

Microkernels and You: Long path of the small project

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Ksys labs

Structure

- Introduction: About Us
- First Case: Trusted Screen
- Practical View on L4Re, Fiasco.OC and Genode
- Our Contribution
- Summer Systems School'12
- 2013

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About Us

- Small R&D enterprise
- Information Security
- Network and mobile devices
- Russian Market

About me

- I'm 27
- Graduate Moscow Engineering Physics Institute in 2010
- Around 8 years experience in embedded development
- Wide range of projects and companies – from Montavista to startups

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First Case: Trusted Screen

- Was started in April of 2011
- See what you real sign
- Electronic signature for banking

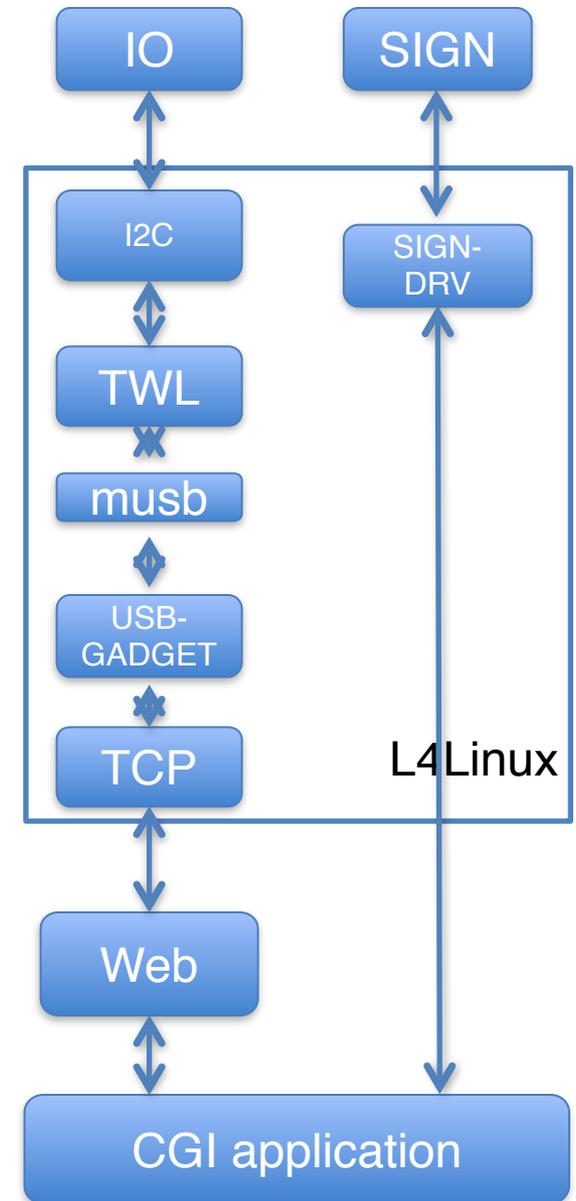
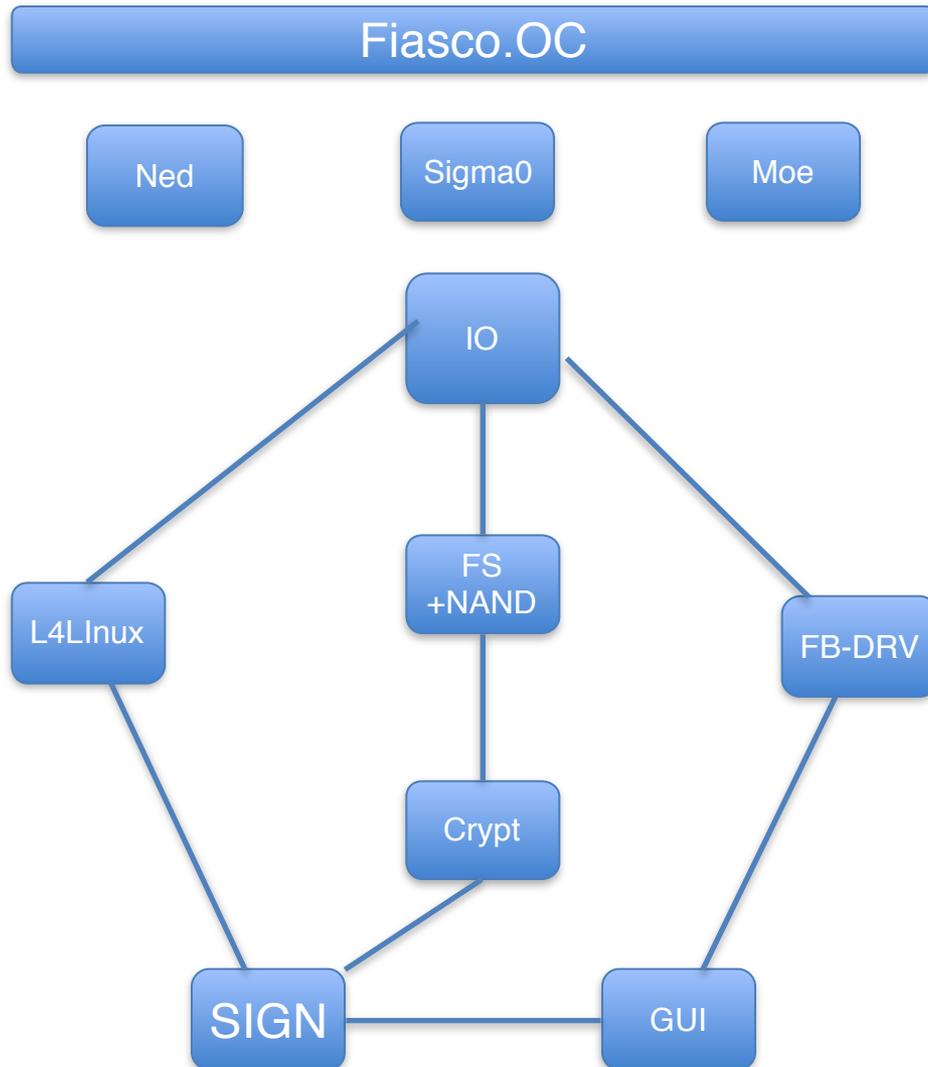
First Case: Trusted Screen

