Unix

Motivation for the Command line

Concepts

GUI

Commandline

Case-sensitive

path

absolute path

relative path

root

commands

cd (change directory)

ls (list)

pwd (print working directory)

cp (copy)

rm (remove)

When You Want Unix

You need to run afni or fsl

When you want a machine that is unlikely to crash (e.g., you want to run a process that takes days)

When you want a machine that does not get viruses

When you want to take full advantage of the commandline

Mostly, you'll learn by practicing, but I hope to introduce some general ideas here.

The Command line

Graphical User Interface

Command line

```
Morticious Thrind

Click here for other themes.

Welcome. Type 'help' for assistance.
guest@morticious-thrind:/$ ls

  DIR    categories/
  DIR    Actually work related/
  DIR    Annoyances/
  DIR    CLI theme/
  DIR    cook/
  DIR    Cries for Attention/
  DIR    Geekery/
  DIR    Inexplicably popular/
  DIR    Listen, you morons.../
  DIR    Look what I found/
  DIR    Not much/
  DIR    pics/
  DIR    Probably crazy/
  DIR    RSS scrapings/
  DIR    Security/
  DIR    Spam/
  DIR    Uncategorized/
  DIR    Well done good man/
  74     Life Patch                       1635    2005-09-08 14:36:57
  84     Telemarketers/Surveyors          6108    2005-09-18 11:35:03
  108    Some geeky tiling backgrounds    1038    2005-10-20 14:04:12
  329    About                            1344    2007-04-28 14:26:24
  331    TV Party!                        53      2007-04-30 16:00:32
  LNK    latest@

guest@morticious-thrind:/$
```

Done

GUIs (graphical user interfaces) are prettier and more familiar than the command line.

For many of us...they *seem* easier.

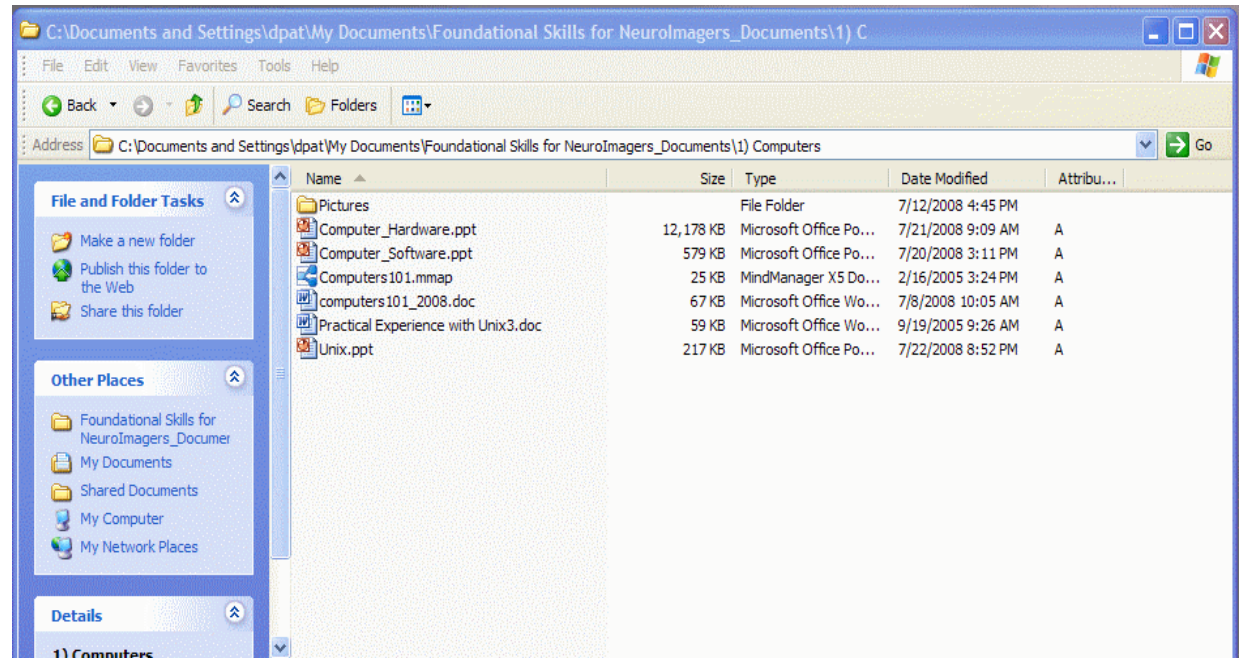This may or may not be true for any given task.

