Maemo Leste

Merlijn Wajer Ivan Jelincic

November 4, 2018

Table of contents

What is Maemo Leste?

- Mobile OS for phones and tablets
- Based on Devuan (ascii release - Debian stretch based)
- No vendor kernels: only mainline (with minimal patches)
- Linux experience: freedom, hackability (and bugs? ;-))
- Pre-alpha stage(!)

Why Maemo Leste?

- Nostalgia, practical, lots of software exists already
- Tired of Android, other mobile OSes
- Open, hackable, not locked down
- Community developed (!)

History: Maemo Fremantle

Mobile OS made by Nokia for the N900.

- 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

Porting

- Replace HAL with udev, upower, udisks, input devices, gadgetfs
- Port Maemo widgets and patches to Qt5, gtk
- Replace or rewrite closed parts/dependencies
- Maemo CSSU has done a lot of porting and reverse engineering
- Device specific X drivers

Porting: a success story

- icd2: internet connectivity daemon 2
- closed source

Porting: a success story

- icd2: internet connectivity daemon 2
- closed source
- reverse engineered using IDA
- wireless plugin relied on wlancond, eapd: also closed
- switch to wpa_supplicant

Porting: a success story

- icd2: internet connectivity daemon 2
- closed source
- reverse engineered using IDA
- wireless plugin relied on wlancond, eapd: also closed
- switch to wpa_supplicant
- next up: 2g/3g/4g data

Porting: another success story: Virtual keyboard

- HIM: hildon input method
- two modes: full keyboard, and special symbols only
- partially closed source

Porting: another success story: Virtual keyboard

- HIM: hildon input method
- two modes: full keyboard, and special symbols only
- partially closed source
- reverse engineered using IDA, debug symbols

Some of the software components

- dsme, mce, ke-recv, clockd
- Hildon UI framework, gtk, Qt5, dbus, gconf
- icd2, wpa_supplicant, ofono
- Telepathy (?)

bugtracker, wiki

- Bugtracker: https://github.com/maemo-leste/bugtracker
- Wiki: https://leste.maemo.org
- IRC: irc.freenode.net #maemo-leste

Maemo Leste infrastructure: CI

- Hosted on maemo.org servers, along with some of our personal hardware.
- Jenkins + jenkins-debian-glue builds our packages
  - https://phoenix.maemo.org/
- Build slaves are Allwinner and Softiron Overdrive machines.

Maemo Leste infrastructure: Packaging

- Packages are all hosted on Github, and are based on a git workflow
  - jenkins-debian-glue
  - https://github.com/maemo-leste/

Building Leste with the Devuan SDK

- https://devuan.org/os/distro-kit
- Build framework for producing Devuan derivatives
- Consists of a common core library (libdevuansdk) and its wrappers
  - arm-sdk
  - live-sdk
  - vm-sdk
- Easy to expand a base Devuan system using a concept called "blends"
- Written in zsh

arm-sdk

- Wrapper around libdevuansdk
- Large knowledgebase of build scripts for various ARM boards
  - Nokia N900
  - LG Nexus
  - Chromebooks
  - Allwinner (sunxi)
  - Raspberry Pi
  - etc.
- Utilizes qemu in chroots if building non-native

vm-sdk

- another wrapper around libdevuansdk
- builds qemu qcow2 images, virtualbox boxes, and vagrant boxes
  - also cloud-ready

Status

Maemo Leste is in a pre-alpha stage

The following mostly just works:

- USB host/peripheral/otg
- Virtual keyboard
- Wireless
- Audio
- Charging

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

Status: work in progress

The following items are being worked on

- ofono (data, sms, calls)
- 3d acceleration (works on some devices)
- accelerometer, ambient light sensor, radio (fm: rx and tx), bluetooth, led control, gps
- browser

Device: N900

- Generally in pretty good shape, needs some power management work
- Linux 4.15, with PowerVR patches, some powervr issues remain
- Wireless, battery, touchscreen, keyboard, usb peripheral, audio works
- 3g data works without UI
- text messages work (phonecalls start, audio routing needs work) - lacks UI

Device: Motorola Droid 4

- Linux 4.14 (newer version also supports audio)
- No 3d acceleration yet
- Wireless, battery, touchscreen, keyboard, usb host and peripheral work
- 3g data, sms, calls are work in progress

