

The Fundamentals of Linux

Caleb Meyer

Agenda

- What is Linux?
- Read 400 **man** pages
- Writing your first printer driver
- 10 flavors of awful C code
- Common pitfalls with shell scripting
- What to do when Linux crashes
- The best way to shave a yak
- Linus Torvalds: the man, the myth, the legendary ego

The ~~Fun~~ of Linux

AKA “How to Train
your Penguin”



Me



My Journey



My Journey



My Journey



My Journey



My Journey





Your PC ran into a problem and needs to restart. We're just collecting some error info, and then we'll restart for you.

25% complete



For more information about this issue and
possible fixes, visit
<http://windows.com/stopcode>

If you call a support person, give them this info:
Stop code: CRITICAL_PROCESS_DIED

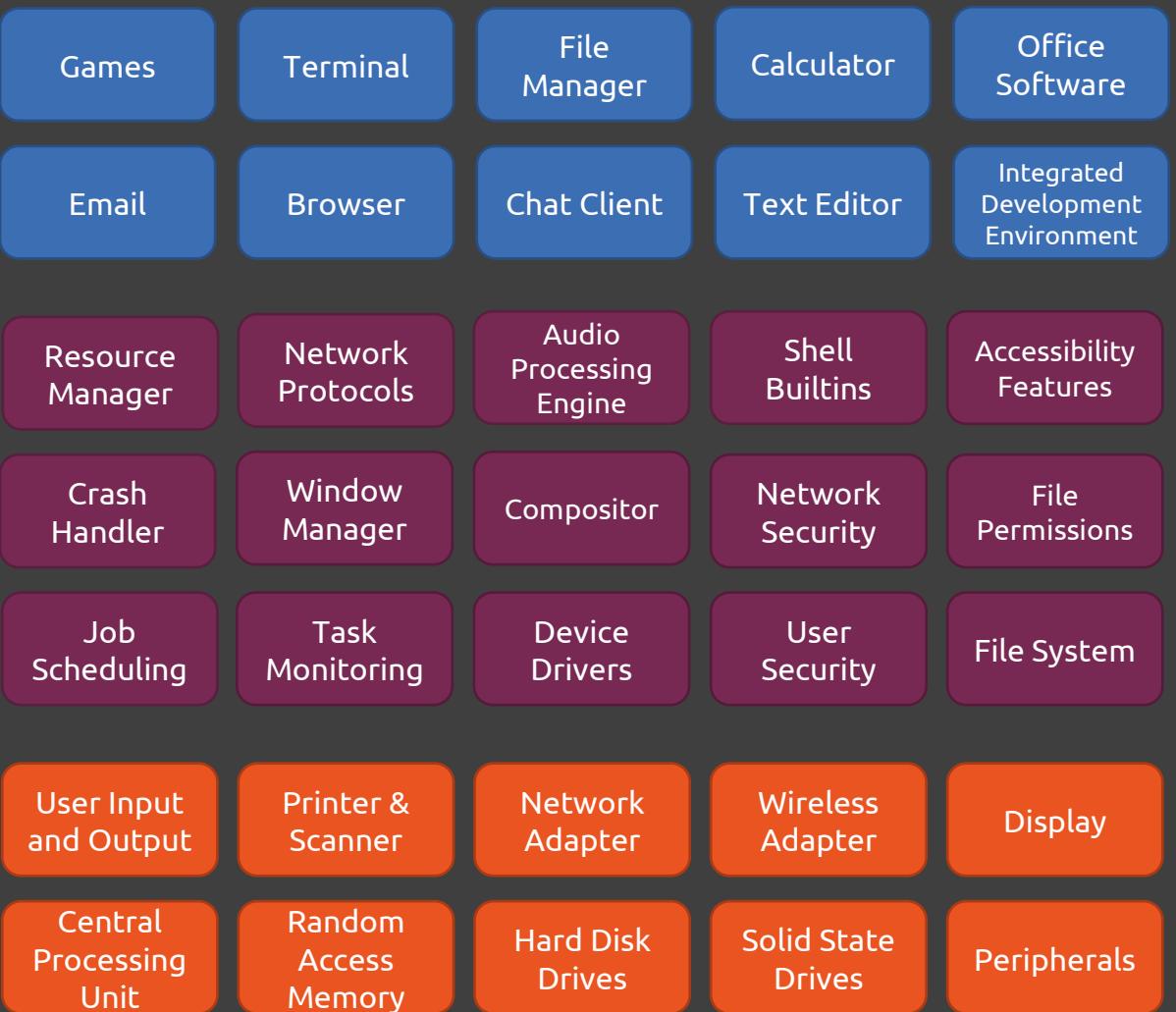
My Journey



Linux

Linux?

