Free software on cell phones: My user experience with Replicant

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About Android

In the GNU/Linux system I can remove and replace parts to obtain a system I like.

That is:

- GNU
- plus Linux

Android is GNU/Linux

A very sad affair.

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The Android software

- Android is mostly free software...
- ...but many components running on phones are usually proprietary
  - some components are always proprietary:
    - almost everything in app "stores"
    - modem driver
    - Wifi driver?
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Proprietary software is a particularly serious problem here

Android runs on this kind of hardware.

Any modern cellphone has:

- antenna, controlled by modems (GSM, Wi-Fi)
- microphone
- cameras

- No hardware kill switches

People have this in their pocket, running proprietary (unknown) software!

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Noun [edit]

bug (*plural* **bugs**)

1. (*entomology*) An insect of the order Hemiptera (the “true bugs”).
2. Any of various species of marine or freshwater crustaceans; e.g. a Moreton Bay bug, mudbug. [quotations ▼]
3. (*informal*) Any insect, arachnid, or other terrestrial arthropod that is a pest.

   *These flies are a bother. I’ll get some **bug** spray and kill them.*
4. (*US*) Any insect, arachnid, myriapod or entognath.
5. (*UK*, *obsolete*, *specifically*) A bedbug. [quotations ▼]
6. (*chiefly computing and engineering jargon*) A problem that needs fixing. [quotations ▼] [synonyms ▲]

   Synonyms: defect, glitch

   *The software **bug** led the computer to calculate 2 plus 2 as 3.*
7. A contagious illness, or a pathogen causing it.

   *He's got the flu **bug**.*
8. (*informal*) An enthusiasm for something; an obsession. [quotations ▼]

   *I caught the skiing **bug** while staying in the Alps.*
9. (*informal*) A keen enthusiast or hobbyist. [quotations ▼]
10. A concealed electronic eavesdropping or intercept device.

    *We installed a **bug** in her telephone.*
11. A small and usually invisible file (traditionally a single-pixel image) on a World Wide Web page, primarily used to track users.

    *He suspected the image was a Web **bug** used for determining who was visiting the site.*
12. (*broadcasting*) A small, usually transparent or translucent image placed in a corner of a television program to identify

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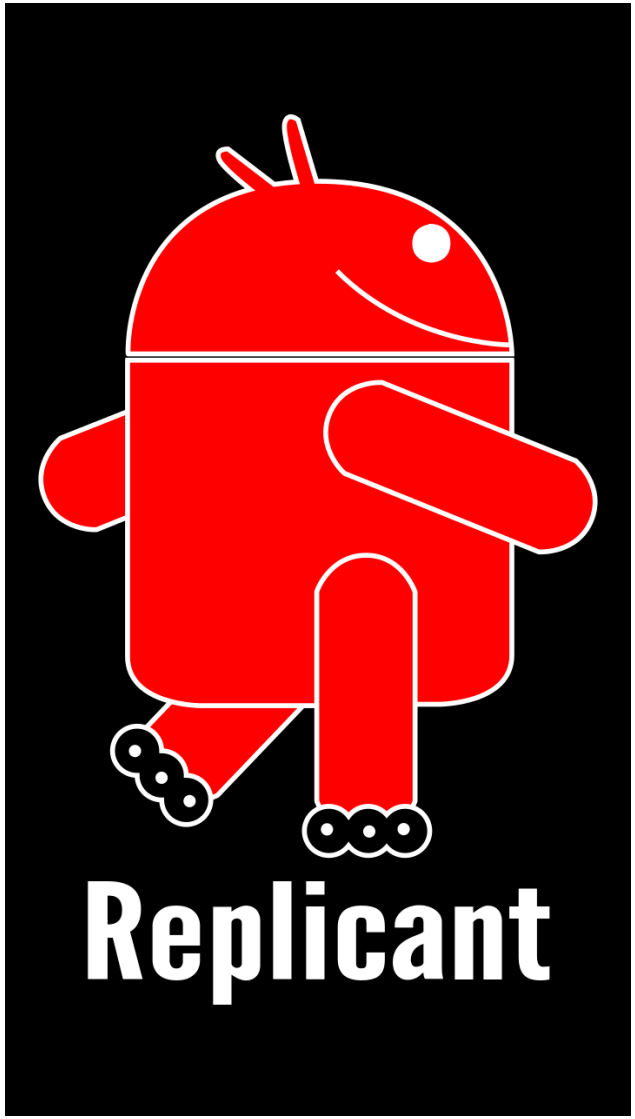
The Replicant Project 1/2



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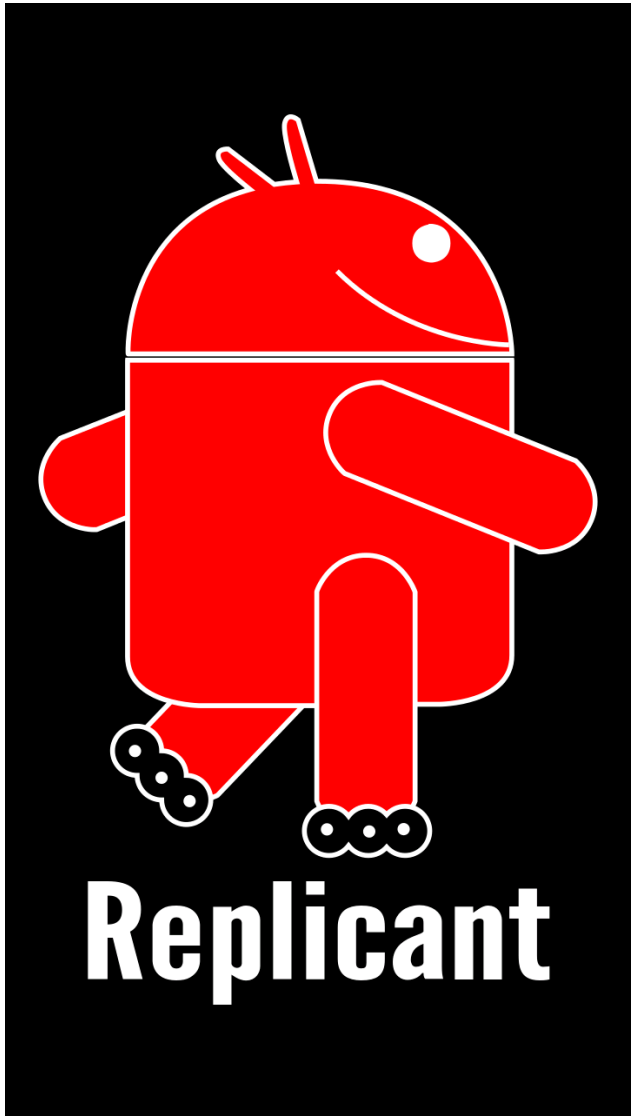

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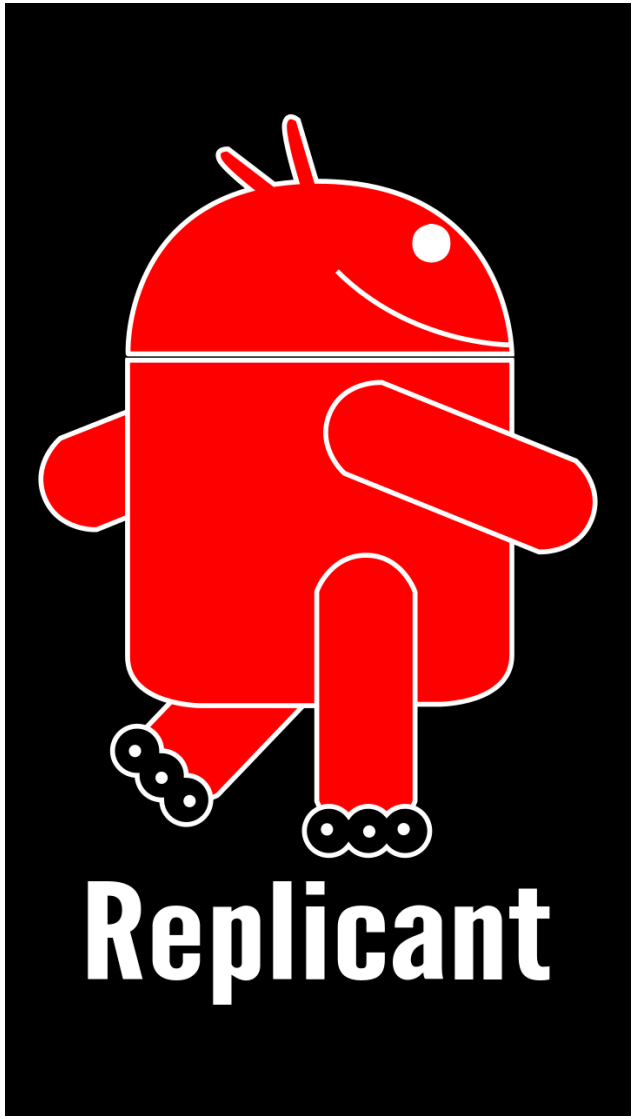

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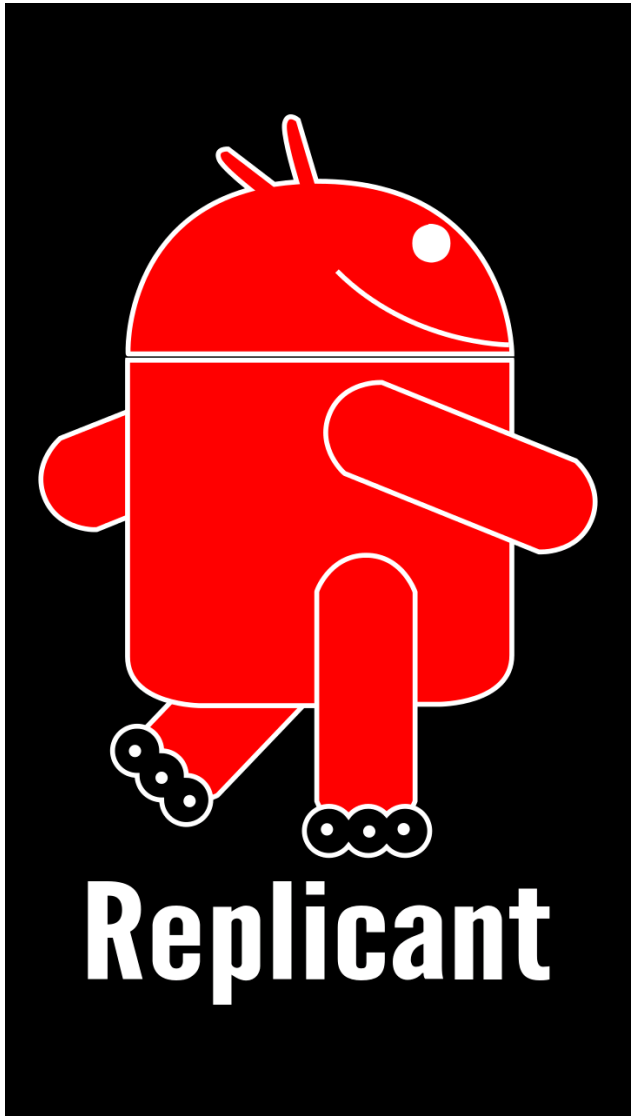

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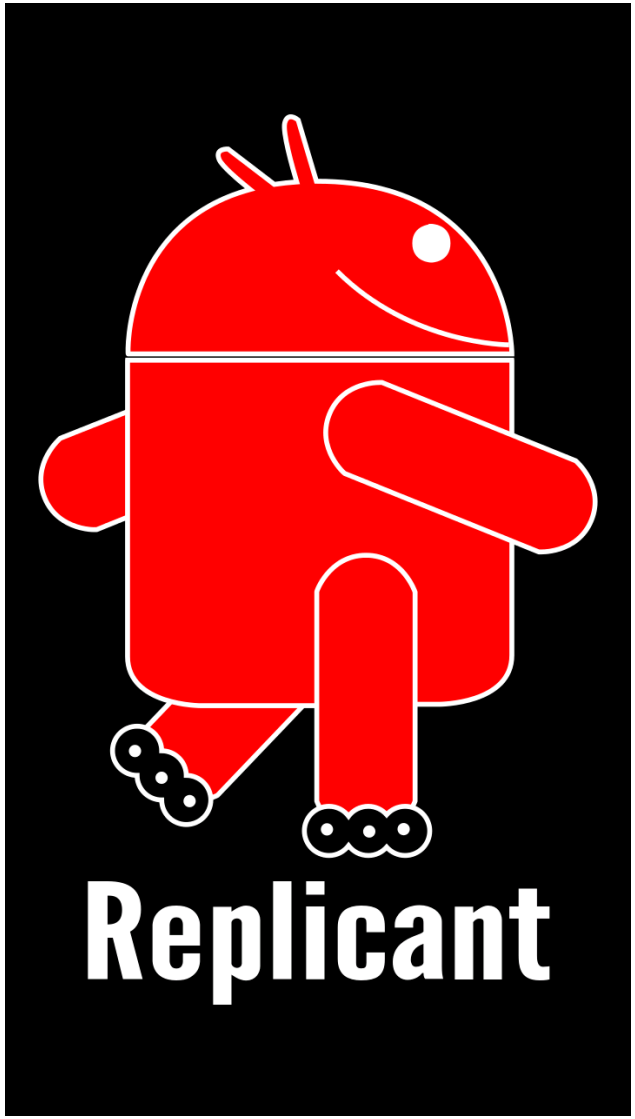

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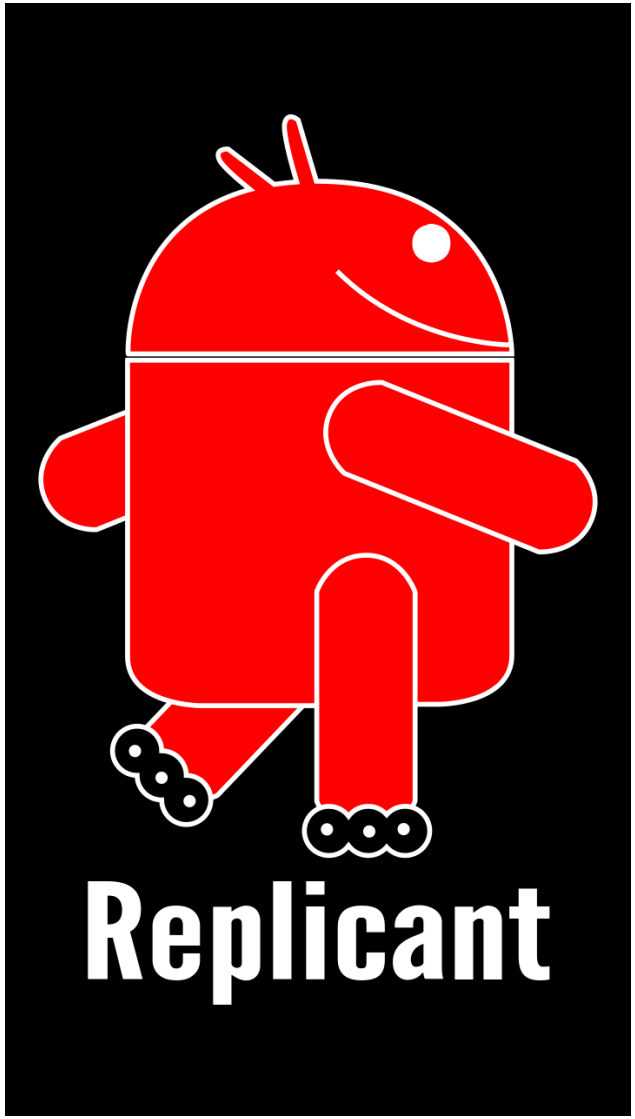

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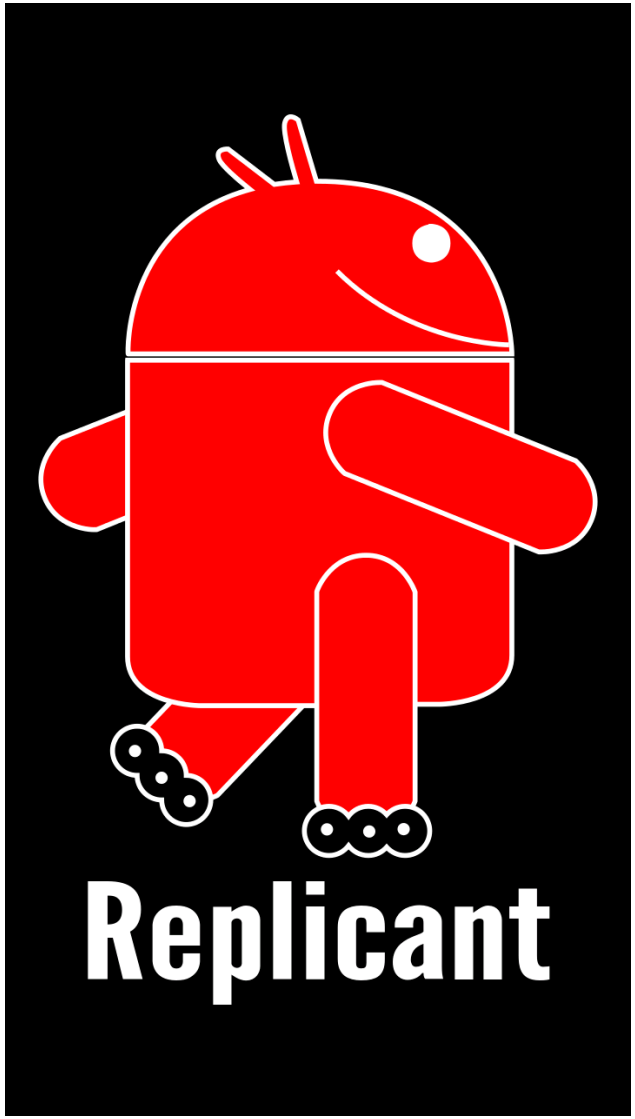

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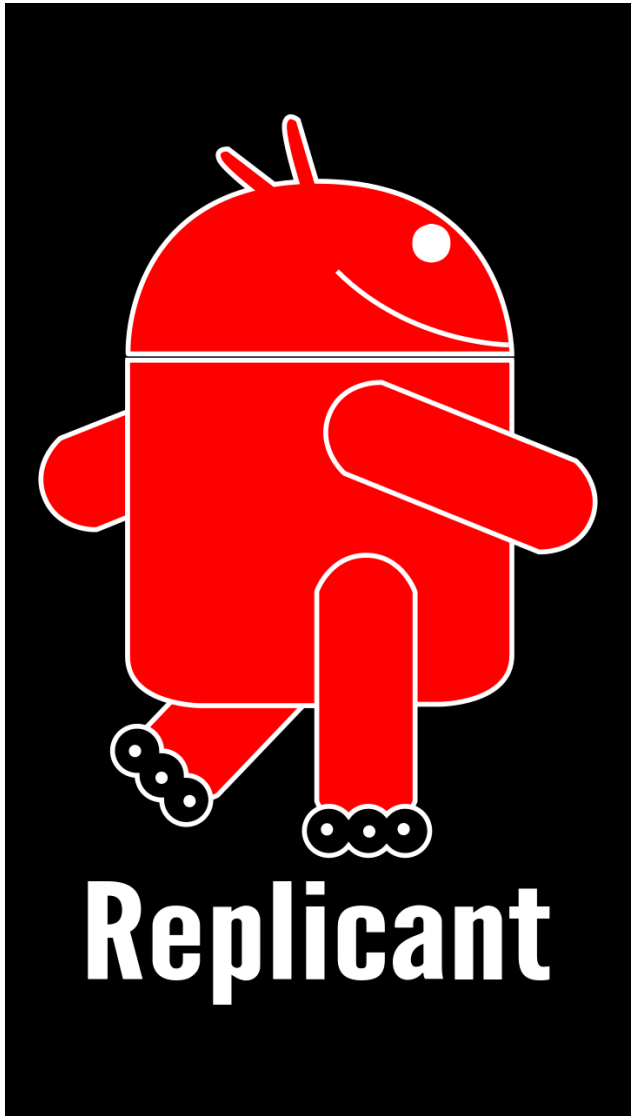

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  - Thanks Ege: she bought one second-hand then gifted it to me
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- You can spend a long time installing apps and (to a limited degree) customising

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- No Wifi, front camera, Bluetooth, GPS (proprietary drivers)
  - But the back camera works with a free-software driver
- Proprietary but isolated GSM modem
- No display acceleration: slowish refresh
  - VLC the only working video player
- The camera app sometimes crashes because of the nonworking front camera
- The entire phone can crash, more easily with some apps
- A very annoying bug sometimes crashes the GSM modem
  - I have an imperfect workaround
- I can cross-compile from GNU/Linux!
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(If it crashes now I can fix it quickly.)

