The Debian status quo on the Openmoko FreeRunner

Luca Capello

Debian FreeSmartphone.Org Team

FOSDEM '09, Debian DevRoom

Outline

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Openmoko: What Is That?

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- Sean Moss-Pultz (*FIC*)
- Harald Welte (*gpl-violations.org*)
- Michael Lauer (*OpenEmbedded*)

2007/02 first code available

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Inc. ← Openmoko → *community*

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GTA01: Neo 1973

480x640 touchscreen
128MB RAM, 64MB flash
Samsung SoC (266MHz, ARMv4)
reader for microSDHC cards
tri-band GSM/GPRS/2.5G
GPS (closed binary-only driver, gllin)
compatible with Nokia BL-5C/6C batteries
charged through USB 1.1 Mini-B plug

GTA02: Neo FreeRunner

same case as the 1973
128MB RAM, 256MB flash
new Samsung SoC (400MHz)
SMedia 3362 2D/3D chipset (NDA)
new GPS chipset (NMEA standard)
Atheros AR6K 802.11 b/g WiFi
two 3D accelerometers
USB 1.1 Host mode (500mA)

GTA0x: Coming Soon (2009?)

GTA03

new case design
new battery
new GSM chipset
  (quad-band 2.75G/EDGE)
new Samsung SoC
  (533/667MHz, include 3D)
new GPS chipset
camera

GTA0x: Coming Soon (2009?)

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new battery
new GSM chipset
(quad-band 2.75G/EDGE)
new Samsung SoC
(533/667MHz, include 3D)
new GPS chipset
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GTA04

3G and USB 2.0
more advanced SoC
(still Samsung)..
OpenGL ES support

Outline

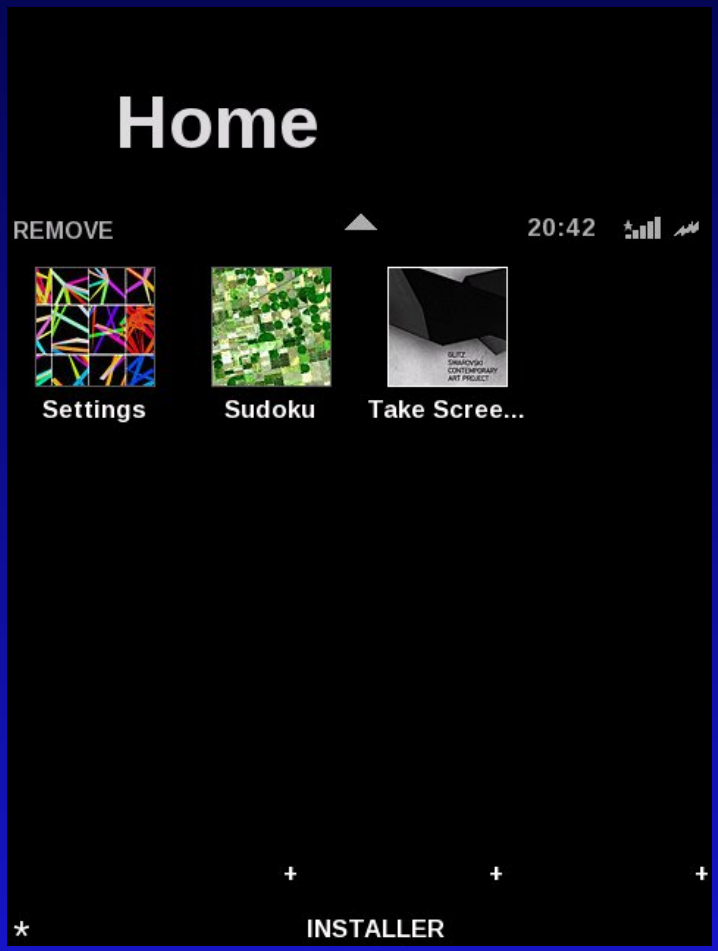
Distributions: *Om2007.2*

GTK+ (*GNOME Mobile*)

Matchbox/Pimlico (*OpenedHand*)

now abandoned by Openmoko

Distributions: *Om2008.12*



phone applications from *Trolltech Qtopia*

Enlightenment and *Illume*

GUI to install applications

Distributions: *FreeSmartphone.Org*

common initiative for all smartphones

new back-end from scratch (Python/Vala)

high-level services available through *D-Bus*

Enlightenment and *Illume*

Distributions: Community

- ***Stable Hybryd Release*** (SHR)
  based on the FSO stack and intended to be a followup
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  based on the FSO stack and intended to be a followup of Om2007.2, now dedicated to provide basic applications

- ***Fat and Dirty Openmoko*** (FDOM)
  applications (everything goes in) and fixes posted to the mailing lists, it demonstrates what the FreeRunner can do

Distributions: External

- ***Hackable:1***
  based on Debian, it implements the GNOME Mobile platform and resembles Om2007.2

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  an Open Handset Alliance project, Koolu sponsors the porting to the FreeRunner and it has released beta2

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- ***Gentoo***
  the FreeRunner boots, but everything should be compiled by hand or cross-compiled on an host machine

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First Official Meeting

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Resources: Alioth

- a public project
  http://alioth.debian.org/projects/pkg-fso/
- contacts:
  - (Alioth) packaging mailing list
    http://lists.alioth.debian.org/pipermail/pkg-fso-maint
  - (FreeSmartphone.Org) upstream mailing lists
    http://www.freesmartphone.org/index.php/Infrastructure
  - (Freenode) IRC channels
    #openmoko-devel and *#openmoko-debian*
- packages maintained in Git
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Problems

