Mobile & Wearable Linux

This Meeting

- Talk about some cool mobile/wearable devices
- Talk about both proprietary & FOSS Linux-based OS's that run on these devices
- Talk about other FOSS devices in brief
- Give a brief history of some of these projects
- NOT teach you how to install any of these

Define "Mobile & Wearable"

- Mobile computing is human-computer interaction in which a computer is expected to be transported during normal usage, which allows for the transmission of data, voice, and video. - Wikipedia
- A wearable computer, also known as a wearable or body-borne computer, is a computing device worn on the body. The definition of 'wearable computer' may be narrow or broad, extending to smartphones or even ordinary wristwatches. - Wikipedia
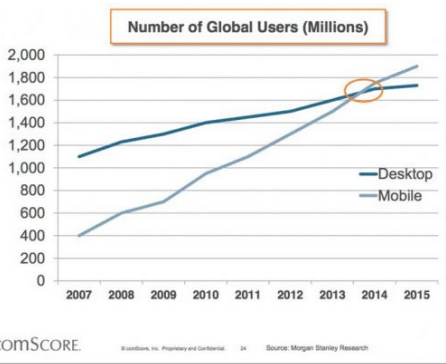
Define "Mobile & Wearable"

- Basically any computer that can be worn, or easily carried with a person
- Includes smartphones, smart watches, smart glasses, fitness trackers, and a growing host of other devices
- Can sometimes also include larger devices such as laptops, portable game consoles, etc.

Why do We Care?

- The world is increasingly relying on mobile computers
- Many users prefer to own just 1 device, or a small number of devices and feel they don't need desktops
- The rise of mobile computing compounded with IoT is going to drastically change how much of the world interacts with computers and the internet

Why do We Care -- The Stats

- Mobile devices drove 61% of visits to U.S. websites in 2020, up from 57% in 2019. Desktops were responsible for 35.7% of all visits in 2020, and tablets drove the remaining 3.3% of visitors.
- Globally, 68.1% of all website visits in 2020 came from mobile devices—an increase from 63.3% in 2019. Desktops drove 28.9% of visits, while 3.1% of visitors came from tablets.
- Source:https://www.perficient.com/insights/research-hub/mobile-vs-desktop-usage

The Elephant in the Room

Android!

- Android *is* Linux, it's built on the Linux kernel
- The Android project was developed by Google to make a Linux-based mobile operating system launched in 2008
- Originally, most of Android was open source (AOSP), but most modern phone OS's also contain a lot of proprietary binaries on top of AOSP
- 72.8% of smartphones use some form of Android as an operating system

BUT!

- As time goes on, even though Android at its core is open, more and more proprietary drivers & software are getting added to smartphones
- Additionally, the easiest systems for using various Android features are run by Google with no well-adopted alternatives
    - Play Store

Custom Android ROMs

CyanogenMod

- CyanogenMod was the first major custom android ROM and the most popular for a long time
- It first released in 2009, but was eventually discontinued in 2016
- At its height over 50 million smartphones were running CyanogenMod
- Widely enjoyed for being customizable, completely FOSS (except for proprietary firmware that the OS couldn't replace)

LineageOS

- The unofficial successor to CyanogenMod
- Still actively in development, and has a large community
- Fully open source, but not fully de-googled
- The largest community in terms of modern FOSS Android distributions

/e/ Project

- Began as a fork of LineageOS
- Has a stated mission of making a completely "de-googled" operating system
- Uses an open source implementation of Google's proprietary apps, MicroG
- Still in relatively early development
- Supported by the non-profit /e/ foundation

Calyx OS

- Another custom Android OS with a central mission of preserving user privacy
- Is also de-googled, uses MicroG
- Ironically only runs on Google Pixels
- Project is support by the non-profit Calyx Institute
- I use this one! It's pretty good c:

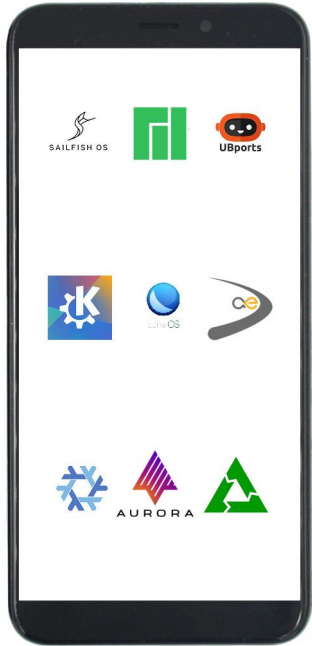# Mobile Full-Linux

Mobile Linux Distros

- Recently, some distro's have tried to make mobile friendly versions, like Mobian or Plasma Mobile
  - Note, these are full Linux distros completely unrelated to the Android project (No native android apps!)
- The PinePhone is the first smartphone specifically designed to be used with these pure-Linux mobile distros

So I should go put a Linux distro on my phone right now?

No!

Most of these are super early in development, in an open beta allowing developers to help out. If that sounds like you then maybe, but don't expect a working smartphone.

Wearables

Android Smart Watches

- Android smart watches are becoming more common, but are still in early phases
- Given the success of the Apple Watch its clear there's demand

PineTime

it's about time

- The PineTime is an attempt to make a FOSS smart watch
  - Runs using a FreeRTOS fork, so it's not Linux
- Recently went on sale for purchase (no longer only for development)
  - NOTE: It's still *in* dev, just not *only* for dev, expect bugs and missing features/polish
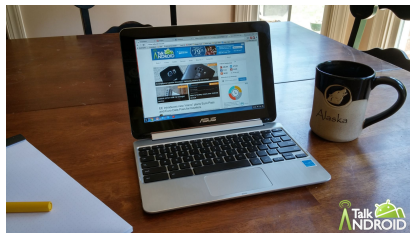
Mobile-ish Linux &
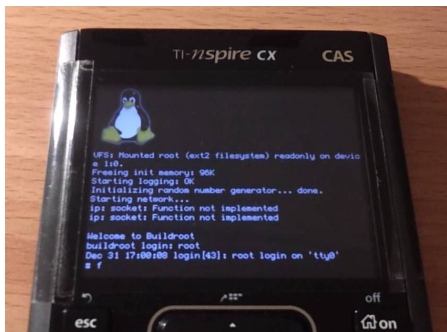# Obscure Mobile Linux

Chromebooks

- Chromebooks are laptops that are designed to be hyper lightweight, cheap, and low in computing power
- Generally come preinstalled with ChromeOS, which is a proprietary Linux-based OS
- There's also ChromiumOS, which lacks some of ChromeOS's features but is fully FOSS
- GaliumOS is a full Linux distro built on top of Xubuntu that has extra driver support and such for chromebooks

Homebrewing

- Through a combination of reverse engineering, a desire for more control of devices and sheer will, people have put Linux on some odd things
- Games consoles
  - 3DS, Nintendo Switch, etc.
- Calculators
  - TI calculators with basic shell
- Anyone in the crowd have any fun ones?

Steam Deck

- Recently Valve announced the Steam Deck which will be a portal game console that runs Linux natively
- A bit early to say much else, but super promising!

Thank You!