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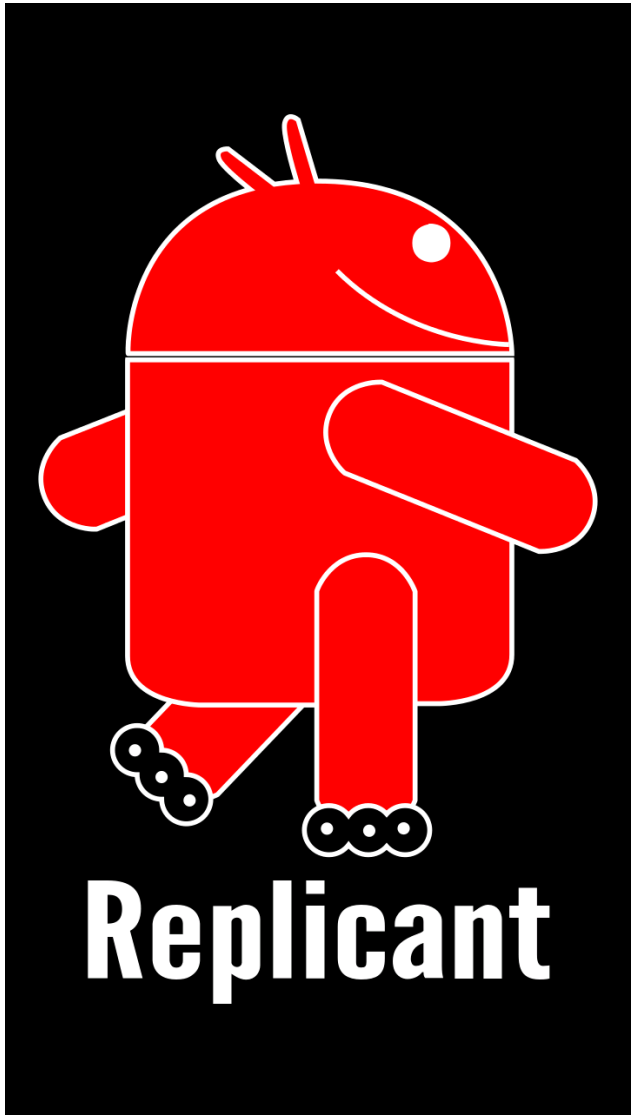

My Replicant system at boot, with the screen locked, in its home screen.

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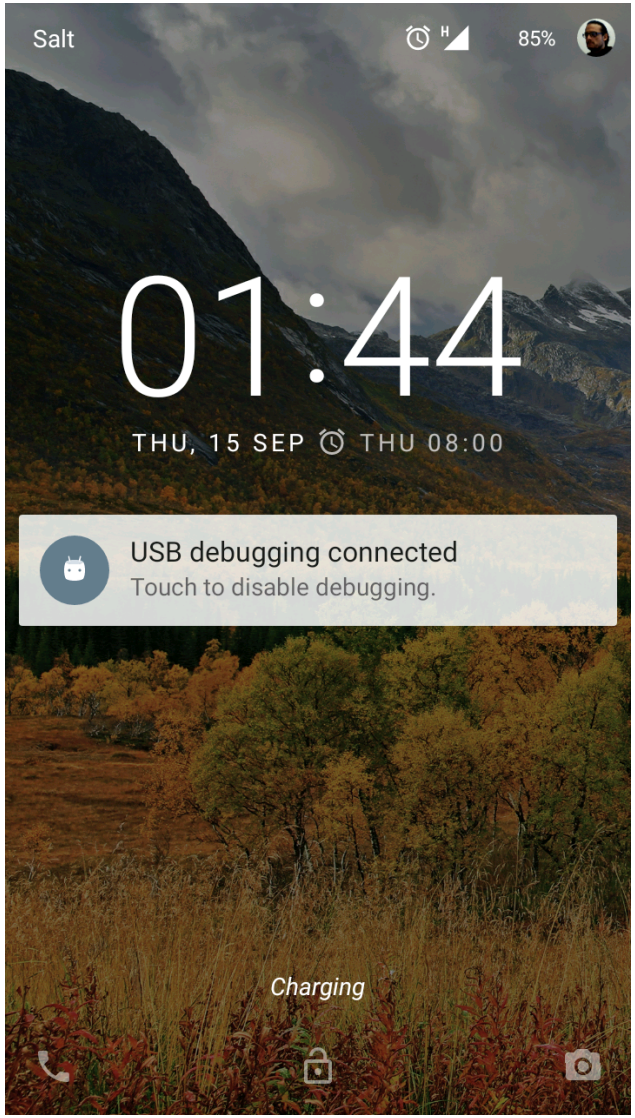

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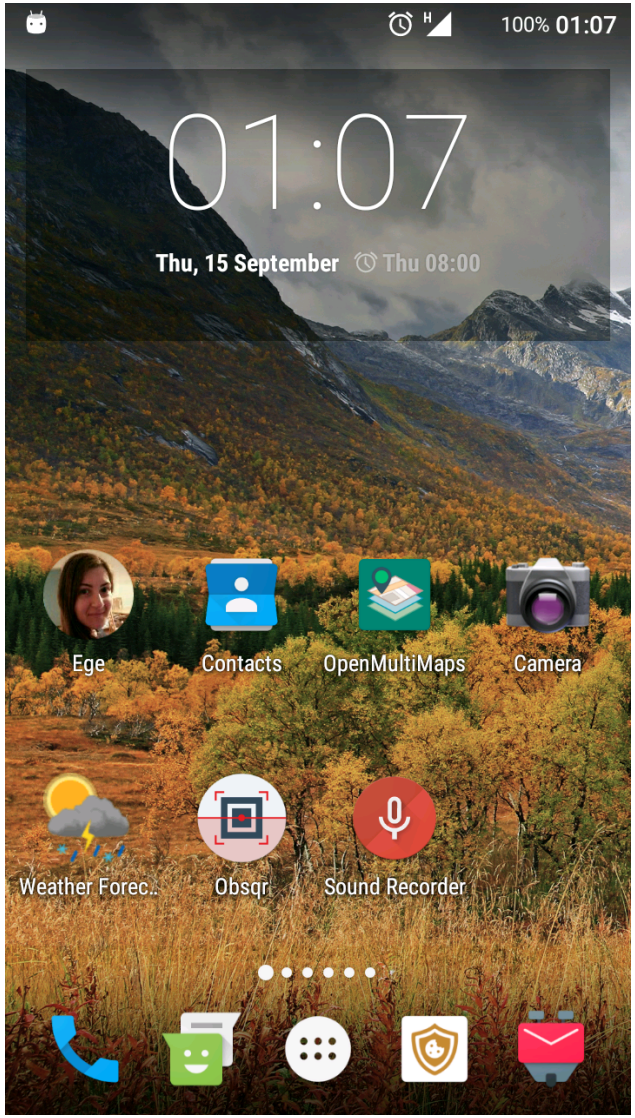

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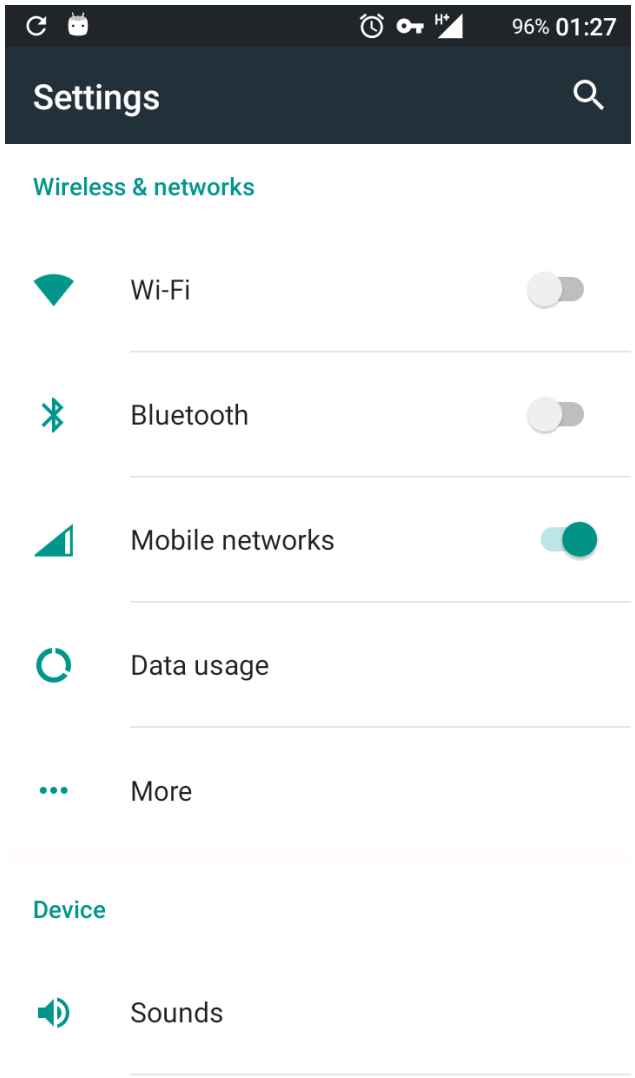

The Android Debugging Bus is useful for controlling your phone from your computer.

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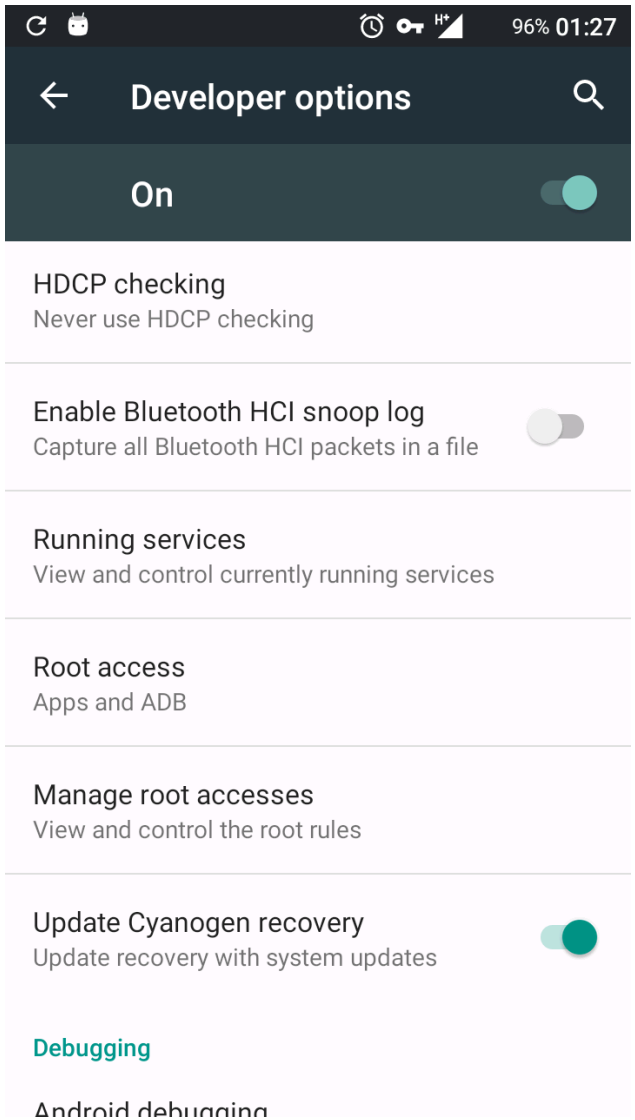

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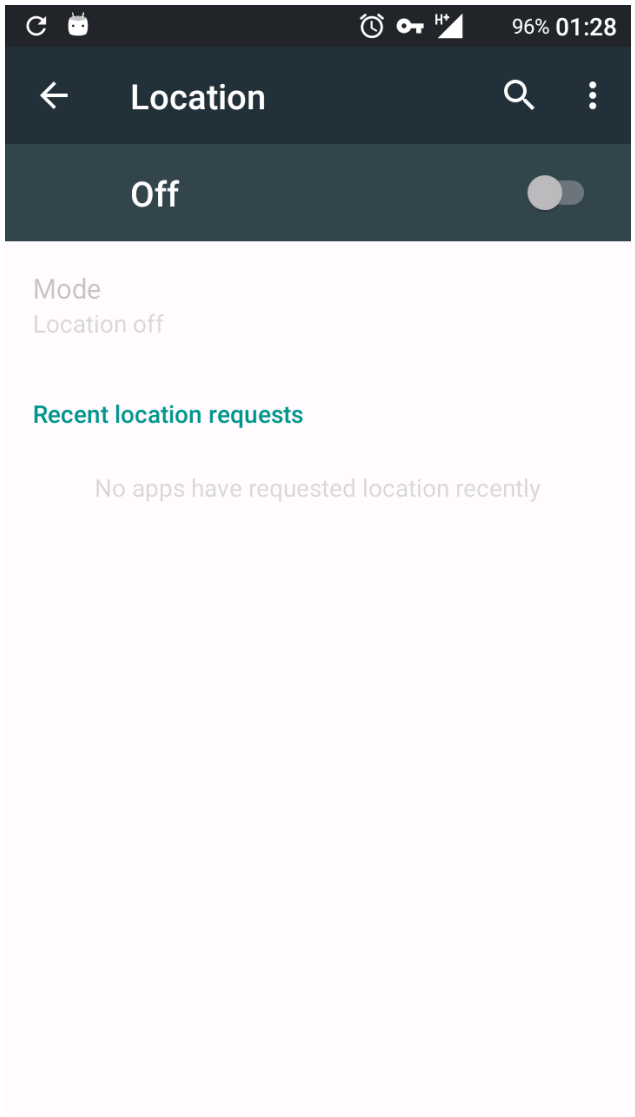

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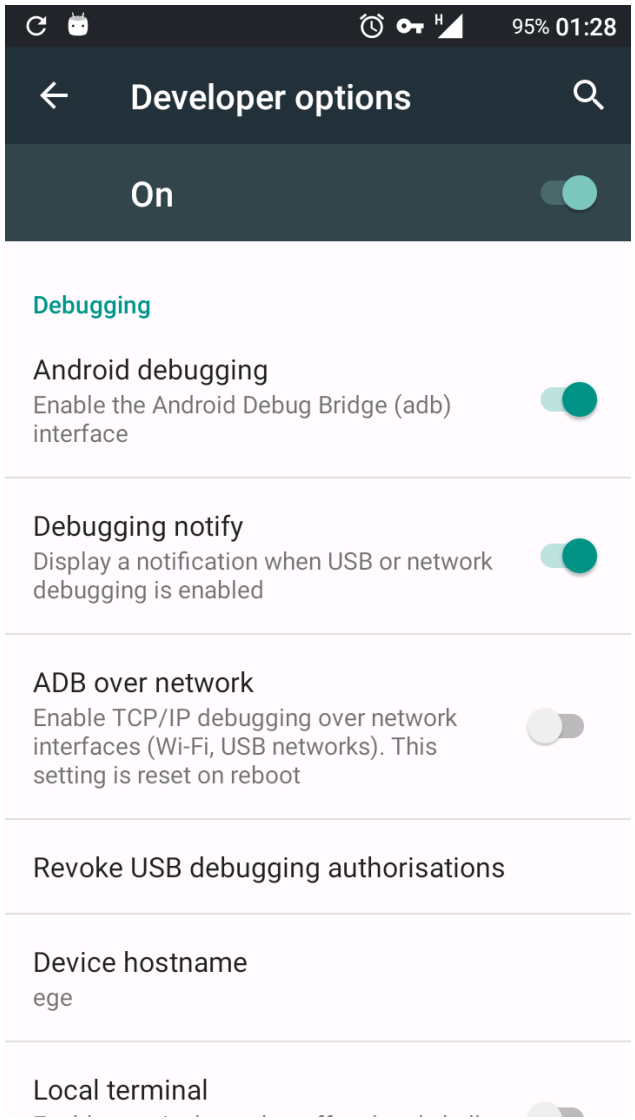

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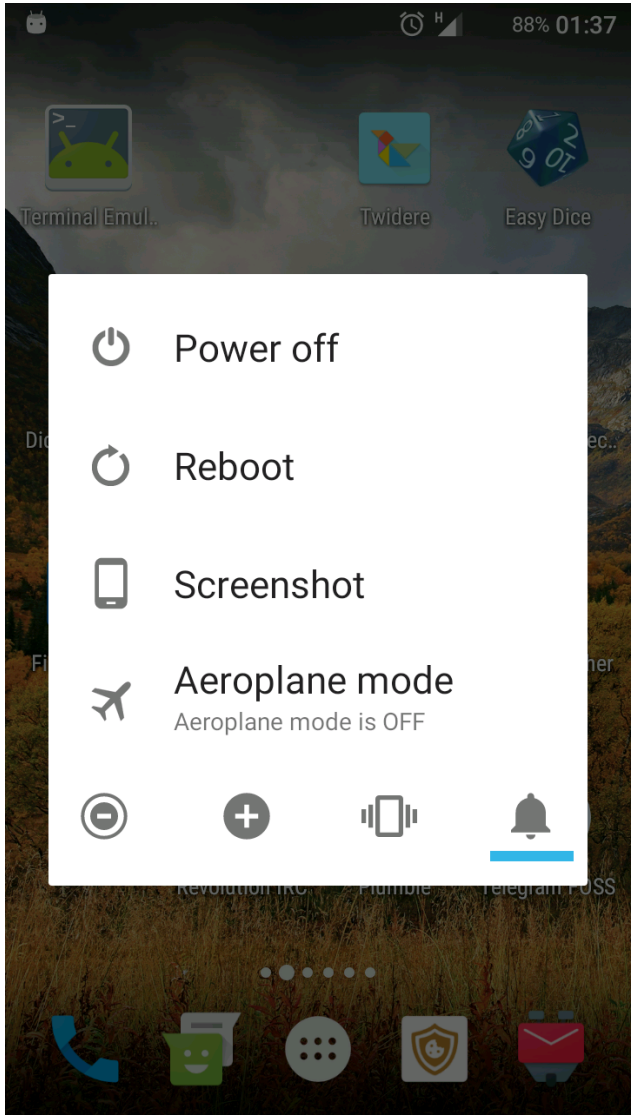
Reboot and recovery mode



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The Recovery image is useful for backing up and restoring without touching mounted filesystems; and for system upgrades.