Operating Systems



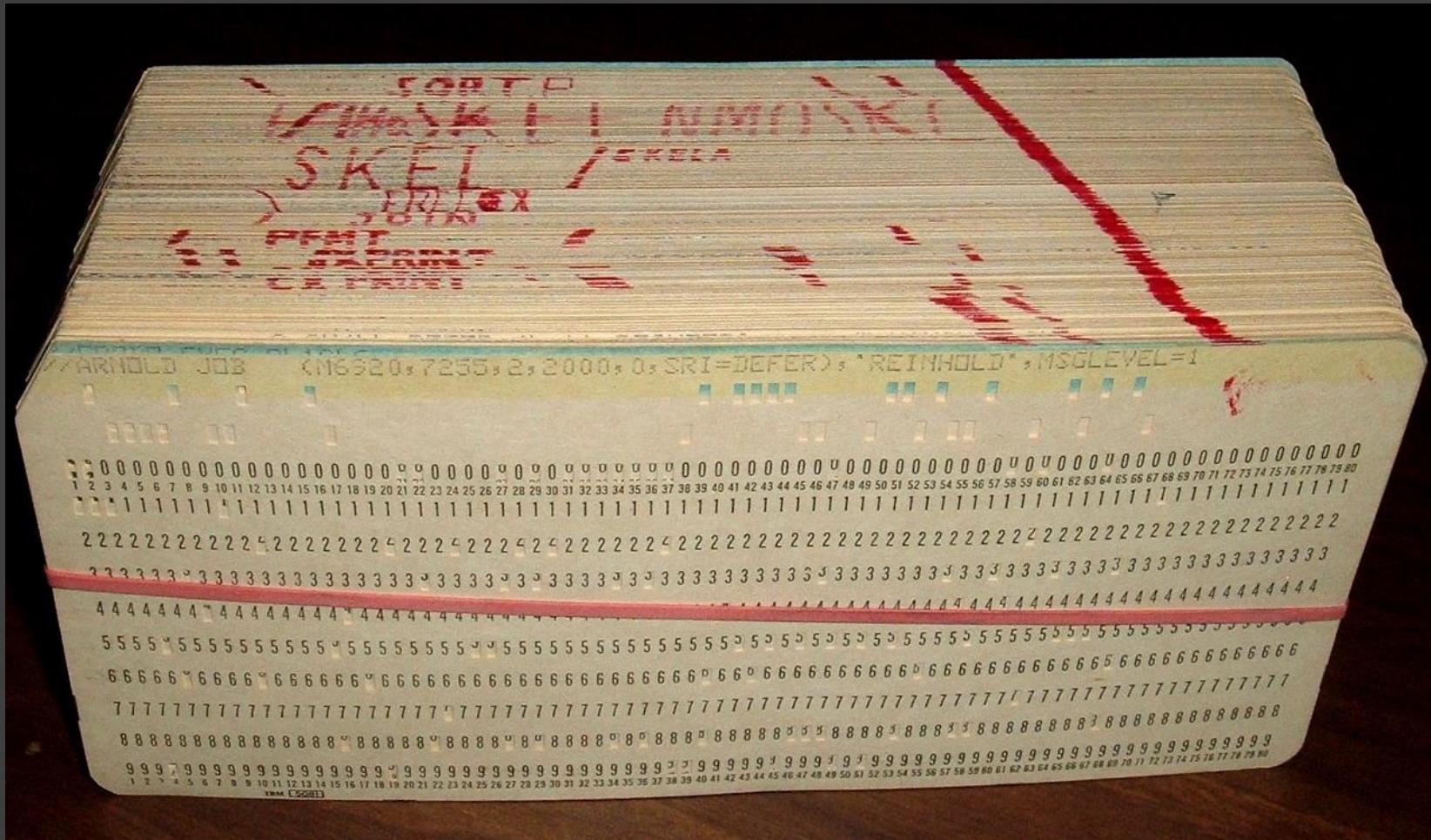
Operating Systems

Software

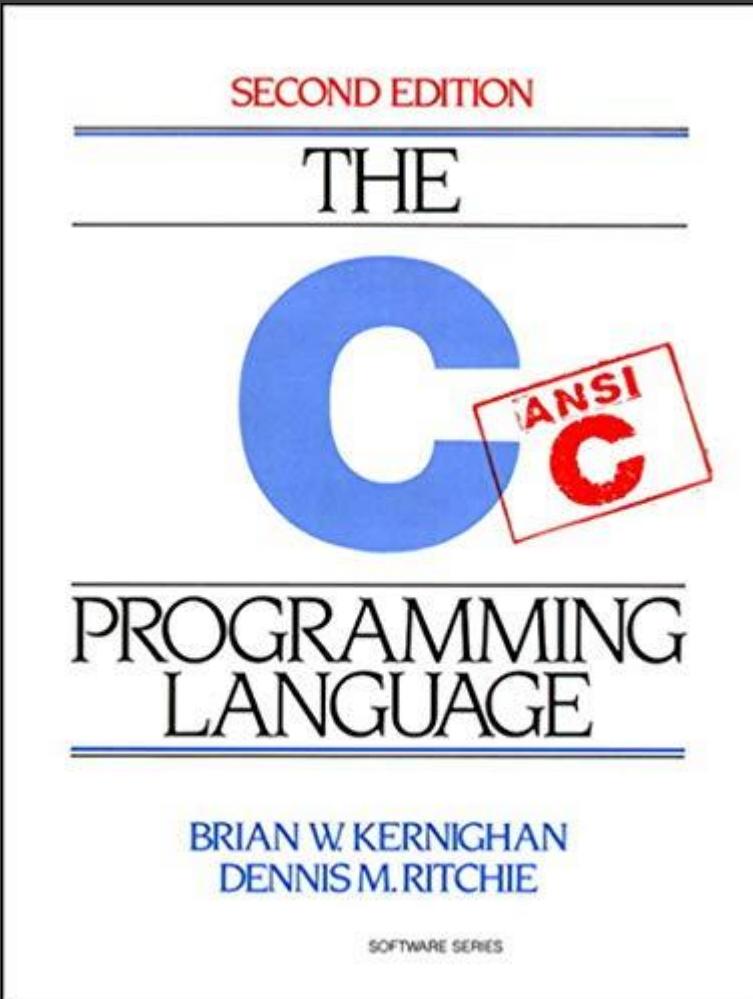
Operating System

Hardware

History



History



A PDP-7

Open Source and The FREE SOFTWARE FOUNDATION



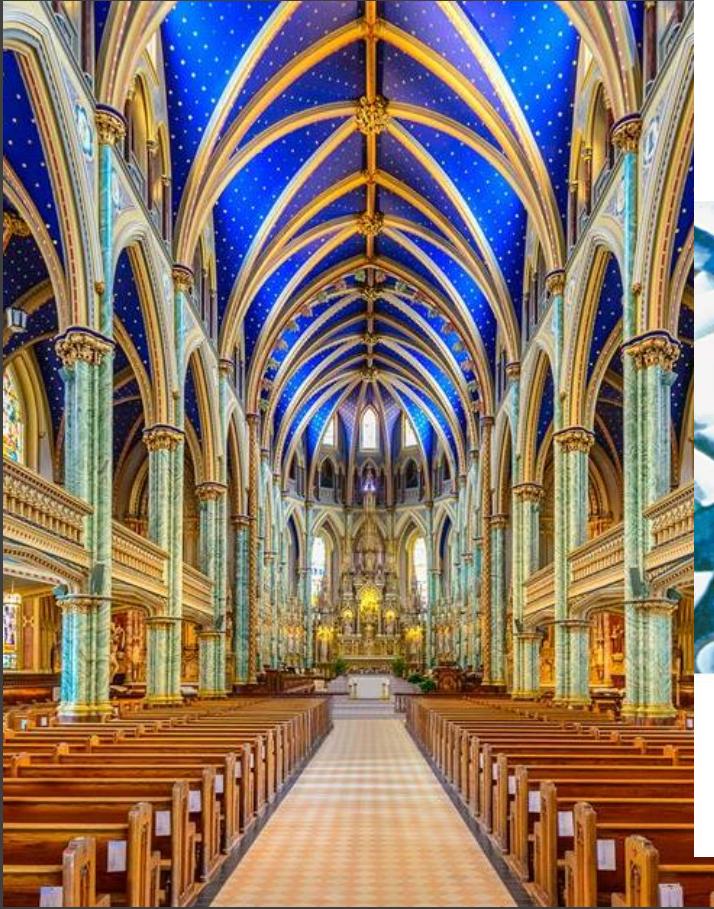
'Free software' is a matter of liberty,
not price. To understand the
concept, you should think of 'free' as
in 'free speech,' not as in 'free beer'.

— *Richard Stallman* —



The Creation of Linux





Revised & Expanded

“The most important book about technology today,
with implications that go far beyond programming.”
—Guy Kawasaki

THE CATHEDRAL & THE BAZAAR

MUSINGS ON LINUX AND OPEN SOURCE
BY AN ACCIDENTAL REVOLUTIONARY



ERIC S. RAYMOND

WITH A FOREWORD BY BOB YOUNG, CHAIRMAN & CEO OF RED HAT, INC.

