



# Can we sustain Software Freedom in the mobile world?

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# Who's talkin' ?

- Nicole Faerber (Germany)
  - Hacking on Linux since kernel 0.96 or so
  - Founded an embedded Linux development company in 1999
  - Started the first GTK+ based UI project for mobile Linux in 2002 GPE, first targeted at Linux PDAs, later with LIPS also for Linux mobile phones
  - 2003-2009 worked with Nokia on the Maemo Linux platform
  - Since 2017 working as CTO of Purism SPC (USA)

...open source and free software enthusiast, hacker, activist, ...

# Who's talkin' ?

- Guido Günther (Germany)
  - Sadly can not be here today
  - Long term free and open source enthusiast and supporter
  - Hard core developer on all levels
  - Debian maintainer
  - Freelancer, also for Purism SPC (USA) working on the Librem5 phone
  - Inventor and maintainer of Phosh / Phoc

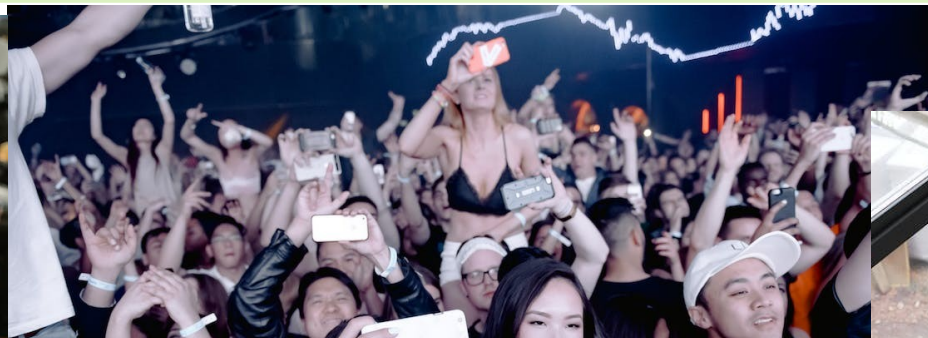
# What's "mobile" ?

- Today 'mobile' usually refers to 'mobile phones', most often also called 'smart phones'
- So it is not about the simple feature phones or just bare phones
- It is also not about laptops and tablets – FLOSS has these covered
- ...and there is also the interesting area of smart watches...  
But this is also not about these, if you are interested, you could look for AsteroidOS, Espruino Bangle, PineTime Infinitime, RiotOS, ...

Back to mobile phones:



# Why is this important?

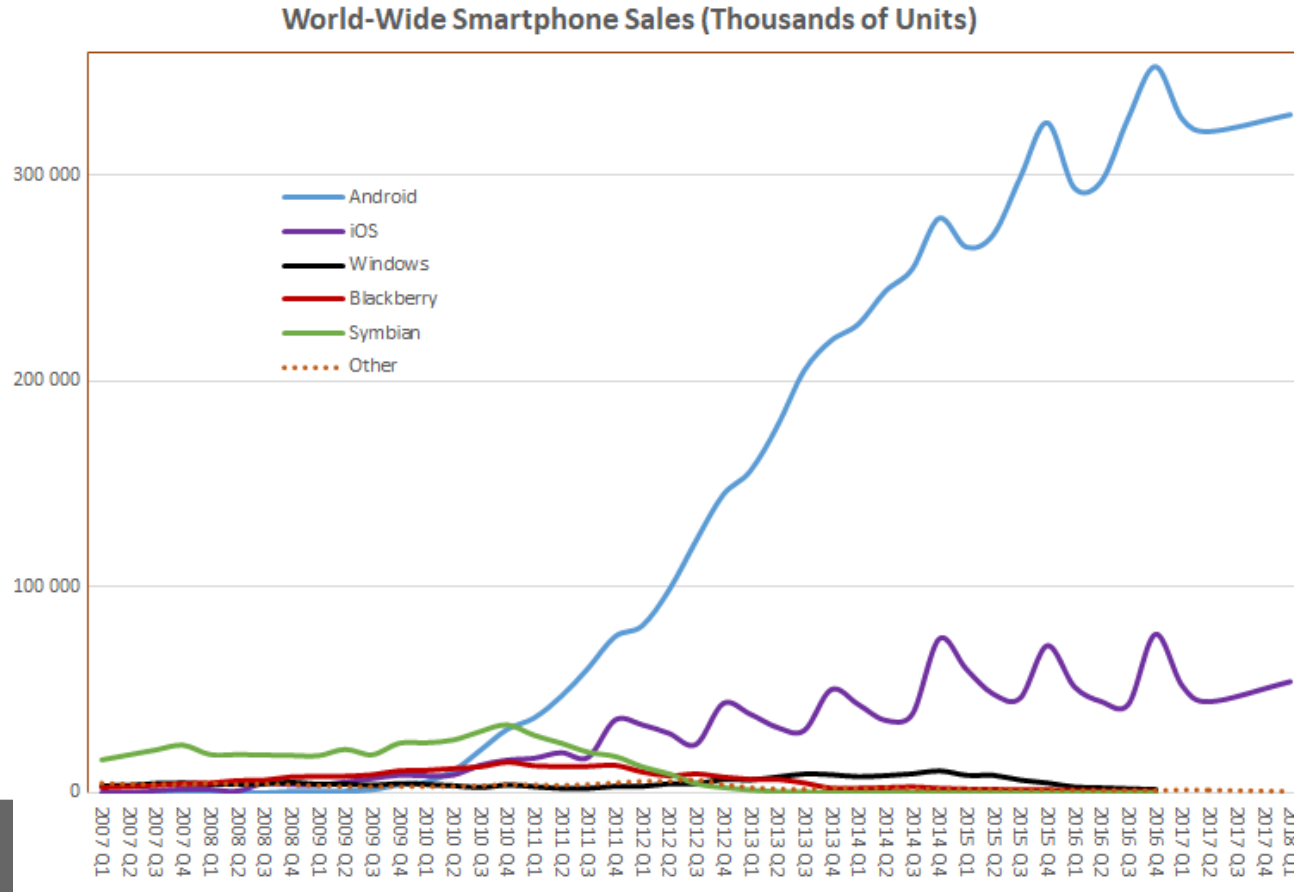


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# Because...

- Every year about 1.2 billion new phones
- Smartphones have by far surpassed relevance of ordinary “computers”
- Have become ubiquitous and universal
- For many the smartphone is their first and only computing device
  - Especially in developing countries
- Many replaced classic computers (PC) with smartphone and/or tablet
  - Tablet market shrinking for years

...and then there is this:



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# And the software?

- Q3 2023 marketshare (source: Statista)
  - 70.46% Android
  - 28.83% iOS
  - Everything else pretty much irrelevant

(Fun fact: The world is run by Linux!)



# What's the problem?

- Android is open source (AOSP), isn't it?
- Well, yes and no ...
  - Platform development is pretty much in one hand: Google
  - Google Mobile Services (GMS) are tied down deep and hard, Google free Android user experience is very limited and getting worse
  - Device makers add a lot of non-free proprietary apps and services
  - Hardware support is often either non-free or very Android specific, learned that while developing the Librem5
- This is not a free and open platform.

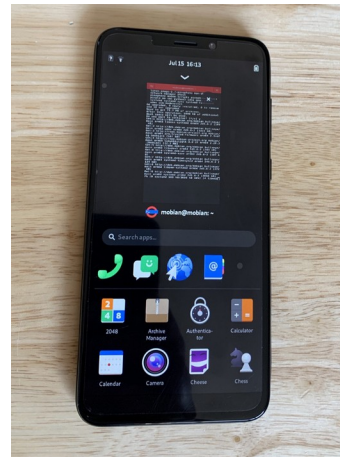


# Software Freedom?

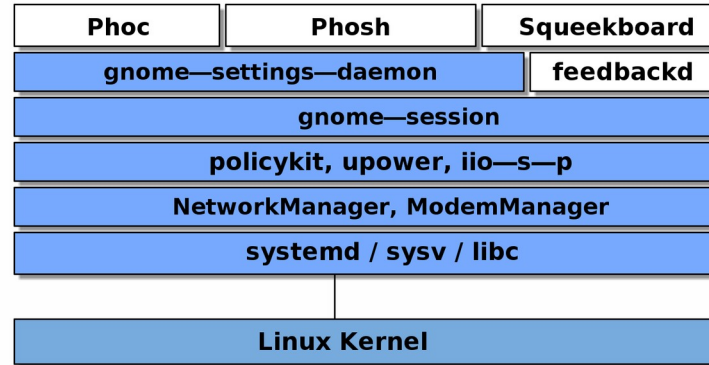
- Software (hence user) Freedom
- Know where your data goes + freedom of control
- Full user instead of vendor control
- Device life cycle determined by hardware, not software
- Mainline, especially (Linux) kernel
  - No binary blobs (drivers, libraries)
  - Device drivers are actively maintained
  - Continuous updates for security & support
  - Only one place to fix → Know where to send patches

# To the rescue!

- Today even several alternatives exist: Plasma mobile, Ubuntu Touch (now @ ubports), Mobian, postmarketOS, PureOS
- Proven implementations for years:



# Case study: Librem5



- (security) updates sorted out via distributions, here PureOS (Debian deriv.)
- all free software stack
- GNOME / GTK+ based UI
- lots of existing, good applications
- allows to use your phone as laptop *and* use the *same* apps



# What we have...

- Framework heavy lifting is solved!
- Free software stacks that have proven to work for most daily tasks:
  - Phone calls
  - Messaging (SMS, MMS, IM)
  - Casual web browsing
  - Photo / video camera
  - A wealth of applications that we know from Linux desktops
  - ...plenty freedom of choice!