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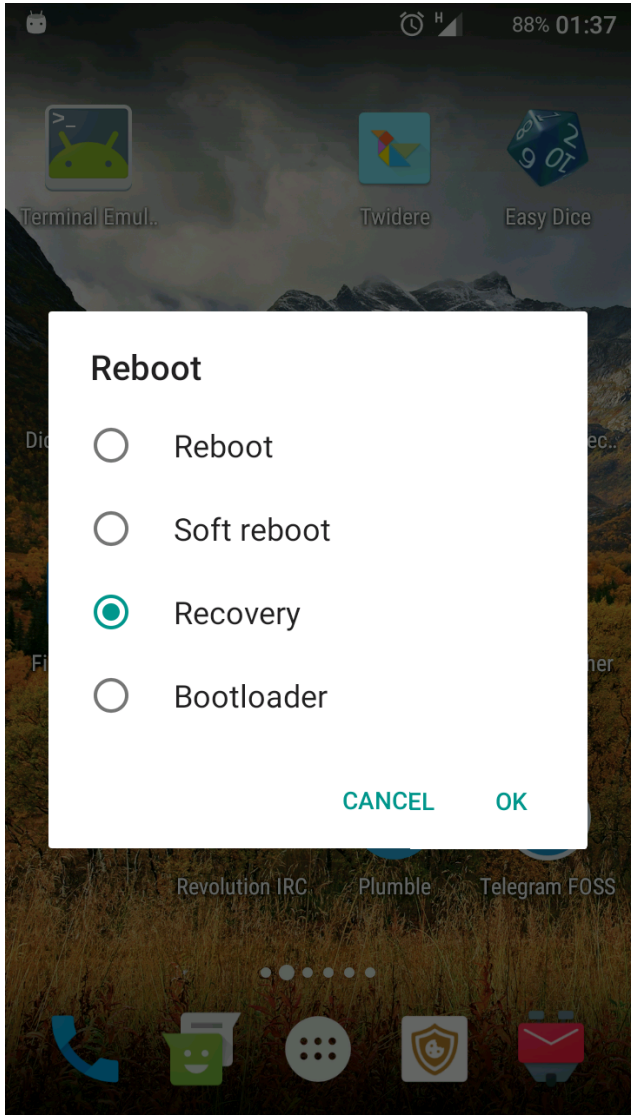

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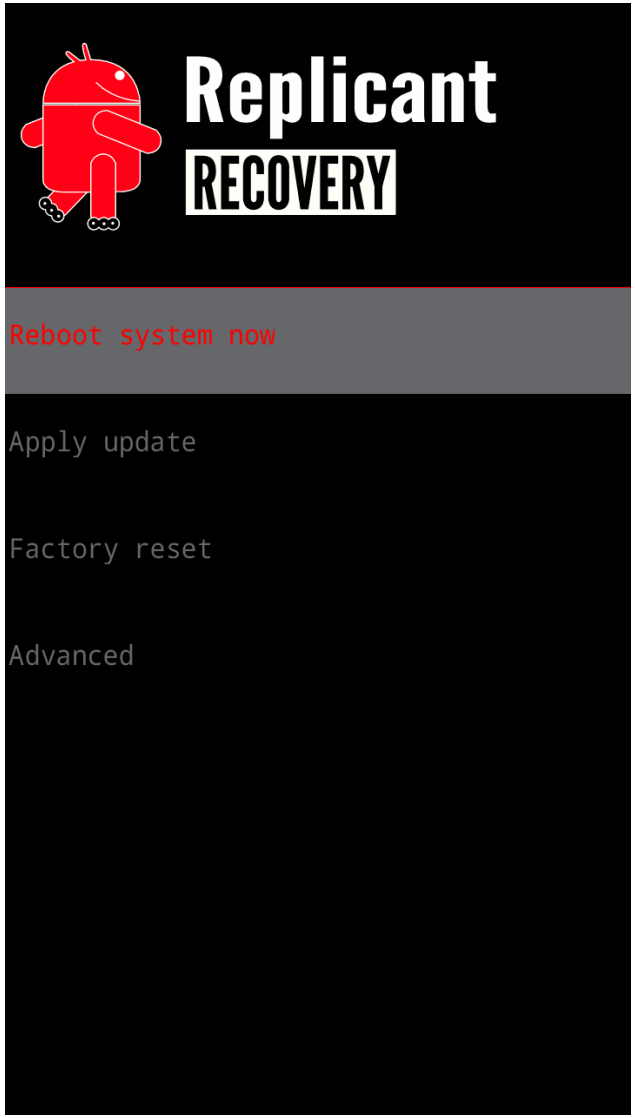

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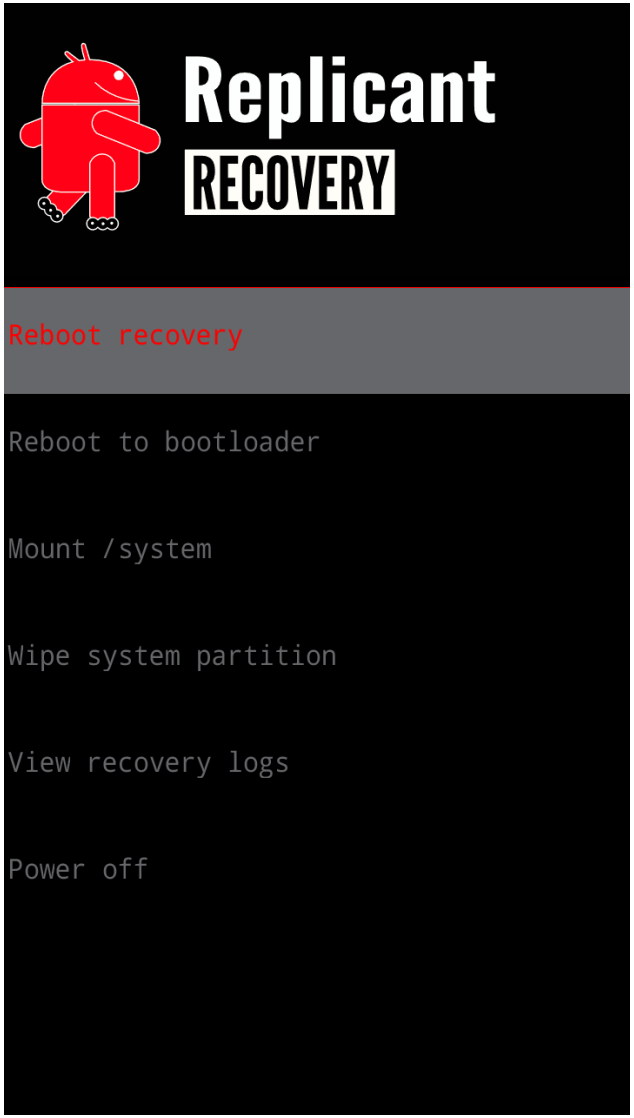

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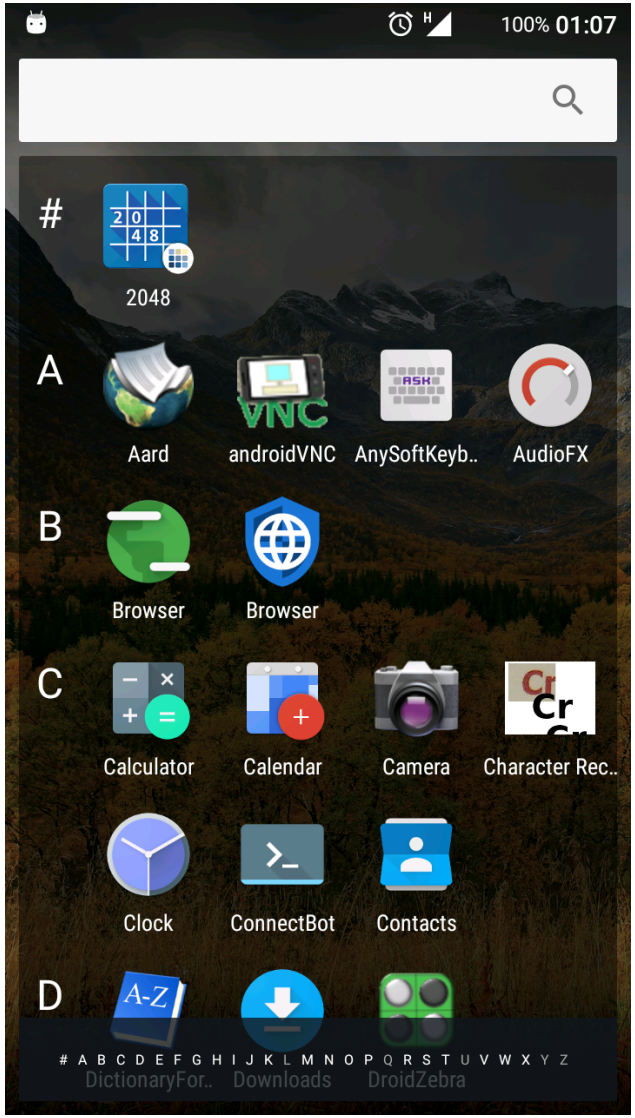

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Some I actually use; a few are silly, some I have just tried once.

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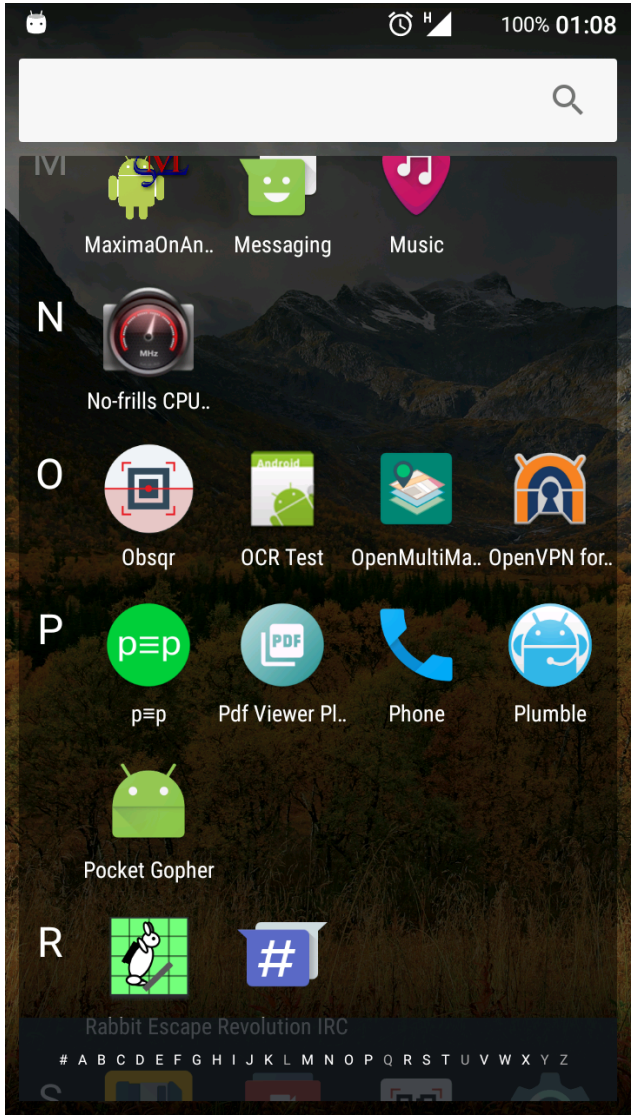

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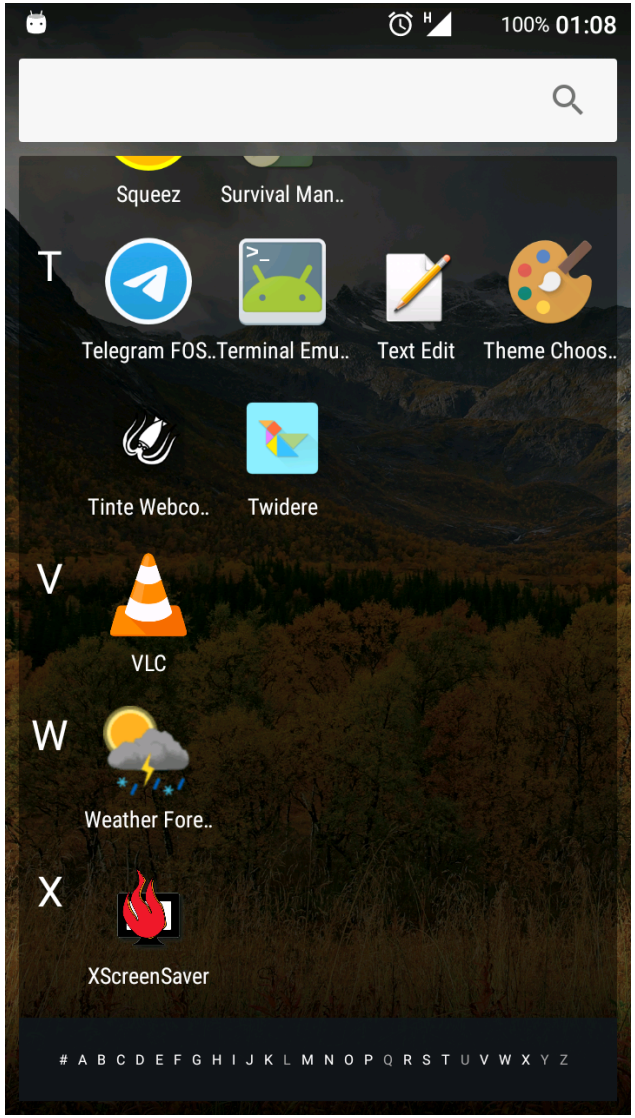

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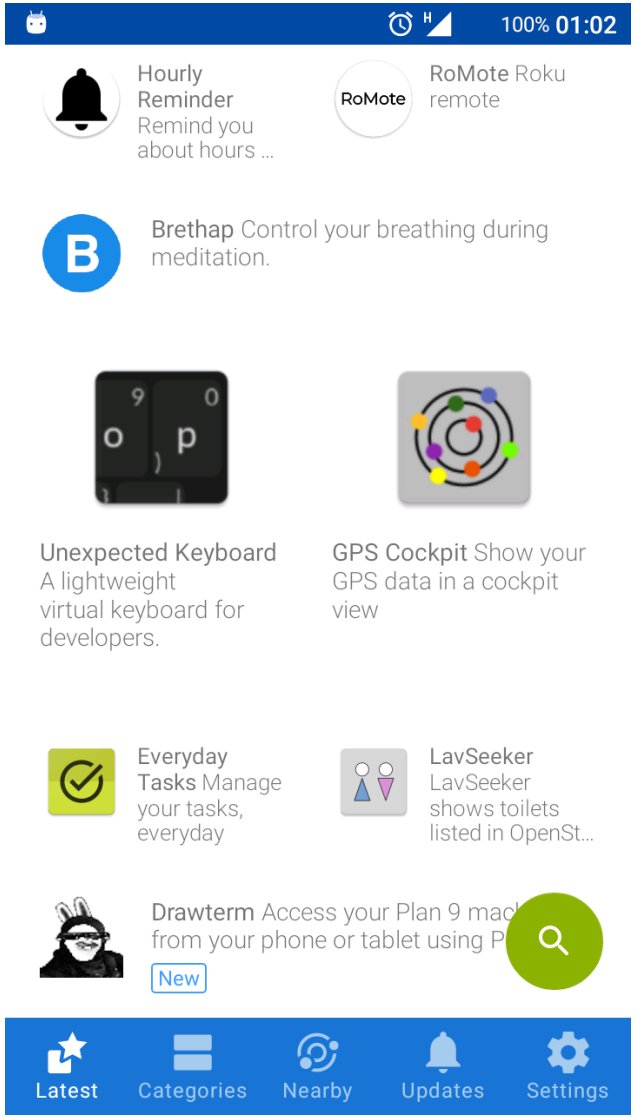
The f-droid "app store" for free-software apps



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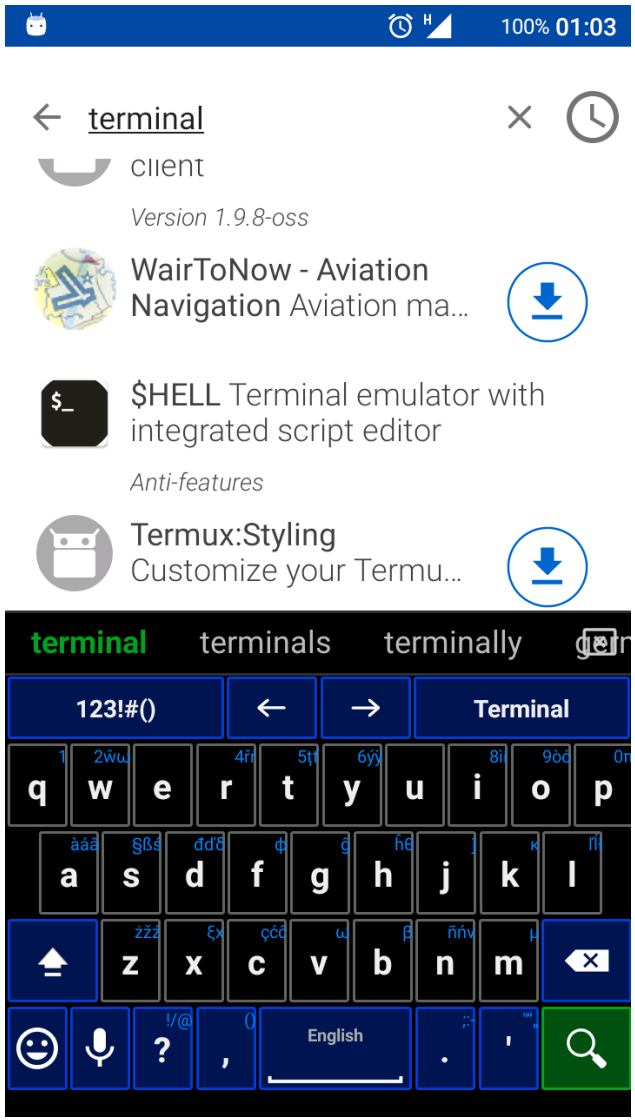