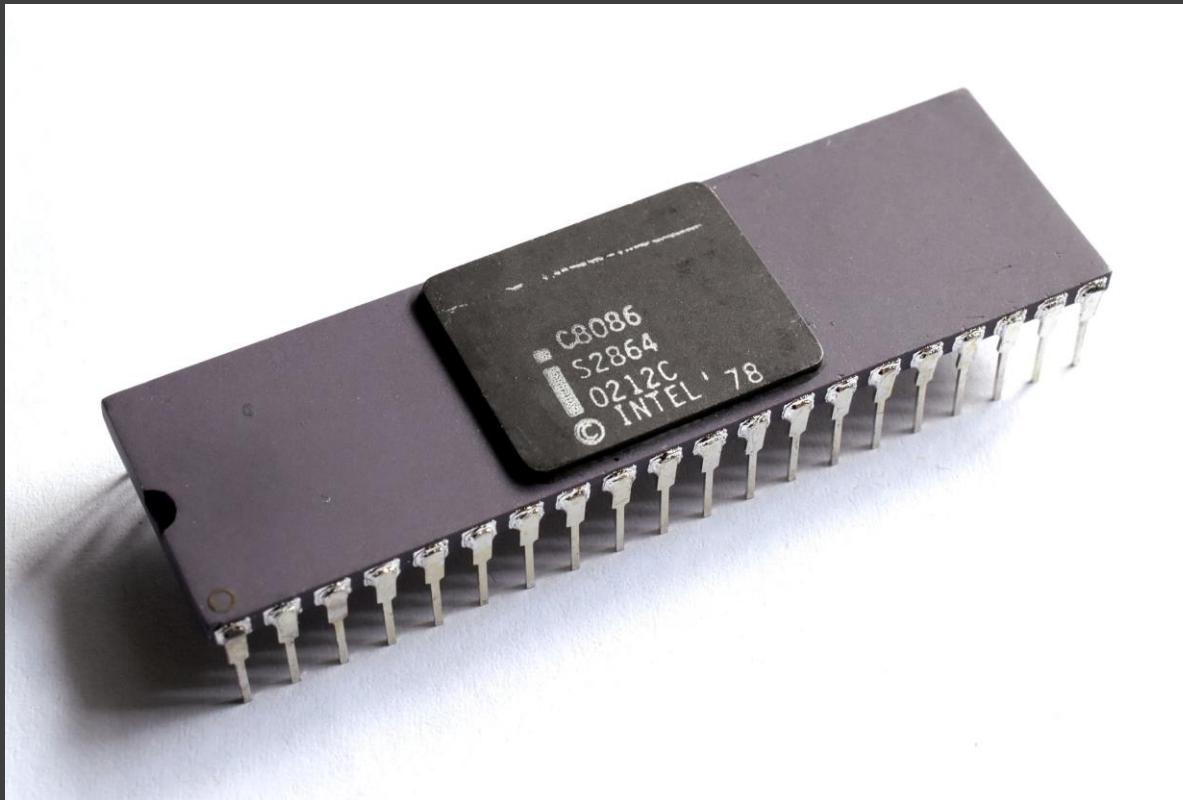


And then came fragmentation



FreeBSD

The Competition

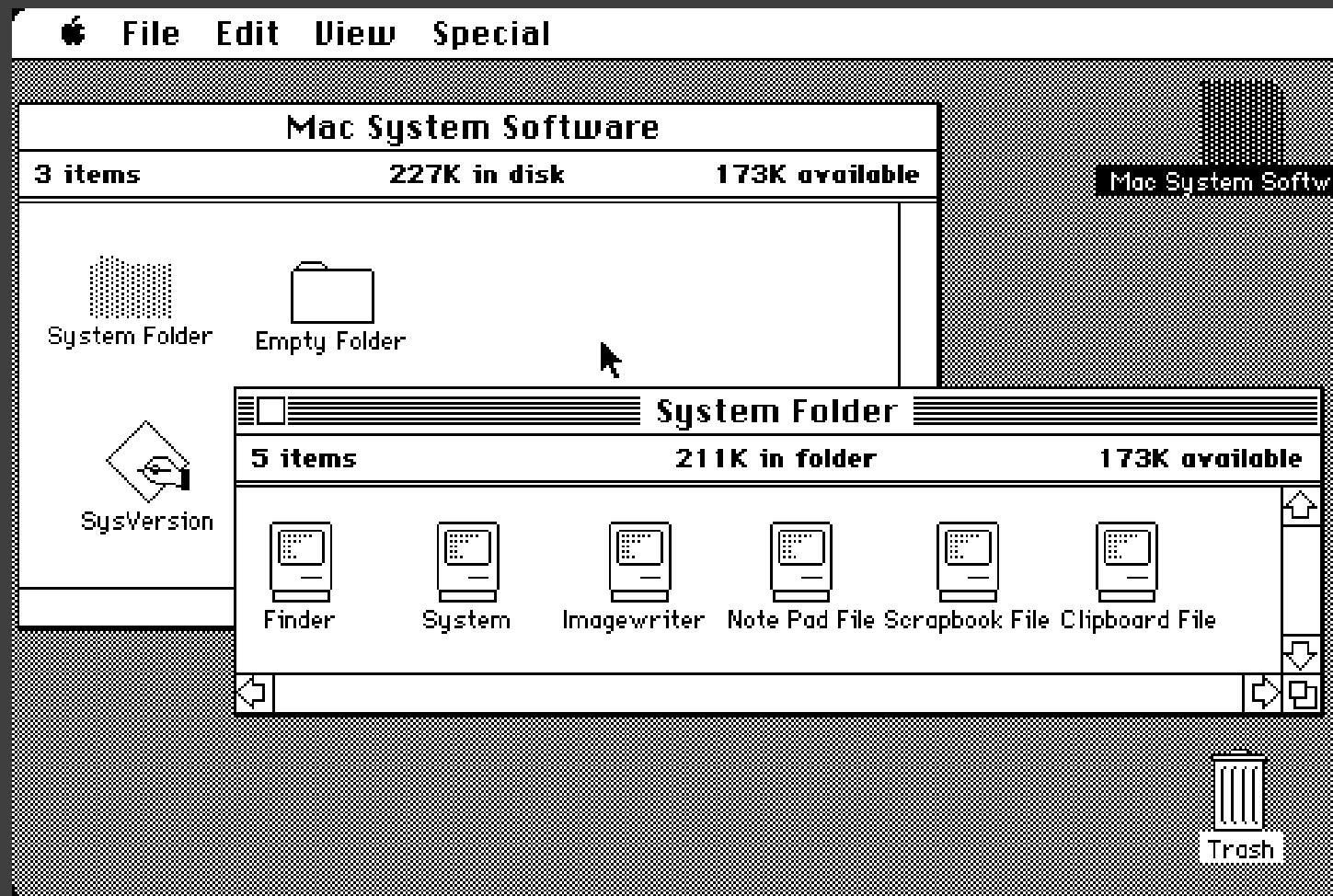


An Intel 8086 Processor

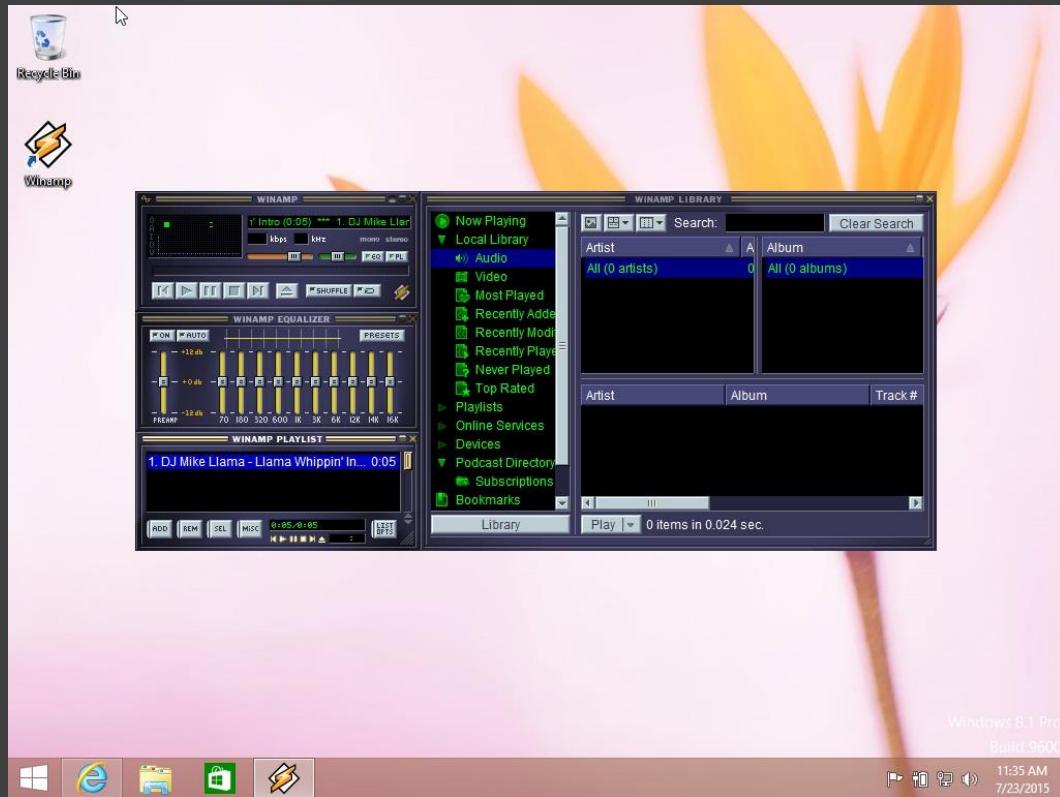


This image is ironically from AMD

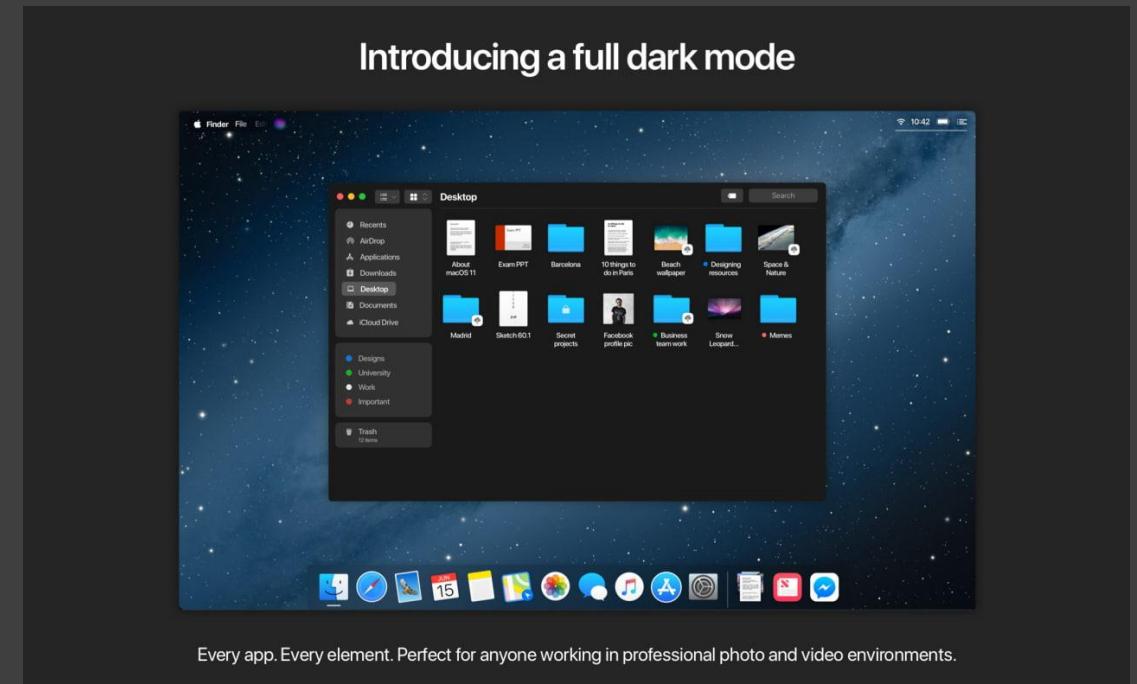
The Competition



The Competition

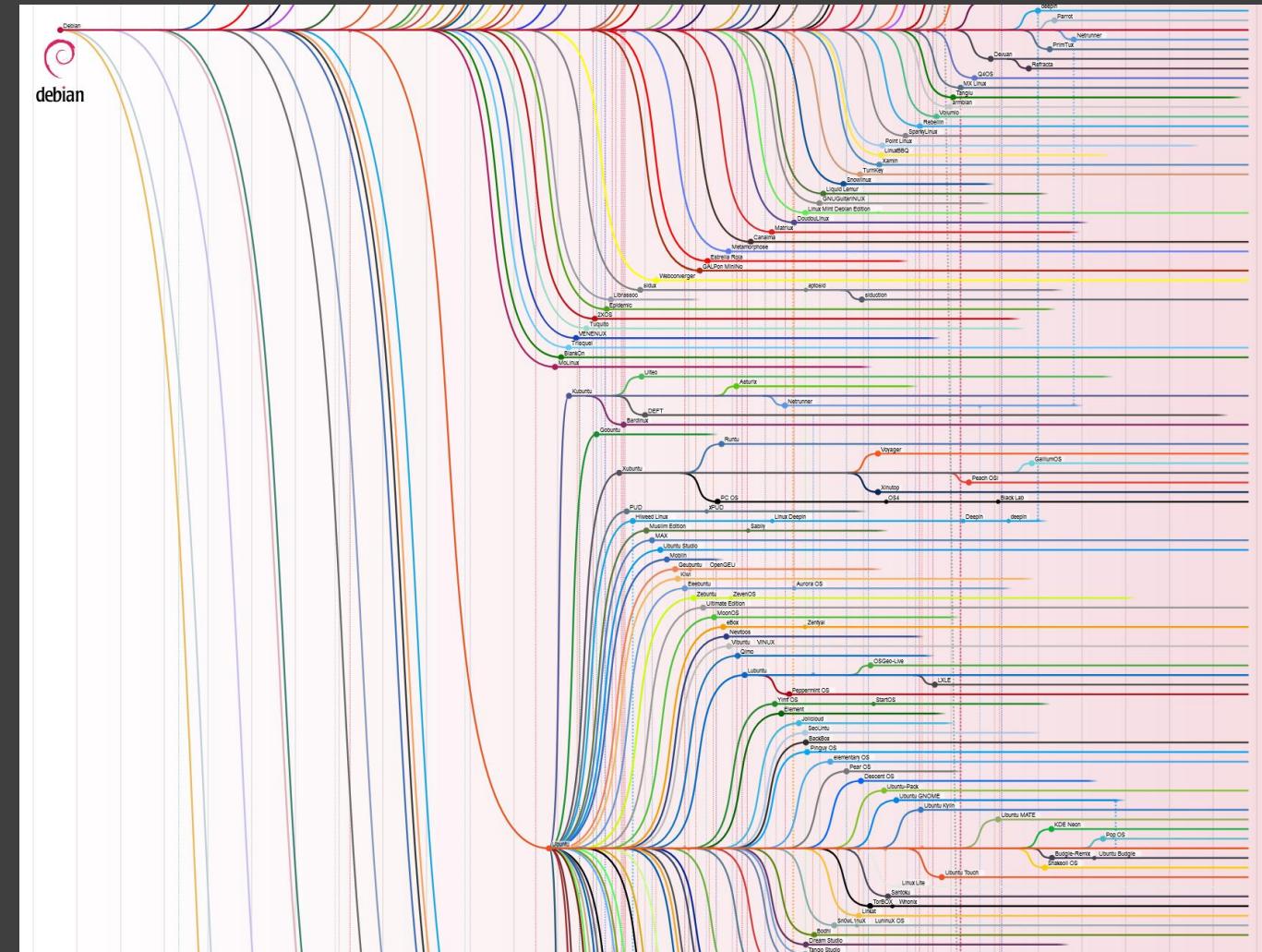


Anyone else miss crossfade in Winamp?



Linux Fragmentation

This is a tiny piece, maybe 10% of this full chart.



The Birth of the Distribution



The Birth of the Distribution



The Birth of the Distribution



Why?



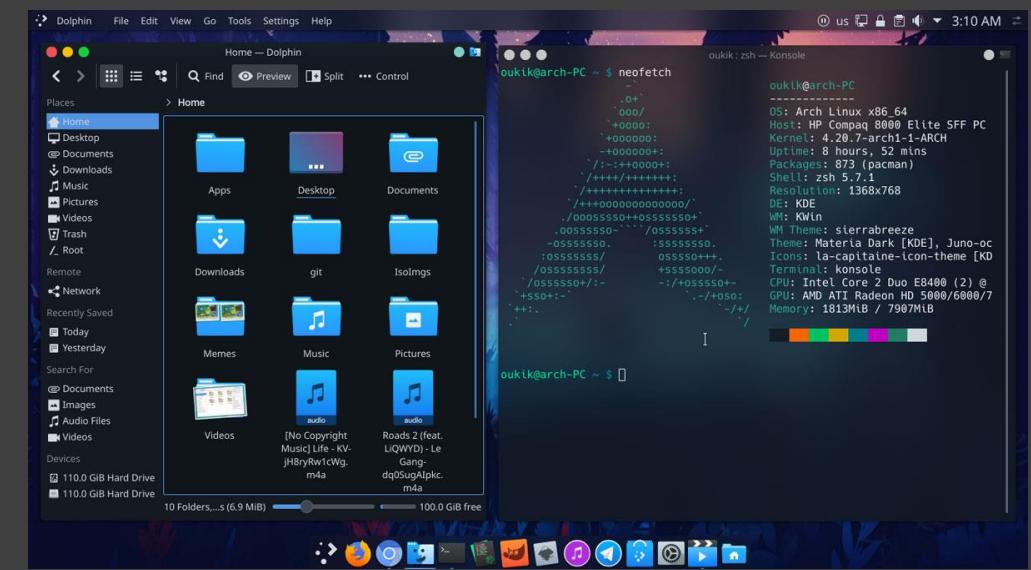
Why?



A screenshot of a Twitter post by Taran Van Hemert (@TaranVH). The post text reads: "A Windows 10 update forces a full screen @MicrosoftEdge window, which cannot be closed from the taskbar, or CTRL W, or even ALT F4. You must press "get started," then the X, and even then it pops up a welcome screen. And pins itself to the taskbar." Below the text are four screenshots illustrating the behavior: 1) A blurred desktop background. 2) A Microsoft Edge window with a blue header and a white body. 3) A Microsoft Edge window with a blue header and a white body, showing a progress bar. 4) A Microsoft Edge window with a blue header and a white body, showing a welcome screen with the text "Check out the new Microsoft Edge".

