process Commands

ps	list your current processes; note the PID (process id); you need the PID to change attributes of the processes;

	tigger (AIX) man page; icarus (Solaris) man page
kill	send a signal to a process; **kill -9 *pid*** terminates the process with process id *pid* tigger (AIX) man page; icarus (Solaris) man page
&	run a command in the background and return immediately with a prompt; put the **&** at the end of your command
nohup	put this command at the beginning to make a background process continue after you break the logon connection; tigger (AIX) man page; icarus (Solaris) man page
Ctrl-c	get prompt back
Ctrl-d	end of input; same as logout when in shell

-- Special command line characters, i/o redirection

.	shorthand for the current directory
..	shorthand for the parent of the current directory
~user	shorthand for the home directory of *user*; if *user* is not specified, then ~ is shorthand your home directory
*	match zero or more characters
?	match zero or one character

> *file*	send all screen output to *file*; erase any existing *file*
>> *file*	append all screen output to *file*
< *file*	read input from *file* rather than from the keyboard
cmd1* | *cmd2	use *cmd1*'s output as input for *cmd2*

Miscellaneous but useful commands

df	show disk space usage for the machine tigger (AIX) man page; icarus (Solaris) man page
diff	compare two files; tigger (AIX) man page; icarus (Solaris) man page
find	recursively search for files; tigger (AIX) man page; icarus (Solaris) man page
grep	search a bunch of files for a string; tigger (AIX) man page; icarus (Solaris) man page
gzip	**gzip *myfile*** compresses *myfile* . The compressed version of myfile has the same name with an appended extension of **.gz** and when possible has the same file ownerships, access, and modification times; tigger (AIX) man page; icarus (Solaris) man page
gunzip	**gunzip *myfile.ext*** decompresses (restores to its original form) myfile.ext where ext can be: **.gz**

	.taz .tgz .z -z z or **.Z** . gunzip decompresses files created by: **gzip** , **zip** , **compress** , **compress -H** , or **pack;** tigger (AIX) man page; icarus (Solaris) man page
logout **exit**	end your Unix session; tigger (AIX) logout man page end your Unix session; icarus (Solaris) exit man page
man	look up a manual page; **man ls** will tell about the options to the **ls** command, for example; main online documentation for Unix; tigger (AIX) man page; icarus (Solaris) man page
more	make the output stop after each screen; **Spacebar** displays next screen, **Ctrl-b** displays the previous screen, **q** quits tigger (AIX) man page; icarus (Solaris) man page
quota	check your own disk space usage and quota (on icarus, use: **quota -v**) tigger (AIX) man page; icarus (Solaris) man page How much disk space are you allowed to use? See ACCC Online Disk Space Policy.
sort	sort the lines of a file; tigger (AIX) man page; icarus (Solaris) man page
w	check system load; tigger (AIX) man page; icarus (Solaris) man page
wc	count words, lines, and characters of a file tigger (AIX) man page; icarus (Solaris) man page

Examples

who am i

To do the obvious; just who lists everyone who is logged on; likewise **hostname** tells you the name of the machine you're using.
(tigger (AIX) man page; icarus (Solaris) man page)

pwd

To display current directory

mkdir *foo*

To make a new directory called *foo*.

cd

To change to your home directory from anywhere.

cd *bin*

To change to the *bin* directory under the current directory.

cd */usr/local/bin*

To change to the */usr/local/bin* directory, regardless of what your current directory is; much of the public software is stored in the subdirectories of the usr directory

ls -l -a -R | more

To get a list of all files in a directory. **-l** to get a long listing, with permissions; **-a** to include files with filenames beginning with a period (**.**); and **-R** (note the R is uppercase) to also list the files in all subdirectories of the current directory. And since this is likely to be a long listing, it's "piped" into **more** so the display pauses at the end of each screen.

ls -l *a*.c*

To get a long listing of all files with filenames starting with *a* and ending in *.c*.

more *.profile*

To display your *.profile* file, when your current directory is your home directory.
(See Using Unix: Customizing Korn Shell for more information about **.profile** and **.env** files.

more *~/.profile*

To display your *.profile* file when your current directory is not your home directory.

cp *../foobar* .

To copy the file *foobar* from the parent of the current directory into the current directory.

rm -i *??*

To remove (erase) all files in the current directory with exactly 2 characters in the filename, verifying each erase with a **y** or **n** .

mv *foobar ../newdir/fubar*

To rename the file *foobar* to *fubar* and place it in the directory *newdir*, that is a child of the parent directory of your current directory.

chmod *u+x foobar*

To make the file *foobar* executable by its owner.

chmod -R *a+r **

To make all files the current directory and all files in all subdirectories (-R) readable by everyone.

man ls

To get information on the command **ls** and its flags.

ps -e | more

To get a list all processes piped into more; without the **-e** only the processes associated with your session are listed

nohup *cmd* < *foo.in* >> *foo.out* &

To run the command *cmd*, taking input from *foo.in*, appending output to *foo.out*, and run the command in the background so that you can log off and have the command continue to run. (Without the >>, **nohup** puts output in the file **nohup.out**.)

grep *double *.c*

To search all the C source files for the string "*double*".

ls -l | grep ^*d* | wc -l

To find the number of subdirectories in the current directory.

find ~ *-name foobar* -print

To search for all files named *foobar* in your home directory tree.

uncompress *foo.Z*

To uncompress the compressed file *foo.Z* in the current directory.
(tigger (AIX) man page; icarus (Solaris) man page)

tar -xf *foo.tar*

To extract the contents of the file *foo.tar* in the current directory.

diff *foobar fubar* > *diffbar*

To find the differences between *foobar* and *fubar* and record the differences in a file called *diffbar*.

pine *consult@uic.edu*

To send a note to *consult@uic.edu*; enter just: **pine** for a complete mail management menu.
(tigger (AIX) man page; icarus (Solaris) man page)

Unix 101 **Previous:** 1. Getting Started **Next:** 3. Email