- Platform – TI OMAP3
- First platform – DEVKIT 8k with screen
- First Linux based example – 1st day

First Case: Trusted Screen

- Idea: let we use uKernel
- Projects:
 - Fiasco.OC, L4Re * dde kit, dope, l4linux
 - L4::ka * there was no omap support
 - XEN * there was no arm support
 - QNX, OKL4 – closed sources

Trusted Screen:



First Case: Trusted Screen

- Vanilla L4Linux does not support any board specific drivers

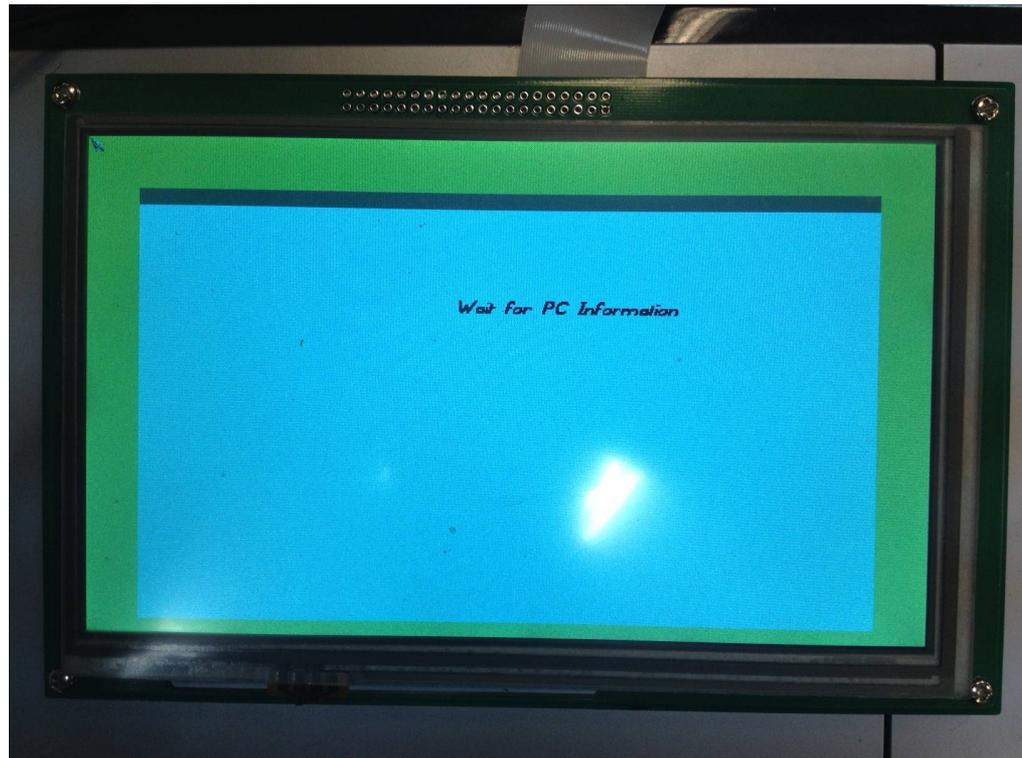
arch/arm/mach-omap/board-<..>.c:

```
ads7846_init
smc911x
display
dss_data,
nand,
mmc
Gpio
i2c
regulator
<..>
```

arch/l4/kernel/arch-arm/setup.c

First Case: Trusted Screen

- L4Linux + L4Re + Mag (Dope) (August of 2011)

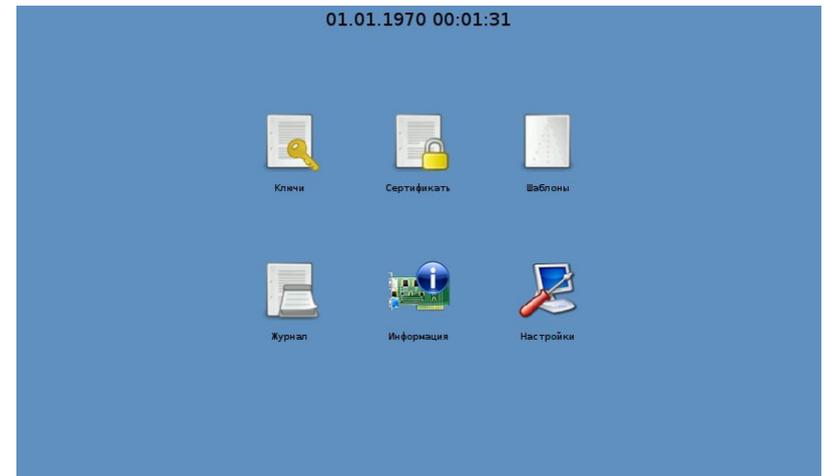
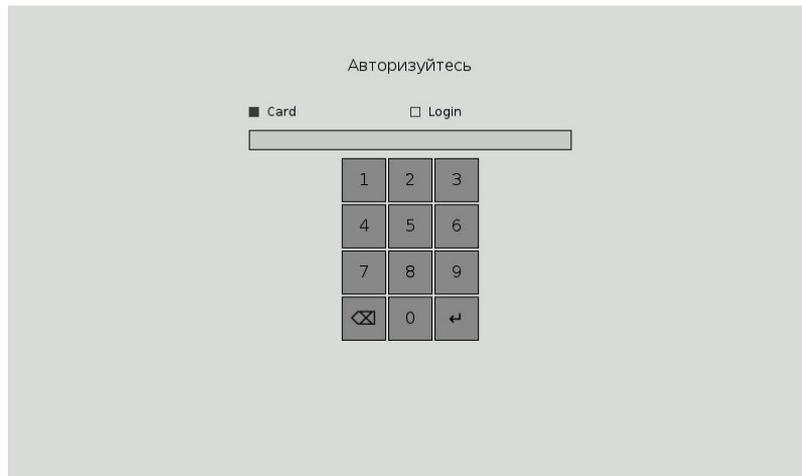


