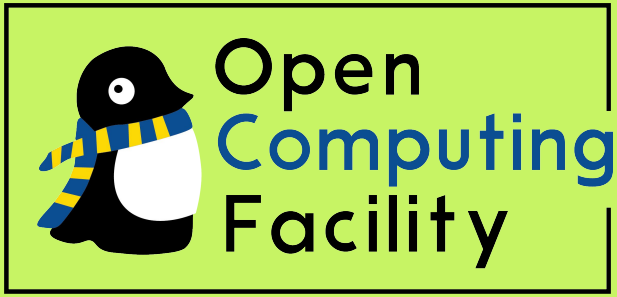


Intro to Linux and OSS

Lecture 1

btorres, trinityc

Topics today

- Course logistics
- Intro to the shell
- What is UNIX?
- Free and Open Source Software

Logistics

- **Lab01** and **Vitamin01** released and due Saturday, 9/9
- You should have access to **Ed** and **Gradescope**
  - Let us know if you do not!
- Lecture slides, recording, and lab will all be posted at decal.ocf.io

Engaging with this lecture

- Connect to the shell (follow along!)
  - `ssh $OCF_USERNAME@ssh.ocf.berkeley.edu`
  - I'll do a demo in a minute!
- Ask questions!
  - During live sessions
  - On #decal-general

Shell

- **What is the shell?** A command line-interface (CLI) to interact with the computer.

- Common shells: bash, zsh, fish
  - They’re mostly the same, (bash will be supported by almost all UNIX systems though).

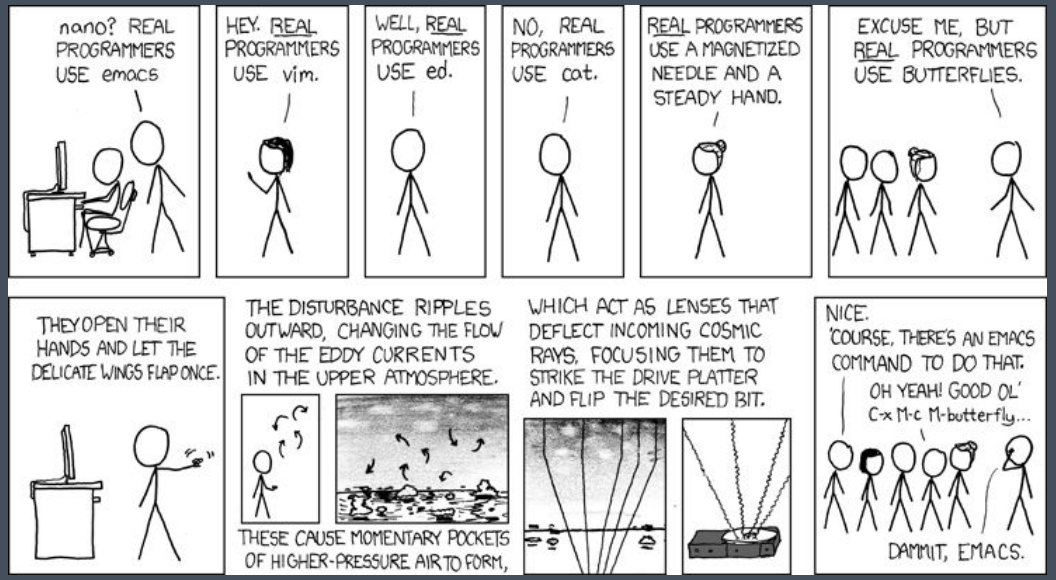
Shell Commands

- Basic structure of a command is `[command] [flags] [arguments]`
- RTFM! `man (command)`
- Google is also your best friend.

Common Shell Commands

- `cd` - change directory
- `ls` - list directory
- `cat` - concatenate and print files
- `head` - read the first 10 lines
- `less` - read larger files
- `mv` - move
- `cp` - copy
- `rm` - delete a file