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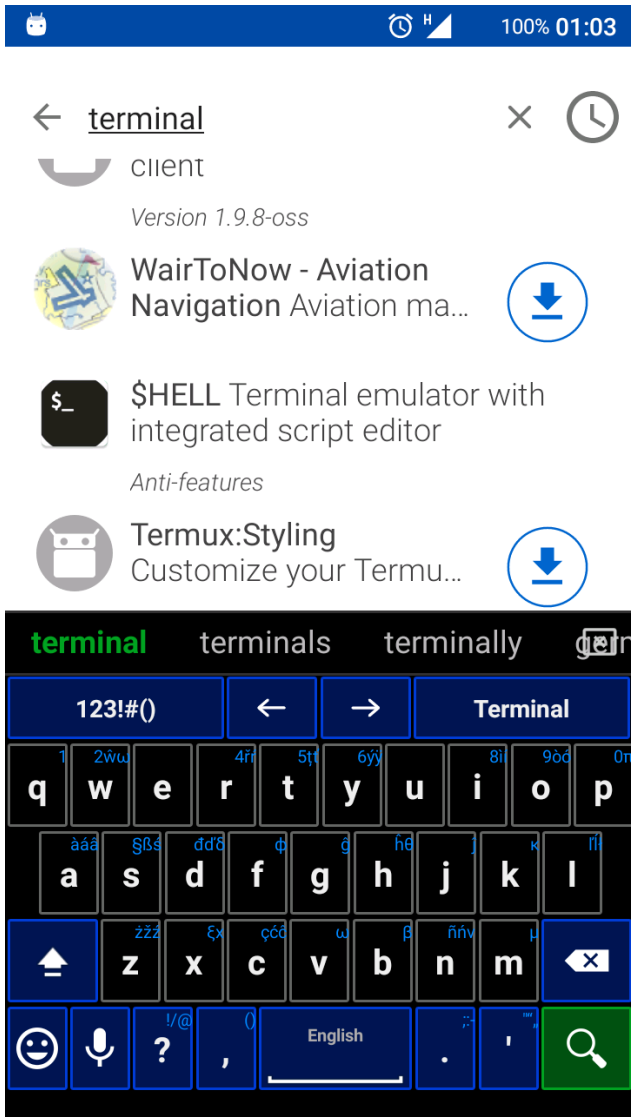

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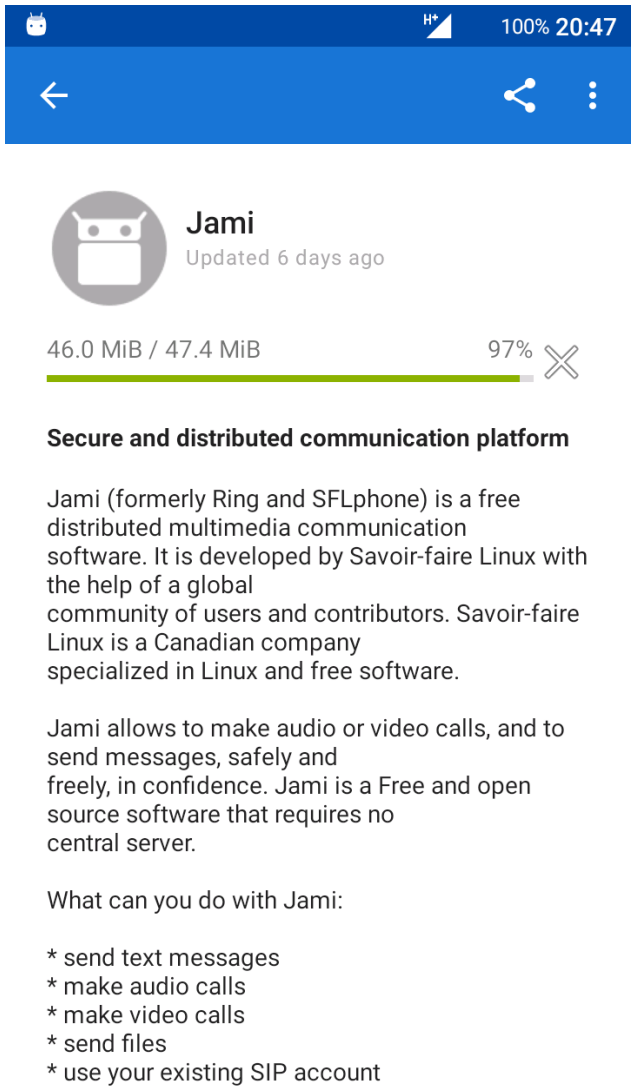

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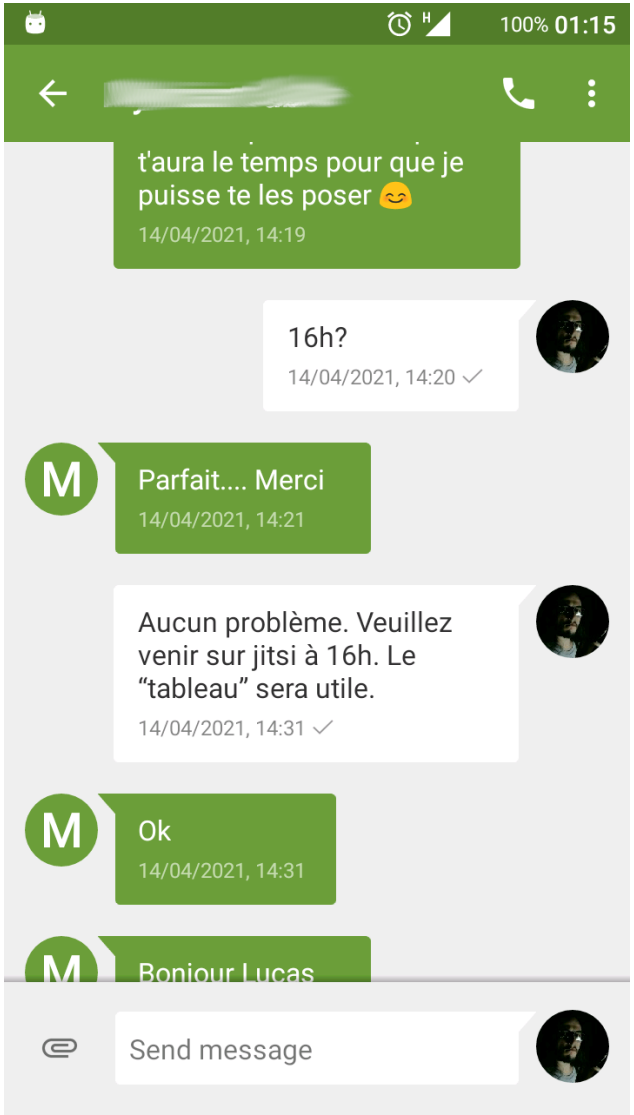
SMS messages



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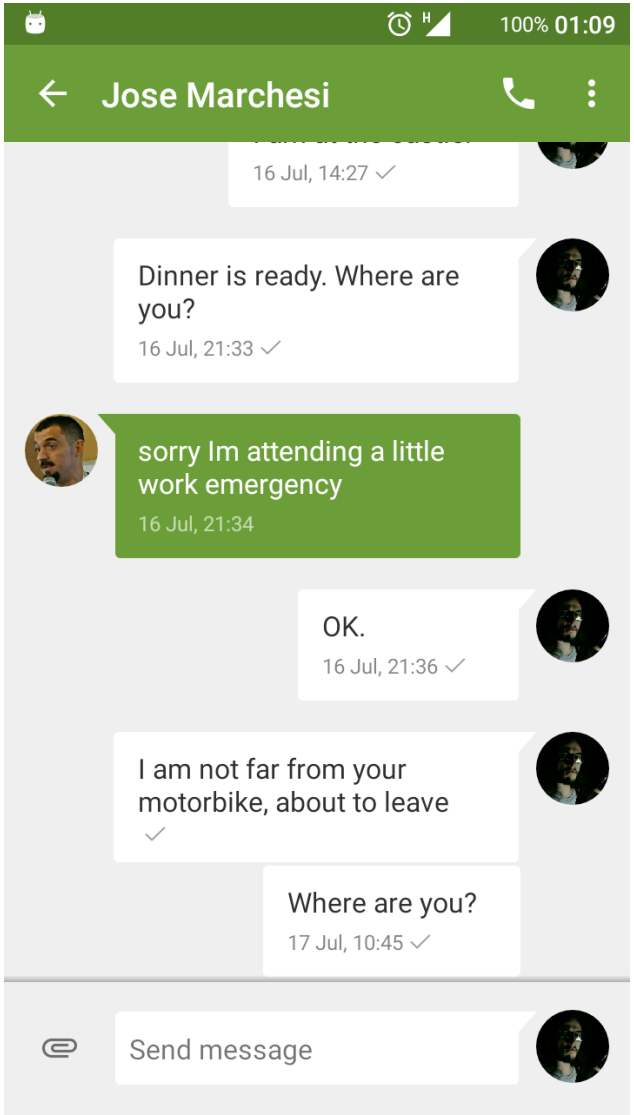

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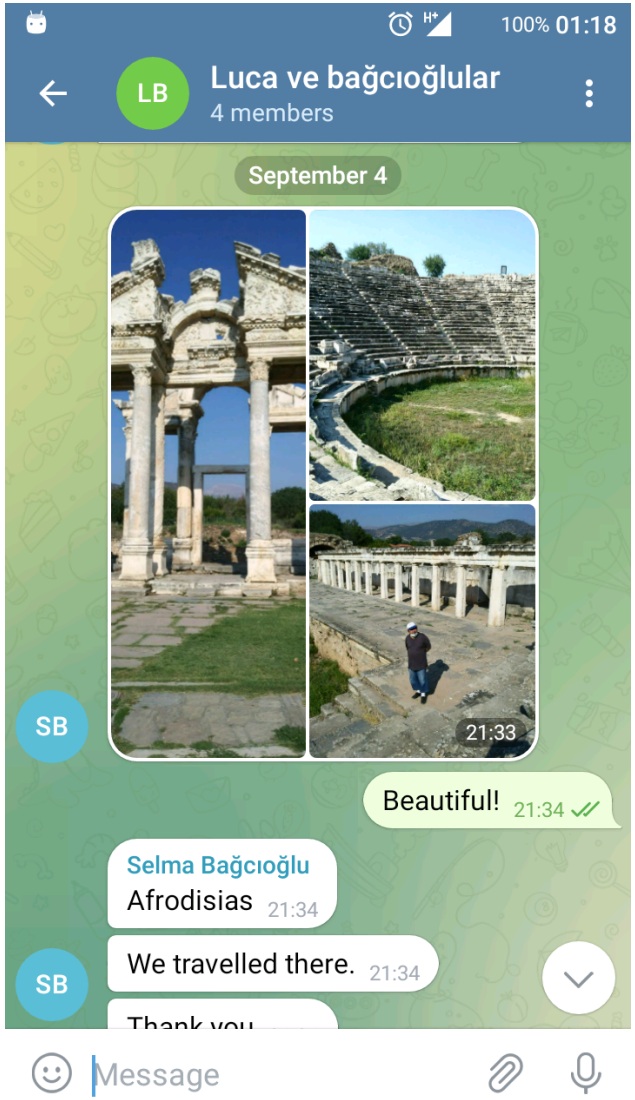

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Calls and groups also work perfectly well.

[Hello to my awesome Turkish parents-in-law.]

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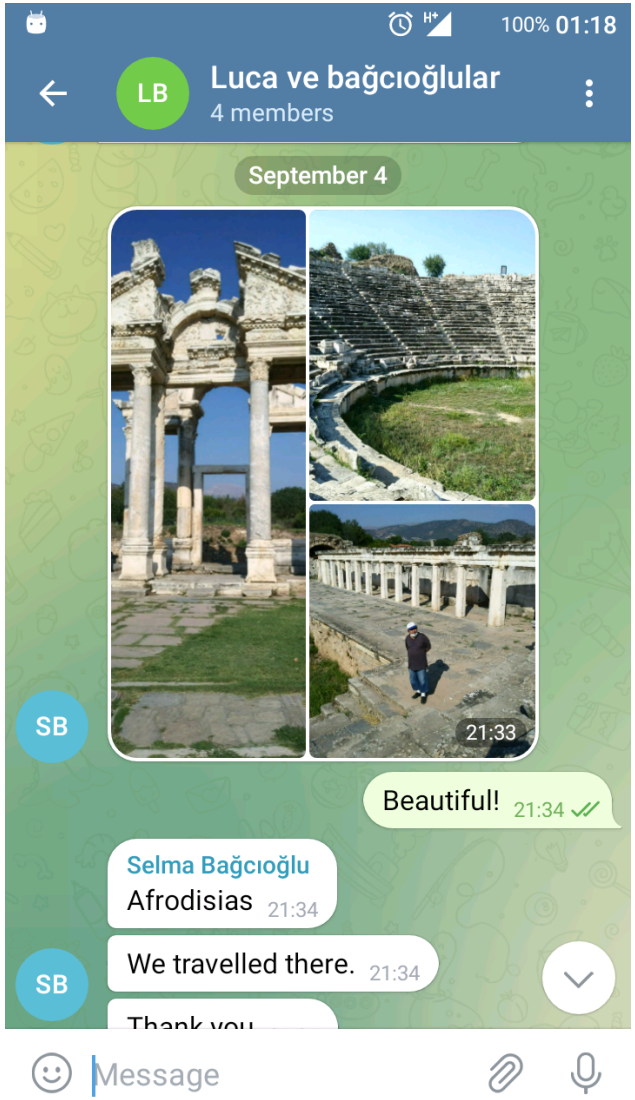

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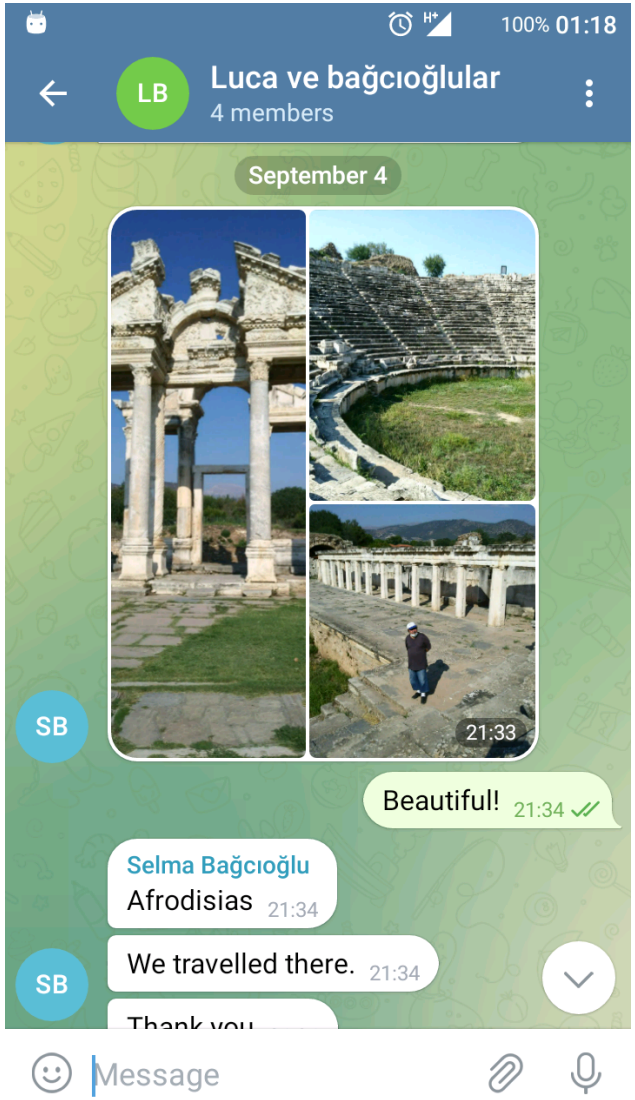

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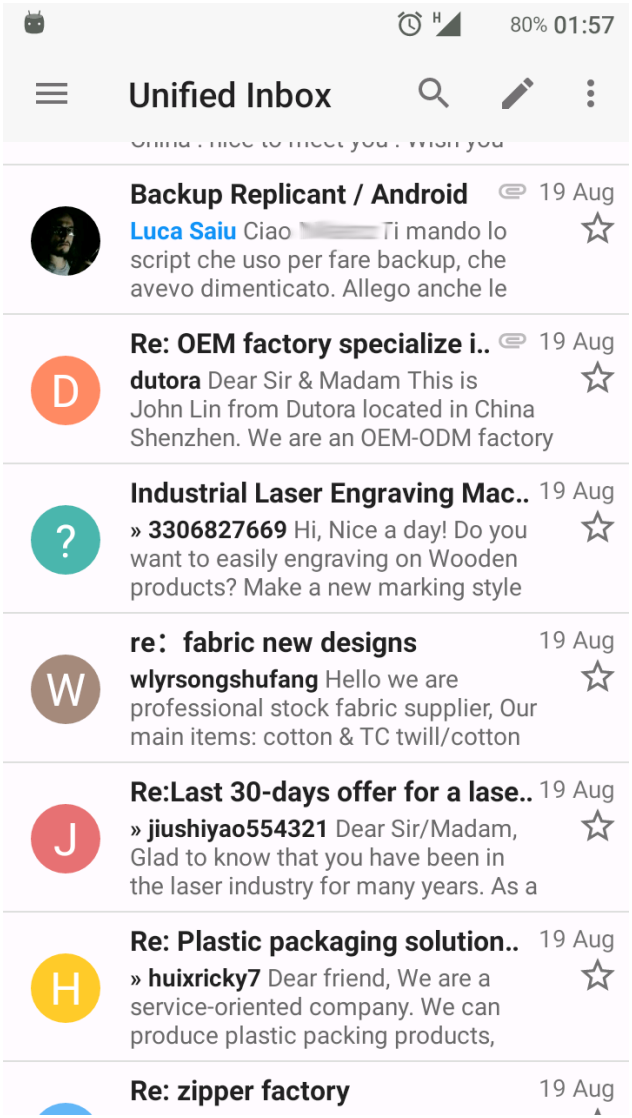

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Inflexible and limited for me, used to the power of Gnus on GNU Emacs...