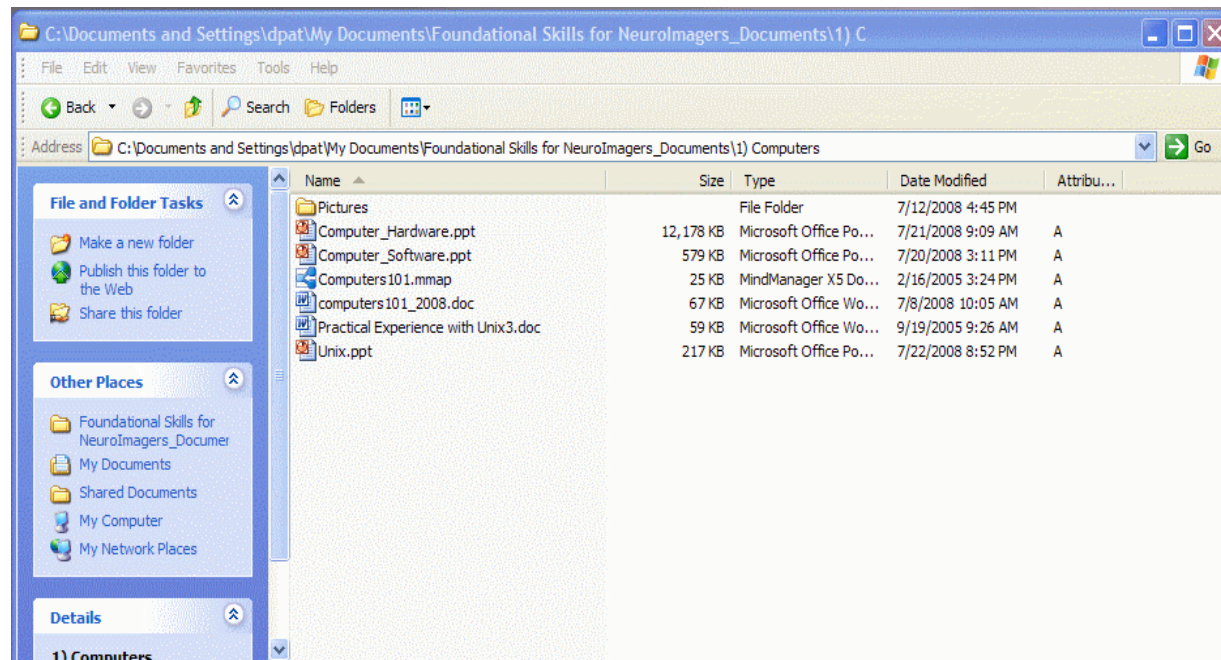Learning the command line definitely demands time.

It isn't good for everything

(especially if you don't gravitate to it naturally)

But it is actually good for some things

How do we print a list of what is in the explorer window?

At the unix commandline,
>ls –l > **printedlist.txt**
saves our list of files and directories
to a text file we can print.

Why the Command line?

- Repetition (or near repetition)

    >**fslstats image01 –R**

    >**fslstats image02 –R**   (now back up the cursor and change 1 to 2, no need to erase)

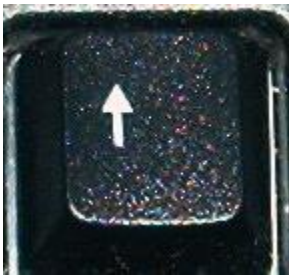   >**fslstats image03 –R**

Why the Command line?

- Very long processes:
  - With a gui, you often have to wait around while one process finishes, so you can start the next.
  - With the commandline, you can specify a sequence of events and walk away

>gzip giant_directory1; gzip giantdirectory2

Why the Command line?

- Handling mistakes: Scroll through recent commands, modify, and rerun.

>**fslstrats image01 –R**

>**fslstats image01 –R**

Why the Command line?

- Keeping a log:
  - Especially with a history, you can cut and paste all of your choices into a text file and keep it...
  - This means you have a record when things get confusing.

  >fslmaths image01 –thr 0.9 image01a

  (what was image01a again??)

Why the Command line?

- Remote Work

  - You get home and realize you didn't start a process…you don't want to go all the way back to school, but you want it to run overnight.

