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Engineering resources for the ARM Linux community

Michael Opdenacker, Community Manager

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Michael Opdenacker

- Previously employed by ST and TI
- Founder of Bootlin,
  an embedded Linux engineering company.
- Head count: 6 - Customers worldwide
- Famous in the embedded Linux community for sharing all its training materials on-line together with other technical resources (blog, conference videos). See https://bootlin.com/docs/
- Community Manager at Linaro since October 2010.

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The ARM platform

- RISC CPU cores developed by ARM Limited
- System on a Chip (SoC)
  = ARM core + on-chip devices
- Instruction set compatibility
- Silicon vendors compete on added features, performance, power consumption and cost.
- Extremely successful today
  (15 billion processors shipped as of Jan. 2011)
  Linux, Android, Apple iOS…

ARM Linux vs x86 Linux

	ARM	x86
CPU Performance		
On-chip hardware acceleration		
Battery life		
Easy software development		
Development and debug tools		
Easy hardware vendor change		

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ARM Linux weaknesses

- Device makers: costs switching SoC vendors
- Software makers: costs supporting all SoC vendors
- Device makers: software development costs
- Community: lack of affordable hardware.
- Dealing with unseen hardware complexity: power management, graphics...

Linaro: improve Linux on ARM

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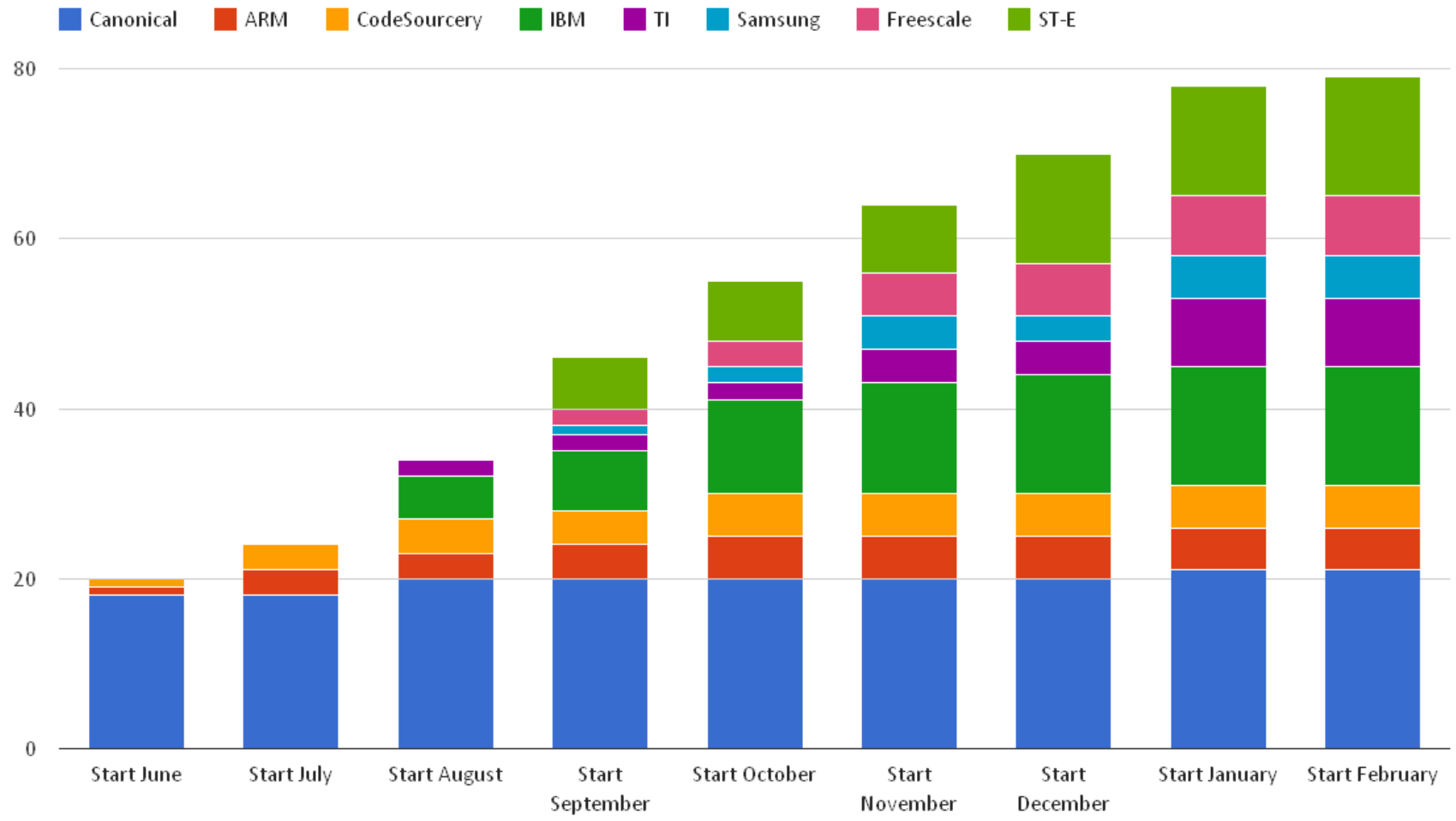
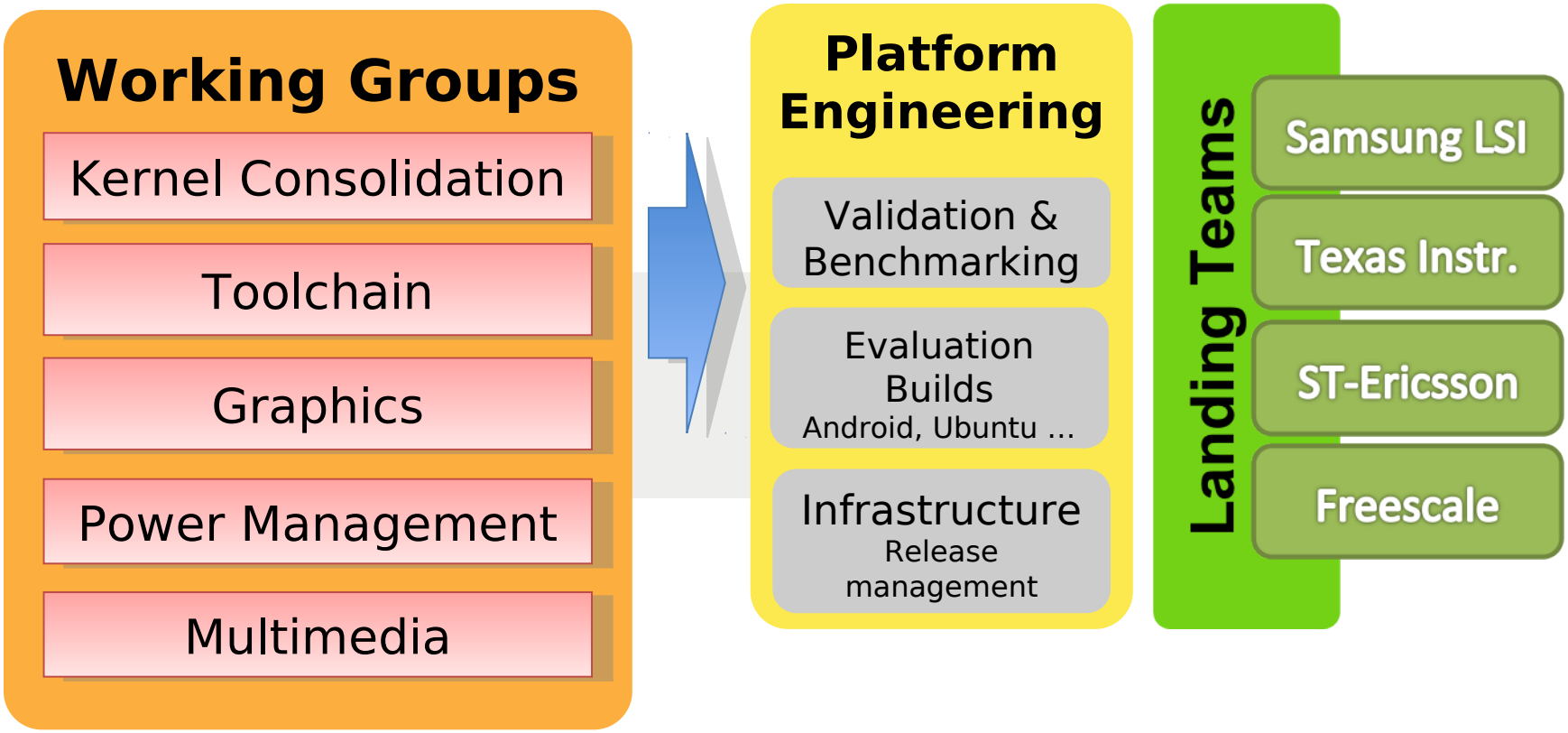
Linaro in a nutshell

- Only an engineering organization
  (around 100 engineers)
- Amazing collaboration at engineering level before silicon competitors
- First goal: improve Open Source projects
- Second goal: backport new features to current versions, for product developers.
- Works completely in the open
- Focus on recent ARM cores:
  Cortex A8, A9, A5, A15.

