

CSCI 274 - Intro to Linux OS

Max Gawason (maxgawason@mines.edu) [A]

Rocco Marchitto (rmarchitto@mines.edu) [B/C/D]

About Max

Education

- BSc in Computer Science (Mines 18-21')
- Pursuing MSc in Computer Science (Mines)



Experience

- Software Engineering Intern at Xetawave
- Software Development Engineering Intern at AWS (Amazon FSx)



Hobbies

- Rock climbing
- Keyboards
- Cooking



About Rocco

Education

- BSc in Computational & Applied Mathematics (Mines)
- Pursuing MSc in Computer Science (Mines)

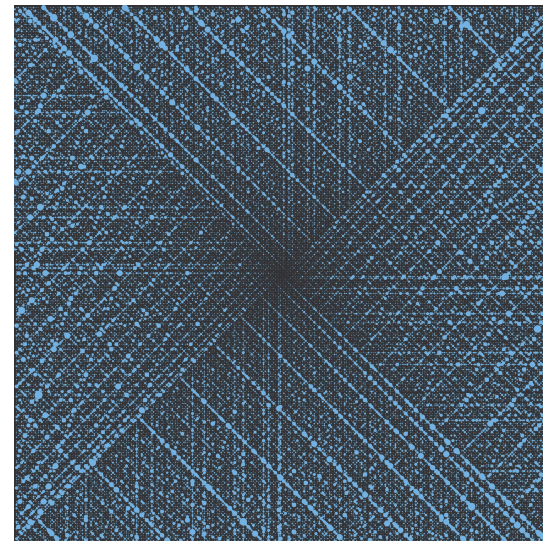


Experience

- Undergraduate research in discrete math w/ conference publication
- Various web design gigs

Hobbies

- Piano
- League of Legends
- Chess
- Recreational math



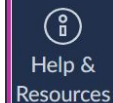
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Overview

1. Syllabus
2. What is Linux?
3. What is bash?
4. Linux “options”
5. Choose an Editor



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INTRO LINUX OS, Sec: A/B/C/D

Fall 21

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CSCI 274 : Intro to Linux OS - Sections A, B, C, & D

- Fall 2021

Course Syllabus

Lecture Times:

- Section A - W at 2:00 - 2:50 PM in Marquez Hall 022 with Max Gawason
- Section B - W at 3:00 - 3:50 PM in Coors Tek 130 with Rocco Marchitto
- Section C - F at 10:00 - 10:50 AM in Marquez Hall 022 with Rocco Marchitto
- Section D - F at 9:00 - 9:50 AM in Marquez Hall 022 with Rocco Marchitto

<https://elearning.mines.edu/courses/32727>

Proficiency Exam

- 70% or higher on the exam can be used as course credit
- You keep the grade that you get on the exam as your grade for the course
 - Can elect to take the course even if you pass
- 11 questions open ended
- 90 minutes total with 10 minutes of terminal time at the end
 - During terminal time you can run any command at the terminal as long as it doesn't access the internet or fire up a graphical user interface
- Exam: Tuesday 8/31 8:00pm-9:30pm

What is Linux?



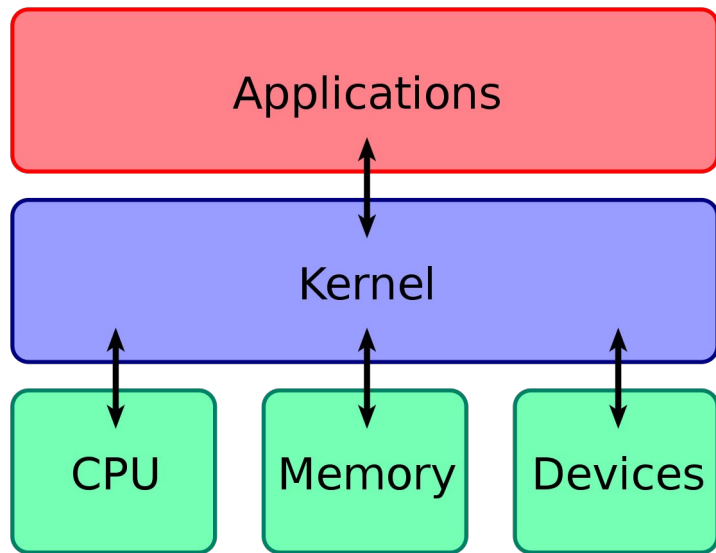
Linus Torvalds created Linux when he was a student at the University of Helsinki in the early 1990s.