1:31 PM · Jul 2, 2020 · Twitter Web App

The Year of the Linux Desktop



Year of the Linux Desktop Handheld

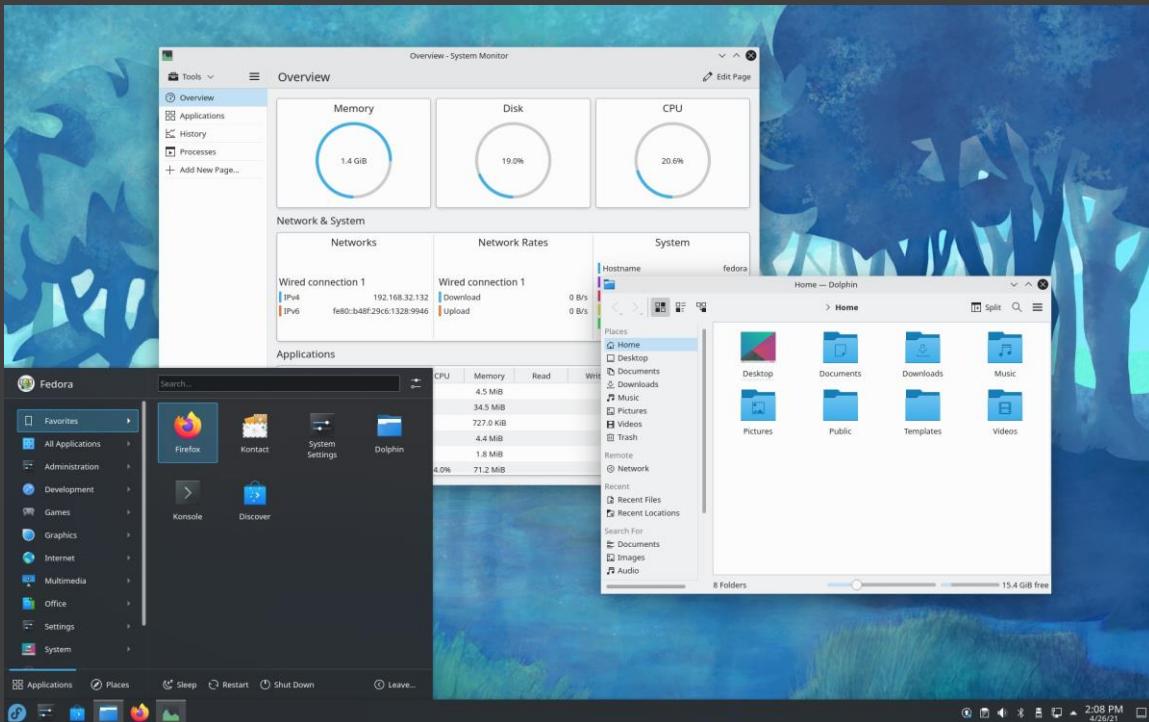


Year of the Linux Desktop Handheld

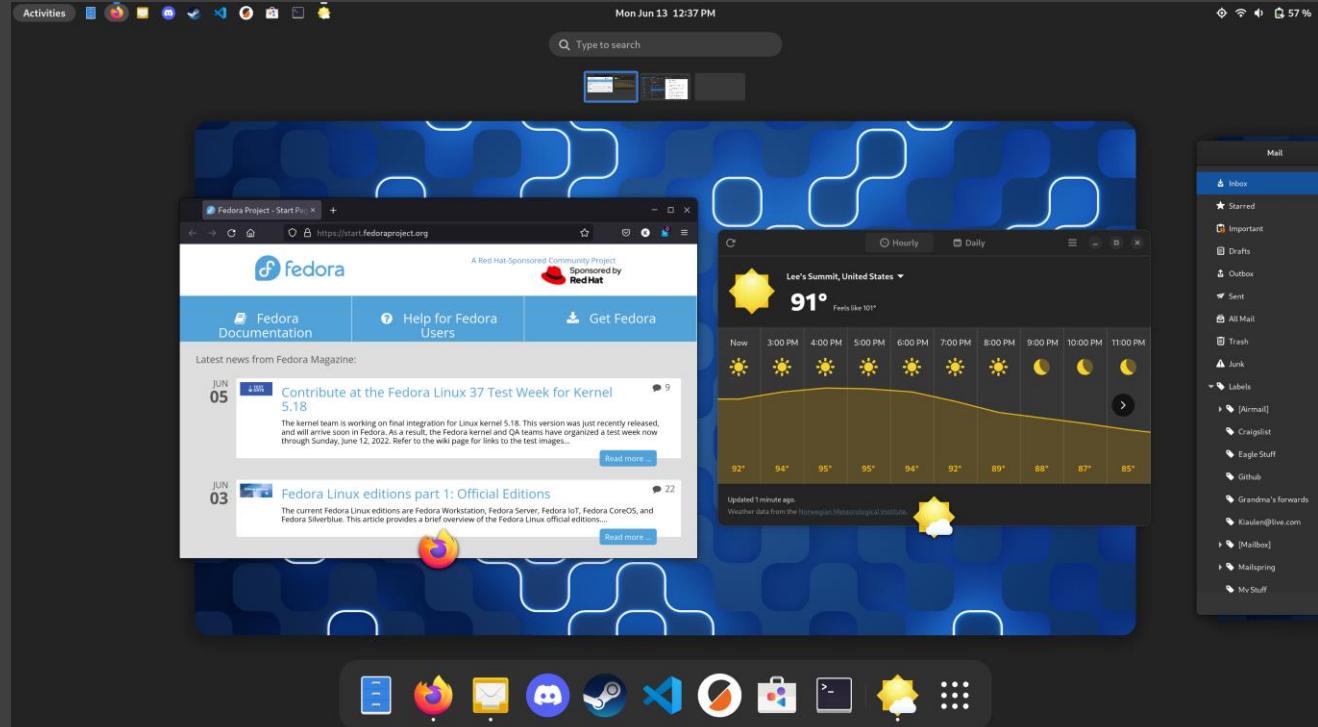


Getting Started With Linux

getfedora.org

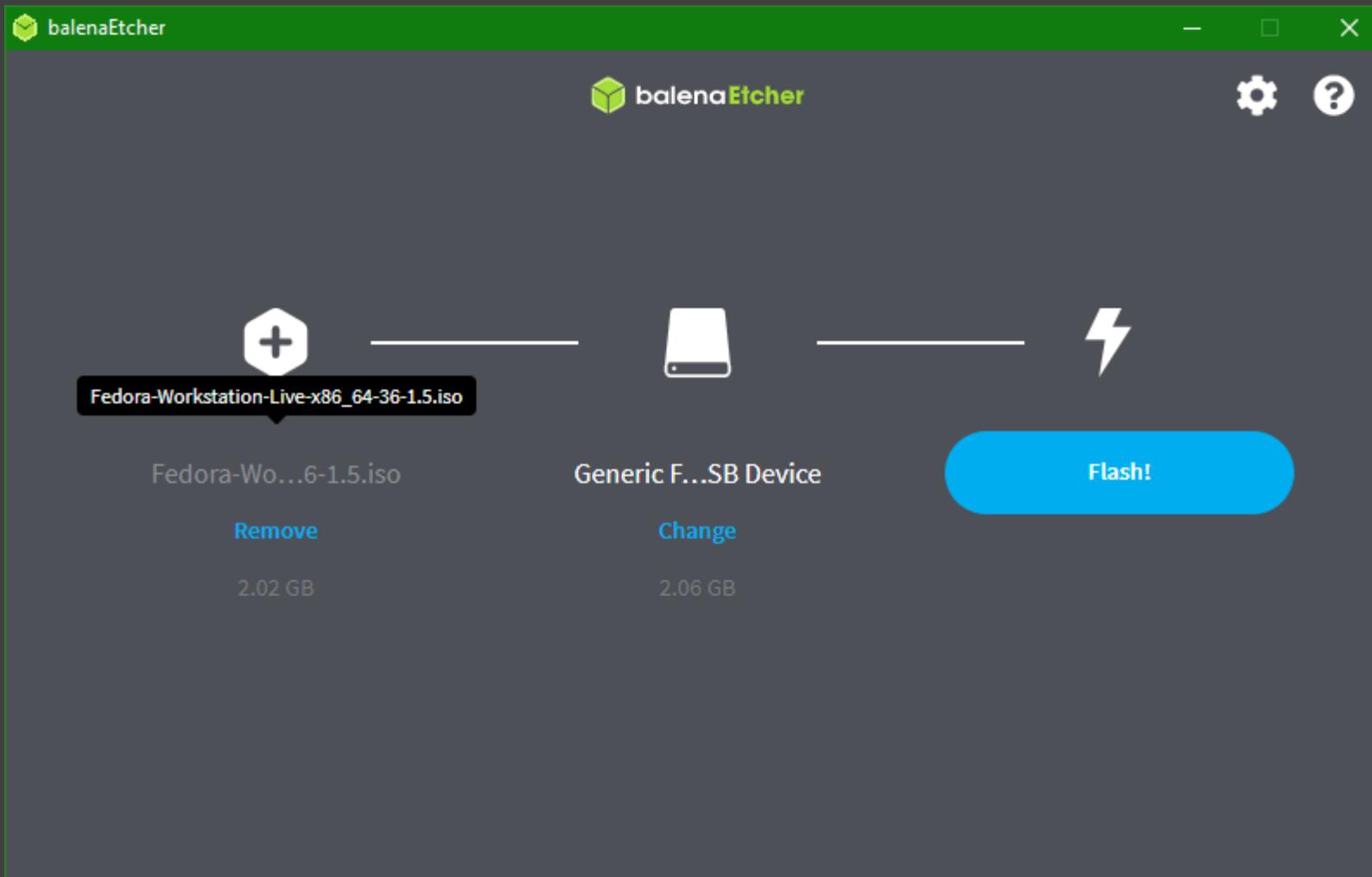


KDE Plasma Desktop Environment

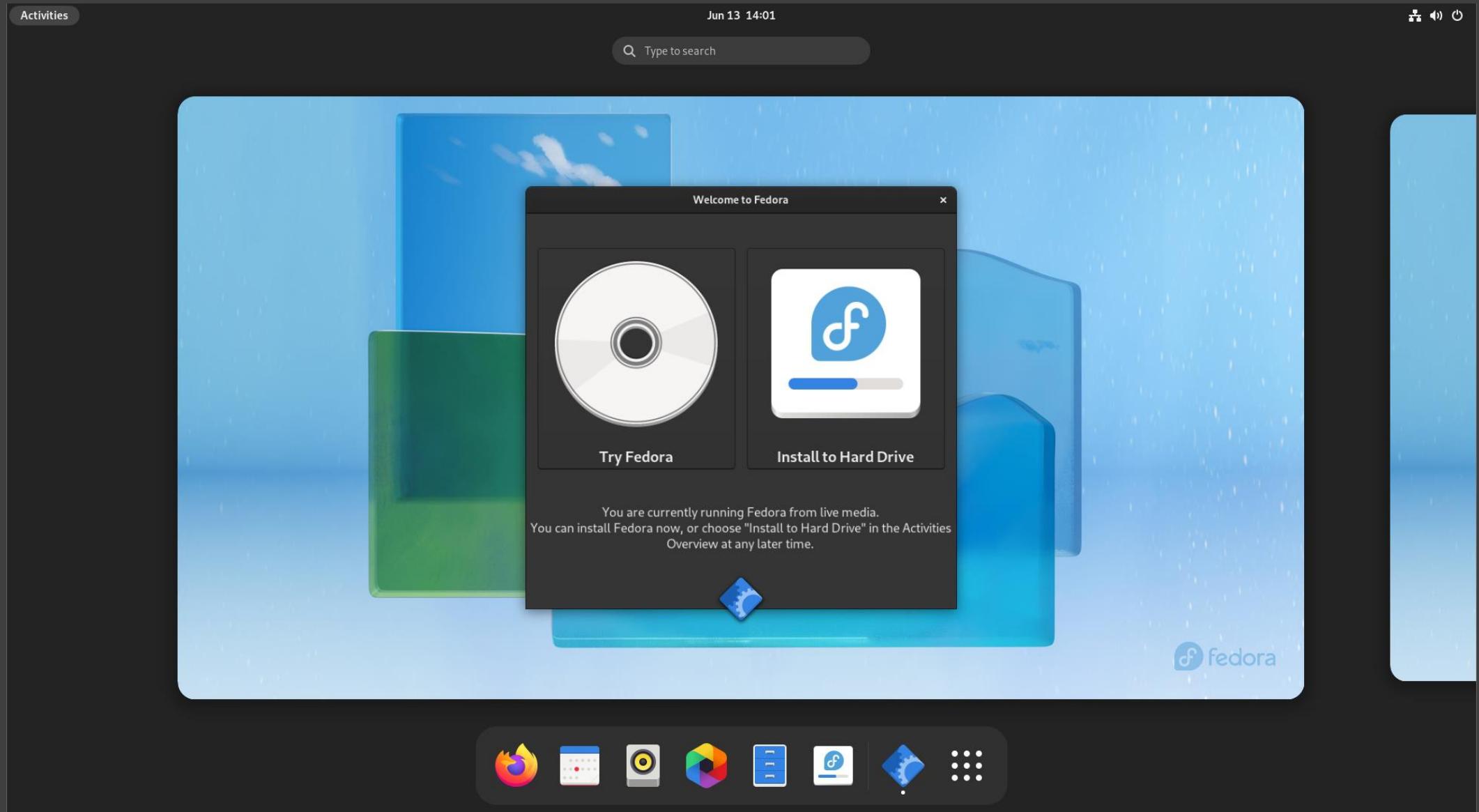


Gnome Desktop Environment
(default)