  - Ssh to the machine and start the process, 5 minutes, not 90 minutes….
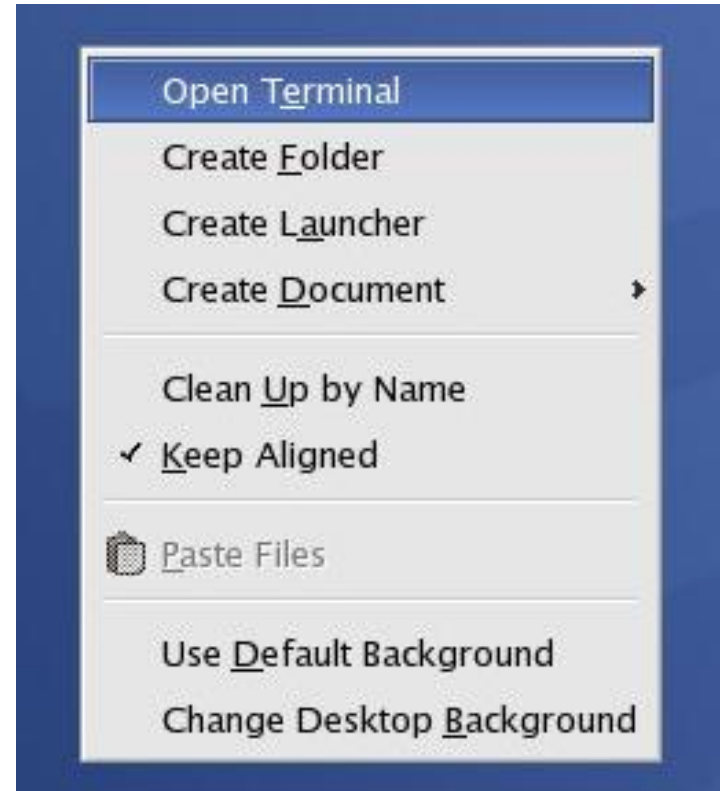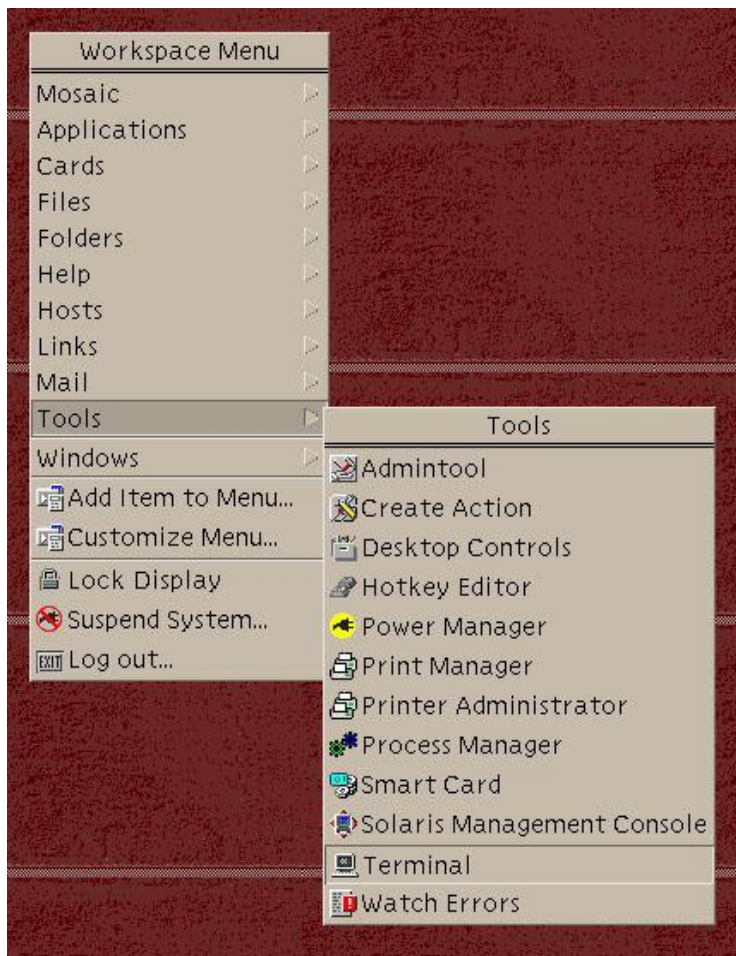
Why the Command line?