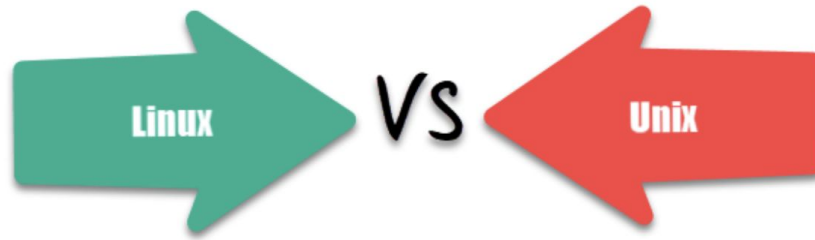
It is not a UNIX-derivative (it was written from scratch). Many of the commands found in Linux are also found in UNIX. UNIX was created by AT&T Bell Labs in the late 1960s.

What is Linux?

A Linux distribution is the Linux kernel and a collection of software together, creating an operating system.

A kernel is the layer between the application and hardware.





Linux	UNIX
Is open source meaning thousands of programmers collaborate online and contribute to its development	Commercial vendors have developed different versions
Can be installed on various types of devices like mobile, tablets, computers, etc.	UNIX is primarily used in internet servers, workstations, and PCs.
Easily portable and can be booted from a USB	Not as portable
Source code is available to the general public	Source code is not available to anyone
Can easily co-exist along with other Operating Systems	Designed for a slow computer system

Common Linux Distributions

 redhat	 MEPIS	 turbolinux	 LUNAR	 EvilEntity	 debian	 Vine Linux	 cAos/CentOS	 MiniKazit	 UTUTO
 archlinux	 m0n0wall	 jamd	 Knoppix STD	 gentoo linux	 DeLi Linux	 Hiweed	 amlug	 slackware	 yellow dog
 Fedora	 LPG	 PLD	 SLAX	 CORE! LINUX	 Progeny	 GEEBOX	 BIGLINUX	 FREEDUC	 Lycoris
 EnGarde	 Mandrakelinux	 BeatrIX	 Linspire	 suse	 中文延伸套件	 YOPER	 BearOps	 ASPLINUX	 kalango
 Slackintosh	 Frugalware	 Foresight	 Mint	 PCLinuxOS	 Haydar Linux	 sabayon	 ubuntu	 JULEX	 blag

What is bash?

The “Bourne Again Shell” (a derivative of the popular Bourne Shell)

A shell’s job is to interface with the Operating System.

A command language with a syntax derived from natural human language.

Features:

Command execution	Functions	Job control
Conditional logic	String manipulation	Maintenance
arrays/dictionaries	expansion	Sysadmin tasks
iteration/looping	Batch processing	Scripting

