

Maemo Leste A Debian/Devuan based mobile hacker OS

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Table of contents

Mix of technical and non-technical parts

- ▶ What and Why
- ▶ History of Maemo and CSSU
- ▶ Overview of components
- ▶ Current status, news
- ▶ Future plans, milestones
- ▶ How you can participate/help

What is Maemo Leste?

- ▶ Mobile OS for phones and tablets
- ▶ GNU/Linux
- ▶ Based on Devuan (chimaera release - Debian bullseye based)
- ▶ In Development since late 2017
- ▶ No vendor kernels: only mainline linux (with minimal patches)
- ▶ Linux experience: freedom, hackability (want wireguard or Tor? no problem. btrfs? got you covered.)
- ▶ Can be used as daily driver on various phones, but still rough around the edges

Why Maemo Leste?

- ▶ Need an OS for FOSSers
- ▶ Tired of Android, other mobile OSes, broken promises about openness, devices spying on people
- ▶ Open, hackable, not locked down
- ▶ Show that we can have a viable FOSS mobile OS
- ▶ Entirely community developed (!)

History: Maemo Fremantle

Mobile "hacker" OS made by Nokia for the N900. (And previous versions before that for the Nokia 770, Nokia 800, Nokia 810)

- ▶ Uses the debian package manager
- ▶ GNU/Linux
- ▶ Only some parts are open source
- ▶ Still maintained by the community: CSSU (Community Seamless Software Update)
- ▶ https://wiki.maemo.org/Fremantle_closed_packages
- ▶ https://wiki.maemo.org/Free_Maemo

Idea: build on Maemo Fremantle's proven OS

- ▶ Maemo Fremantle got a lot of things right, but hard to port because a lot of components are (or were) closed source.
- ▶ Open source everything (reimplement if necessary), stay mostly compatible on API level with Fremantle (no need to figure out APIs)
- ▶ Big ecosystem of open source applications written for Fremantle, recompile/port them

Userspace components: standardised daemons

- ▶ dbus (bus for communication), gconf and gsettings (settings)
- ▶ udev (kernel events), evdev (input events), iio-sensor-proxy (sensors)
- ▶ pulseaudio (audio), mpris
- ▶ upower, udisks (power and disks detection)
- ▶ hostapd/wpa_supplicant, ofono, lircd, bluez/bluetoothd (connectivity)

Porting older Maemo code

- ▶ Replace HAL with udev, upower, udisks, input devices, gadgetfs
- ▶ Port from Qt4 to Qt5, eventually move from Gtk 2 to Gtk 3
- ▶ Replace or rewrite closed parts/dependencies
- ▶ Maemo CSSU has done a lot of porting and reverse engineering
- ▶ Device specific X drivers (2D and 3D acceleration)

Maemo Leste infrastructure: CI

- ▶ Repository hosted on maemo.org servers
- ▶ Build servers hosted at home
- ▶ Jenkins + jenkins-debian-glue builds our packages
 - ▶ <https://phoenix.maemo.org/>
- ▶ Build slaves are KGPE-D16 desktop and a Honeycomb machine (arm64).

Status

The following mostly just works:

- ▶ Virtual keyboard
- ▶ Wireless
- ▶ 2g/3g/LTE connectivity
- ▶ Audio
- ▶ Charging
- ▶ Alarms
- ▶ Basic browsing
- ▶ USB peripheral/OTG
- ▶ Contacts management
- ▶ SMS and calls
- ▶ CalDAV synchronisation of calendar, contacts and notes

Also see <https://leste.maemo.org/Status>

Status: work in progress

The following items are being worked on

- ▶ Better UI for calls and SMS
- ▶ Simple UI for chatting using many more protocols (XMPP, IRC, Matrix, SIP, Slack, Telegram, etc)
- ▶ Even better power management
- ▶ Documentation
<http://maemo-leste-manual.motionlibre.org/>
- ▶ Camera support (Pinephone has basic support out of the box)
- ▶ Support more devices

Status: funding

Previously funded by NLNet in 2019, DAPSI in 2020.

