

Introduction to Linux

...

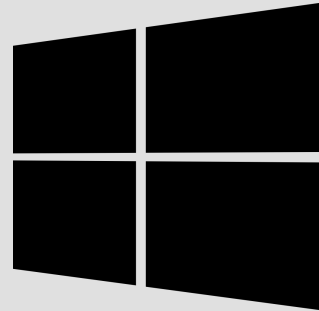
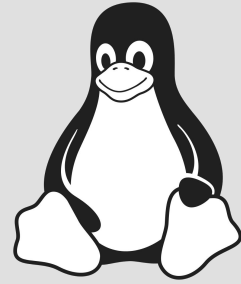
An important clarification

Outline

- What is Linux?
- Why do I care?
- How can I get Linux?
- What do I do next?

What is Linux?

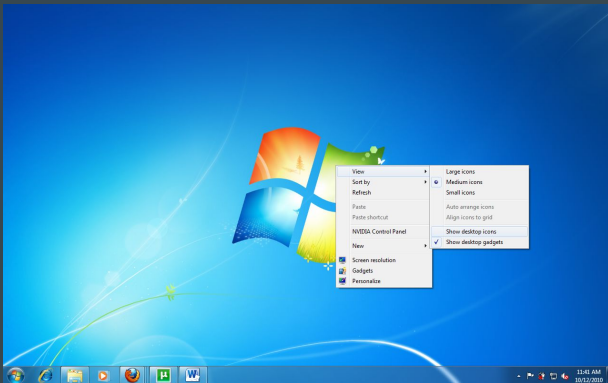
Linux is an operating
system.



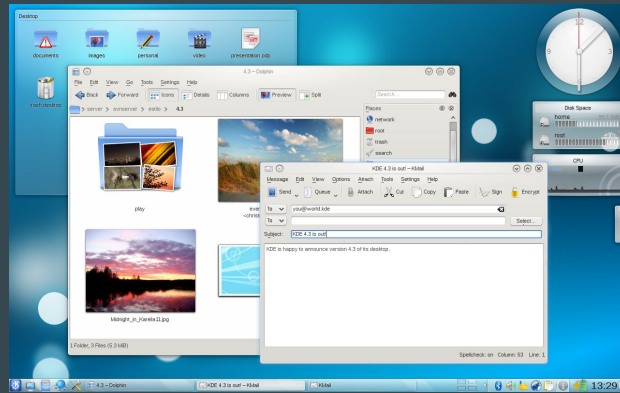
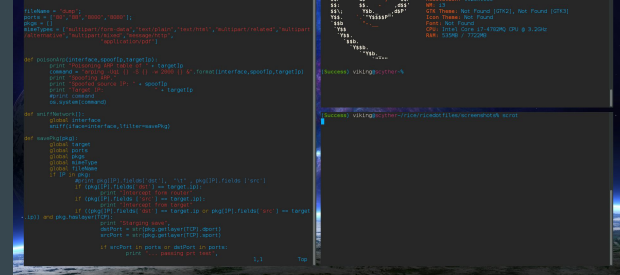
What is an operating system?

- Some people think that UI is part of an operating system, but that's not quite right

Windows



Mac OS



What does an operating system even do?

omg this "operating system" sure is helpful!

♥
your cool programs
♥

interface to the OS

hi keyboard, I see you're typing, I'll get those song lyrics to the right place

Want to send 1 GB of data over a sketchy network connection without any mistakes? I know TCP!

OPERATING SYSTEM

27 programs all want to use the CPU & I only have 4 cores. You'll have to take turns!

you plugged in a rubber duck shaped USB drive? I know how that works!

