Daily-driving NixOS on the Librem 5

Sophie Tauchert

Why

- Got my Librem 5 in March 2023
- Used default PureOS with Phosh for a while
- Wanted to try out other "desktops"
- NixOS for reproducibility and easy switching
- Curiosity

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- pureos/phosh worked pretty much out of the box, didn't test a lot of things though
- phosh is great, but i personally don't like the ui -> switching

The Librem 5

- Quad core AArch64 CPU @1.5 GHz
- 3 GB RAM
- 32 GB eMMC storage + microSD
- As free and open as possible for a phone
  - Modem has firmware blob

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- somewhat little storage for NixOS (ghc alone is >2 gib)
- builds on this hardware take a while
- nix eval sometimes is OOM-killed
- floss/flosh (is this a thing?) -> nixos should work fine with the right software patches
- 12mm thick phone -> hardware not suitable for a phone, select for free firmware
  - -> also short battery life

Getting Started

- Existing PR #557 to NixOS/nixos-hardware by @balsoft with groundwork
- Took some tinkering to get everything to build, flash and boot
- services.xserver.desktopManager.plasma.mobile.enable = true;
- My continued PR #698 was merged on 2023-09-03

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- https://github.com/NixOS/nixos-hardware/pull/557
- custom uboot, custom kernel fork by purism
- PR merged (less than a week ago, thanks Mic92!) -> you can try it too!

```
 sophie@sophie-l5   🏠 ~
› neofetch
```



```
sophie@sophie-l5
-----------------
OS: NixOS 23.11.20230822.b85ed9d (Tapir) aarch64
Host: Purism Librem 5r4
Kernel: 6.4.14-librem5
Uptime: 21 hours, 17 mins
Packages: 1112 (nix-system), 1184 (nix-user)
Shell: zsh 5.9
Resolution: 720×1440
WM: kwin
Terminal: /dev/pts/2
CPU: (4) @ 1.500GHz
Memory: 1119MiB / 2959MiB
```

What works, what doesn't

- Working: touchscreen, bluetooth, wifi, keyboard, audio, sms
- Broken: audio, camera, GPS, multi monitor output
- UI is somewhat broken too

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- yes, audio works and not. audio generally worked, but no modem audio
- audio didn't work for alarms/timers either -> fixed with modem audio?
  – wakeup on timer elapse seems to be broken though
- plasma recognizes an external monitor and I can configure it (through broken UI) but no display output
- ui issues mainly in settings dialogues
  – doesn't matter because I have nix for settings :D
  – Virtual kbd in plasma doesn't have a control key (she's lost control)

Getting things working

- Camera: required packaging millipixels (fork of megapixels) + kernel config
- GPS: requires settings for gnss-share and geoclue, TTFF is still pretty long
- Modem audio: requires Pulseaudio instead of pipewire with some configuration from Purism

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- Millipixels PR is still open!
- Megapixels *might* have support for the Librem 5 camera soon™
- gps is currently being tinkered on, a-gps requires scripts for sourcing data
- kernel config and pa are part of my nixos-hardware pr
- pa file for pulse taken from upstream librem5-base package

Next steps

- Still working on A-GPS, modem audio
- SXMO
- Waydroid

- sxmo is sway,bemenu,others and a lot of scripts+config files
  - mobile-optimized ui based on sway
  - some repos on github with varying states of implementation
  - probably should be pretty much fully rewritten as nix config instead of some loose scripts
  - *much* less ram hungry than plasma/phosh
- waydroid for running android apps in an emulation layer
  - services.waydroid.enable=true;
  - modern android in an environment that memory pressured might be difficult

Contributing

Find me at:

- Matrix: @sophie:catgirl.cloud
- Mastodon: @sophie@catgirl.cloud
- GitLab/Hub: 999eagle
- The NixCon Hackathon tomorrow

Q/A