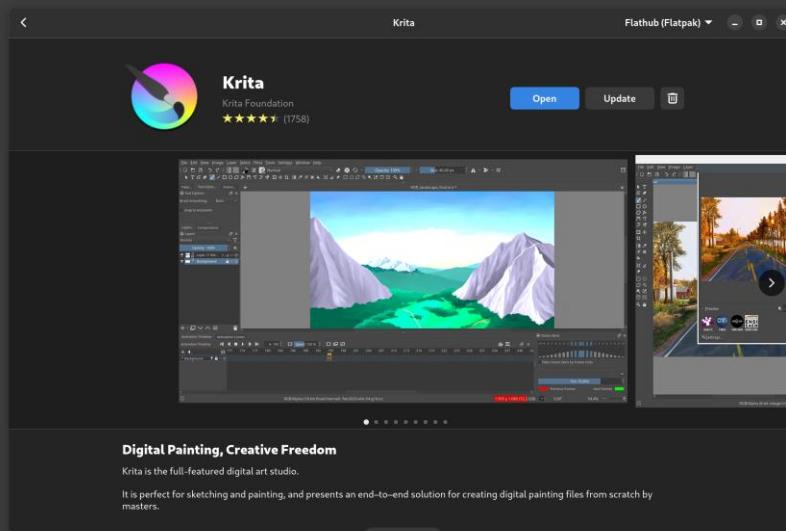
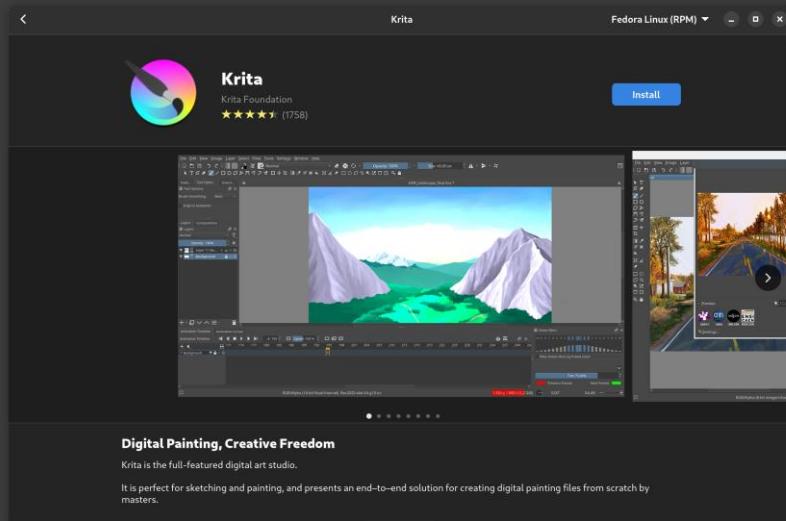
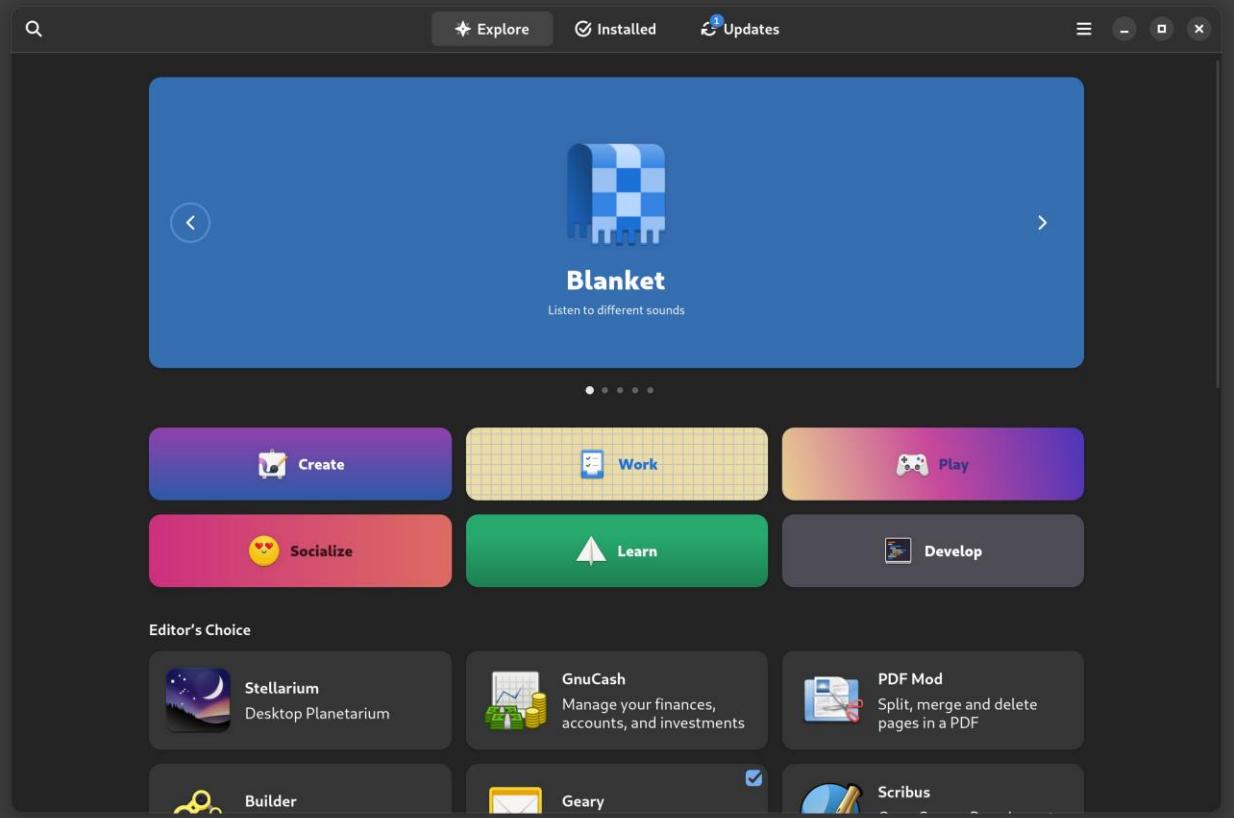
Installing



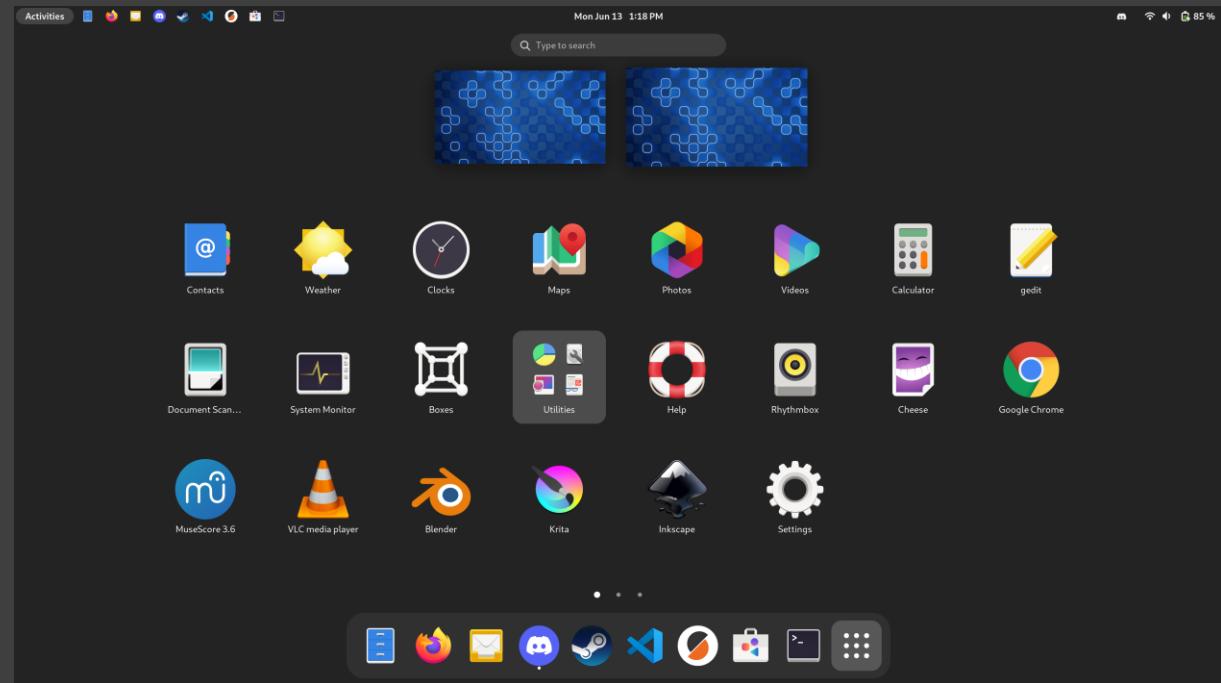
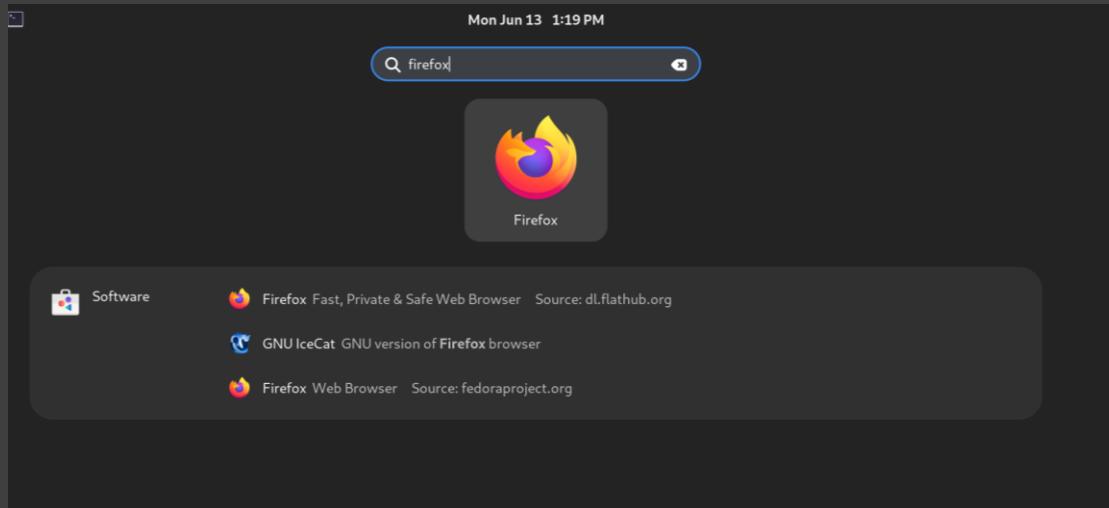
Live CD