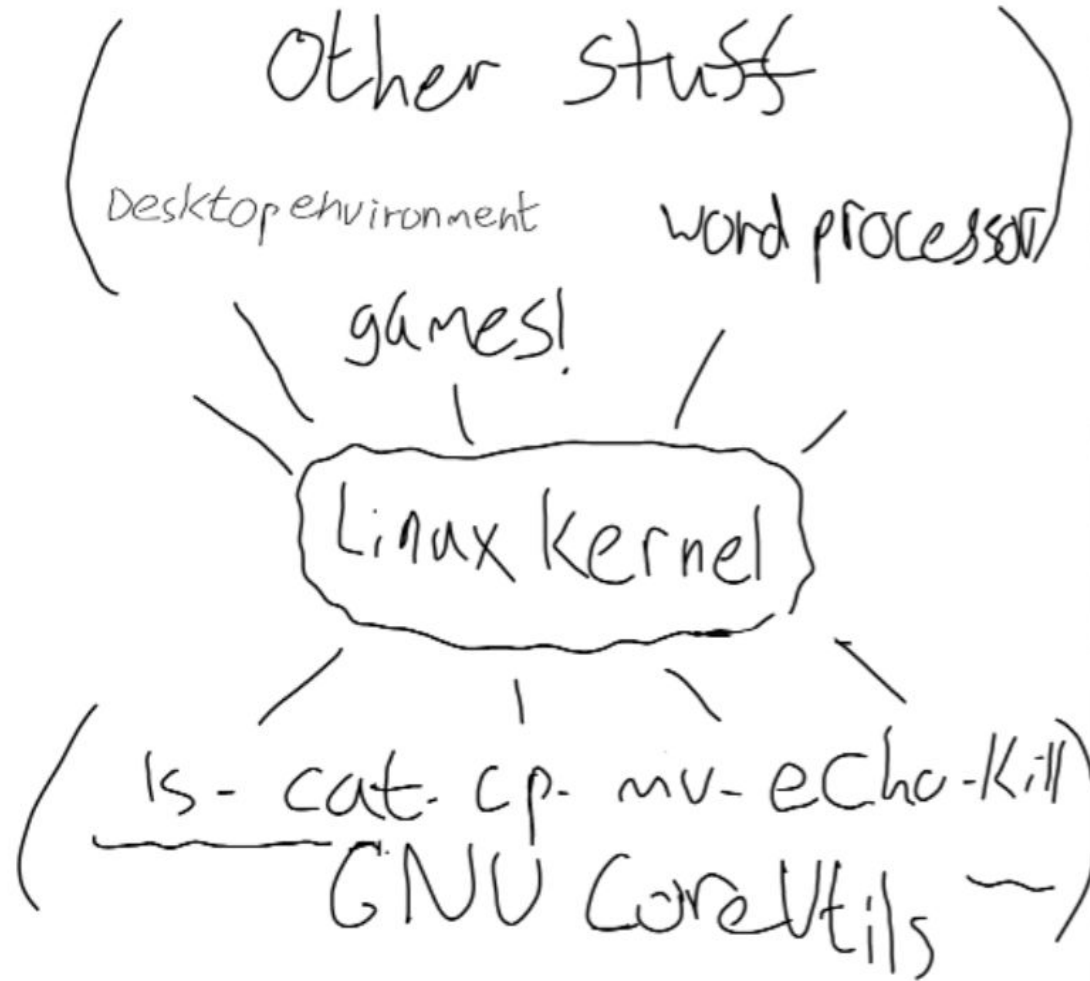
want to read a file? Boy can I help you! I know so many filesystems!!

I have 1.2 GB of RAM left on this machine if anyone wants it



JULIA
@b0rk
jvns.ca

Linux is actually
a kernel



Linux comes in *flavors* (*distributions*)

What are the **priorities** of the distro?

What software does it come bundled with?

- desktop environment
- office tools
- penetration testing utilities

I think that you should use:

Distribution	Priorities
Ubuntu	User-friendliness
Linux Mint	Being better than Ubuntu
Arch Linux	Minimalism
Manjaro	Being easier than Arch
Debian	Stability and reliability
Fedora	I'm not really sure
Elementary	Looking like a Mac

What's the point?

