

An Introduction to the Linux Command Line

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5/28/14

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Don't be intimidated!

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File system

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File system: Paths

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File system: ls & cd

```
[magitz@gator1 scripts]$ ls
renamer.sh test.py
[magitz@gator1 scripts]$ cd ../Documents/
[magitz@gator1 Documents]$ ls
data.txt
[magitz@gator1 Documents]$
```

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The command prompt

```

[usermagitz@hostgator1 current directoryscripts]$ ls
renamer.sh test.py
[magitz@gator1 scripts]$ cd ../Documents/
[magitz@gator1 Documents]$ ls
data.txt
[magitz@gator1 Documents]$ █

```

File system: Basic commands

- pwd: Present Working Directory
- ls: List--show contents of directory
- cd: Change Directory
- mkdir: Make directory
- rm: Remove a file (rm -r for directories)
- rmdir: Remove directory

There is no
trashcan!
(or backups)



- cp: Copy a file: cp data.txt ../analysis/
- mv: Move a file: mv data.txt ../analysis/

Command arguments

- Modify how a command works
 - Used from the most basic command like ls, to most applications you will run

```

[magitz@gator1 scripts]$ ls
renamer.sh test.py
[magitz@gator1 scripts]$ ls -l
total 0
-rw-rw-r-- 1 magitz ufhpc 0 Jul 25 12:22 renamer.sh
-rw-rw-r-- 1 magitz ufhpc 0 Jul 25 12:22 test.py
[magitz@gator1 scripts]$ ls -la
total 8
drwxrwxr-x 2 magitz ufhpc 4096 Jul 25 12:22 .
drwxrwxr-x 4 magitz ufhpc 4096 Jul 25 12:25 ..
-rw-rw-r-- 1 magitz ufhpc 0 Jul 25 12:22 renamer.sh
-rw-rw-r-- 1 magitz ufhpc 0 Jul 25 12:22 test.py
[magitz@gator1 scripts]$ █

```

Linux permissions

Indicates a directory (d) or a file (-)
 Group (set of users)
 drwxrwxrwx
 Other users (everyone else)
 User (owner) permissions

- Change with: chmod o-rwx file
 - ls -l shows permission details
- ```

-rw-rw-r-- 1 magitz ufhpc 0 Jul 25 12:22 renamer.sh
 u g o user group

```

## Viewing text files

- more and less: show contents of a file, less has more features (search, scroll up, etc.)
- head: show start of file (10 lines by default)
  - head -n 20 file.txt
- tail: show end of file (10 lines by default)
- grep: search for text in file
  - grep Gainesville weather.txt
- Text editors: nano, vi, vim, emacs, etc.

## Redirecting output

- The ">" can be used to redirect output:
  - grep GNV weather.txt > Gainesville.txt
  - ls -l > file\_list.txt
  - **Caution:** > will overwrite the specified file!
- You can append to a file with ">>"

## Connecting commands

- ▶ The pipe, "|", can be used to send, or pipe, the output of one command to the input of another:
  - `ls -l | grep Jun > files_modified_in_June`

Tip: Don't use spaces in file or directory names

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## Tools

ssh client to connect to [hipergator.hpc.ufl.edu](http://hipergator.hpc.ufl.edu)

e.g.: Terminal, PuTTY

SFTP client to move files to/from your computer

e.g.: Cyberduck, FileZilla

Text editor to prepare files

Especially on Windows, be sure to convert DOS line breaks to Unix, and *don't use Word*

Both have SFTP built in

e.g.: TextWrangler, Notepad++

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## SSH Clients

Mac/Linux: Terminal

Windows: PuTTY

ssh user@hipergator.hpc.ufl.edu

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## PuTTY

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## FileZilla

Tutorial at: <http://wiki.hpc.ufl.edu/doc/FileZilla>

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## Text Editors

- ▶ **Not** Microsoft Word or other word processor
- ▶ Contextual coloring
- ▶ Built-in SFTP Client
- ▶ Regular expression find/replace
- ▶ **Unix line breaks**

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## Unix line breaks

The screenshot shows a 'Preferences' dialog box with several tabs. The 'Line breaks' section is active, showing three radio button options: 'Unix (LF)' (selected), 'Classic Mac (CR)', and 'Windows (CRLF)'. There are also checkboxes for 'Ensure file ends with line break' and 'Strip trailing whitespace'. Other tabs include 'General', 'Encoding', 'Backups/Auto-Completion', 'File Association', and 'Language Menu/File Settings'.

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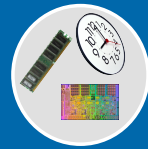
## Cluster basics

User interaction




Login server (Head node)

Scheduler



Tell the scheduler what you want to do

Compute resources



Your job runs on the cluster

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## Learn by doing...

Handouts also available on Wiki

Unix/Linux Command Reference


| Command             | Description                                                                                                                            |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| cd                  | Change the current directory                                                                                                           |
| cp                  | Copy files and directories                                                                                                             |
| mv                  | Move or rename files and directories                                                                                                   |
| rm                  | Remove files and directories                                                                                                           |
| find                | Search for files and directories                                                                                                       |
| grep                | Search for patterns in text                                                                                                            |
| cat                 | Concatenate files and print on the standard output                                                                                     |
| ls                  | List directory contents                                                                                                                |
| pwd                 | Print the current working directory                                                                                                    |
| mkdir               | Make new directories                                                                                                                   |
| rmdir               | Remove directories                                                                                                                     |
| chmod               | Change the mode or permissions of files and directories                                                                                |
| chown               | Change the ownership of files and directories                                                                                          |
| diff                | Compare files line by line                                                                                                             |
| diff -r             | Compare directories recursively                                                                                                        |
| diff -u             | Compare files line by line, showing only lines that have changed                                                                       |
| diff -w             | Compare files line by line, ignoring white space                                                                                       |
| diff -q             | Compare files line by line, giving only a yes/no answer                                                                                |
| diff -y             | Compare files line by line, side by side                                                                                               |
| diff -r -y          | Compare directories recursively, side by side                                                                                          |
| diff -u -r          | Compare directories recursively, showing only lines that have changed                                                                  |
| diff -u -r -w       | Compare directories recursively, showing only lines that have changed, ignoring white space                                            |
| diff -u -r -q       | Compare directories recursively, giving only a yes/no answer, showing only lines that have changed                                     |
| diff -u -r -y -q    | Compare directories recursively, giving only a yes/no answer, showing only lines that have changed, side by side                       |
| diff -u -r -y -q -w | Compare directories recursively, giving only a yes/no answer, showing only lines that have changed, side by side, ignoring white space |

FOSWire

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  - <https://support.hpc.ufl.edu>
  - For any kind of question or help requests
  - Searchable database of solutions
- ▶ <http://wiki.hpc.ufl.edu>
  - Documents on hardware and software resources
  - Various user guides
  - Many sample submission scripts



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