First Case: Trusted Screen

- L4Linux + L4Re + Qt (September of 2011)

First Case: Trusted Screen

- L4Linux + L4Re + Disko GUI (November of 2011)

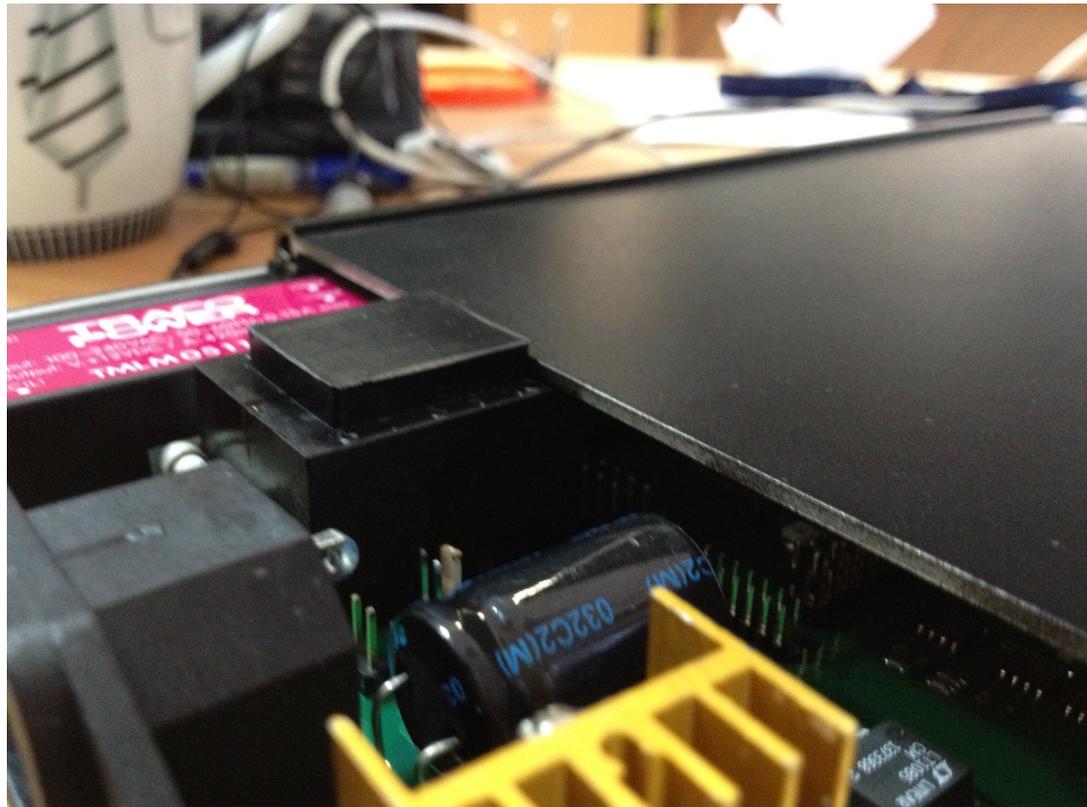


First Case: Trusted Screen

- Summary:
 - 8 person-month
 - Mag/Dope, Qt, DISKO
 - Two times we made OTG support from scratch