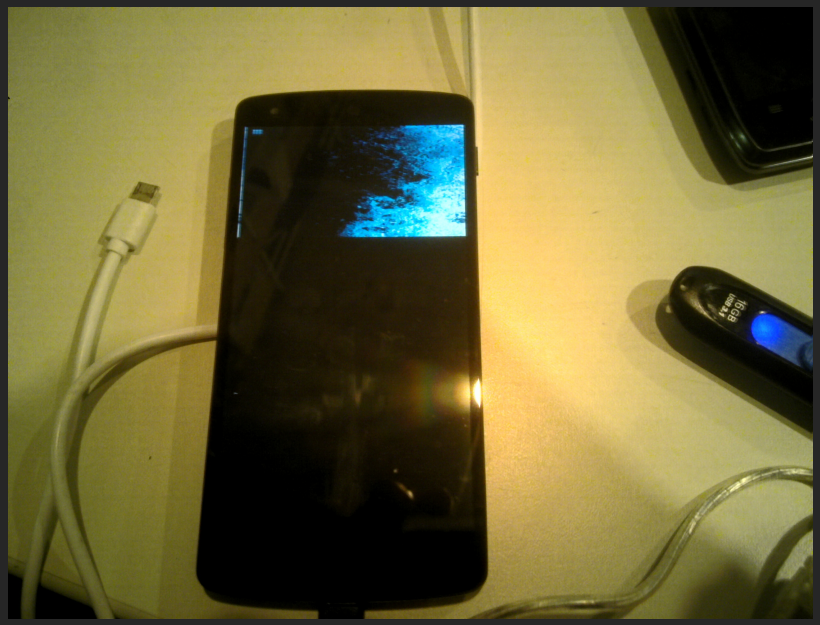
Device: Allwinner devices

- OLinuXino LIME2, Allwinner A33 tablets
- No 3d acceleration yet, but looking good
- wireless, battery, touchscreen, usb host and peripheral work
- Mainline hardware video decoding!

Device: Allwinner devices

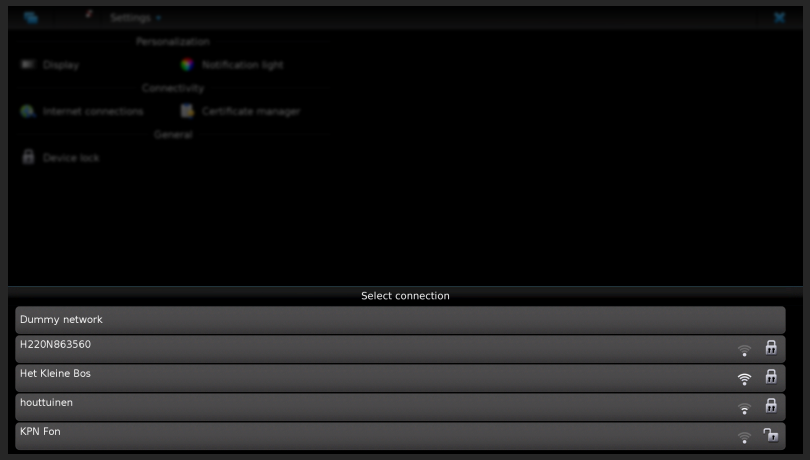
- OLinuXino LIME2, Allwinner A33 tablets
- No 3d acceleration yet, but looking good
- wireless, battery, touchscreen, usb host and peripheral work
- Mainline hardware video decoding!
- ... Pine64 phone?

Device: Nexus 5



- Very much work in progress
- hopefully a working environment in a couple of weeks
- Has a working open source driver for 3D acceleration (freedreno)
- Work on the modem has begun

Device: Raspberry Pi 2+



- Working 3d acceleration, wifi
- Makes for a nice demo platform when connected to a FullHD touchscreen

Device: virtual machine

- Works with Qemu, Virtualbox, VMware
- Useful for development
- Passthrough of hardware (usb wifi) is very useful

Future

Various milestones yet to reach:

- Alpha, Beta releases for N900, Droid 4
- Working phone calls, phone UI
- Proper IPv6 connectivity/support
- More here:
  https://github.com/maemo-leste/bugtracker/milestones

Generally:

- More community involvement (more people helping out)
- Pine64 phone (2019), other devices
- Anything you want

Future?

- btrfs as root filesystem
- full disk encryption
- support for 5+ phones
- decent browser (firefox or webkit based)
- Android emulation with Anbox

Summary

- Still in pre-alpha stage; alpha soon
- Already usable on several devices, more to come
- No phone calls ... yet
- Need more people to document, test and write code

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: irc.freenode.net #maemo-leste
- Mailing list: https://mailinglists.dyne.org/cgi-bin/mailman/listinfo/maemo-leste

Extras: Browser

- Likely webkit based, firefox/gecko embedding hasn't worked well for a long time
- https://luakit.github.io/
- https://surf.suckless.org/