We applied for additional funding at NLNet in August 2022... to work on more secure communications, porting to chimaera, documentation and support more devices



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Grant request has been approved!

Device overview

Supported with power management and calls: Nokia N900, Pinephone, Motorola Droid 4, Motorola Droid Bionic, Raspberry Pi (no call audio), Allwinner A20 LIME (no call audio) and other boards

Ports in progress: Nokia N9, Motorola Droid 3 (XT862), Motorola Droid Razr (XT910 / T912), Motorola Atrix 2 (MB865), Moto G4 Play (XT1602), Motorola Droid XYBoard 7" and 10" tablets (MZ609, MZ617), ... and more

Device: Motorola Droid 4



- ▶ Linux 6.1, with PowerVR patches
- ▶ Battery life up to several days
- ▶ Physical keyboard (slide mechanism)
- ▶ What works: 3D acceleration, Wireless, battery, touchscreen, keyboard, usb host/slave, audio, 3g data, sms, calls with audio routing

Device: Motorola Droid 4



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We have devices available for experienced and enthusiastic developers!

Device: N900



- ▶ Original Maemo Fremantle device, 256MB ram, 600Mhz CPU - weak!
- ▶ Needs more power management work (24 hours of battery life)
- ▶ Linux 6.1, with PowerVR patches
- ▶ What works: 3D acceleration, Wireless, battery, touchscreen, keyboard, usb host/slave, audio, 3g data, sms
- ▶ calls with audio routing are working, but still under development

Device: Pinephone

- ▶ Linux 6.1 plus patches
- ▶ Hardware kill switches for wifi, mic, modem
- ▶ Worldwide LTE modem, on usb (no DMA)
- ▶ Power management not great
- ▶ 3D via open source "lima" driver

Full specifications: <https://www.pine64.org/pinephone/>

Device: Pinephone part II

Prototype on the left, development kit on the right



Device: Allwinner devices



- ▶ OLinuXino A20 LIME2 with metal frame (mountable tablet)
- ▶ Various Allwinner A33 tablets

Device: virtual machine



- ▶ Works with Qemu, Virtualbox, VMware
- ▶ Useful for development
- ▶ QEMU passthrough of hardware (wifi, modem) is very handy

Status: Milestones

We have reached various big milestones:

- ▶ Dogfooding (eat your own dog food) - switch over from Fremantle
- ▶ Community contributed packages/apps
- ▶ Alpha release for the Pinephone
- ▶ Beta releases for N900 (working calls), Droid 4 (3d accel)
- ▶ Finish cellular UI and data plugin
- ▶ Working phone/sms/contacts UI

Future?

- ▶ Mainline Linux without any patches
- ▶ Full disk encryption (maybe collaborate with postmarketOS)
- ▶ Better qt5 support, gtk3 migration
- ▶ More here:
<https://github.com/maemo-lestes/bugtracker/milestones>

Generally:

- ▶ **More community involvement** - we need help!
- ▶ Anything you want...

Summary

- ▶ Now in beta stage
- ▶ Mainline linux and devuan/debian makes a lot of powerful things simple
- ▶ Fun to play with
- ▶ Already usable on several devices, more to come
- ▶ Need more people to document, test and write code, get more organised in general
- ▶ Have a stand here where we show off Maemo Leste on various hardware, come by for stickers, a chat and check our the project!

Resources

- ▶ Homepage: <https://maemo-leste.github.io/>
- ▶ Wiki: <https://leste.maemo.org>
- ▶ Source: <https://github.com/maemo-leste/>
- ▶ Bugtracker: <https://github.com/maemo-leste/bugtracker>
- ▶ Maemo community: <https://maemo.org>
- ▶ IRC: [#maemo-leste](irc.libera.net)
- ▶ Mailing list: <https://mailinglists.dyne.org/cgi-bin/mailman/listinfo/maemo-leste>

Also check out similar efforts: UBPorts, Mobian, PostmarketOS