Who needs more than two operating systems anyway?

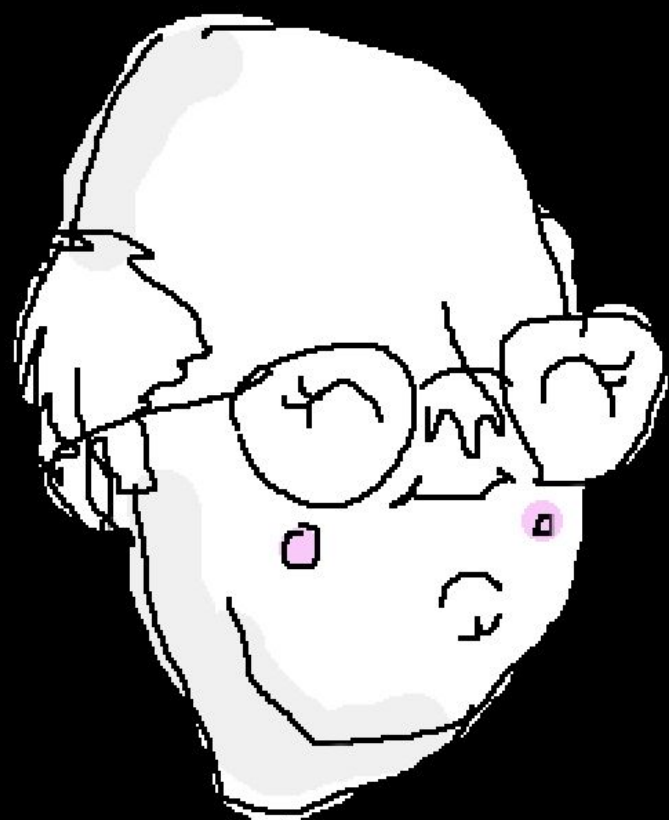
Historical Aside



Unix was released
around 1975 by
AT&T Bell Labs

It was later licensed

Ken Thompson and Dennis Ritchie at the PDP-11



minix 1987
by TANENBAUM

4 year old Linus Torvalds saw Minix and created Linux 12 days later



According to legend, he was too small to reach the keyboard, so he built a robot that would type for him

Linux is free

- Free as-in free beer
- Free as-in free speech
 - Linux is really yours!

Here's the legal stuff

Last updated July 2015

MICROSOFT SOFTWARE LICENSE TERMS

WINDOWS OPERATING SYSTEM

IF YOU LIVE IN (OR IF YOUR PRINCIPAL PLACE OF BUSINESS IS IN) THE UNITED STATES, PLEASE READ THE BINDING ARBITRATION CLAUSE AND CLASS ACTION WAIVER IN SECTION 10. IT AFFECTS HOW DISPUTES ARE RESOLVED.

Thank you for choosing Microsoft!

Depending on how you obtained the Windows software, this is a license agreement between (i) you and the device manufacturer or software installer that distributes the software with your device; or (ii) you and Microsoft Corporation (or, based on where you live or if a business where your principal place of business is located, one of its affiliates) if you acquired the software from a retailer. Microsoft is the device manufacturer for devices produced by Microsoft or one of its affiliates, and Microsoft is the retailer if you acquired the software directly from Microsoft.

This agreement describes your rights and the conditions upon which you may use the Windows software. You should review the entire agreement, including any supplemental license terms that accompany the software and any linked terms, because all of the terms are important and together create this agreement that applies to you. You can review linked terms by pasting the (aka.ms/) link into a browser window.

By accepting this agreement or using the software, you agree to all of these terms, and consent to the transmission of certain information during activation and during your use of the software as per the privacy statement described in Section 8. If you do not



ENG

Back

Decline

Accept

Linux is secure-ish

Goodbye, viruses. Hello uninhibited torrenting.