- Scripting:
  - If you have a set of commands you use over and over, you can put them in a text file and then run the whole text file as a command.
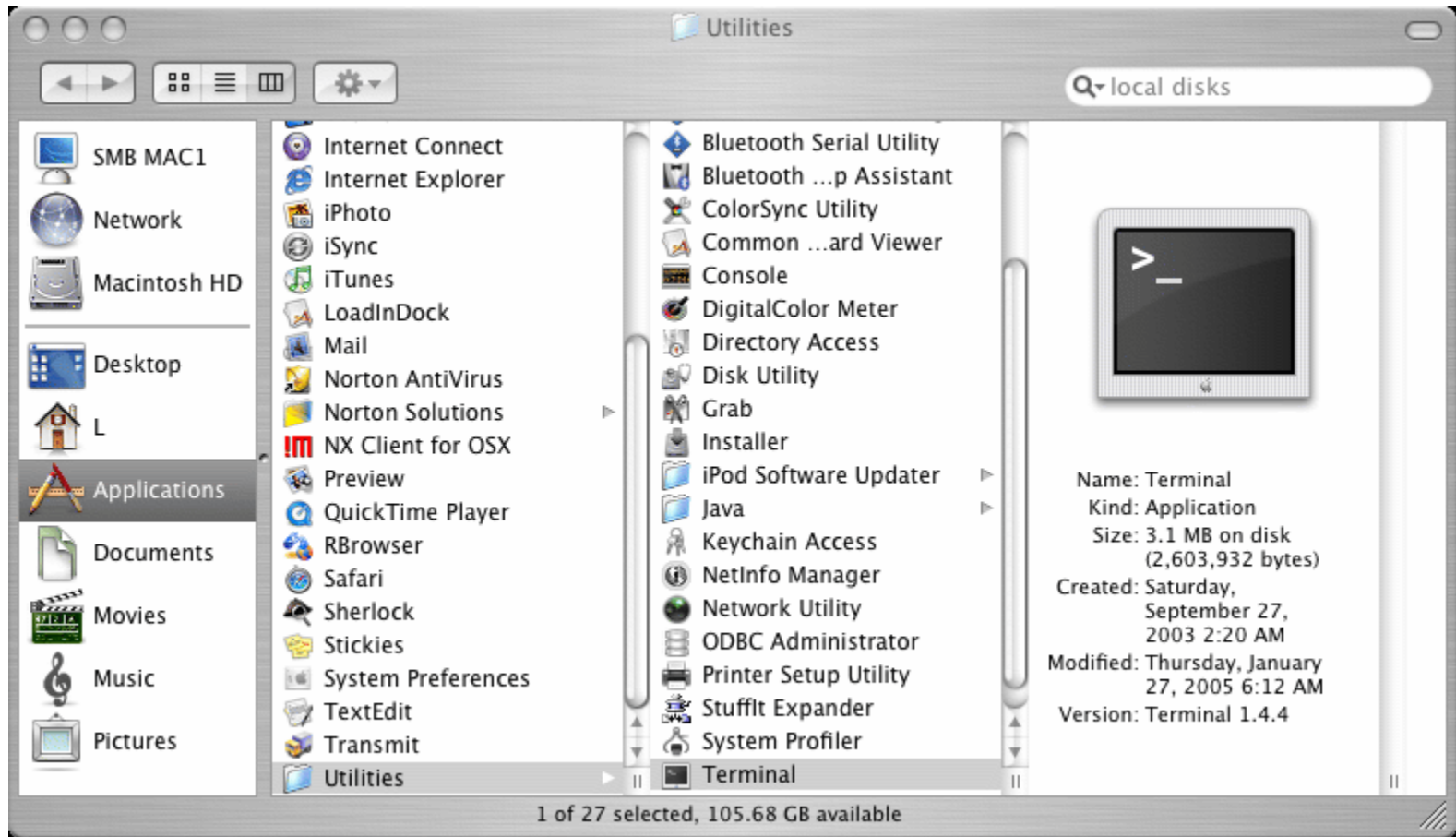
Open Command Prompt

- Several Possibilities:
  - Right click on screen, choose "open terminal" or "command prompt" or console (or similar command) from right click menu
  - Look for dock or start menu item

Open Command Prompt

Open Command Prompt (Mac)

Five Important Commands

- **cd** (change directory)
- **ls** (list files and directories)
- **pwd** (print working directory)
- **cp** (copy)
- **rm** (remove)