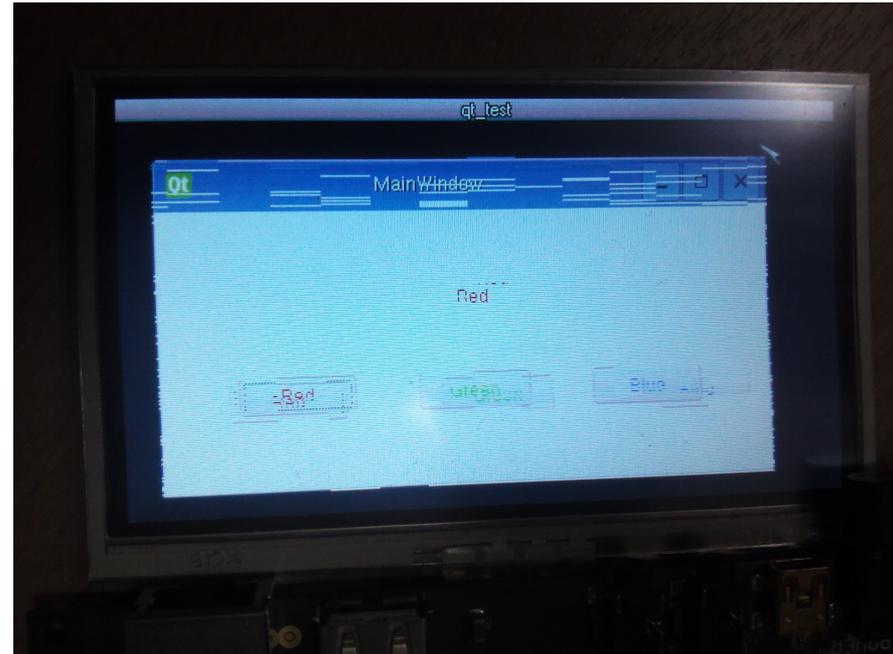
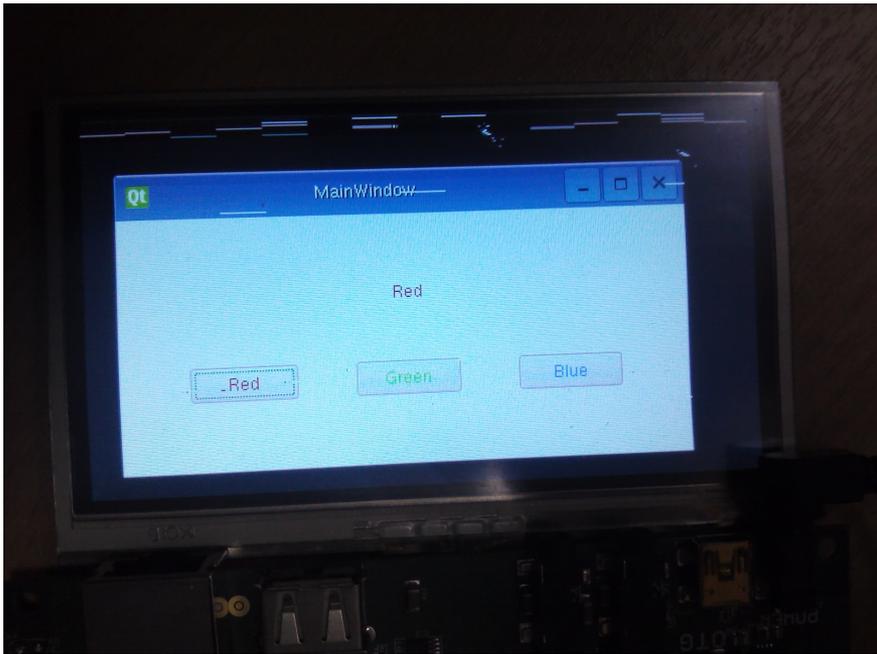
First Case: Trusted Screen

- Stopped in December of 2011
- Hardware prototype was outsourced and made with a lot of bugs