Linux is for scientists

The language of Linux is increasingly spoken in Computer Science, Software Engineering, and Bioinformatics communities (etc. etc.)

Caveat 1: Mac OS often serves as a suitable substitute due to its status as a **Posix-compliant operating system**

Caveat 2: Some communities (notably, the **game-dev** community) do not widely use Linux

Linux is FUN!

(for tinkerers and control-freaks)

- If you're ever asking "can I configure *this*?" The answer is probably yes.
- Linux is really yours.
- Beware the rabbit-hole



I'm not *crazy*.
My reality is just
Different from yours.

- Cheshire Cat

How can I get it?

Two Ways

1. The safest -- a virtual machine
2. The fastest -- a dual boot

Which one is right for me?

Virtual Machine

- Hardware-compatibility
- Low-risk (encapsulation!)
- Simplicity

Dual-boot

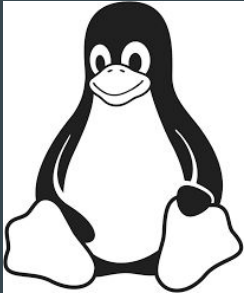
- It's way faster!
- Low-risk with a bit of caution
- Your data should be backed up to a secure location anyway!
- You **learn** from the process

- It's slower compared to a dual-boot

- It's less temporary than a VM
- Complexity

Installation: General Procedure

1. Choose your flavor
2. Download its ISO image
3. Flash the ISO to a USB (Unless installing on VM)
 - a. You can download a program called Unetbootin to do this
4. Configure and boot your host with the new OS



VM How-to (Please find an up-to-date and more complete tutorial to follow along)

Installation steps

1. Download and install virtualbox [virtualbox.org/wiki/downloads](https://www.virtualbox.org/wiki/downloads)
2. Download your OS of choice as an ISO file
3. Open virtualbox and create a new linux virtual machine
 - a. Default settings are probably good -- read the prompts and make choices
4. Boot into the new machine and select your ISO

Dual-boot how to (Please find an up-to-date and more complete tutorial to follow along)

1. Backup your data!
2. Download your chosen flavor of linux
3. Write it to a USB (or a CD if you have a time-machine to the 90's)
4. Reboot into the USB (shouldn't be tricky, but can be)
5. Try it out for a little, or install it
6. Partition your disk! Oooh scary!

Aside 1: SSH/PuTTY

- Allows you to connect to a linux computer via the internet
- SSH works for Mac users, PuTTY is a program for Windows users to download
- If you are in a class that uses `eecs-lab1.case.edu` then you can use that
- Otherwise, go to `acm-people.case.edu` and follow along!

