Freedom on mobile devices through simplicity and hackability
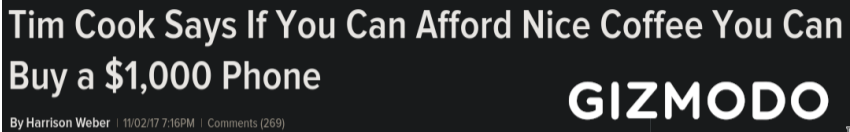
Anjandev Momi (anjan)

Libreplanet 2022

Sunday, March 20, 2022; 16:20–17:05 EDT

Current State of Mobile

- Users need to constantly a buy new phone

Tim Cook Says If You Can Afford Nice Coffee You Can Buy a $1,000 Phone

GIZMODO

By Harrison Weber | 11/02/17 7:16PM | Comments (269)

- No expectation of privacy

TECH

Google CEO On Privacy (VIDEO): 'If You Have Something You Don't Want Anyone To Know, Maybe You Shouldn't Be Doing It'

03/18/2010 05:12am EDT | **Updated** December 6, 2017

HUFFPOST

- Users are addicted to their phones

Free Software is when Users have The Four Freedoms

By Christian Noguera, Valentin Pasquier, Richard Stallman, CC-BY-3.0

- ▶ Without these freedoms, users must repeat and follow the proprietor's agenda
- ▶ Non-programmers ethically benefit from collective freedoms directly and individual freedoms indirectly

Sxmo's Principles

- **Simplicity** - Simple free software in a regular GNU/Linux environment that follows the unix philosophy in doing things well and doing one thing only.
- **Extensibility** - Give control back to the users; everything is easily tweakable and extensible.
- **Reuse** - Reusing existing tools:
  - what can we accomplish by using tools we already have, tying them together, and adding things only where needed?
  - we don't seek out to mimick existing mobile interfaces

Overview of Technologies Used in Sxmo

- Distribution: postmarketOS (and others)
- Window Manager: Sway/dwm with menus in bemenu/dmenu
- Radios: Modemmanager, NetworkManager
- Sxmo developed utilities: mnc (my next cron), lisgd (gestures), wvkbd/svkbd (keyboard), etc.
- sxmo-utils glues the tools developed internally and externally via POSIX shell script and coreutils
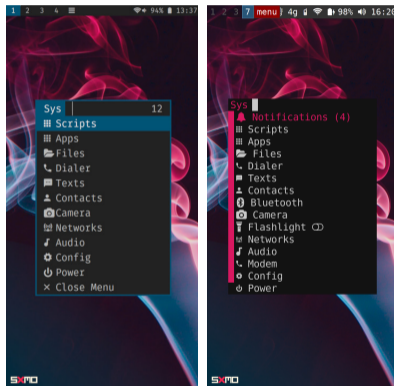
What is postmarketOS?

- Aiming for 10 year life-cycle on smartphones
- Minimalistic GNU/Linux distributions run fine on ten year old PCs - So lets run a GNU/Linux distribution on phones!
- Similar projects include: Mobian and Arch Linux ARM
- Android consistently mistreats its users because the users are not empowered to exercise the 4 freedoms

postmarketOS relies on the GPL

- ▶ The kernel running on Android devices is heavily modified such that it cannot be maintained by the community
- ▶ postmarketOS devs "mainline" the forked kernel code so it can be maintained by the upstream kernel team and the community by reading the GPL'ed Android source code - "From Android to mainline on the Snapdragon 845" By Caleb Connolly FOSSDEM 2022
- ▶ Bradley Kuhn: "preventing the iot dystopia with copyleft" (2019) highlights the number of projects the GPL enforcement has brought into existence - OpenWRT, SamyGO
  - ▶ Request GPL'ed sources for every device you own, try to build and install it (your rights as per the GPL)
  - ▶ Every single type of device needs an alternative firmware project
  - ▶ OpenWRT because of its free software base has plugins for vpn service, privacy protecting, owncloud type services.

# Other User Interfaces on postmarketOS
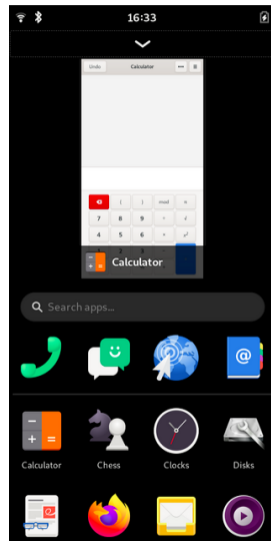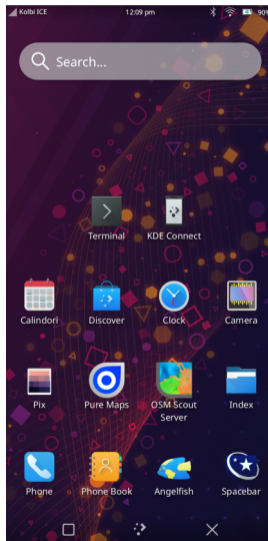
Power Management

