Crashing into EECS like a wrecking ball

Pat Pannuto / **Cameron Gagnon**

Quick Poll

Quick Poll

Mac -- Windows -- Linux

Quick Poll

Mac -- Windows -- Linux

Terminal/command line

Quick Poll

Mac -- Windows -- Linux

Terminal/command line

SSHed into CAEN

Quick Poll

Mac -- Windows -- Linux

Terminal/command line

SSHed into CAEN

Git

Quick Poll

Mac -- Windows -- Linux

Terminal/command line

SSHed into CAEN

Git

Vi/Vim or Emacs

Linux/Unix: What is it?

Linux/Unix: What is it?

Unix

- Proprietary (think: costs money, closed source)
- Kernel + GUI pieces + everything else that comprises an OS
- Comes from specific vendors
- Ex. Solaris

Linux/Unix: What is it?

Unix

- Proprietary (think: costs money, closed source)
- Kernel + GUI pieces + everything else that comprises an OS
- Comes from specific vendors
- Ex. Solaris

Linux

- Open sauce kernel developed by Linus Torvalds and fam (not actually family)
- Technically just kernel (no GUI or commands)
- GNU (GNU's not Unix) + Linux == OS
- Ex. Ubuntu is built on top of Debian which is built on top of Linux

Linux/Unix: What is it?

Unix

- Proprietary (think: costs money, closed source)
- Kernel + GUI pieces + everything else that comprises an OS
- Comes from specific vendors
- Ex. Solaris

Linux

- Open sauce kernel developed by Linus Torvalds and fam (not actually family)
- Technically just kernel (no GUI or commands)
- GNU (GNU's not Unix) + Linux == OS
- Ex. Ubuntu is built on top of Debian which is built on top of Linux

EECS 482 for more background on what a kernel and OS is

If you are ever wondering what to do with those extra engineering prints

Enough talk, let's play

Fire up a terminal

Enough talk, let's play

Fire up a terminal

- What is this?

Enough talk, let's play
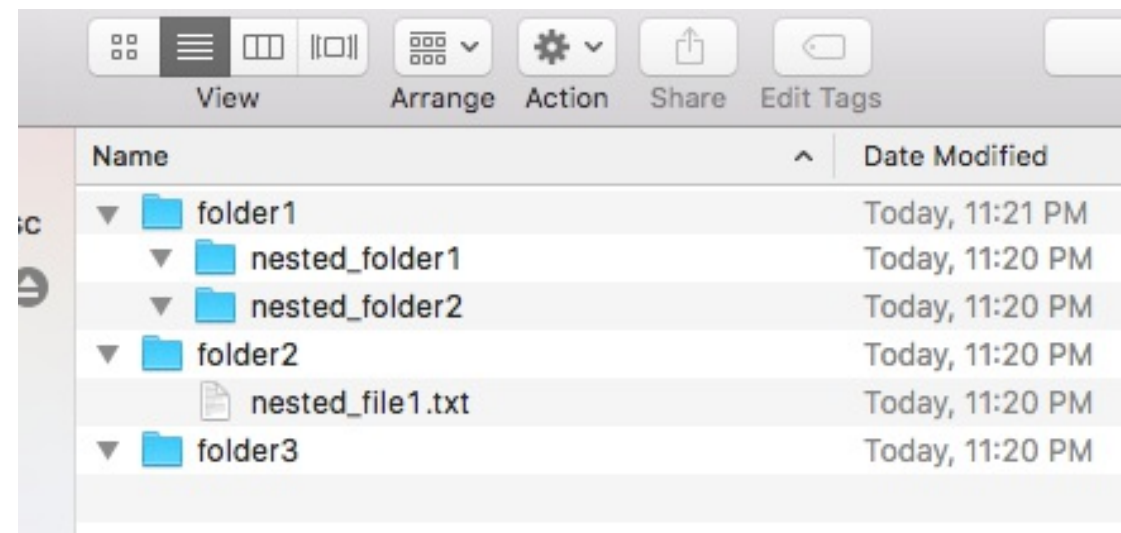
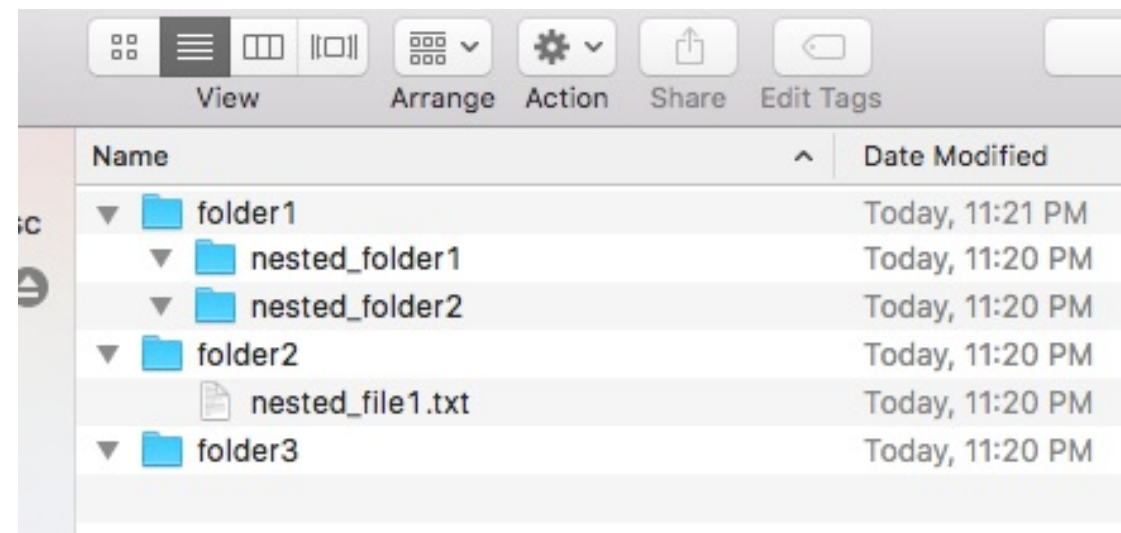## Fire up a terminal

