

An Introduction to Working in the Linux Command Line

May 28th, 2014

Note: Do not attempt to copy/paste out of this document. Commands will likely not work!

Some software you will need (Note: these are examples of free software, not endorsements):

<u>In order to</u>	<u>From Mac or Linux</u>	<u>From Windows</u>
Connect to submit (ssh)	Terminal	PuTTY
Move files to/from submit	FileZilla, CyberDuck (Mac)	FileZilla, CyberDuck
Edit text files	TextWrangler (Mac)	Notepad++

Getting around in Linux:

- File paths (directories or folders): `/`, `/home/magitz/`, `/scratch/lfs/magitz/`
- `pwd`, `cd`, `ls` (Where am I, change directory, list directory)
- `cp`, `mv`, `rm` (copy, move, delete)
- `more`, `less`, `head`, `tail`, `cat` (examine files)
- `nano`, `vim` (text editors in Linux)

Making things easier:

- Tab completion- type part of a path and hit tab-key, shell will auto-complete for you
- `history`: redo something that you did before without retyping (use `↑`)
- `man`: getting help, also `-h` or `--help` flag (e.g.: `man ls`)

Learning by doing:

1. Connect to HPC Center: `ssh <user>@gator.rc.ufl.edu`
 - a. Type your password and hit return (no characters display while you type).
2. Where are you when you login? `pwd`
3. What files are there? `ls`
4. Make a directory: `mkdir test_script`
5. Now what's there? `ls -l`
 - a. Linux commands usually have flags to change how they work
 - b. `man`, `-h` or `--help` often give you help
6. Change into `test_script` directory: `cd test_script` or `cd te<tab>`
7. Copy a sample file here (`.`): `cp /scratch/lfs/bio/training/2014-05-28/simple.pbs .`
8. Check that the copy worked: `ls`
9. Delete that file: `rm simple.pbs`
10. That file is now **GONE!** Not in your recycle bin or trashcan, but gone!
11. Luckily we were working with a copy, let's copy it again: up-arrow, up-arrow, return
12. Look at the file: `less simple.pbs` (type `q` to exit when done)

13. For now, ignore lines that start with a # or #PBS, what does this script do?
 - a. Can we run this script here? Why not?
 - b. Connect to an interactive development/test node: `ssh dev[1 or 2]`
 - c. Notice that when you connect to an interactive node, you are in your home directory—same thing happens when your jobs start on compute nodes (see 15a below).
 - d. Get back to where you want to be: `cd test_script`
 - e. Now we can run our script: `./simple.pbs`
 - f. Did it do what you expected?
 - g. Logout of test node: `logout`

14. Use the scheduler to run this job:
 - a. Can't run from home, so...
 - b. Change to scratch file space: `cd /scratch/lfs/$USER`
 - c. Submit the job: `qsub ~/test_script/simple.pbs` (~ means your home)
 - d. The scheduler pays attention to the #PBS lines to schedule and manage your job
15. Look at the result file: `less test.out`
16. How do the results differ?
 - a. **Note** this script, and any that you write, *should* have: `cd $PBS_O_WORKDIR`
 - i. Notice that the `pwd` command shows your job was in your home directory, **not** where you launched the job from.
 - b. Notice all of new environment variables like `PBS_O_WORKDIR`, `PBS_NP`, `TMPDIR`, etc. These can all be used in your scripts.

17. Time to get some data!
 - a. Find a file on your computer, or a web site, with some text. Copy and paste that into a new file in your text editor (E.g. TextWrangler, NotePad++). We're just looking for some text to process. It doesn't matter what it is!
 - b. Save the file as: **some_text.txt** (Check that line breaks are Unix)
 - c. Using your text editor or FileZilla, upload this file to your space in `/scratch/lfs/`
 - i. SFTP (port 22) to host: `gator.rc.ufl.edu`
 - ii. Make a directory in `/scratch/lfs/$USER/` called: `word_cloud`

18. Go back to your ssh client and navigate to `/scratch/lfs/$USER/word_cloud`
19. Use `more`, `head` and `tail` to look at `some_text.txt`
20. Copy the example `cloud.pbs` script to your directory:
 - a. `cp /scratch/lfs/bio/training/2014-05-28/cloud.pbs .`
21. Edit this script to have your e-mail: `nano cloud.pbs`
22. Submit the cloud script: `qsub cloud.pbs`
23. Check your e-mail
24. Use FileZilla to download your results.
25. Open in a web browser