Getting Oriented - Software



Getting Oriented - Desktop Environment



Getting Oriented - Folder Structure

/

The root directory

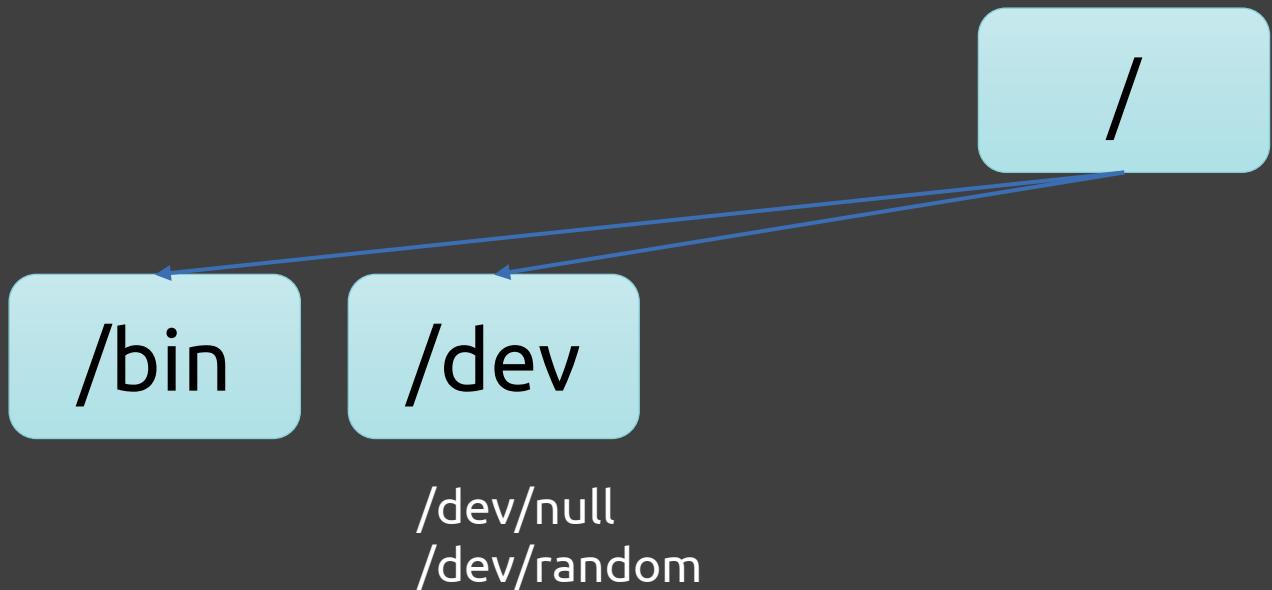
Getting Oriented - Folder Structure

/

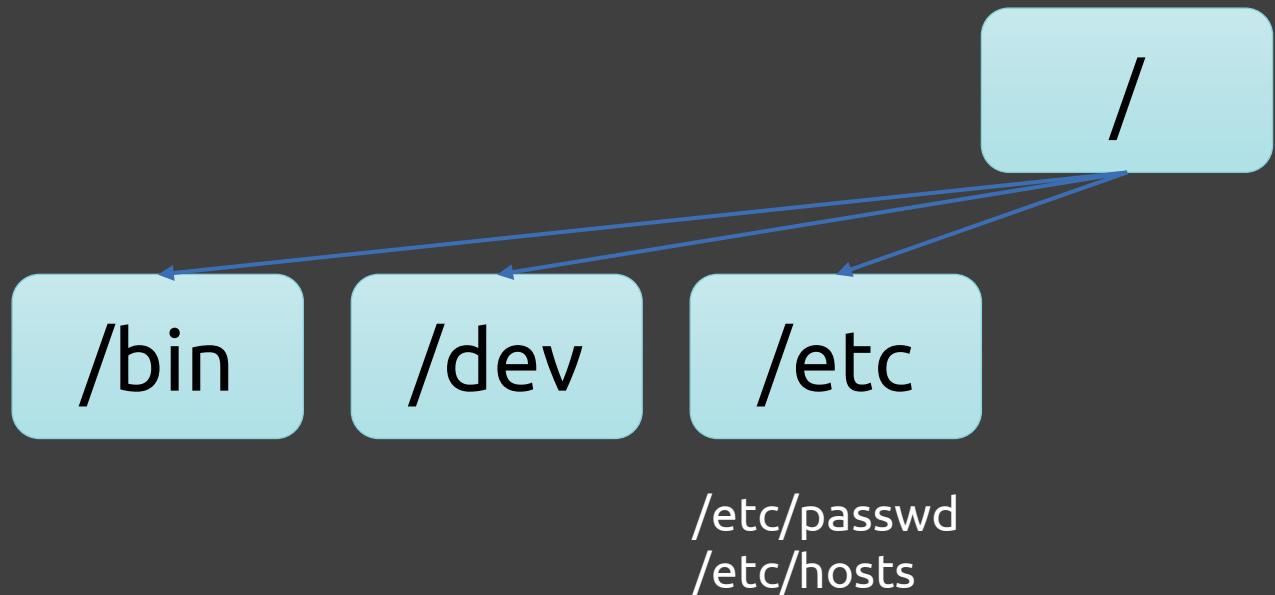
/bin

/bin/cd
/bin/ls

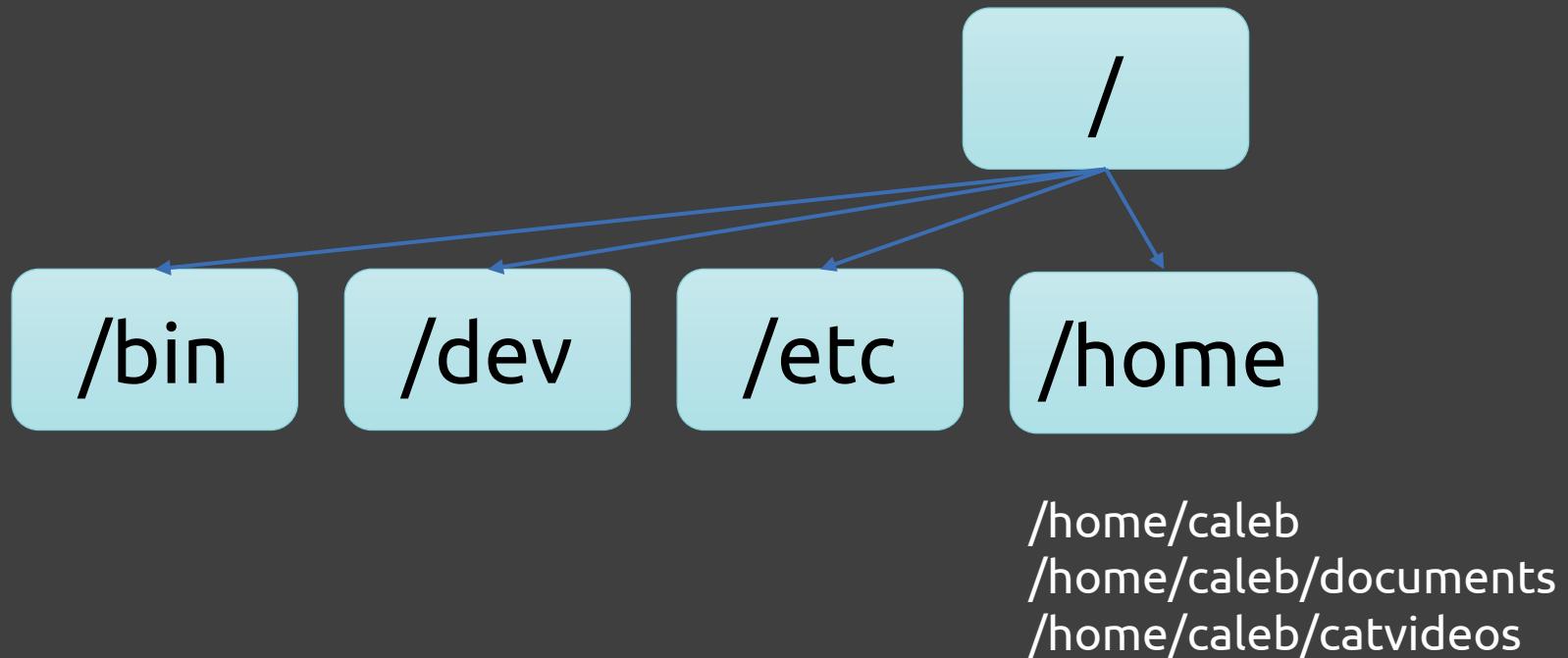
Getting Oriented - Folder Structure



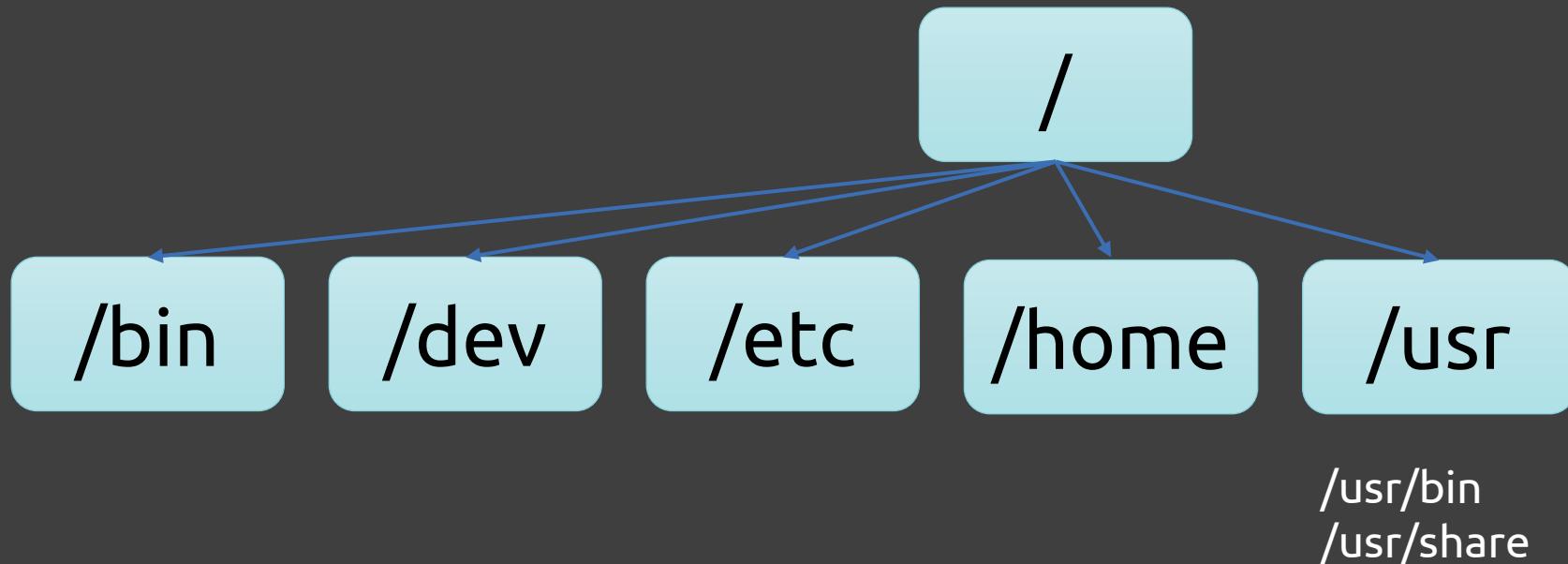