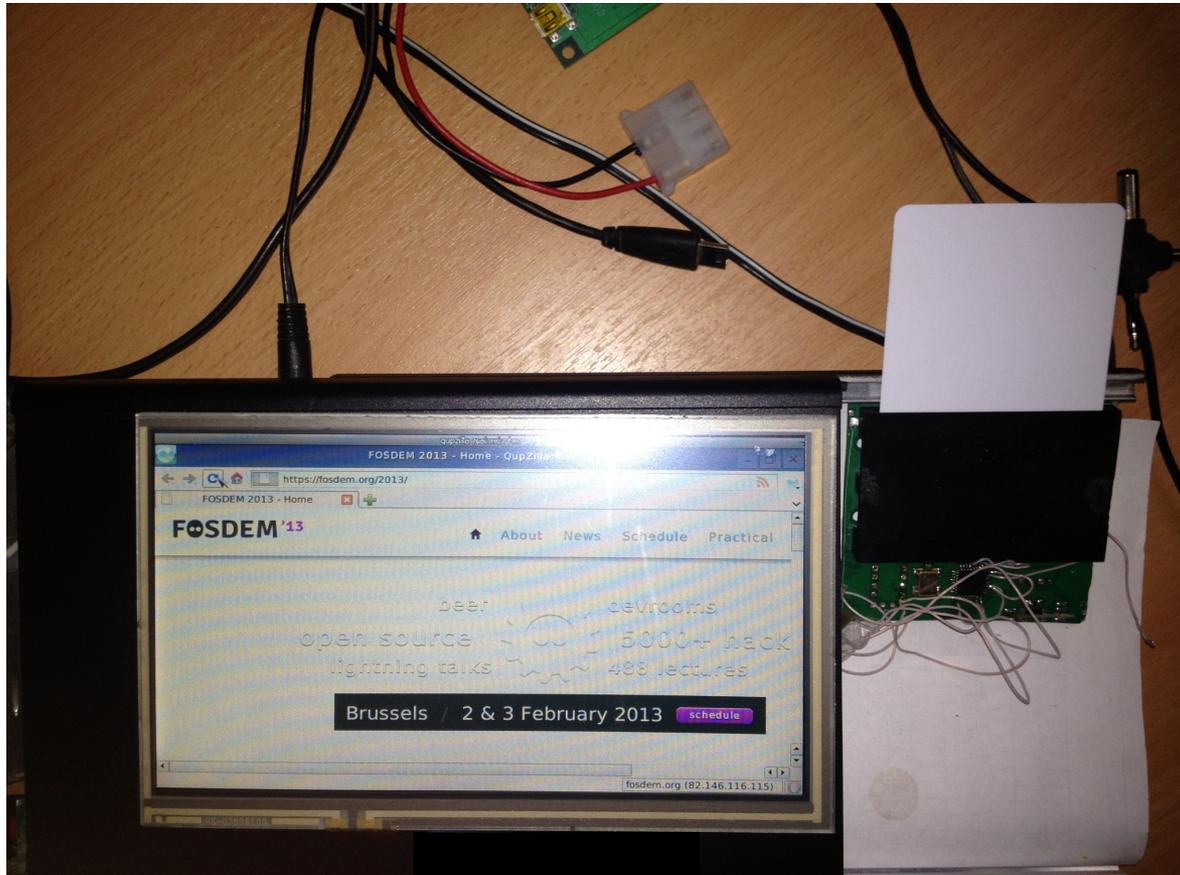
First Case: Trusted Screen

- Qt + Genode on OMAP3



First Case: Trusted Screen

- OMAP4 -> IMX6 with Genode



Practical View on L4Re, FOC and Genode

- Fiasco.OC/L4Re:
 - Rare and silent Releases
 - Uncertain future, there is no public roadmap
 - SMP, DMA, L2 cache
 - Publications—sources gap
- Genode:
 - Public Github
 - Low performance lwIP
 - Slow FB
 - Pandaboard support

Practical View on L4Re, FOC and Genode

- We use:
 - L4Re for OMAP3
 - Genode for OMAP4
 - Switch from L4Re to Genode on x86

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Our Contribution

- L4Reap – L4Re (additional) applications
 - L4Linux for OMAP3
 - L4Re applications:
 - freetype2
 - libsigc++
 - libwhefs
 - libxml2
 - openssl
 - Disko GUI



<http://ksyslabs.org>

Source: http://etc.usf.edu/clipart/53300/53327/53327_reaping.htm

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Summer Systems School'12

- 7 lectures from TUD and Genode plus 3 own.
- Theory and practice
- Very important material for new developers and students

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- Good Cases: Network appliances
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2013

- Summer Systems School'13
- Hardened Fiasco.OC
- Fiasco.OC for PowerPC

Thanks

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