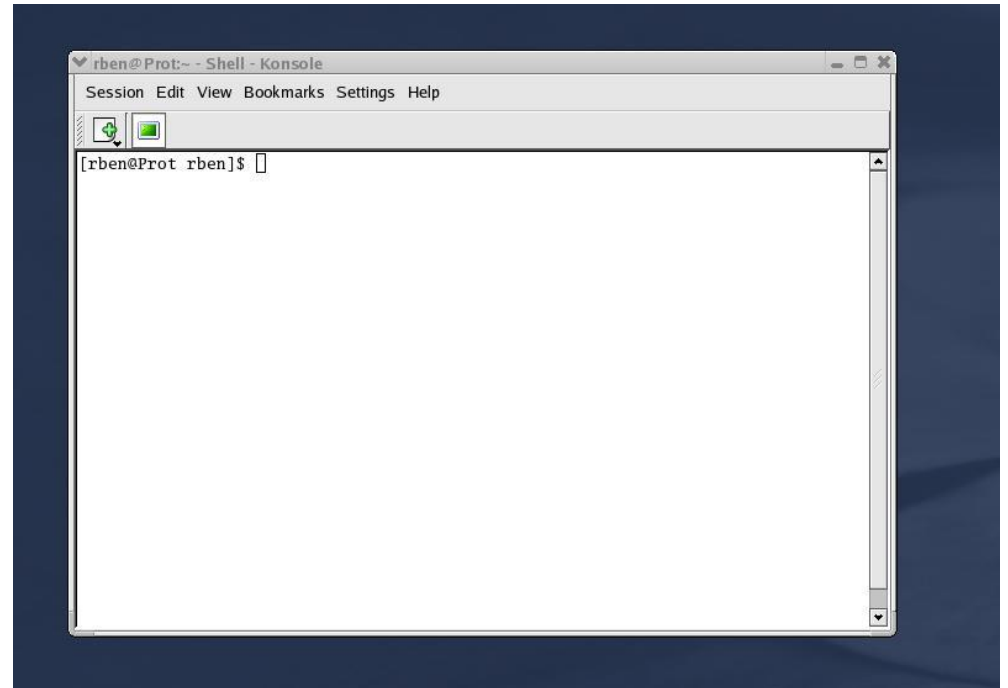# Close Command Prompt

- Type exit at the prompt (>):

>**exit**
  Case matters.

…Don't type

>**EXIT**

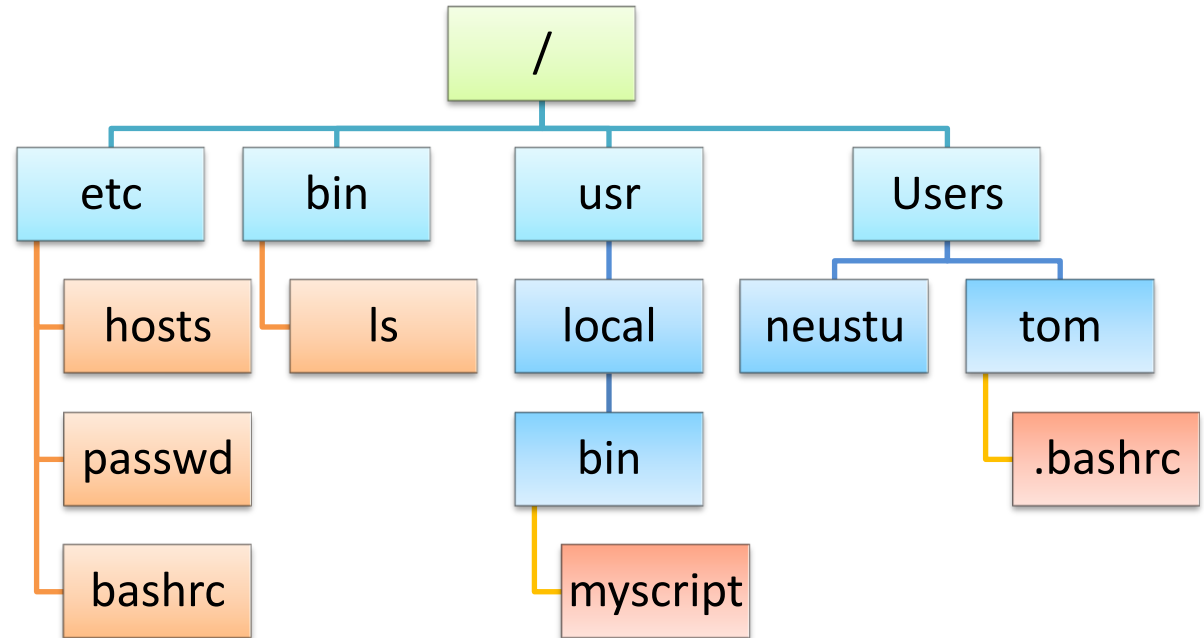(the x on the upper right corner should work too)