...But users of mail apps on cell phones will feel perfectly at home with this.

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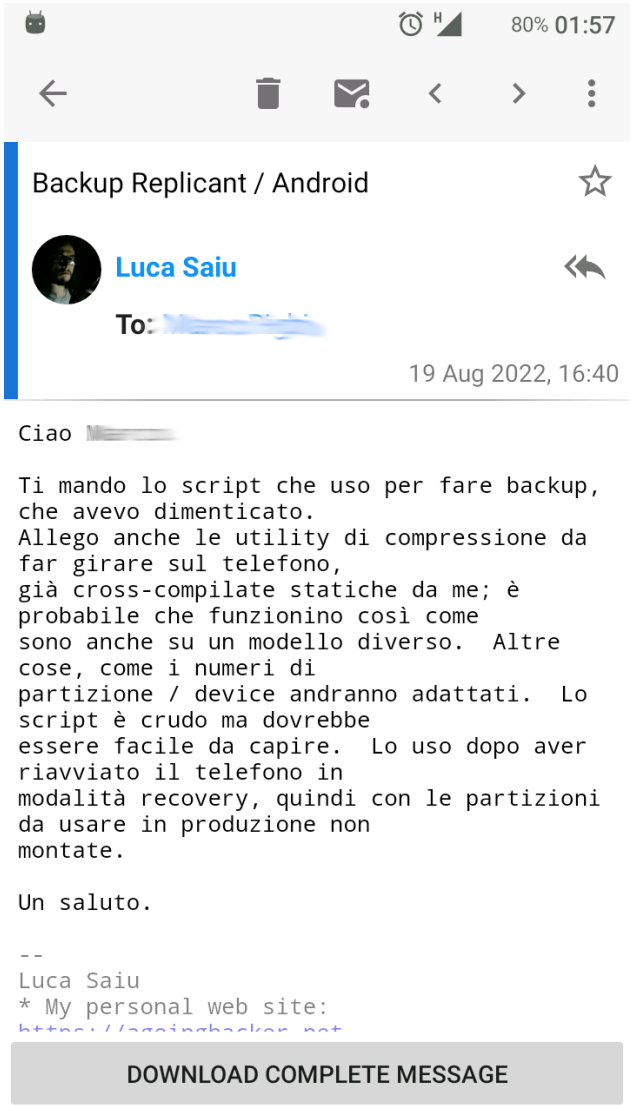

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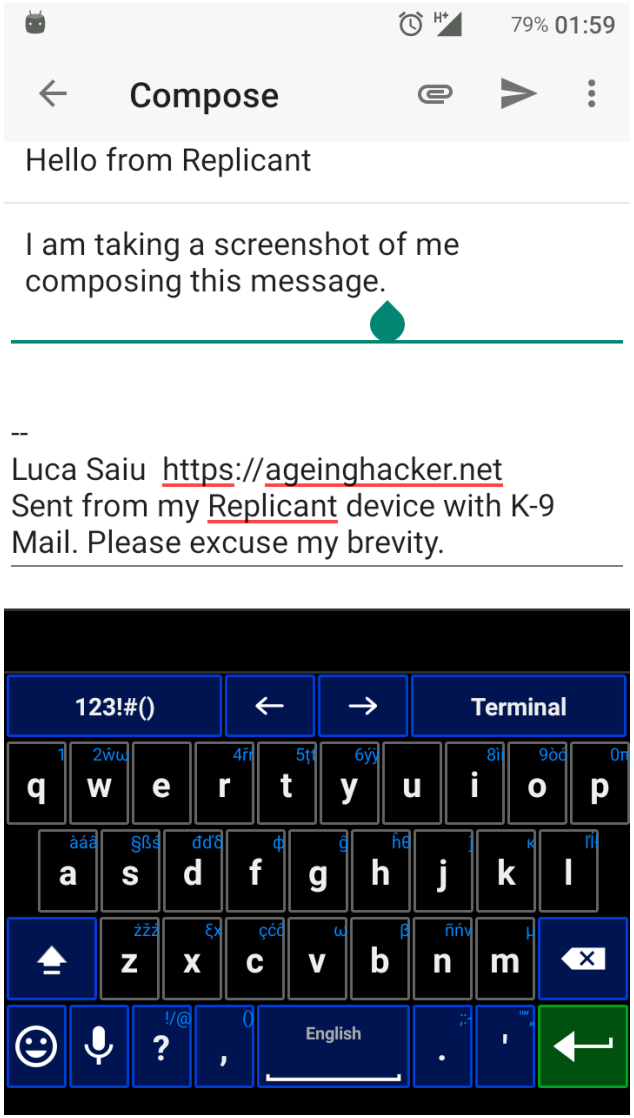

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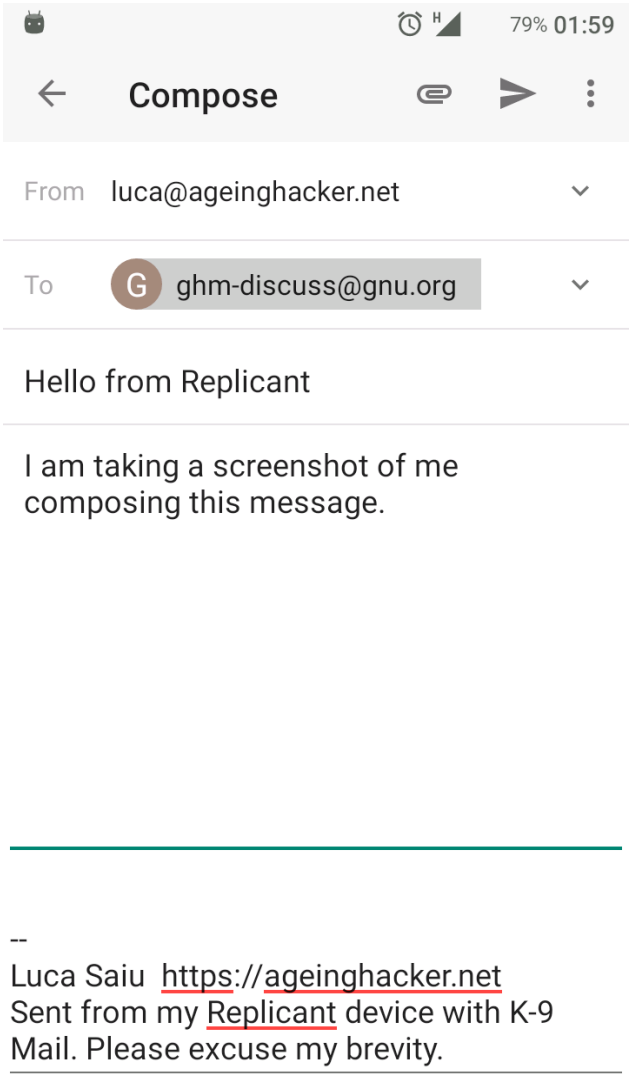

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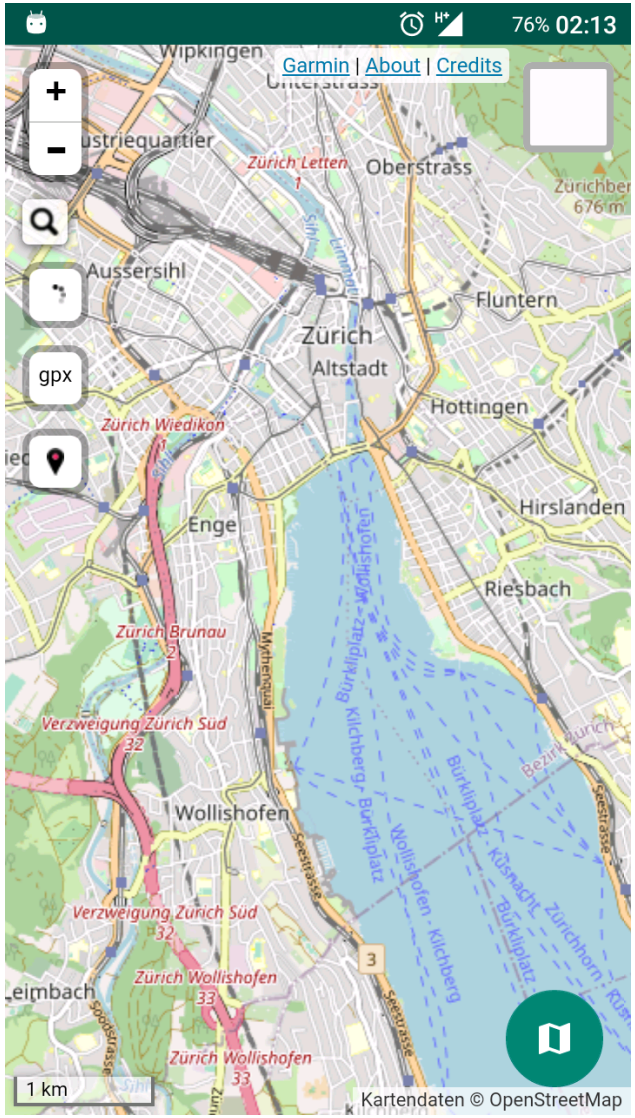
Web browsing

SmartCookieWeb is the best web browser I found.

Maps: several unusable apps use OpenStreetMap...



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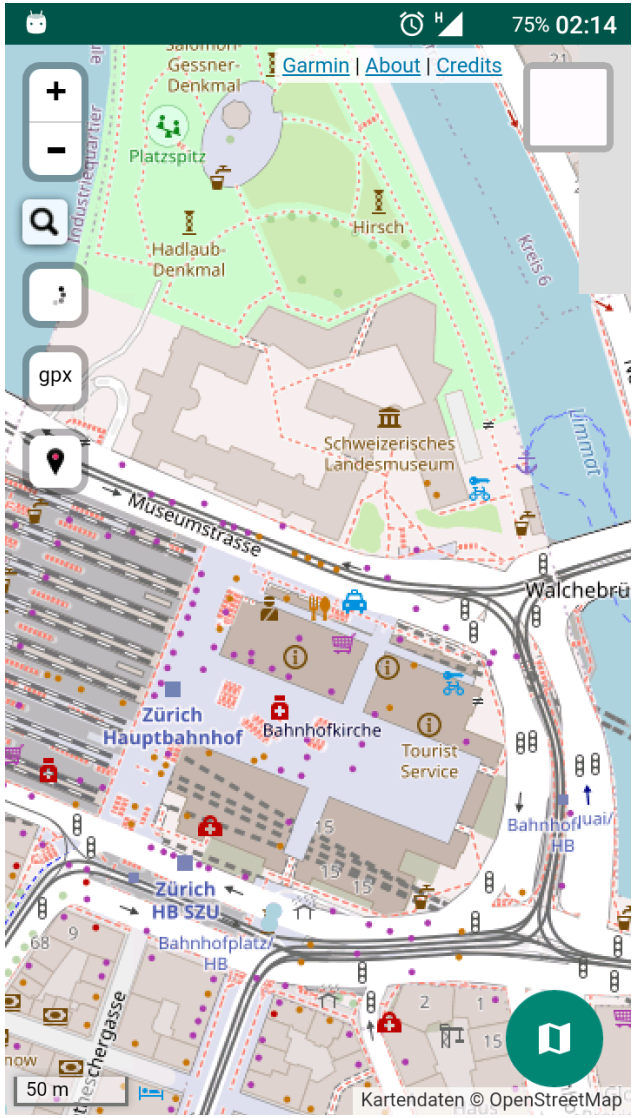

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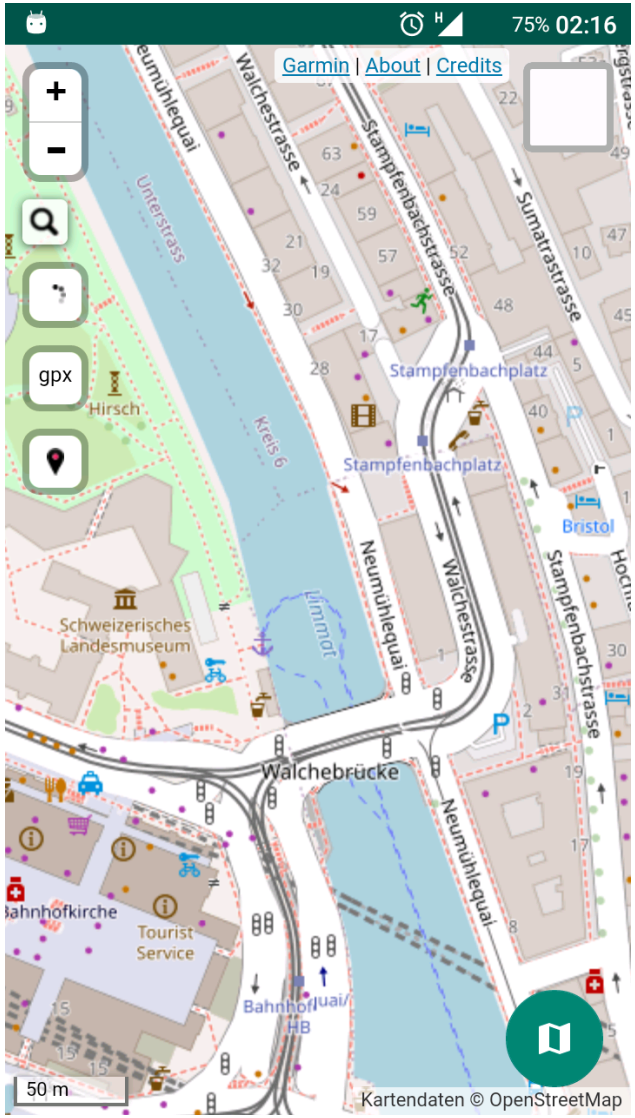

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Organic Maps is unfortunately slow on my phone. But it really works, and is usable.

This app downloads maps in advance and uses them offline: excellent for privacy.

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Even if I had no network I could use here the Turkey maps I had downloaded back in Switzerland!

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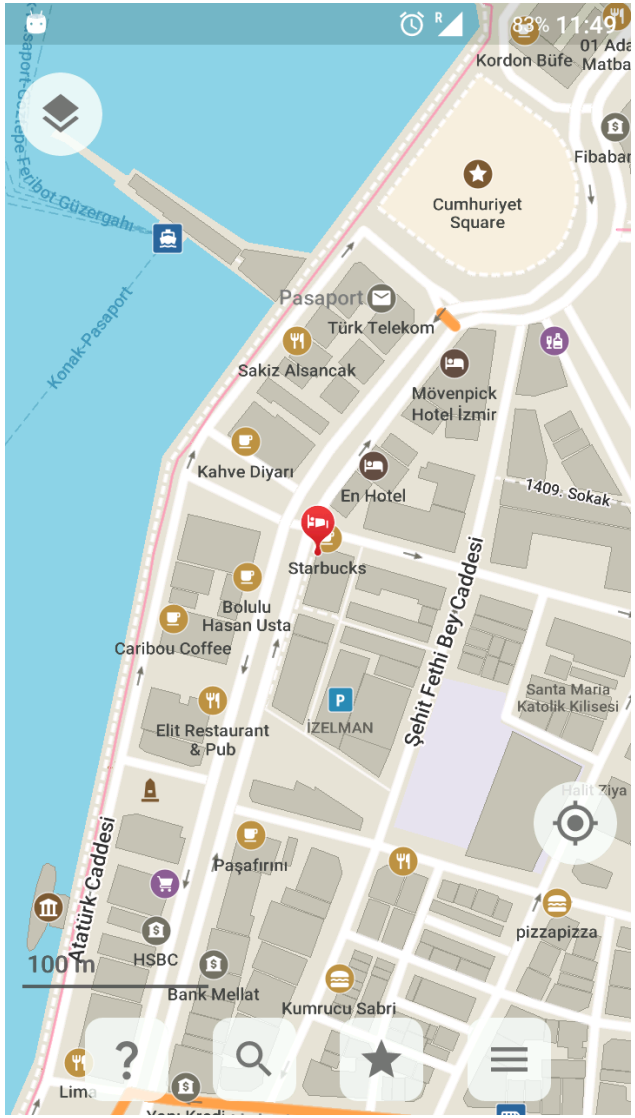

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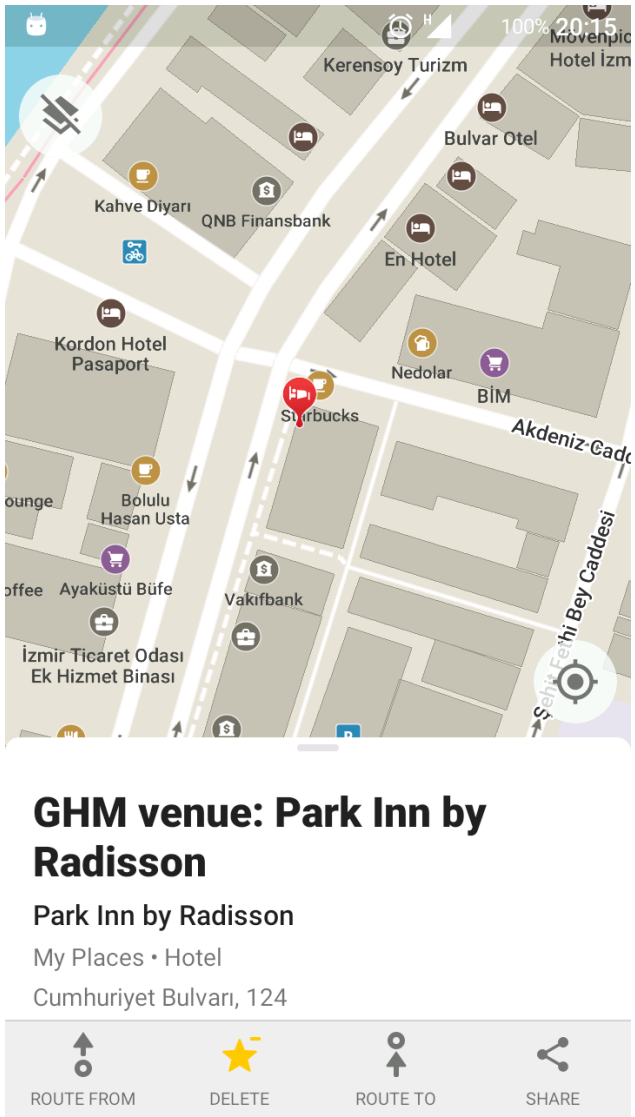