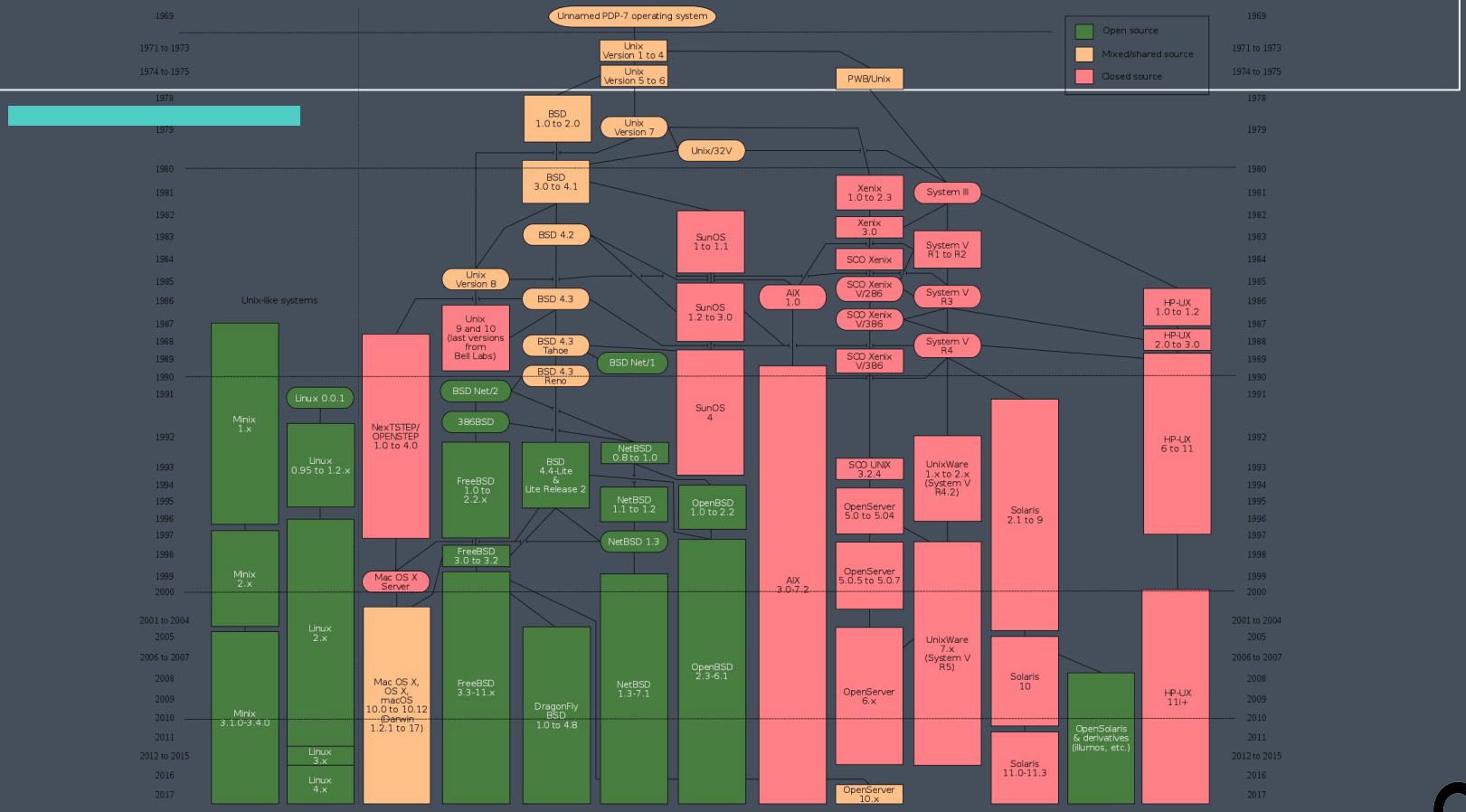
Editors



- Nano
- Vim (`vimtutor`)
- Emacs (Emacs Tutorial)
- Try running `(editor of choice) (file)
- Try searching “vi” or “emacs” on google

Demo

Evolution of UNIX



Open Source Software (OSS)

Free and Open Source Software (FOSS)* or *Free/Libre Open Source Software (F/LOSS)

“Free as in beer, and free as in freedom”

Open source software - term used by some software and technology companies. You may not have the right to use, modify, or redistribute the software or source code.

GNU and the Free Software Movement

“So that I can continue to use computers without violating my principles, I have decided to put together a sufficient body of free software so that I will be able to get along without any software that is not free.”

Richard Stallman (1983)

https://groups.google.com/forum/#!msg/net.unix-wizards/8twfRPM79u0/1xlglzrWrU0J

GNU and the Free Software Movement

“So th uters
witho ve
decid body of
free s get
along ot free.”

Richard

https://groups.google.com/forum/#!msg/net.unix-wizards/8twfRPM79u0/1xlglzrWrU0J

The Four Freedoms

1. The freedom to run the program as you wish, for any purpose.
2. The freedom to study how the program works, and change it so it does your computing as you wish. Access to the source code is a precondition for this.
3. The freedom to redistribute copies so you can help others.
4. The freedom to distribute copies of your modified versions to others. By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

What is free software? by the Free Software Foundation

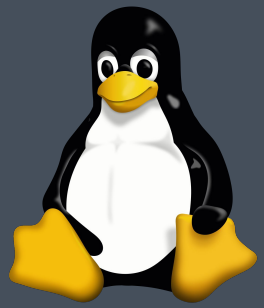
Berkeley Standard Distribution

- A UNIX derivative (BSD) was created at UC Berkeley
- Popular and reliable, a lot of things from BSD are used today
  - vi and Berkeley sockets
- Stuck in legal limbo w/ AT&T
- BSD derivatives still remain popular (MacOS, FreeBSD, OpenBSD)

Unix’s advantages over non-Unix systems

- UNIX philosophy: simple, short, clear, and modular code
- UNIX idea: “everything is a file”
- Worse is better.
- Sockets for networking, now copied beyond Unix systems
- “It’s very simple — you read the protocol and write the code.” - Bill Joy on implementing TCP/IP

Why FOSS?



- Security
- Cost
- Privacy
- Control
- Collaboration

OSS Licenses: Legal Jiggery-Pokery

- Copyleft (GPL)
  - “I want to make sure that all versions of GNU remain free.” - Stallman (GNU Manifesto)
  - “a cancer that attaches itself in an intellectual property sense to everything it touches” - Steve Ballmer
- Permissive (MIT, BSD, Apache, WTFPL)
  - Do whatever you want (basically)
- choosealicense.com/licenses

(even more) Demo

Additional Resources

Resources on learning:

- *How to ask good questions* by Julia Evans
- *How to teach yourself hard things* by Julia Evans

Technical resources:

- ArchWiki
- The Linux System Administrator's Guide from The Linux Documentation Project
- The Debian Administrator's Handbook by Raphaël Hertzog and Roland Mas

Fun reads about UNIX history and culture:

- In the Beginning was the Command Line by Neal Stephenson
- About the GNU Project by the Free Software Foundation
- Philosophy of the GNU Project by the Free Software Foundation

GOOGLE.COM

(even more)*2 Demo