The Directory Tree

Organization and Paths

etc, bin and usr directories
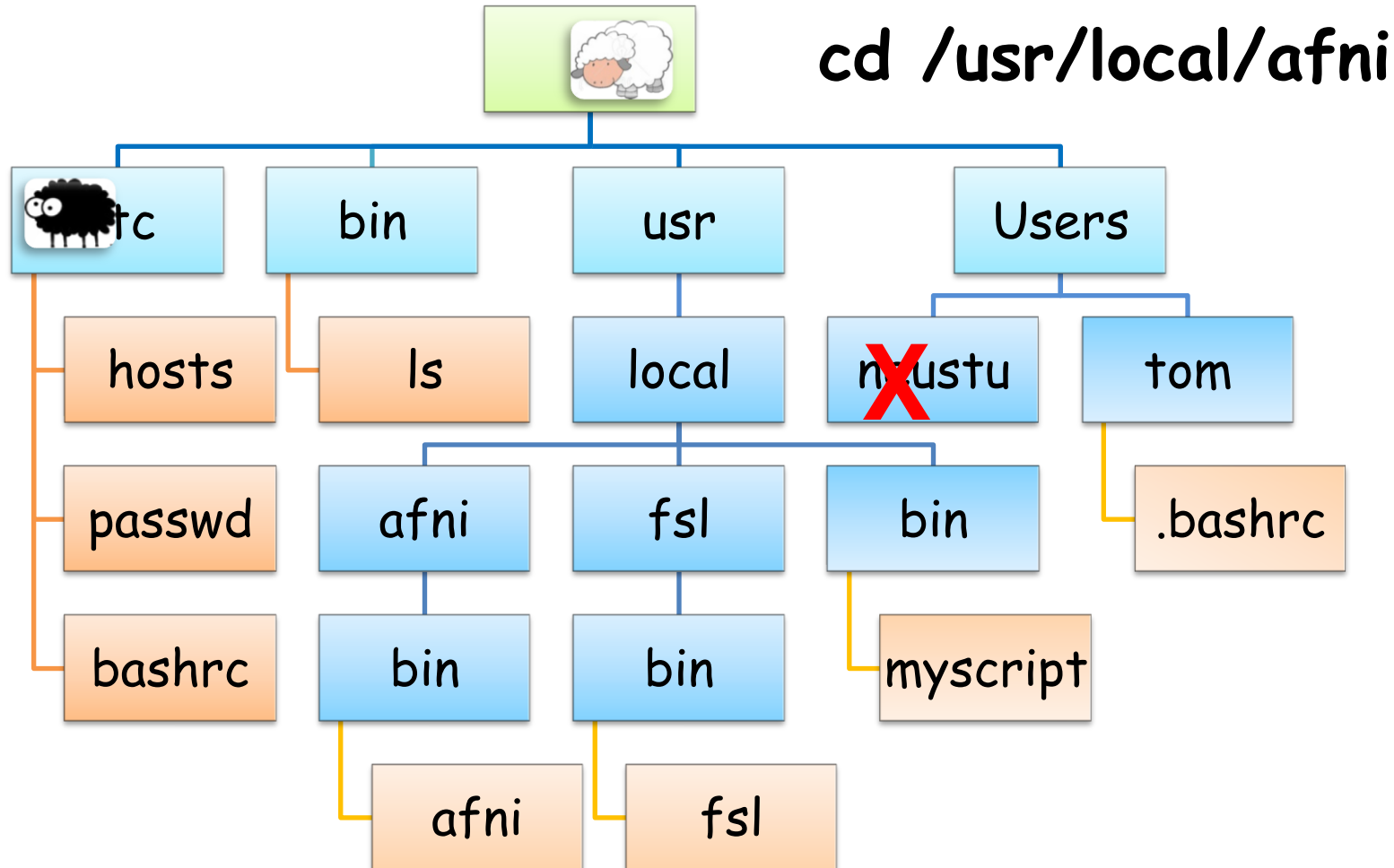occur on
all unix variants

The root is the top level of the directory tree

Files can occur in any directory.
A command is one kind of file.

```
/
├── etc
│   ├── hosts
│   ├── passwd
│   └── bashrc
├── bin
│   └── ls
├── usr
│   └── local
│       └── bin
│           └── myscript
└── Users
    ├── neustu
    └── tom
        └── .bashrc
```