Engineering



Linaro Teams



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A few recent deliverables

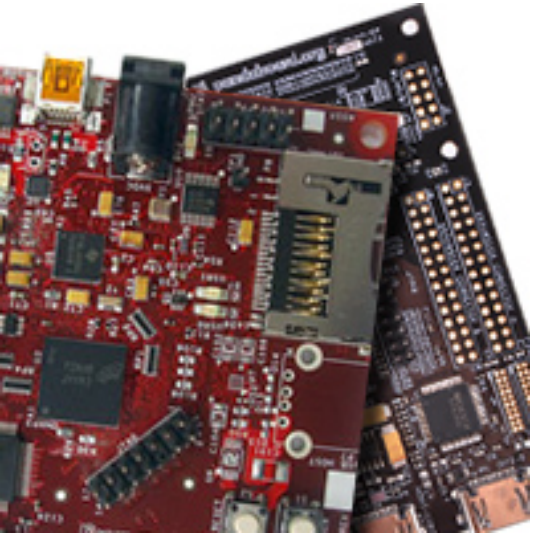
Linaro Evaluation Builds (LEB)

- Currently available for Android and Ubuntu.
- Released monthly
- Built with Linaro toolchains, and including Linaro kernels and other deliverables.
- Android LEB: hardware accelerated 3D, noticeable performance improvements over binaries built with Google's toolchains.
- Tested extensively and supported by Linaro
- Meant to simplify product development.
  Easy way to test Linaro releases.
- Currently available on the TI Panda Board
  More boards to come.

3D desktop on ARM

First time in the industry

- Only existed on x86 so far
- Released through 11.06 LEB for the Panda Board (Ubuntu 11.04 with Unity 3D)
- Based on OpenGL-ES. Powered by Compiz and relies on the Nux toolkit for its rendering.



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NEON accelerated libjpeg-turbo

- libjpeg-turbo used SIMD instructions (MMX, SSE2) to accelerate JPEG decoding and encoding (2-4x)
- Now supporting NEON, ARM's SIMD instructions
- Linaro accelerated other multimedia and video codecs in the past.

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QEMU improvements

- Model for the Gumstix Overo board
- USB keyboard/mouse support on BeagleBoard.
- QEMU with OpenGL ES acceleration
- Allows to test Linaro without ARM hardware.
- Details on http://j.mp/lJ7lf4

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Previous contribution highlights

From past releases

- A lot of kernel consolidation work:
  power management, device tree...
- Advanced kernel releases
- gcc performance improvements
  Android cross toolchains
- Cortex string routines
- Valgrind on ARM
- Powertop on ARM. Powerdebug.
- And many more!

Get involved

- Get a low cost - high perf board:
  http://www.linaro.org/low-cost-development-boards
- Go to the developer wiki:
  https://wiki.linaro.org/
- Try our monthly releases:
  http://www.linaro.org/downloads/
- Join our IRC channel:
  #linaro on Freenode
- Quick news:
  http://twitter.com/LinaroTech, http://twitter.com/LinaroOrg
- See who is already on board:
  https://wiki.linaro.org/MeetTheTeam

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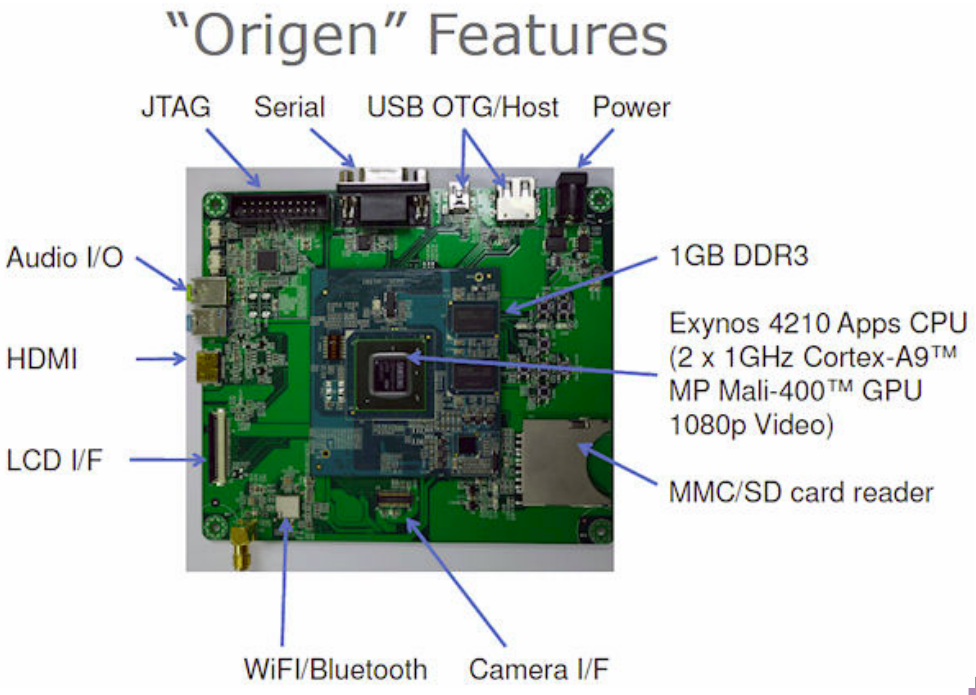
Thank you

- Slides: http://j.mp/iPLkQz
- Any I/O?



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