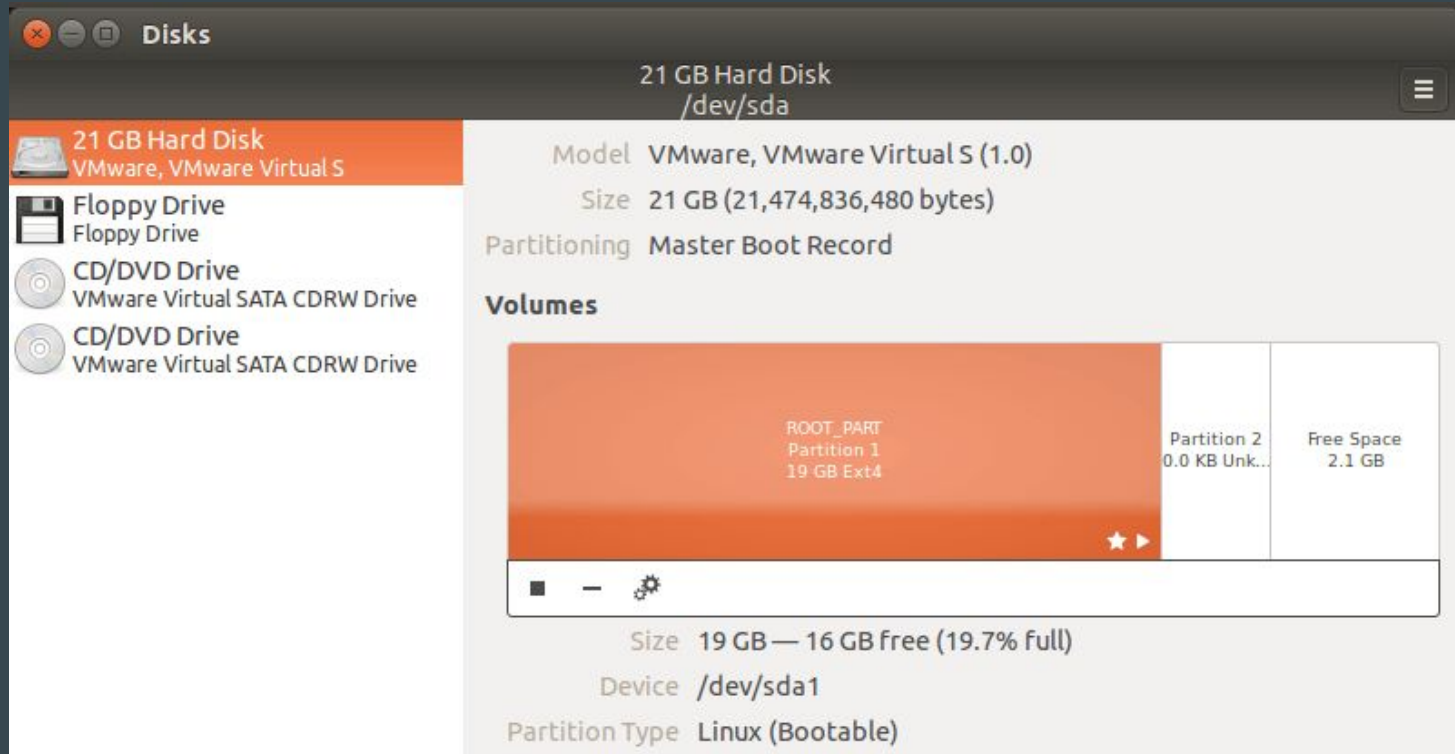
Aside 2: Disk partitioning... like, what?

Disk partitioning: the creation of one or more regions on a hard disk, so that an operating system can manage information in each region separately.

ie...

Your hard drive can be divided into sections. This lets you dual-boot, among other things.

Disk partitioning... like, what?



Partitioning confusions

- **Vocab:**
 - **sda, sda1, sdb**
 - S device a, S device b
 - **Mount and unmount**
 - **GPT vs MBR**
 - These are disk interfaces and disk interface standards. **GPT** is the current standard, forget about MBR
 - **EFI vs BIOS**
 - See above - forget about bios
 - **EXT4, NTFS, FAT32, swap**
 - Filesystem types
 - **Bootloader**
 - Grub, etc.

Let's make partitioning simple

Easiest: all in one

My system:

4gb swap, 40gb root, the rest home.

Tadah! It's installed! Now what?

Linux - next steps

Configure it:

- cosmetically
- functionally

Get to know your package manager (apt-get, pacman, dpkg)

Learn bash

Learn a text editor

Additional Resources, Bibliography, and Interesting Stuff

- drawings.jvns.ca
 - drawings.jvns.ca/proc/
 - drawings.jvns.ca/wizard-programmer
- wiki.archlinux.org/
- hacsoc.slack.com
- Lessons Learned from 30 Years of MINIX
 - Andrew S. Tanenbaum
 - <http://bit.ly/1T6bEqD>
- Fat - What is open source? (and why do I feel so guilty?)

Welcome to Hacker Society

Today's talk: Intro to Linux

Starting Time: 7:30ish