Getting Oriented - Folder Structure



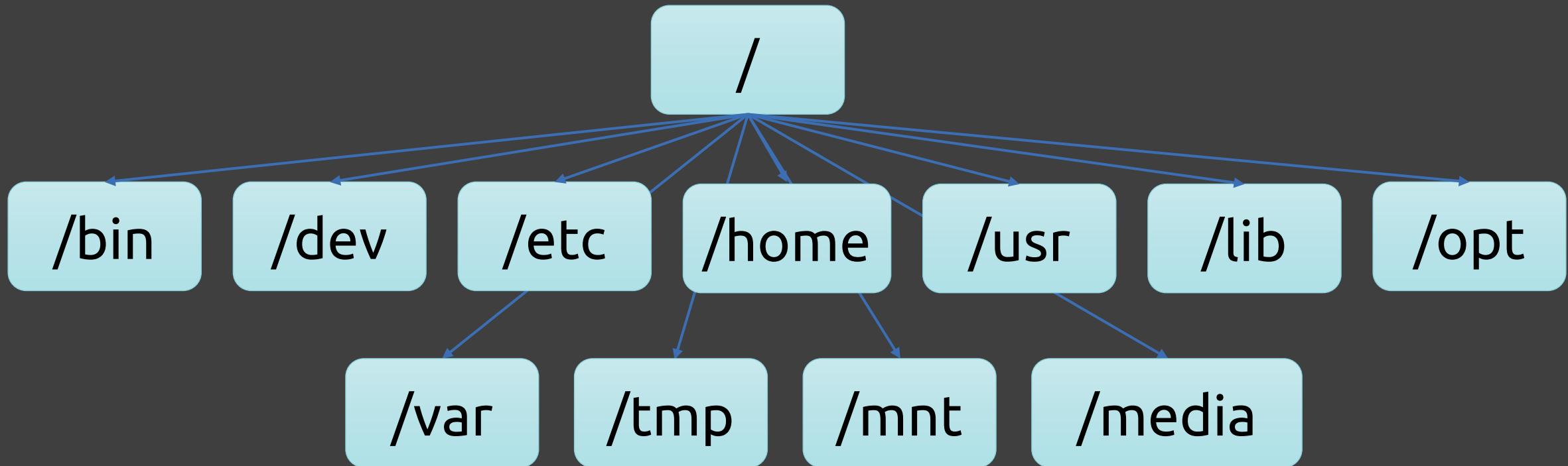
Getting Oriented - Folder Structure



Getting Oriented - Folder Structure



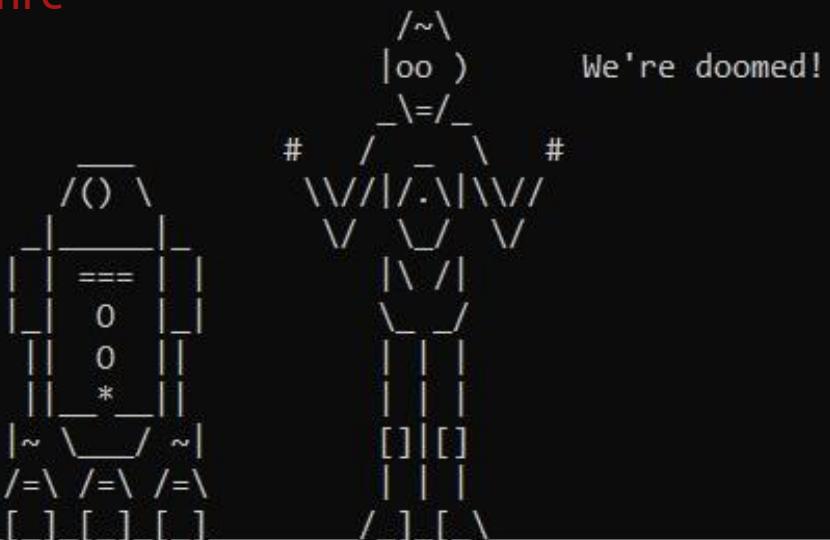
Getting Oriented - Folder Structure



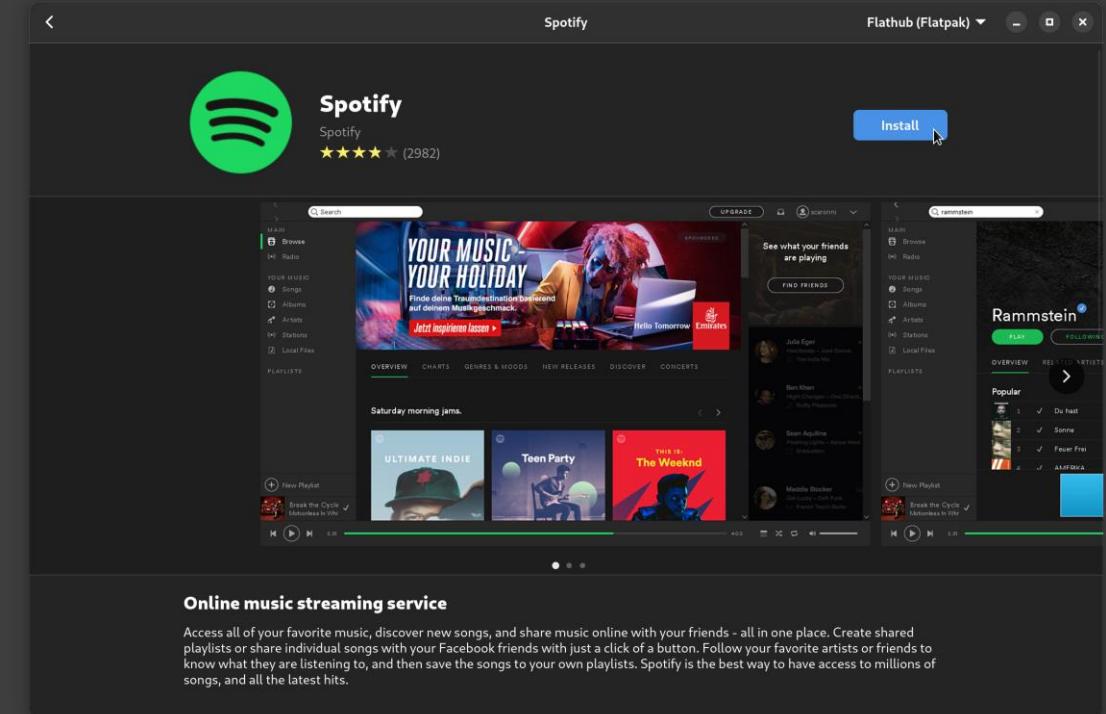
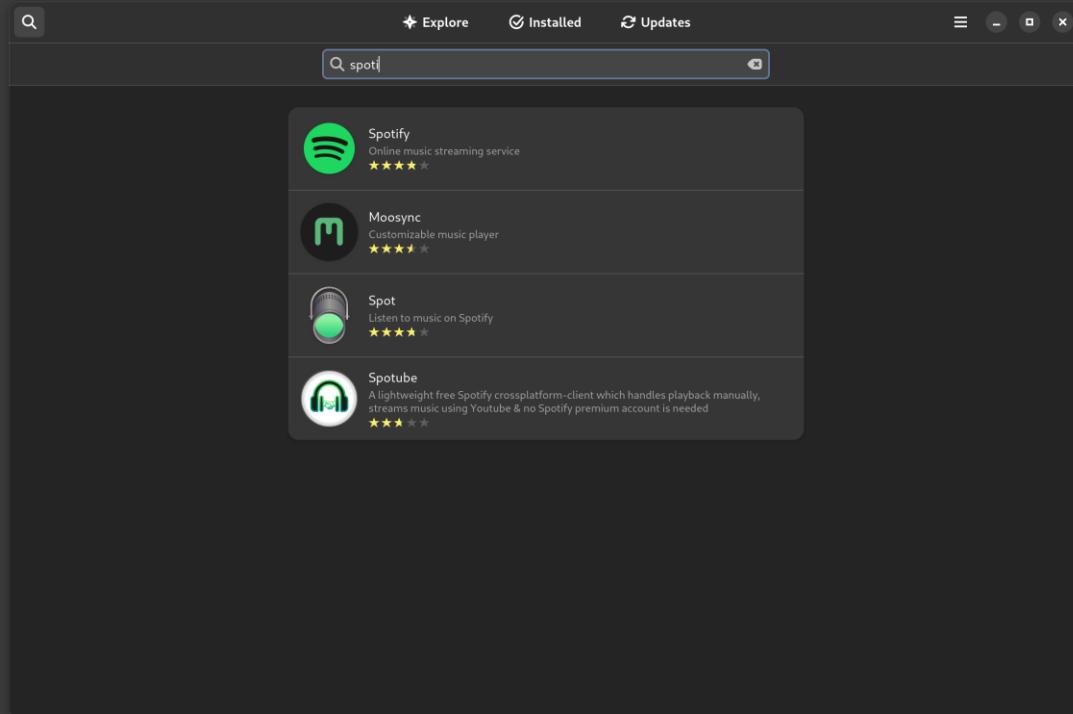
The command line (is not necessary)

```
> sudo apt-get install -qy yarn
```