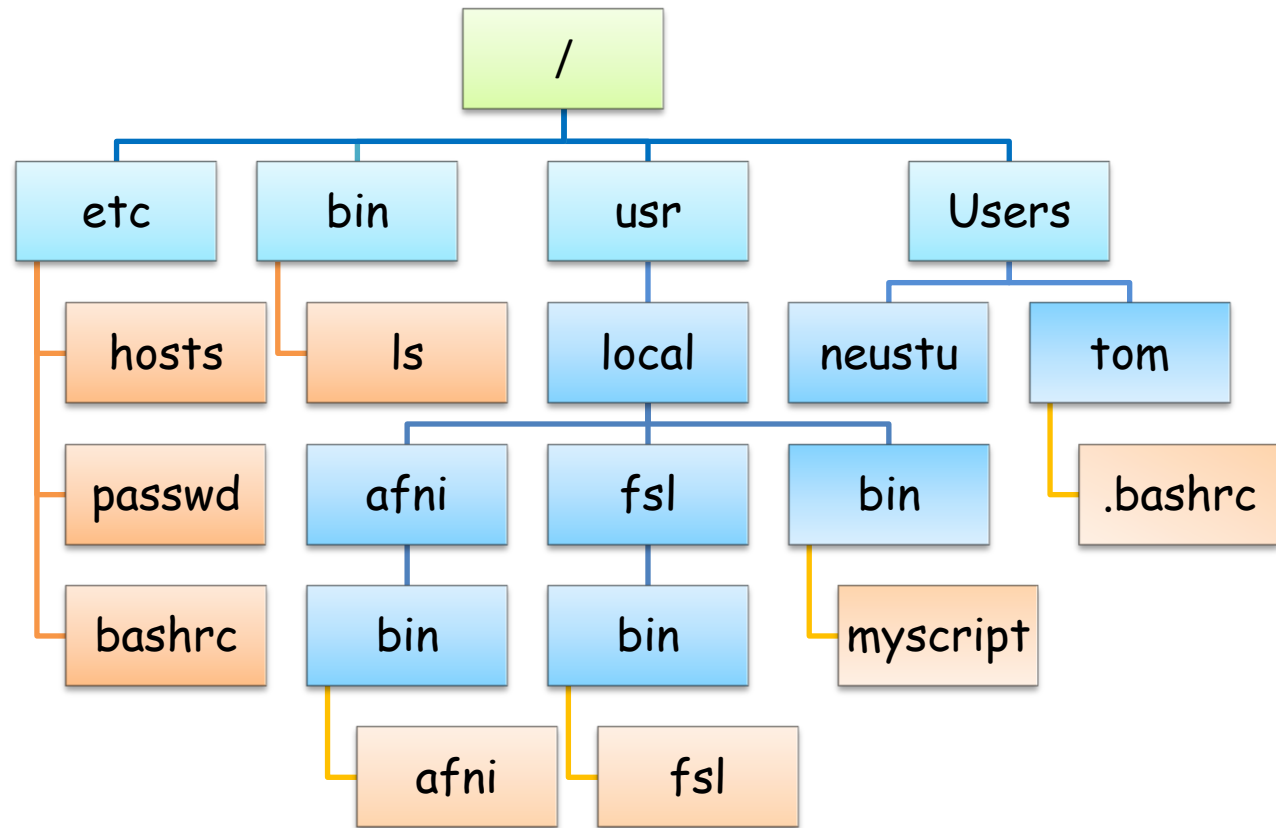# To move around in the tree, you MUST follow a path along the branches