- Waking from sleep to make sure cron jobs run
- Hooks for different reasons for waking from sleep
- Issue with sms in sleep is fixed so users can use crust without issues
- Detect if idle and go to sleep
- Allow users to define conditions that if true, the phone won't suspend when idle. For example: if using a hotspot, user has ssh'ed in, or has a certain program running - dont suspend
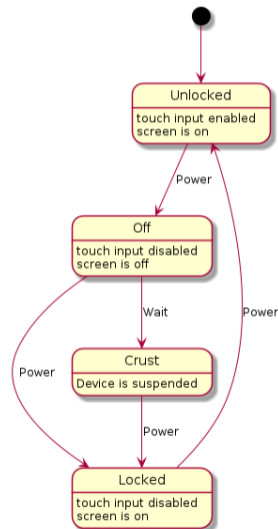
Modem Support

- ▶ Added mms support
- ▶ Added visual voice mail support
- ▶ Added pipewire support
  - ▶ In the future: Allow user to electrically power off microphone via dipswitches and only allow microphone via audio jack or Bluetooth
  - ▶ Vulnerable people (activists and journalists) shouldn't use Bluetooth
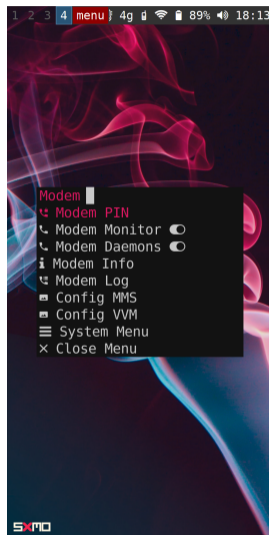
Mobile is a crucial battleground for Free software

- ▶ GNU Health on Sxmo
- ▶ GNU Taler in the future?
- ▶ Increasingly impossible to find non-smart dishwasher, television, etc.
  - ▶ We need the communal infrastructure that teaches people how to exercise their rights (postmarketOS) and support organizations doing Community-Oriented GPL Enforcement (Conservancy/fsf)
  - ▶ sxmo_washdishes.sh and sxmo_hook_tesladoorclose.sh when?
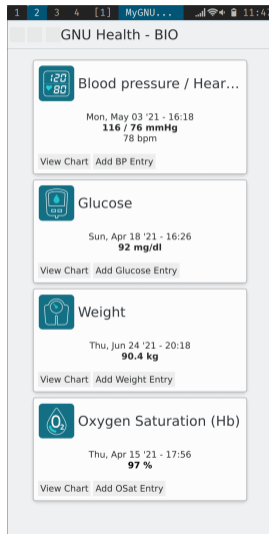
Improving GNU/Linux for Desktop Users

- ▶ Better Bluetooth support
- ▶ Better touch support in Sway and Bemenu (Stacy Harper)
- ▶ Improved on screen keyboard for GNU/Linux (svkbd and wvkbd)
- ▶ Sxmo scripts can be used on desktops/laptops to configure bluetooth, network, etc!
- ▶ Rather than learning a new tool or going to a proprietary program, just use the sxmo utilities (sxmo-utils, bemenu, etc.) to extend the desktop/laptop programs to your mobile device and have side benefits like SSH as a first class citizen.

Key idea: Solidarity with the free software ecosystem we benefit from helps everyone!

Daily Driving and Testing mobile stack using Sxmo

Sxmo has issues but they're easy to workaround if you are daily driving. Moreover, we can easily write tests using Sxmo because:

▶ Hooks for everything and every reason (ie. various wakeup reasons)

▶ Simple code

▶ Works on new devices provided the kernel/low level stuff is working - Allows us to test new devices easily

▶ Supports Xorg alongside wayland for devices that dont have Xwayland support

▶ Lightweight

Help here: `https://git.sr.ht/~anjan/sxmo-check`
(Must be run on a physical phone)
`https://git.sr.ht/~mil/sxmo-utils` (Tests run in CI)

Please Help us Free Mobile Devices!

- ▶ Source, Mailing List, Bug tracker, Hacking/User Documentation: https://sxmo.org
- ▶ Ask questions in irc: #sxmo and #sxmo-offtopic channels on oftc.net
- ▶ Help the distribution and other low-level issues related to Free Software on Mobile: https://postmarketos.org
- ▶ Anjan's Contact:
  - ▶ Website: https://momi.ca (Resume here - I am looking for a job)
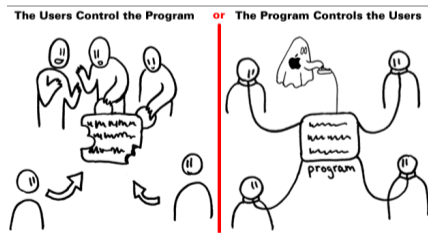 - ▶ irc nick: anjan on OFTC and libera.chat

Figure: By Christian Noguera, Valentin Pasquier, Richard Stallman, CC-BY-3.0