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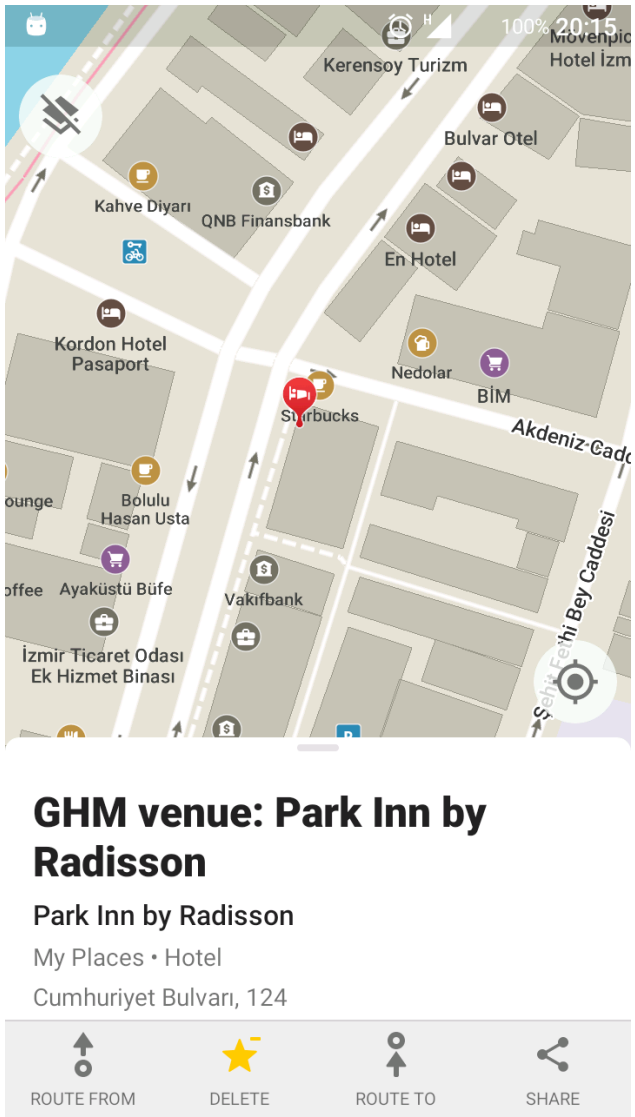

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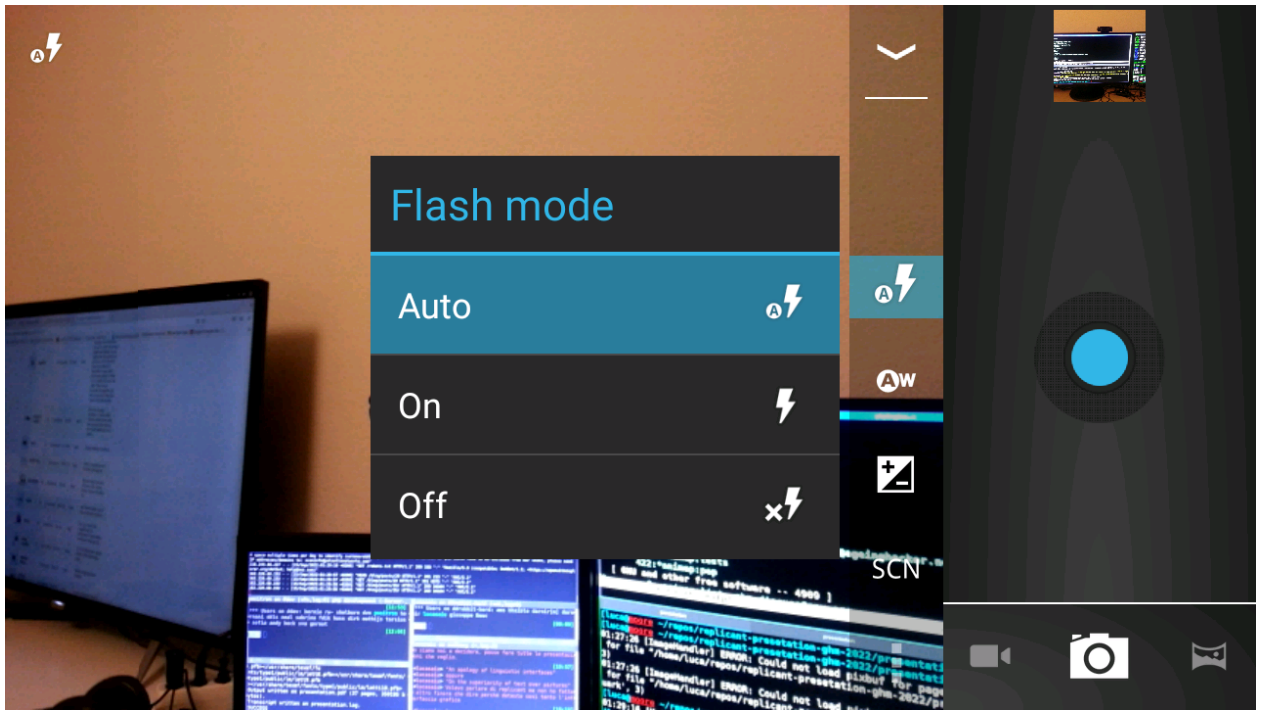
Weather Forecast

There are weather forecast apps: I do not know which one to recommend.

(Even without a GPS driver I think that this leaks privacy. . .)

Taking photos



I have had system crashes occasionally when using this in the past.

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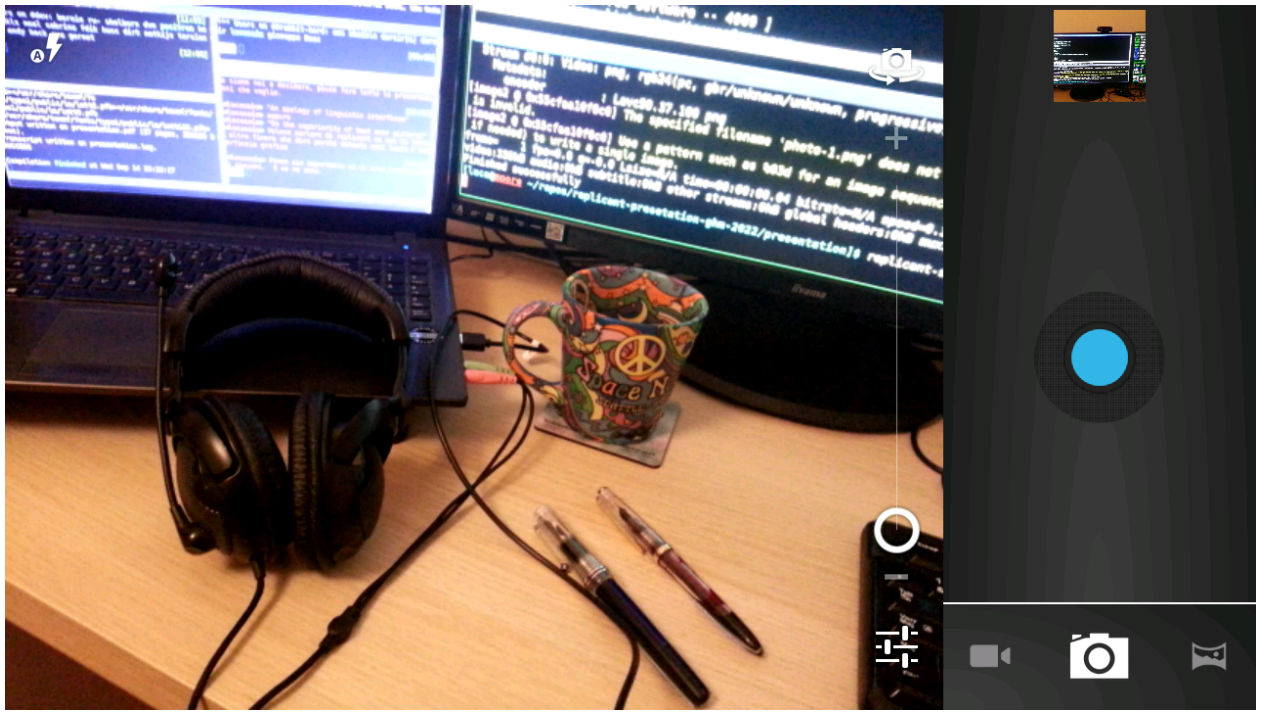

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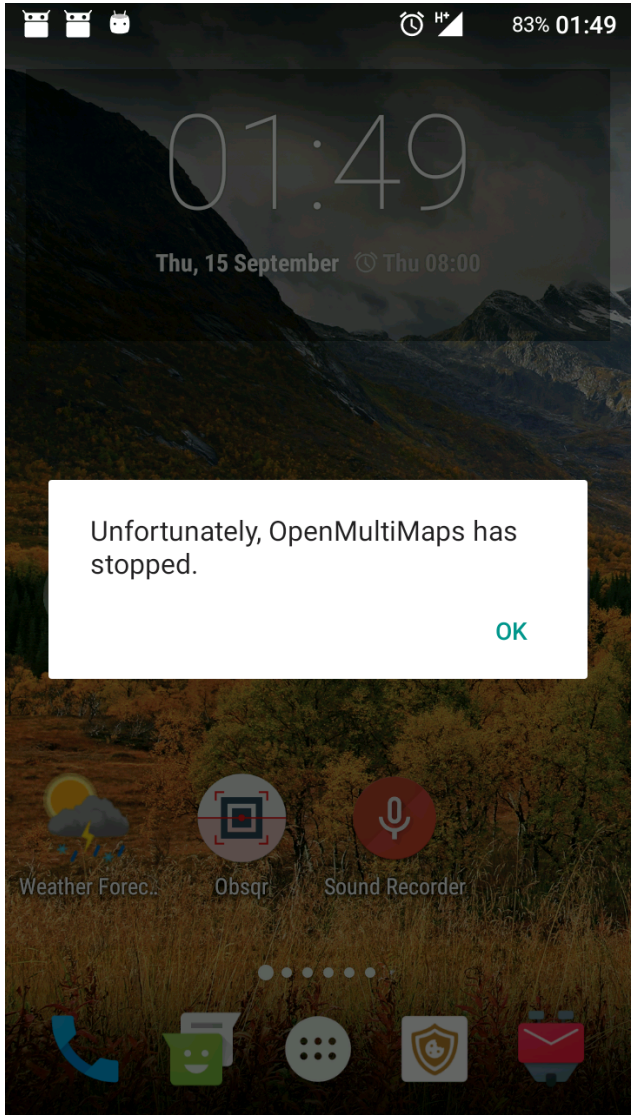
Crashes



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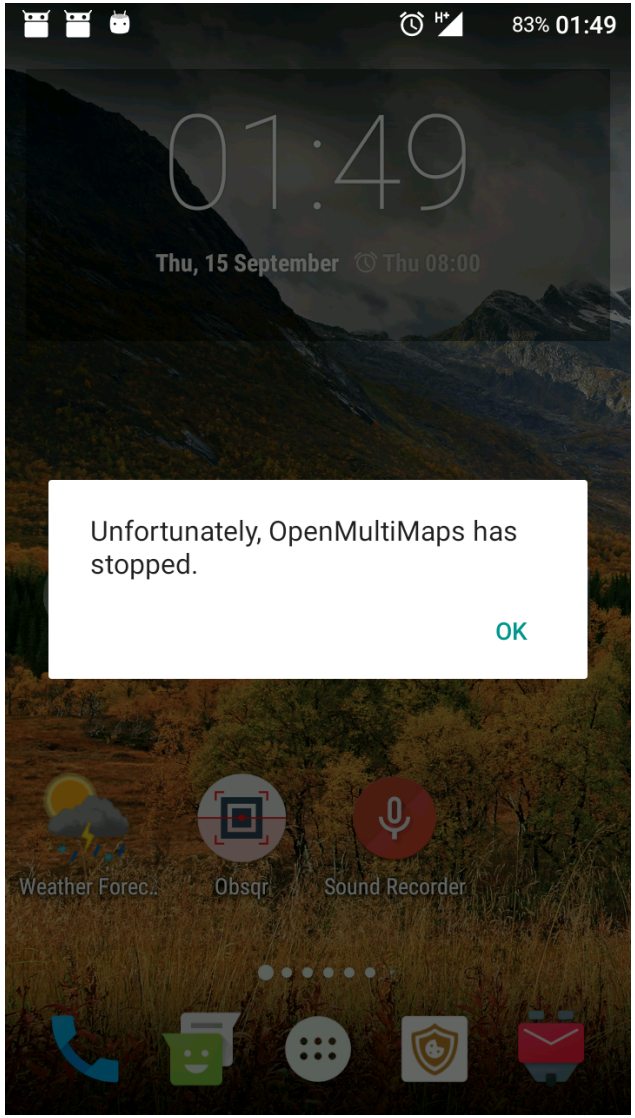
- This might have depended on a working GPS
- **App** crashes are not a big deal

Crashes



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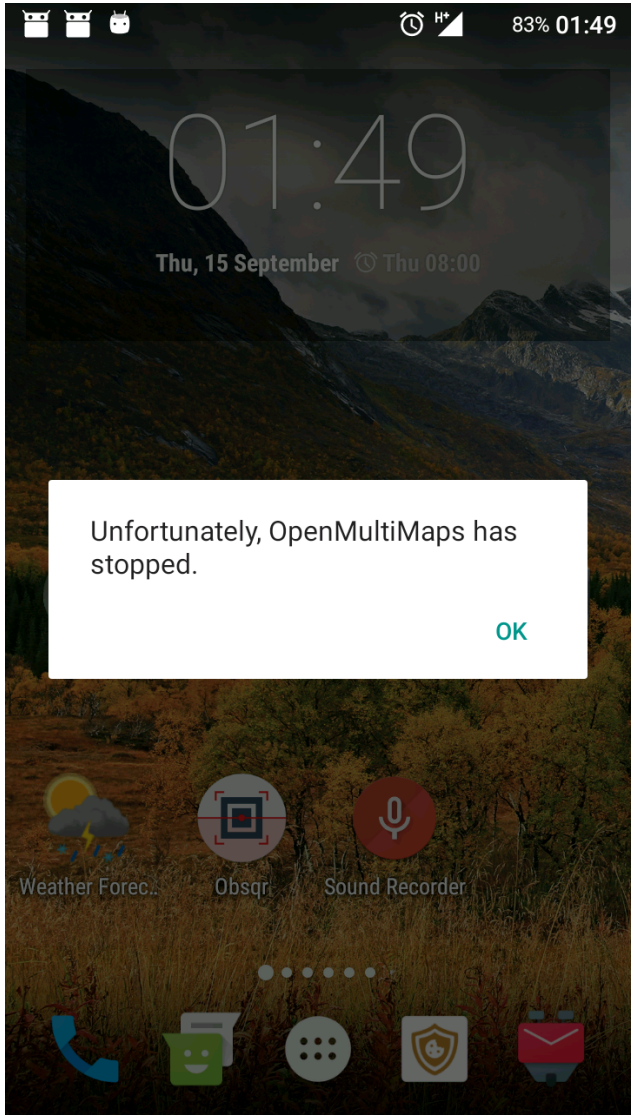

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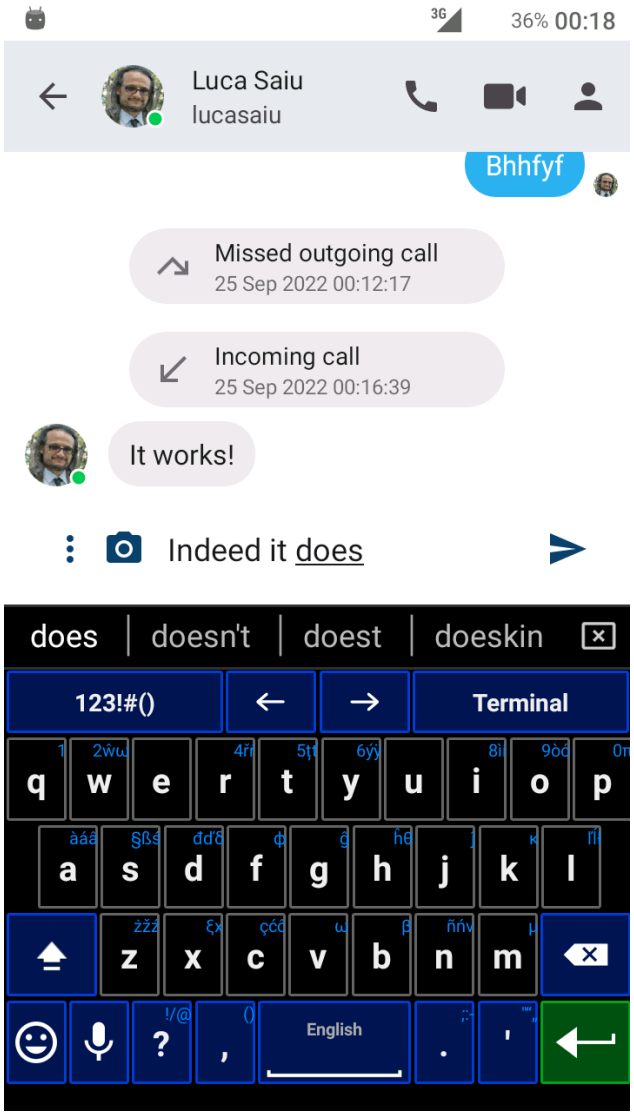
Jami



GNU Jami works well, and is a complex application. (Recommended).