- What is this?

- Not magic

Enough talk, let's play

Fire up a terminal

- What is this?

- Not magic

Two images of the same directory structure

Finder

Terminal

Enough talk, let's play

Fire up a terminal

- What is this?

- Not magic

Two images of the same directory structure

Finder

Terminal

We'll hit up our friend `tree` later, he/she/it/tree is pretty cool

Let's play around a bit:

- `cd` `c`hange `d`irectory
- `pwd` `p`rint `w`orking `d`irectory
- `ls` list files
- `mkdir` make directory
- `touch FILENAME` create an empty file if it doesn't yet exist
- `mv SRC_FILE DESTINATION` move file(s) around
- `rm FILENAME` remove files
- `rm -r DIRECTORY` remove directories

Still no clue…

Still no clue...

- What do you do when you have a question?

Still no clue...

- What do you do when you have a question?

- Ask for...

Still no clue...

- What do you do when you have a question?

- Ask for...

`help`!

Several ways of getting help

- `help CMD`

- `man CMD`

- `info CMD`

- `CMD --help` or `CMD -h` sometimes works

Knowing a bit about what's on this slide should help with a future homework...

But one towers over the rest…

But one towers over the rest...

...not really, but it's the most commonly used

But one towers over the rest...

...not really, but it's the most commonly used

`Man`ual

Opens a document with another command called `less`

- `q` (uit)
- `j` down one line at a time
- `k` up one line at a time
- `d` (own) half a page at a time
- `u` (p) half a page at a time
- `/searchPattern` ex. `/output`
- `n` (ext) occurrence of search
- `g` (o to) top of page
- `Shift` + `G` jumps to bottom of page

Still more commands, but not as commonly used

Let's explore a bit with `man`

- Might as well bring back our friend `tree`

Let's explore a bit with `man`

- Might as well bring back our friend `tree`

What if `man` pages didn't suck so much?

WARNING: TOO COOL COMMAND AHEAD!!!!

WARNING: TOO COOL COMMAND AHEAD!!!!

You've been warned. Proceed with caution

`tldr`

Too long; didn't read

- Use it the same way as `man`

To install

- Mac: `brew install tldr`
- Ubuntu: multiple methods
  - One option: `sudo apt install python-pip && pip install tldr`
  - Another: `sudo apt install npm && npm install -g tldr`
  - Otherwise refer to: https://github.com/tldr-pages/tldr

Take a minute and install it

`tldr`

Too long; didn't read

- Use it the same way as `man`

To install

- Mac: `brew install tldr`
- Ubuntu: multiple methods
    - One option: `sudo apt install python-pip && pip install tldr`
    - Another: `sudo apt install npm && npm install -g tldr`
    - Otherwise refer to: https://github.com/tldr-pages/tldr

Take a minute and install it

Try it out on a few commands. `tree`, `man`, even `tldr` itself

You've earned it

SSH and CAEN

Start out with a `man ssh` to feel our way around. Or better yet, try out `tldr ssh`

SSH and CAEN

Start out with a `man ssh` to feel our way around. Or better yet, try out `tldr ssh`

- `ssh uniqname@login.engin.umich.edu`

SSH and CAEN

Start out with a `man ssh` to feel our way around. Or better yet, try out `tldr ssh`

- `ssh uniqname@login.engin.umich.edu`

Cool! What's actually happening?

SSH and CAEN

Start out with a `man ssh` to feel our way around. Or better yet, try out `tldr ssh`

- `ssh uniqname@login.engin.umich.edu`

Cool! What's actually happening?

Let's make it easier

Add:

```
Host caen
    HostName login.engin.umich.edu
    User uniqname
```

to `~/.ssh/config`

SSH and CAEN

Start out with a `man ssh` to feel our way around. Or better yet, try out `tldr ssh`

- `ssh uniqname@login.engin.umich.edu`

Cool! What's actually happening?