# What's missing...

- In short: Hardware to run it on
  - Only very few devices can be bought “off the shelf” that are made for mobile Linux, as of today mainly PinePhone and Purism Librem5
  - A lot of effort is put into supporting mobile Linux on non-native Linux devices, mainly former Android devices
    - Android kernels with either Android userspace or Halium / libhybris
    - Pro: Broad device support
    - Con: Android core is very fragmented and often manufacturer dependent (proprietary glue libs)
    - Con: It's full of blobs



# Hardware support - PostmarketOS

## Phones

Device	Codename	Architecture	USB Net	Flashing	Touch	Screen	Wifi	FDE	Battery	3D	IMU	Audio	Bluetooth	Camera	GPS	Mobile Data	SMS	Calls	USB-OTG	NFC
BQ Aquaris X5	bq-paella	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	-
Fairphone 4	fairphone-fp4	aarch64	Y	Y	Y	Y	Y		N	Y	N	N	Y	N	N	N	N	N	N	N
Lenovo A6000	lenovo-a6000	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	-	-
Lenovo A6010	lenovo-a6010	aarch64	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y			Y	Y	Y	P	-
Motorola Moto G4 Play	motorola-harpia	aarch64	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	N	Y	Y	Y	Y	P	
Nokia N900	nokia-n900	armv7	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	P	P	Y	Y	P	-	-
OnePlus 6	oneplus-enchilada	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	P	Y	Y	Y	P	N
OnePlus 6T	oneplus-fajita	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	P	Y	Y	Y	P	N
PINE64 PinePhone Pro	pine64-pinephonepro	aarch64	Y	-	Y	Y	Y	Y	P	Y	Y	Y	Y	N	Y	Y	Y	Y	N	-
Samsung Galaxy A3 (2015)	samsung-a3	aarch64	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
Samsung Galaxy A5	samsung-a5	aarch64	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
Samsung Galaxy E7	samsung-e7	armv7	Y	Y	Y	P	Y	Y	Y	Y	P	Y	Y	N		Y	Y	Y	Y	Y
Samsung Galaxy Grand Max	samsung-grandmax	armv7	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	Y	N		Y	Y	Y	Y	-
Samsung Galaxy S III	samsung-m0	armv7	P	Y	Y	Y	Y	Y	Y	Y	N	P	P		N	N	N	N		
Samsung Galaxy S4 Mini Value Edition	samsung-serranove	armv7	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
SHIFT SHIFT6mq	shift-axolotl	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	N	N
Wileyfox Swift	wileyfox-crackling	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	P	-
Xiaomi Mi A1	xiaomi-tissot	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	P	P	Y	-
Xiaomi Mi A2 Lite	xiaomi-daisy	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	P	P	Y	
Xiaomi Mi Note 2	xiaomi-scorpio	aarch64	Y	Y	Y	Y	Y	P	P	Y	N	P	Y	P	N	N	P	N	Y	Y
Xiaomi Pocophone F1 / POCO F1	xiaomi-beryllium	aarch64	Y	Y	Y	Y	Y	Y	P	Y	N	Y	Y	N	P	Y	Y	Y	N	-
Xiaomi Redmi 2	xiaomi-wt88047	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	-
Xiaomi Redmi 4 Prime	xiaomi-markw	aarch64	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	N	N	N	N	N	Y	-
Xiaomi Redmi 5 Plus	xiaomi-vince	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	N	N	N	P	P	Y	-
Xiaomi Redmi Note 4	xiaomi-mido	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	P	P	Y	
Xiaomi Redmi S2 / Redmi Y2	xiaomi-ysl	aarch64	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	P	P	Y	-



# Is it ?

- So, can we sustain Software Freedom in the mobile world?
  - I think, yes!  
The free software communities have proven it, many times, over and over again!
  - But we need
    - more supported hardware, so that developers can develop for it and users can run it.
    - more mobile Linux apps



# How to help?

- Don't accept proprietary apps
- As a tinkerer: Get a Linux Mobile device and start experimenting. Maybe you even have one in your drawer?
- As a developer:
  - Think about mobile Linux when designing applications
  - Write the app you miss the most
- As a distro hacker: Add more apps that work on phone screens to your favorite distribution: <https://linmobapps.frama.io/>
- As a user: Buy a device that runs mobile Linux
- As a student: Maybe do your master thesis on mobile Linux
- As hardware vendor: Use mainline Linux, it works!



# Thank you very much !

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- Some links:
  - <https://pureos.net/>
  - <https://phosh.mobi/>
  - <https://developer.gnome.org/>
  - <https://www.postmarketos.org/>
  - <https://plasma-mobile.org/>
  - <https://mobian-project.org/>
  - <https://ubports.com/en/>