- Here I am in a Jami video call between phone and computer

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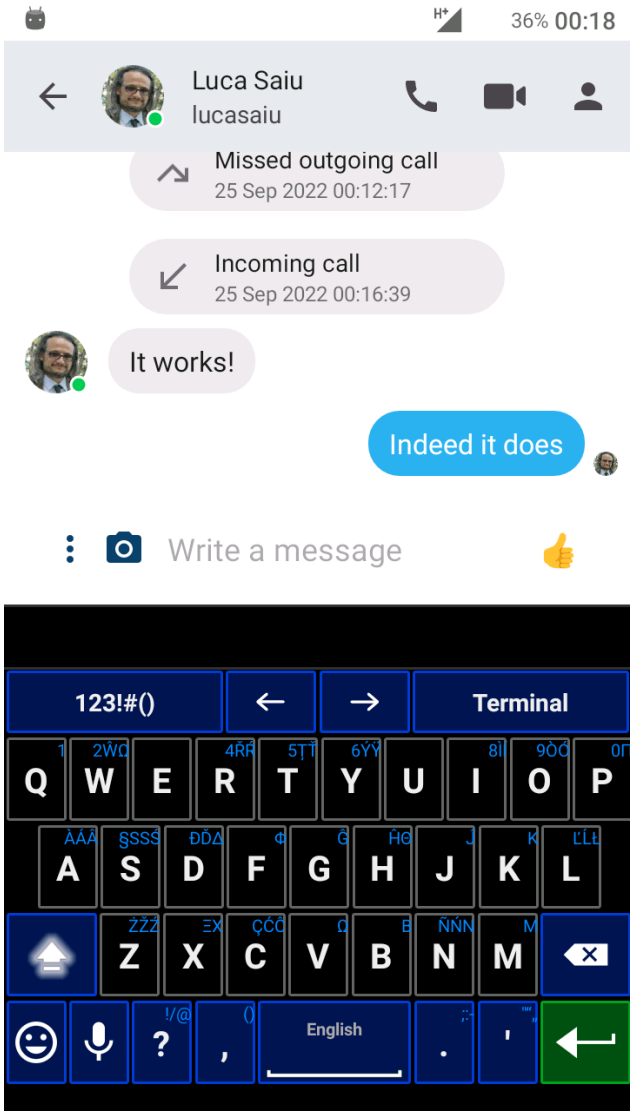

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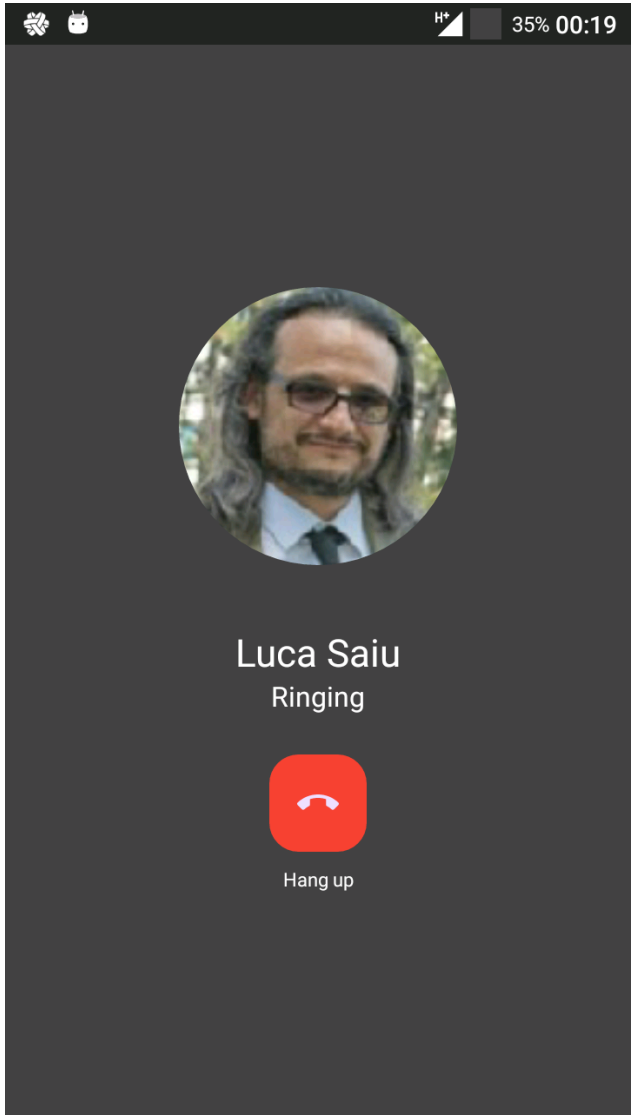

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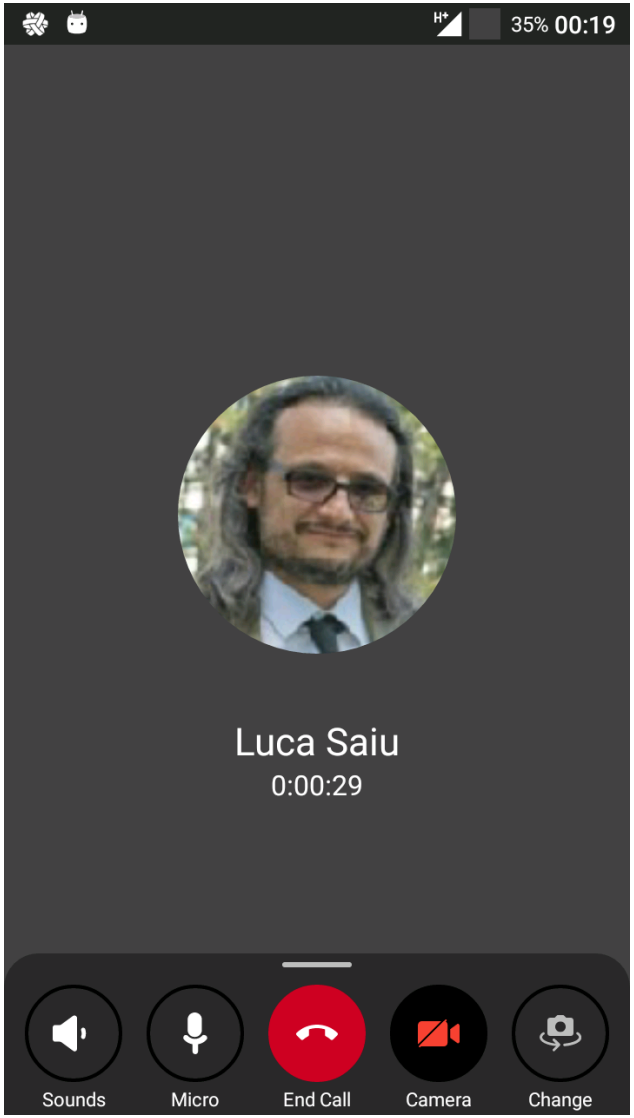

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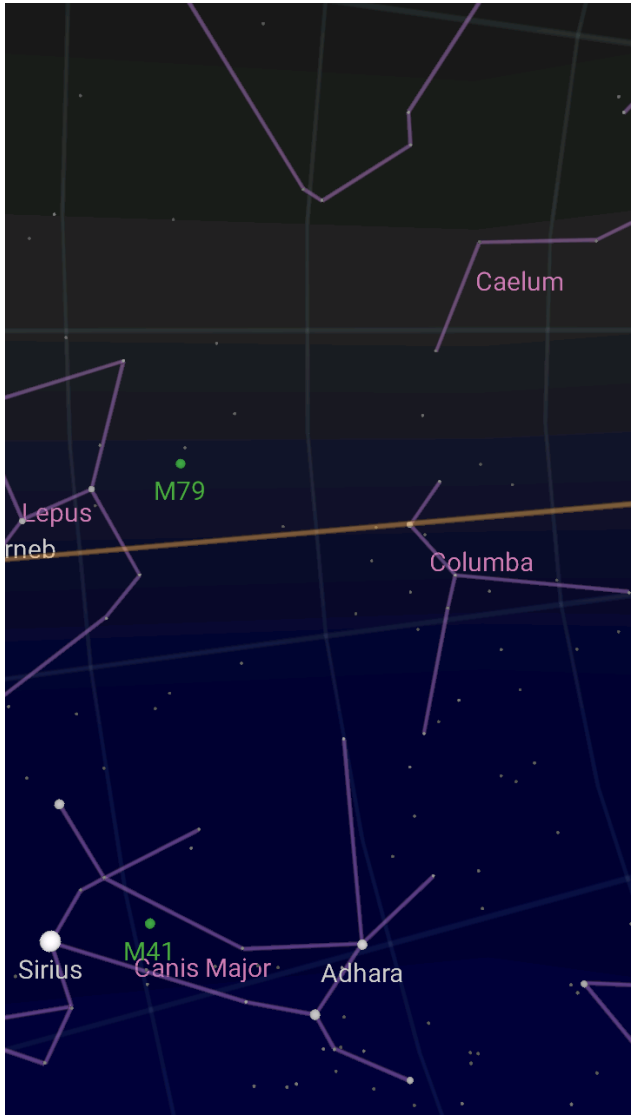
Skymap



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- Here I am slowly turning my phone to face up

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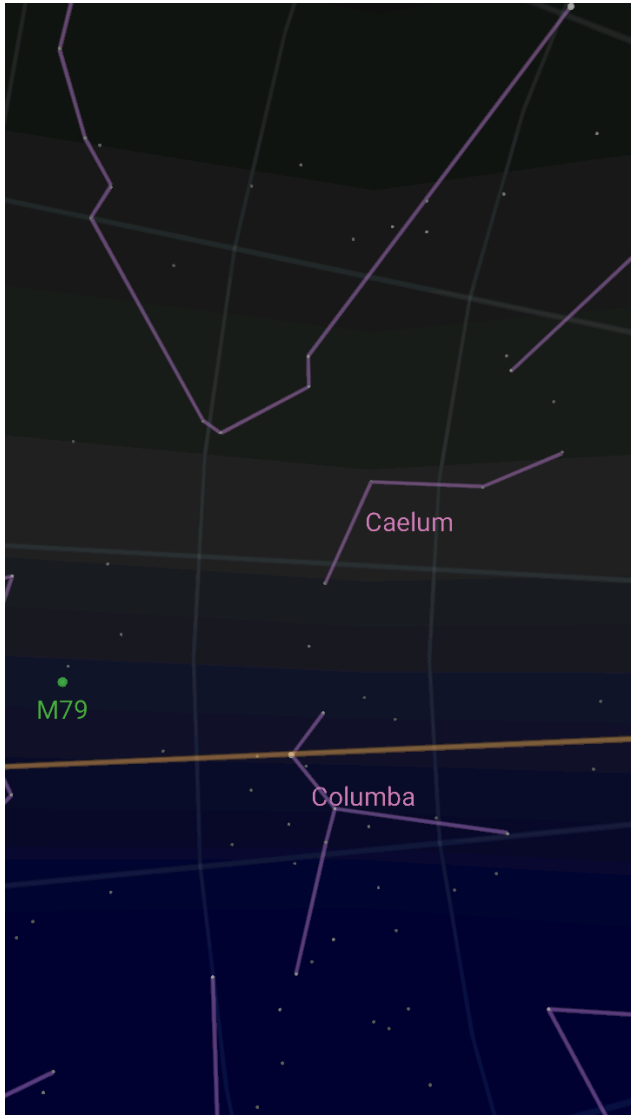

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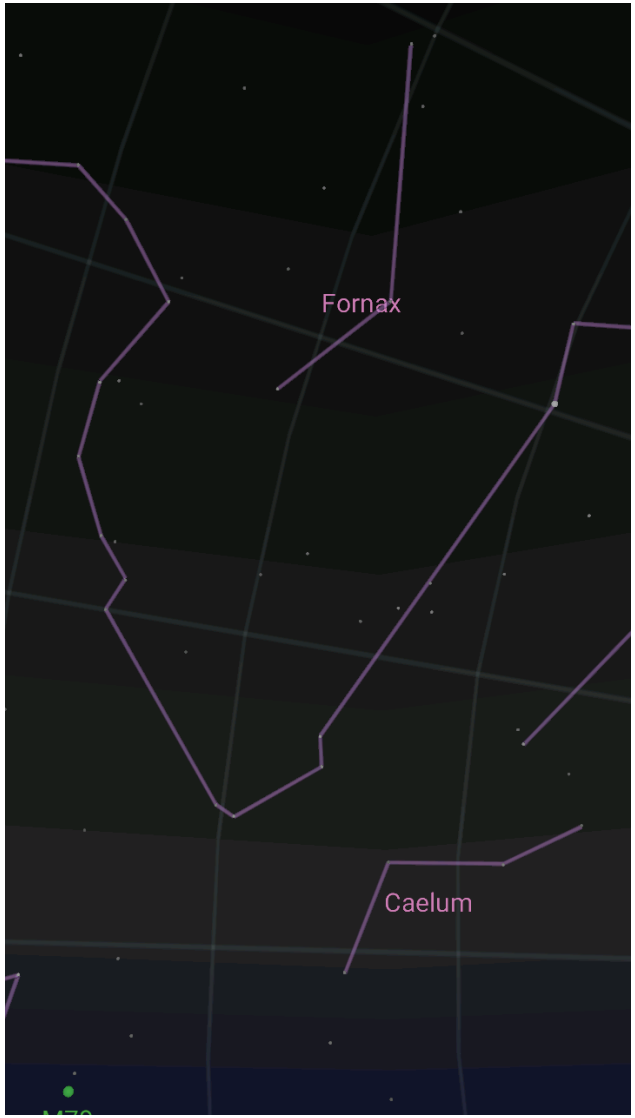

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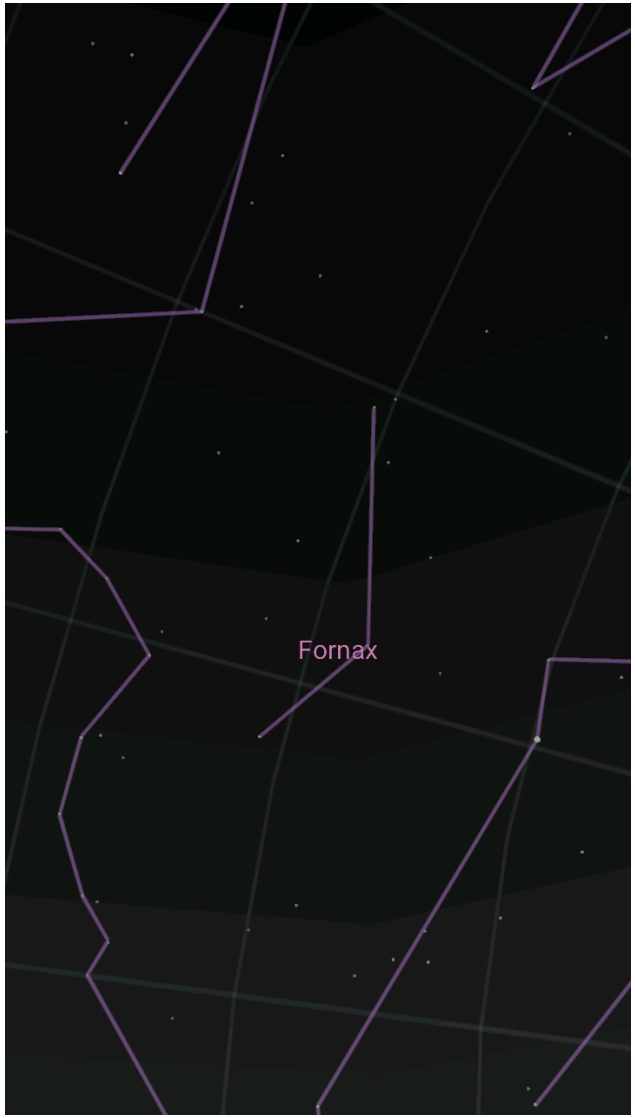

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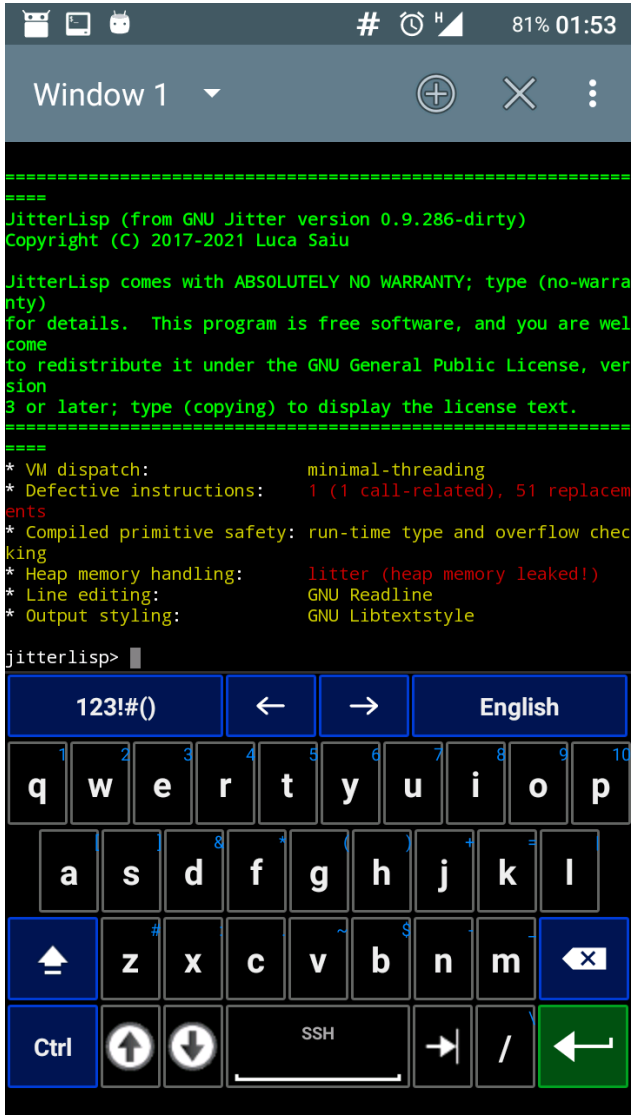
JitterLisp, cross-compiled by me on my computer!



This AnySoftKeyboard virtual keyboard is as good as it can be, but a touchscreen is still a terrible interface for the command line.

Finally some assembly in this boring talk!