Let's make it easier

Add:

```
Host caen
    HostName login.engin.umich.edu
    User uniqname
```

to `~/.ssh/config`

Now you can type `ssh caen` and give your password to login

git

Let's set up ssh keys with GitHub

- `ssh-keygen -t rsa -b 4096 -C your_email@example.com`
  - On Mac: `cat ~/.ssh/id_rsa_github.pub | pbcopy` (install `pbcopy`)
  - On Ubuntu: `cat ~/.ssh/id_rsa_github.pub` and then copy it to your clipboard
- Go to https://github.com/settings/keys
- Do *NOT* copy the `~/.ssh/id_rsa_github` key. That one is *private*

git

Let's set up ssh keys with GitHub

- `ssh-keygen -t rsa -b 4096 -C your_email@example.com`
  - On Mac: `cat ~/.ssh/id_rsa_github.pub | pbcopy` (install `pbcopy`)
  - On Ubuntu: `cat ~/.ssh/id_rsa_github.pub` and then copy it to your clipboard
- Go to https://github.com/settings/keys
- Do *NOT* copy the `~/.ssh/id_rsa_github` key. That one is *private*

Add this to your `~/.ssh/config` file:

```
Host github.com
    HostName github.com
    User git
    IdentityFile ~/.ssh/id_rsa_github
```

git

Let's set up ssh keys with GitHub

- `ssh-keygen -t rsa -b 4096 -C your_email@example.com`
  - On Mac: `cat ~/.ssh/id_rsa_github.pub | pbcopy` (install `pbcopy`)
  - On Ubuntu: `cat ~/.ssh/id_rsa_github.pub` and then copy it to your clipboard
- Go to https://github.com/settings/keys
- Do *NOT* copy the `~/.ssh/id_rsa_github` key. That one is *private*

Add this to your `~/.ssh/config` file:

```
Host github.com
    HostName github.com
    User git
    IdentityFile ~/.ssh/id_rsa_github
```

What if working with `git` didn't have to suck so much?

WARNING: TOO COOL COMMAND AHEAD!!!!

WARNING: TOO COOL COMMAND AHEAD!!!!

You've been warned. Proceed with caution

`scm_breeze` makes `git` life easier

- Check it out:
`https://github.com/scmbreeze/scm_breeze`

- Install it:

```
git clone git://github.com/scmbreeze/scm_breeze.git ~/.scm_breeze
~/.scm_breeze/install.sh
source ~/.bashrc   # or source ~/.zshrc
```

Let's mess around

You've earned it

Getting repos on CAEN

- Create a local repo `git init`
- Create a repo on GitHub https://github.com/new (give it whatever name you like)
- Follow the steps on GitHub for creating a new repo

Getting repos on CAEN

- Create a local repo `git init`
- Create a repo on GitHub https://github.com/new (give it whatever name you like)
- Follow the steps on GitHub for creating a new repo

- `ssh uniqname@login.course.engin.umich.edu`

Getting repos on CAEN

- Create a local repo `git init`
- Create a repo on GitHub https://github.com/new (give it whatever name you like)
- Follow the steps on GitHub for creating a new repo

- `ssh uniqname@login.course.engin.umich.edu`

Also check out https://c4cs.github.io/commands/Caen-Connect-Tutorial

Getting repos on CAEN

- Create a local repo `git init`
- Create a repo on GitHub https://github.com/new (give it whatever name you like)
- Follow the steps on GitHub for creating a new repo

- `ssh uniqname@login.course.engin.umich.edu`

Also check out https://c4cs.github.io/commands/Caen-Connect-Tutorial

For more cool ideas

- https://dotfiles.github.io/

Vim

Three main modes

- Insert (regular typing)
- Normal (issue commands to do things)
- Visual (highlight and select text)

Normal mode commands

- `:q` (uit)
- `:w` (rite)
- `j` down
- `k` up
- `gg` (go to top of file)
- `Shift` + `G` (go to bottom of file)
- `dd` delete line
- `yy` yank (copy) line

WARNING: TOO COOL COMMAND AHEAD!!!!

WARNING: TOO COOL COMMAND AHEAD!!!!

You've been warned. Proceed with caution

Another awesome trick

`z` - jump around

https://github.com/rupa/z

After you `cd` around a bit, `z` builds up a database that lets you quickly jump to where you need to go

- ex. `z 398` takes you to your `398` folder

Another awesome trick

`z` - jump around

https://github.com/rupa/z

After you `cd` around a bit, `z` builds up a database that lets you quickly jump to where you need to go

- ex. `z 398` takes you to your `398` folder

How to install

- On Mac with `brew`:
  - `brew install z`
- On Ubuntu:
  - `git clone https://github.com/rupa/z ~/z`
  - `echo ". ~/z/z.sh" >> ~/.bashrc`

You made it!