- space: can a graphical Debian fit on 256MB?
  no, the microSD card must be use instead
- d-i: can it be started from the FreeRunner?
  too much work, bootstrapping is faster
- U-Boot: it can not read big partitions
  two partitions: 8MB /boot and the rest for /
- U-Boot: by default it expects the first partition to be vfat
  configure-uboot.sh to modify the U-Boot environment
- kernel: Openmoko or Debian?
  Openmoko patches not yet integrated in the mainline kernel, thus the Openmoko kernel must be used

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install.sh

- runs from any official Openmoko distribution
- uses official Debian cdebootstrap
- highly configurable:
  HOSTNAME SD_DEVICE SD_PART1_FS
  INST_DIR INST_MIRROR APT_RECOMMENDS
  DASH_BINSH FSO_MIRROR FSO_DEVICE
  QI QI_VERBOSE_BOOT SINGLE_PART
- divided into self-contained stages:
  all testing time partition format
  mount debian apt fso configuration
  kernel unmount *uboot (risky)*

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Result

Matchbox components
- window manager
- virtual keyboard

Openmoko-panel-plugin
- shows powerstates
- enables/disables devices

FSO Zhone
- sends/receives calls
- manages SIM contacts
- sends/receives SMSs
- checks GSM status
- shows GPS position

Outline

Boot Loader

U-Boot is too slow -> Qi

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- pros
  - just loads the Linux kernel
  - supports ext3 for /
- cons
  - no menu
  - expects the kernel on /
  - expects the kernel as uImage-GTA0x.bin

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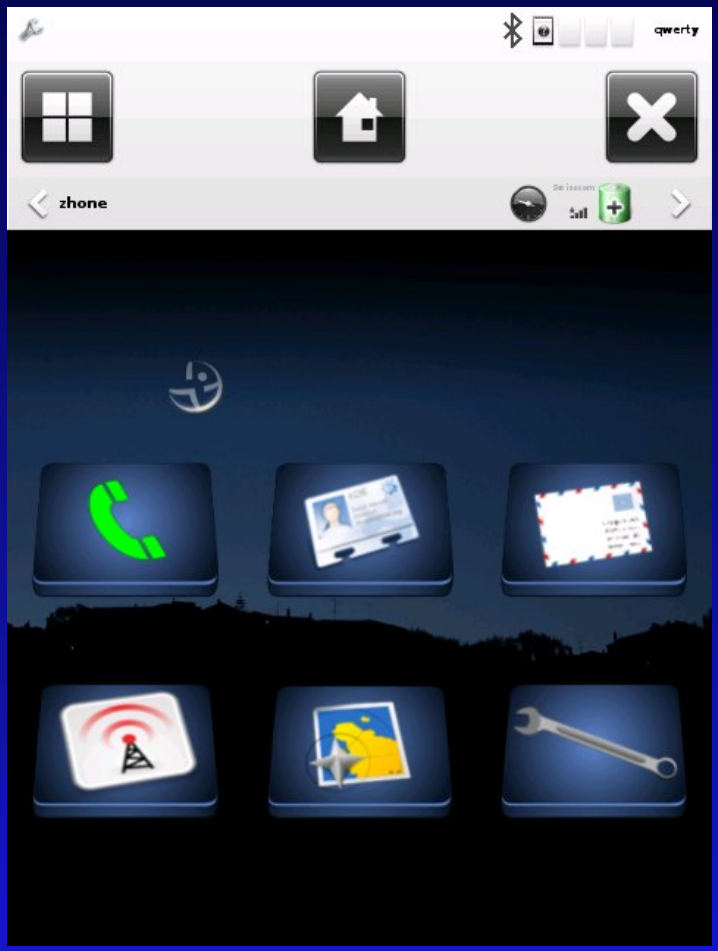
Illume



upstream choice

not fully functional
- keyboard (pending fixes)
- menu (debugging)

non-Illume problems render the experience worse
- fonts
- 2.6.28 kernel

Outline

Upstream

- *answering calls sometime fails*
- receiving/sending SMSs sometime fails
- *VoIP software is not usable (ALSA bug)*
- missing pieces in fso-frameword: PIM and WiFi
- missing a fully functional phone+PIM GUI: *Paroli*
- Vala migration (faster startup and smaller memory footprint)
- tslib right-click (*patch available*, but it breaks other devices)

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Packages

- fixing bugs
- Debian Policy-compliant and lintian clean
  manpages, non-embedded fonts, better location into /
- upload to main
  unstable, except those who depend on experimental versions
- kernel
  - better mimic the Debian linux-2.6 package
    package building, all drivers as modules, initrd
  - provide general package for all *Samsung S3C devices*
- new software
  from distributions (SHR, Qtopia, etc.) or user-contributed

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debian-installer

- how to boot it?
  should not require modifications to a stock FreeRunner
  (both distribution and boot loader)
- the FreeRunner does not have any physical keyboard
  - tslib support?
  - preseeding until SSH?
- where to install Debian?
  - Python requires a lot of space (288MB without DE)
  - nothing should changes if installing into NAND
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  in line with Debian development
  working and tested solution
  no need to strange setups

- second choice: mixing NAND and microSD
  full Debian installation
  stops working if the microSD is removed

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Outline

Call for Help

- maintainers
- d-i support
- EmDebian
- more devices

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if someone knows where I can still find a GTA01 model...

Aknowledgements

non exhaustive list, simply the people I remember

Christian Adams - Arne Anka - Joachim Breitner
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Albin Tonnerre - Sascha Wessel - Neil Williams
Nikita V. Youshchenko - Enrico Zini

zack for DPL!

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http://people.debian.org/~gismo/talks/

Luca Capello <gismo@debian.org>