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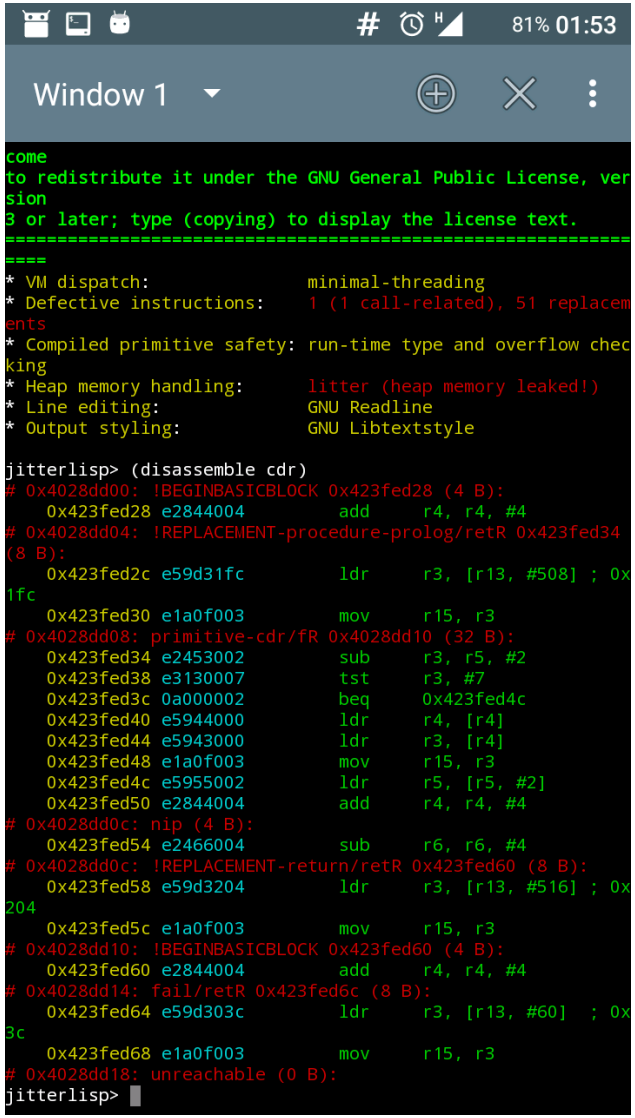

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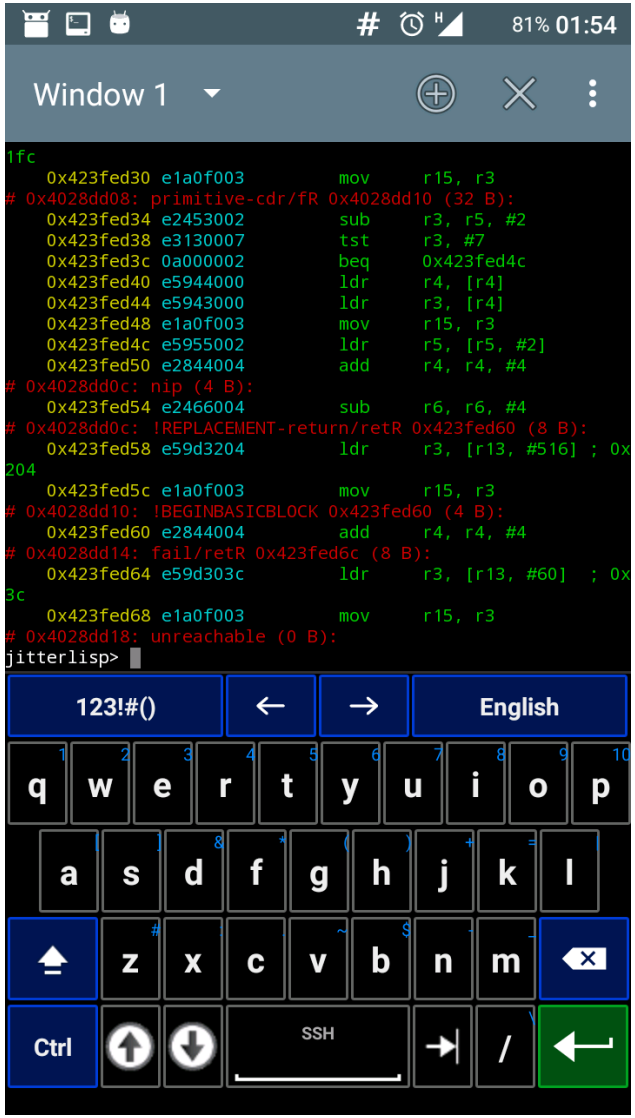

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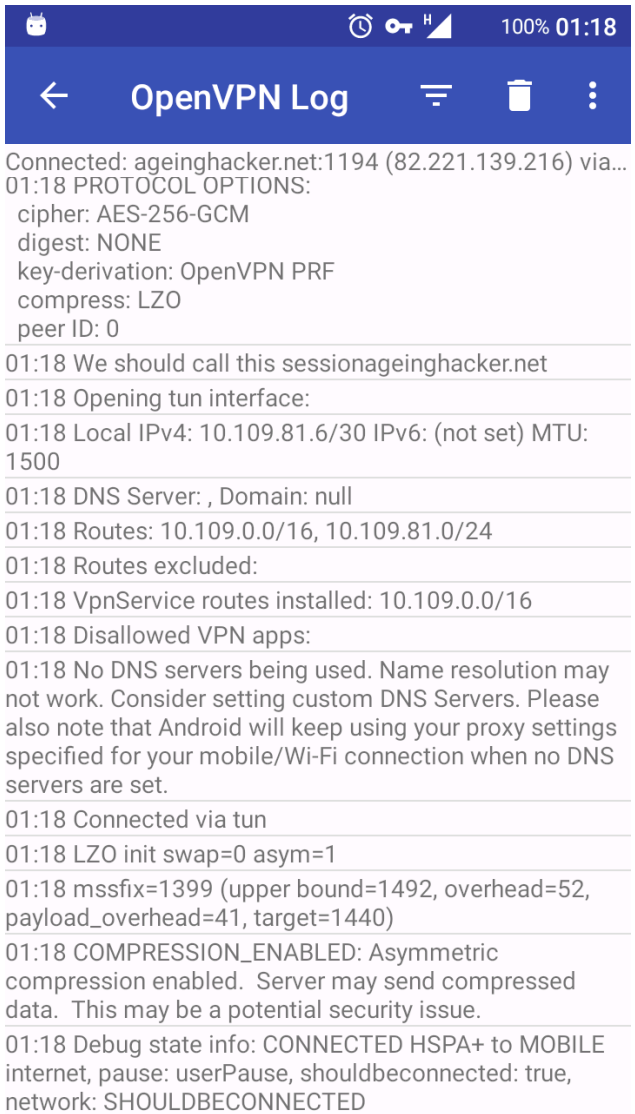
OpenVPN



I use an OpenVPN client to connect my phone to the VPN server on my personal server `ageinghacker.net`.

Through the VPN I can have my phone and local computers in the same LAN.

More apps should be free!

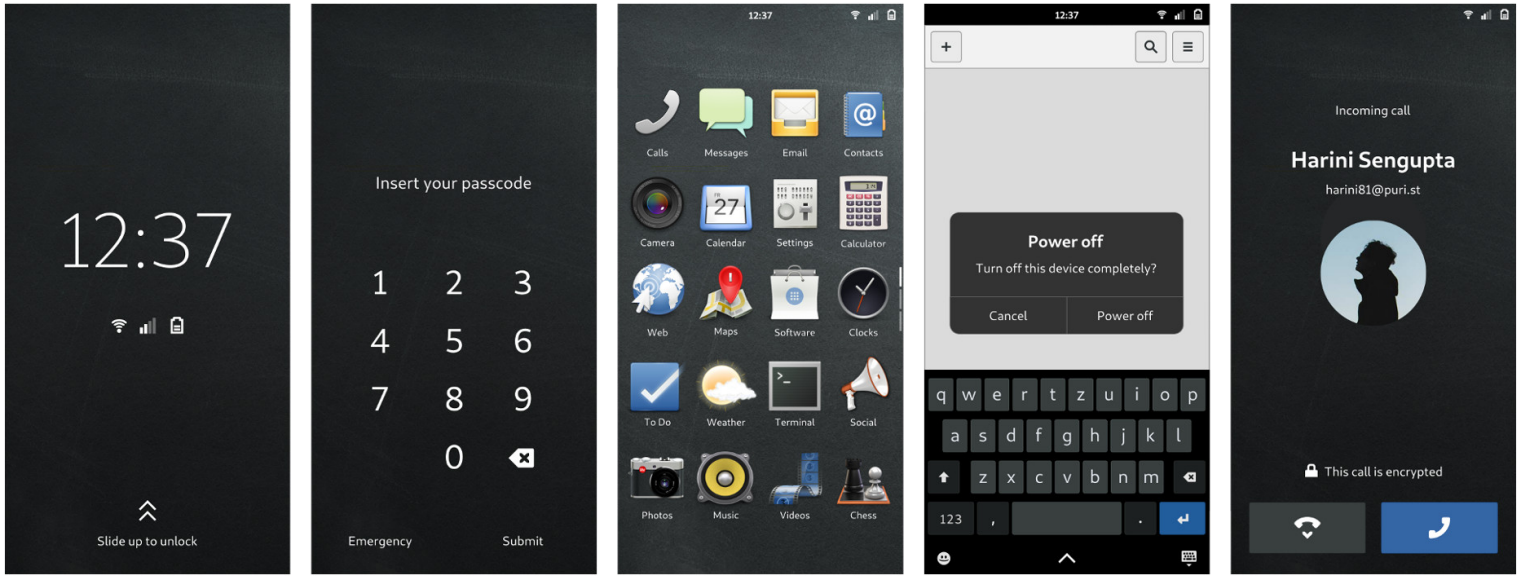
It is very frustrating that, for example, public transport apps are proprietary.

We should insist that organisations **release the plain data**: we as a community can write good apps ourselves.

A friendly attendee wanted to help people coming to İzmir for the GHM, but we found no way of using one specific form of public transportation without a proprietary app. (This is **not** specific to İzmir or Turkey)

Alternatives to Replicant

Purism Librem 5



- Almost 100% free software (proprietary modem, isolated);
- *not based on Android*, but on Gnome;
- hardware kill switches;
- Recent: first sold in 2020;
- Limited availability?
- expensive (∼2000$).

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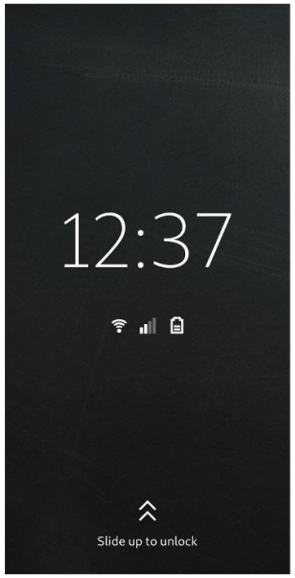

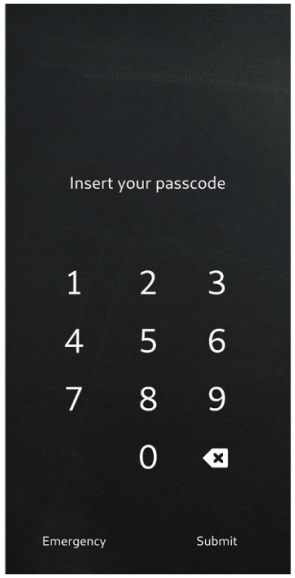

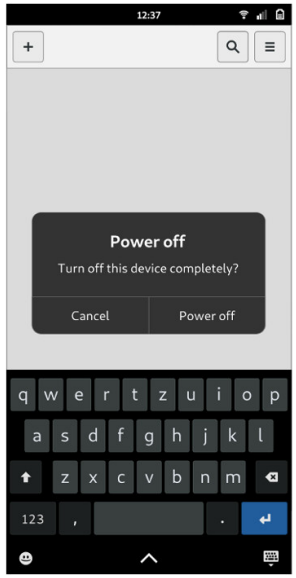

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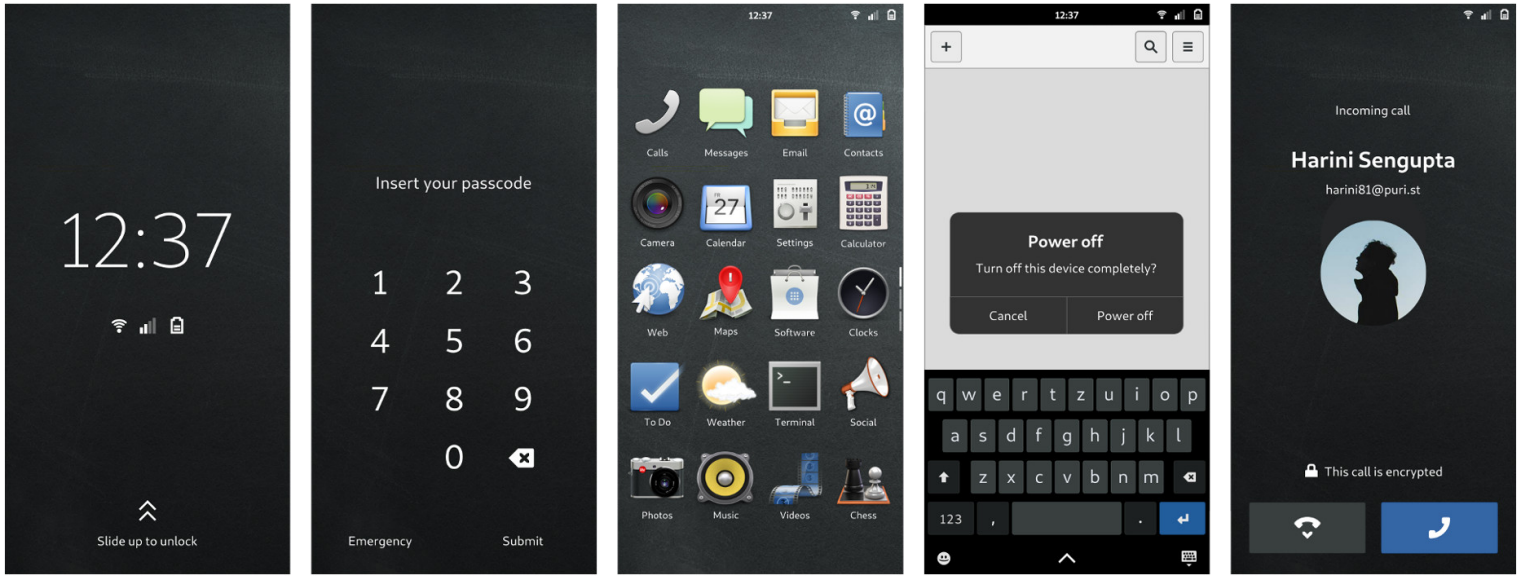

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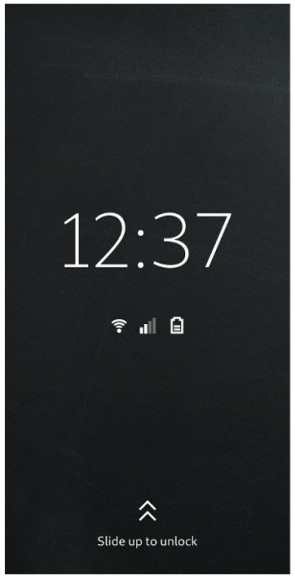

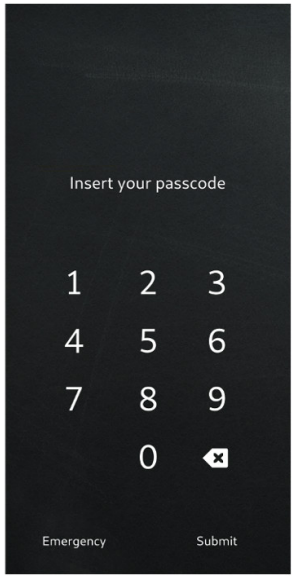

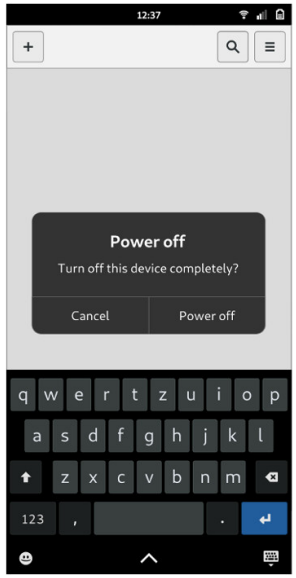

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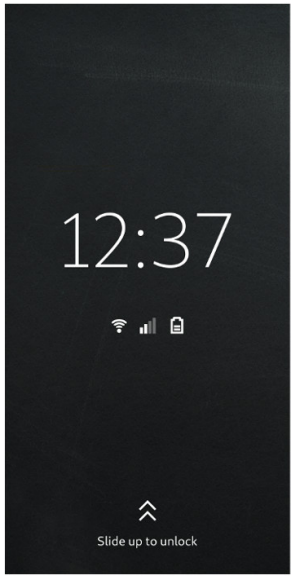

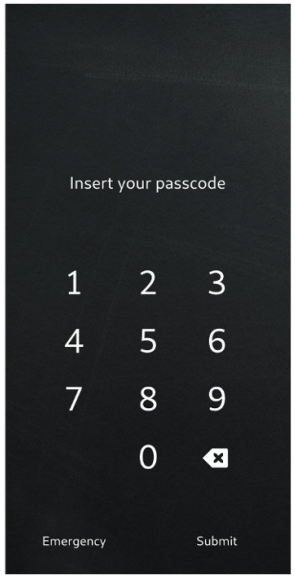

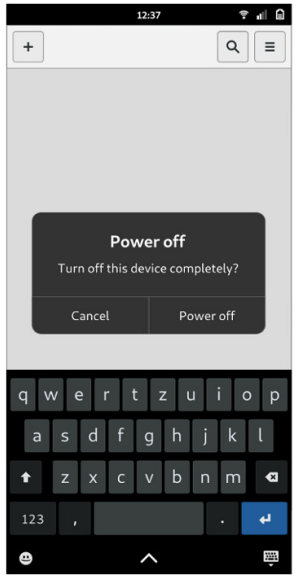

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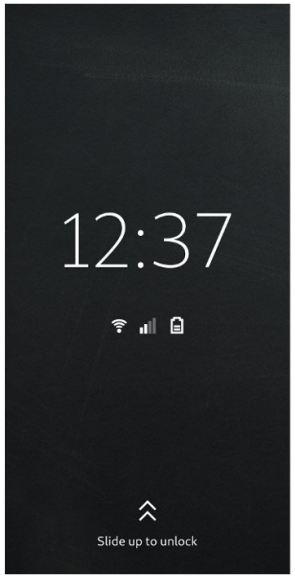

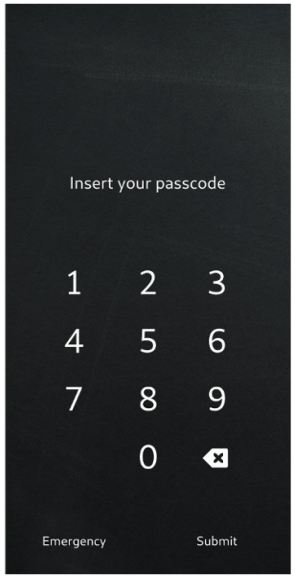

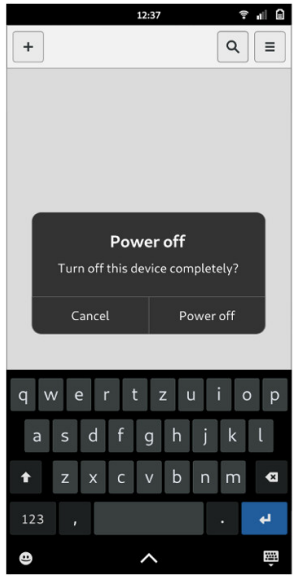

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Other alternatives to Replicant

[Slide added after the public presentation:

. . . Apparently more alternatives exist: people in the audience (local and remote) during my talk in İzmir suggested several.

That is good, but check that these alternative do not require proprietary drivers, for the exercise not to be futile.]

The end

- https://replicant.us
- I will publish my backup scripts: follow ghm-discuss and look at the event web page once in a while: https://www.gnu.org/ghm/2022/.

Thanks

Image credits I

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- Phosh screenshots: Purism (company) team, François Téchené, GPLv2+ `https://en.wikipedia.org/wiki/Librem#/media/File:Phosh,_the_GNOME_mobile_shell,_developed_by_Purism_and_GNOME_(2018-05).jpg`

Bibliography I