cd /usr/local/afni

Which are good commands, and which are bad?
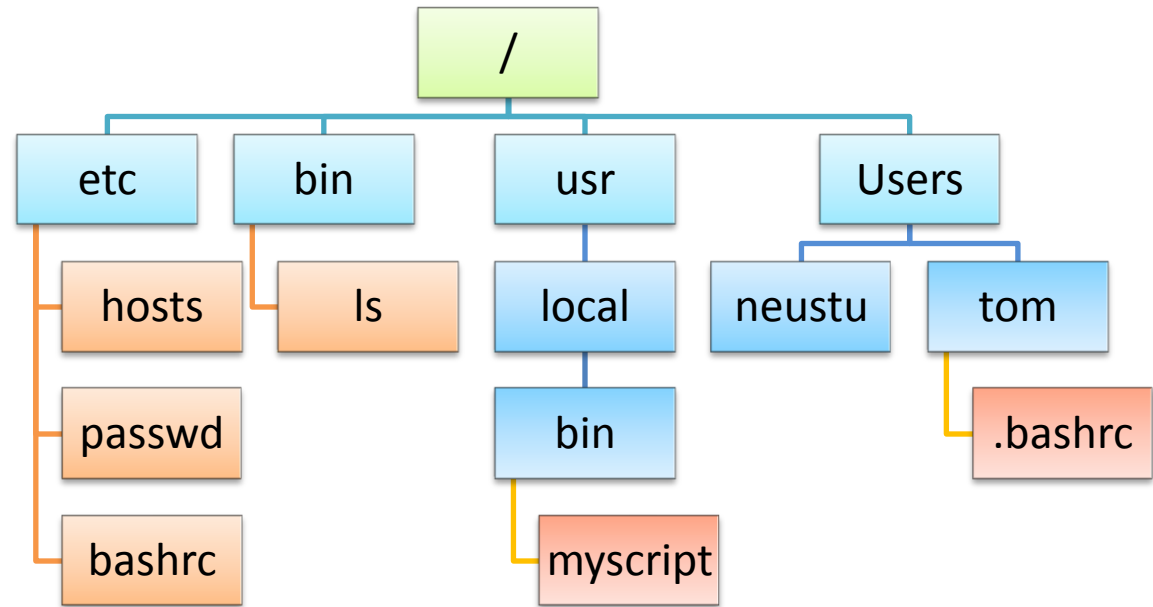cd /usr/local/fsl/bin
cd /etc
cd /etc/bin
cd /neustu/fsl/bin

- There are 2 kinds of paths:
  - Those that start at root
  - Those that start somewhere else

Absolute Path

- Starts **at** root, then follows a branch to get to some endpoint:
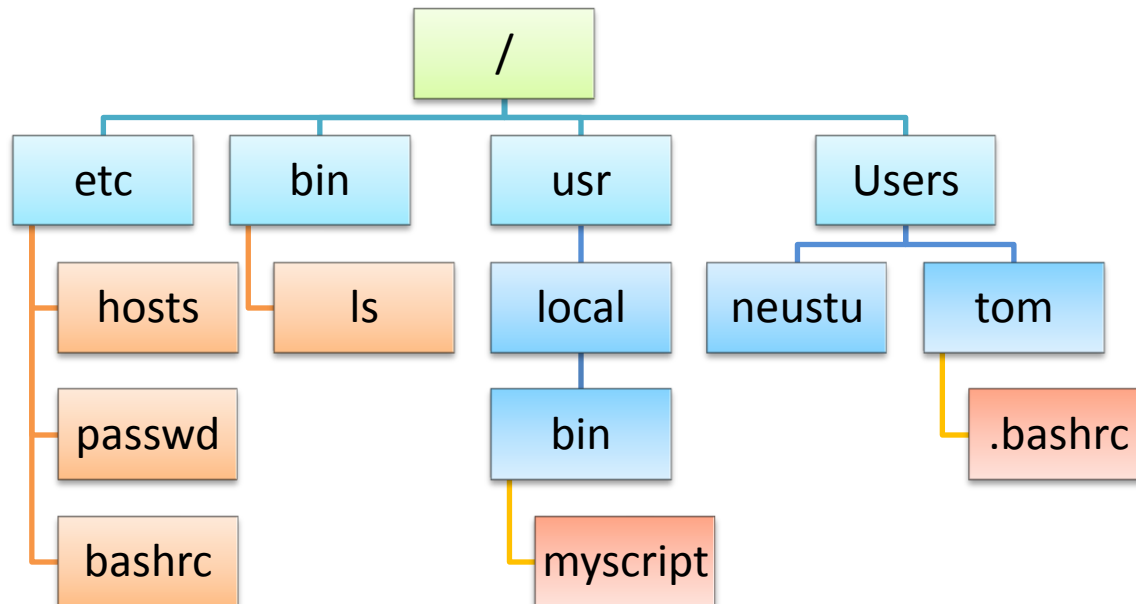- cd /usr/local/bin/
- cd /bin/

Relative Path

- Start **where you are**, specify branches to follow to get to some endpoint:

  >cd local/bin (from usr)

  >cd bin (from local)

  A relative path does NOT start with /

Summary

- The commandline can be very powerful
- To use the commandline, you must understand
  - how to start the terminal window
  - the directory structure
  - several commands
  - absolute and relative paths

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