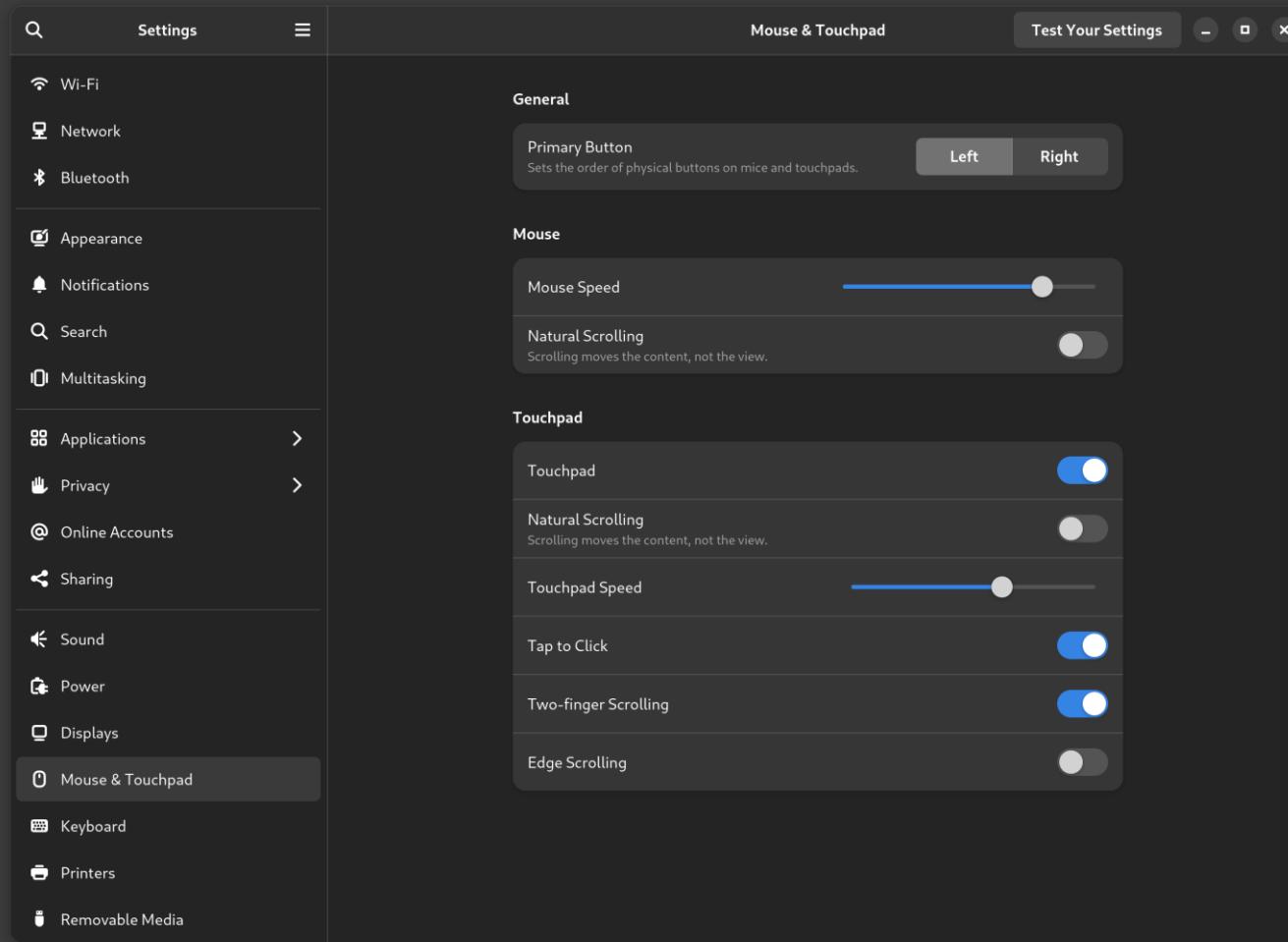
```
> vim ~/.bashrc
```



Installing a package



Changing a setting



The command line (is not scary)

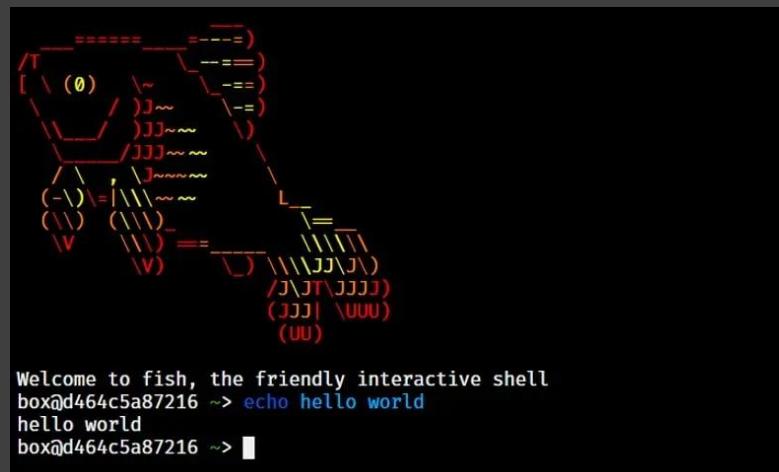


A mainframe

powers



A terminal

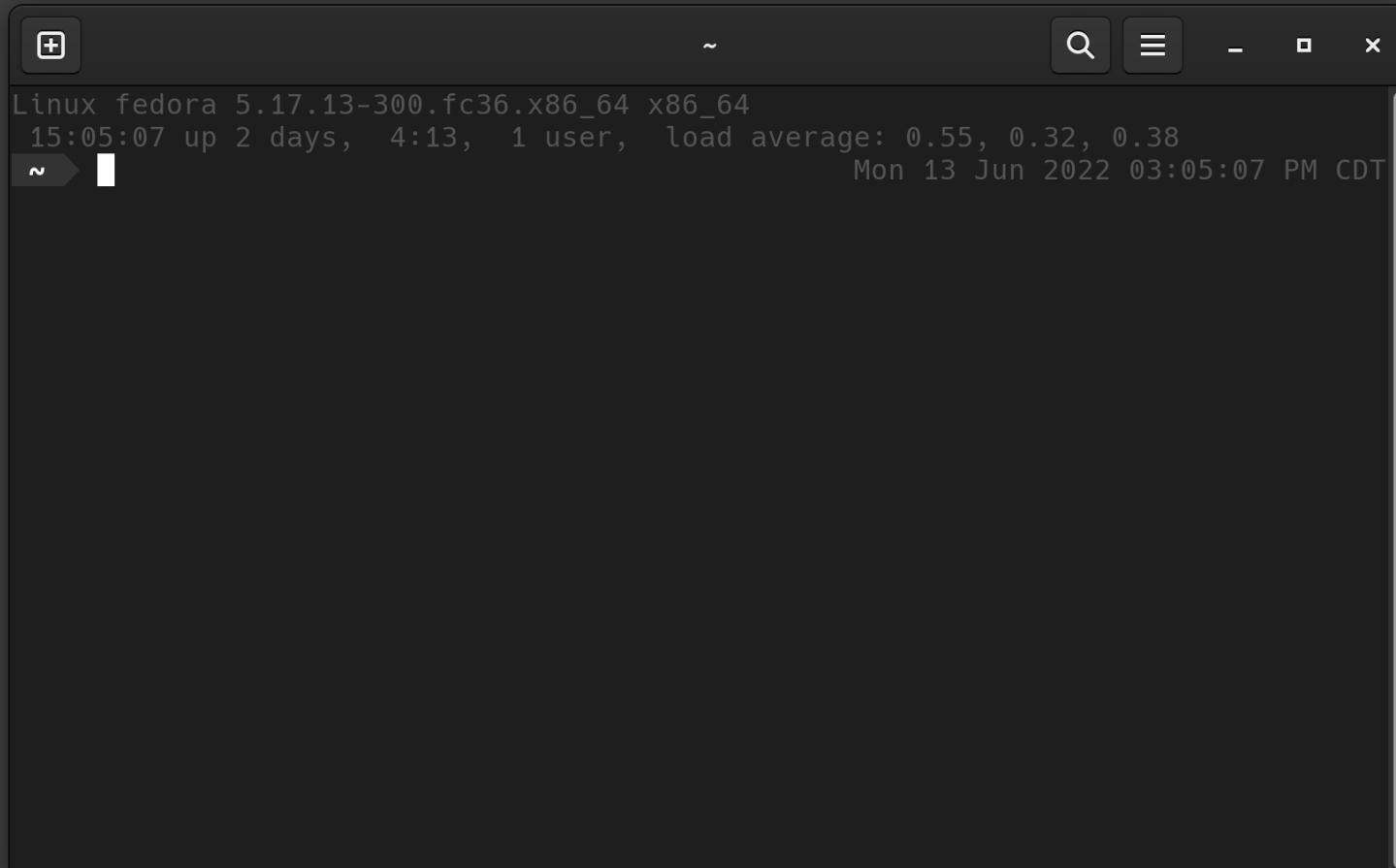


```
Welcome to fish, the friendly interactive shell
box@d464c5a87216 ~> echo hello world
hello world
box@d464c5a87216 ~> █
```

A shell

which displays

The command line (is not scary)



A terminal emulator

```
Linux fedora 5.17.13-300.fc36.x86_64 x86_64
15:08:24 up 2 days, 4:16, 1 user, load average: 0.26, 0.31, 0.36
~ ➔ ls
Applications/ Downloads/ Pictures/ Templates/
code/ eat_breakfast.txt powerlevel10k/ Videos/
Desktop/ install_linux.sh Public/
Documents/ Music/ take_over_the_world.txt
~ ➔ █
```

The Command Line Interface



~/Documents



-



```
Linux fedora 5.17.13-300.fc36.x86_64 x86_64
15:09:05 up 2 days, 4:17, 1 user, load average: 0.21, 0.29, 0.35
~ ➤ ls
Applications/ Downloads/ Pictures/ Templates/
code/ eat_breakfast.txt powerlevel10k/ Videos/
Desktop/ install_linux.sh Public/
Documents/ Music/ take_over_the_world.txt
~ ➤ cd Documents/
~/Documents ➤ ls
'Gloomhaven 14 coins - 2h15m.gcode'
'Letter E Zentangle | Super Coloring.pdf'
'Pine Tree - 4h17m.gcode'
'Pine Tree - Mini - PLA - 4h26m.gcode'
'Pizza recipe.md'
'RPi Integrated - Base - 1h42m.gcode'
'RPi Integrated - Body - 6h40m.gcode'
'RPi Integrated - Lid - 4h52m.gcode'
'Tree Base large - 7h11m.gcode'
'Tree large - 8h16m.gcode'
~/Documents ➤ █
```

Mon 13 Jun 2022 03:09:10 PM CDT

The Command Line Interface

```
Linux fedora 5.17.13-300.fc36.x86_64 x86_64
15:09:05 up 2 days, 4:17, 1 user, load average: 0.21, 0.29, 0.35
~ ls
Applications/ Downloads/ Pictures/ Templates/
code/ eat_breakfast.txt powerlevel10k/
Desktop/ install_linux.sh Public/
Documents/ Music/ take_over_the_world.txt
~ cd Documents/
~/Documents
'Gloomhaven 14 rooms - 2h15m.gcode'
'Letter E Zentangle | Super Coloring.pdf'
'Pine Tree - 4h17m.gcode'
'Pine Tree - Mint - PLA - 4h26m.gcode'
'Pizza no. 1 - 1h10m.gcode'
'RPi Integrated - Base - 1h42m.gcode'
'RPi Integrated - Body - 6h40m.gcode'
'RPi Integrated - Lid - 4h52m.gcode'
'Tree Base large - 7h11m.gcode'
'Tree large - 8h16m.gcode'
~/Documents
```

Command Arguments

The Command Line Interface

```
Linux fedora 5.17.13-300.fc36.x86_64 x86_64
15:24:15 up 2 days, 4:32, 1 user, load average: 0.28, 0.22, 0.24
~ ➔ ls | fpaste
Mon 13 Jun 2022 03:24:15 PM CDT
Uploading (0.2KiB)...
https://paste.centos.org/view/fdc5ac6d

~ ➔ curl example.org > output.txt      224ms < Mon 13 Jun 2022 03:24:19 PM CDT
% Total    % Received % Xferd  Average Speed   Time     Time     Time  Current
               Dload  Upload   Total   Spent    Left  Speed
100  1256  100  1256      0      0  12567      0 --::-- --::-- --::-- 12686
~ ➔ █
106ms < Mon 13 Jun 2022 03:24:22 PM CDT
```

The Command Line Interface

Summary

Thank You !

<https://github.com/calebmeyer/linux-slides>

[Install Linux instead of Windows 11](#)

<https://getfedora.org/>

<https://www.balena.io/etcher/>



Fonts Used:

Ubuntu Mono

Ubuntu

Accent Colors Used:

Ubuntu Orange #E95420

Ubuntu Purple #772953

Fedora Light Blue #3C6EB4

Fedora Dark Blue #294172