Other Shell Programs

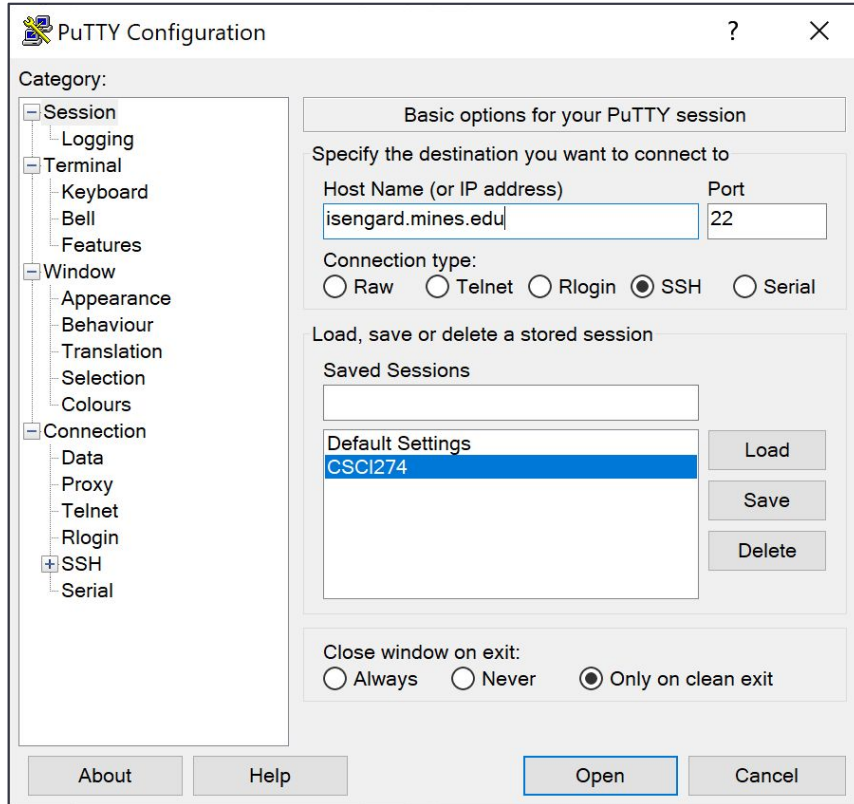
- ksh (KornSHell) - developed by David Korn at AT&T Bell Laboratories in the early 1980s. It is backwards-compatible with the Bourne shell and includes many features of the C shell.
- tcsh (“tee-see-shell”) - based on and compatible with the C shell (csh). It expands on csh with command-line completion, command-line editing, and a few other features. It is backwards compatible with csh.
- Zsh (Z shell) - used as an interactive login shell and as a command interpreter for shell scripting. It extends bash and includes features from ksh and tcsh.

<https://www.makeuseof.com/tag/best-linux-shells/>

Linux “options” on Windows

- **Remote Connection (PuTTY)**
- **Windows Subsystem for Linux**
- **Virtual Machine**

PuTTY



Is an SSH and telnet client. Can be installed on most operating systems.

Opens a terminal on **isengard.mines.edu** server. Login via campus wide username and password.

Terminal emulator is a program that opens a window and lets you interact with the shell.

First commands

- **man** - accesses the system **manuals**
 - Can be used to look up what a command does

\$ man [COMMAND]

- **exit** - terminates the current process
 - At the terminal this will exit your current bash session

\$ exit

Emacs vs. Vim

Emacs Pros:

- Customizable and extensible.
- Powerful editing capabilities.
- Mature integration with many free software programming tools.
- You never need to leave it because you can edit files, browse the web, and so on.

Emacs Cons:

- Questionable ergonomics. (AKA: Emacs Pinky Syndrome.)
- If you want to customize Emacs you'll need to learn Emacs Lisp which introduces a whole new learning curve.
- Not available everywhere by default. If you need to edit files on a system that you don't have root access to and emacs isn't installed, then you'll end up using vim. Lack of emacs availability is common for server installations.

Who Emacs Is For:

- Emacs is for people who want more than just a text editor as Emacs can be an “environment.” It's also for people who have a strong desire or need to customizations.

Emacs vs. Vim

Vim Pros:

- Vim serves one and only one purpose; to efficiently edit text.
- It's astoundingly powerful. Making complicated edits can be quick and easy.
- You can unlock unparalleled efficiency and speed with powerful features such as multiple file/window support, keyboard shortcuts for everything, macros, registers, quick command repetition, auto-completion, text objects, filters, and global substitutions.

Vim Cons:

- The learning curve often scares away new users.
- If you don't know what you're doing you'll look like an idiot. ("Who do I exit out of Vim?!?!?!")
- If you only ever need to perform super simple edits, Vim can be overkill.

Who Vim Is For:

- Vim is a must for Linux system administrators. It's also great for programmers because coding is mainly editing plain text files which Vim excels at. It's also ideal for anyone who works on the command line often or has to log into Linux servers. Really, Vim is for those who work with textual data of any type.

Due Dates

- Quiz 1 on “man” command due August 28 at 11:59pm
- Choose your Editor assignment due September 4
- Proficiency exam survey due Sunday August 29 at 11:59pm
 - The survey is under the quizzes tab in canvas at the bottom
- Proficiency exam on Tuesday August 31 from 8:00pm-9:30pm