

# Linaro Update

December 2012



# Why Linaro?

- Increasing need for shared ARMv7/v8 software engineering
  - Without working together fragmentation and duplication result
- Standards for ARM implementations in different segments (server, networking etc.) for Linux are often absent
- SoC vendors seek to supply “OEM and distribution ready” software stacks
- In the last 2 years, Linaro has become the place for ARM licensees to safely work together on new open source technology development
  - Very strong engineering team established
  - Significant pieces of upstream plumbing merged
  - Roadmap of technology development published

# Linaro Overview

- Linaro is a not for profit engineering company that delivers core Linux technology for the benefit of members

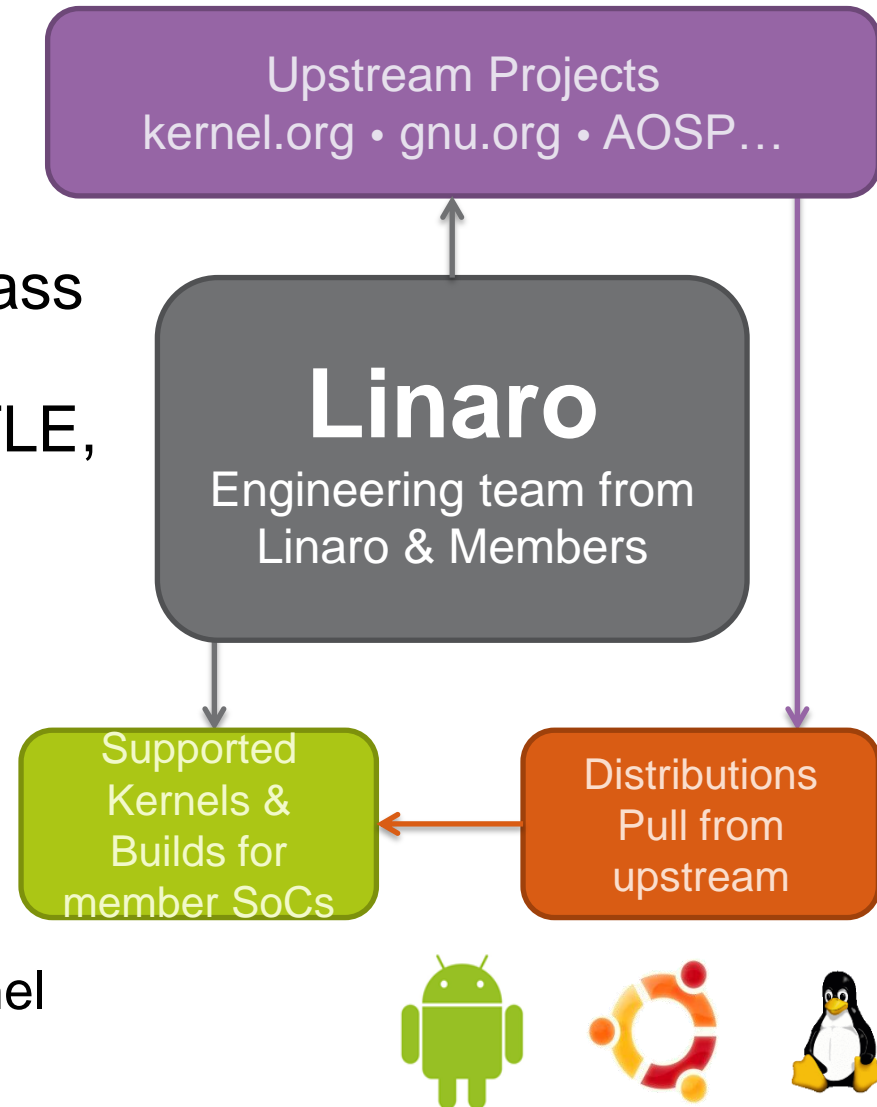
## Our key goals:

- Use shared investment to provide high ROI to members
- Accelerate time to market for member products
- Reduce fragmentation and resulting costs
- Work closely with ARM to deliver Linux software and tools for new ARM technology – big.LITTLE, server, ARMv8
- Make ARM a leading architecture in open source



# What does Linaro do?

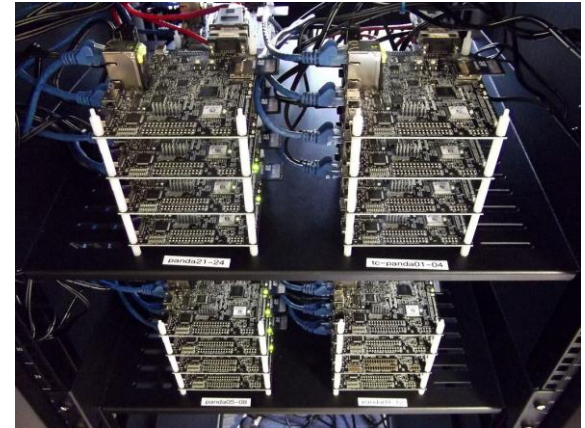
- Linux kernel on ARM SoC
  - Focus on Consolidation & Optimization
  - Latest ARM SoCs, Cortex-A series
- ARM GCC toolchain: best in class
  - Monthly builds
- New ARM technology: big.LITTLE, 64-bit,...
- Delivers upstream
- LAVA, Test, Validation
  - Continuous Integration framework for Linux & Android
- Focus on member SoCs
  - Linux, Android & Ubuntu
  - Advance work on next Android kernel



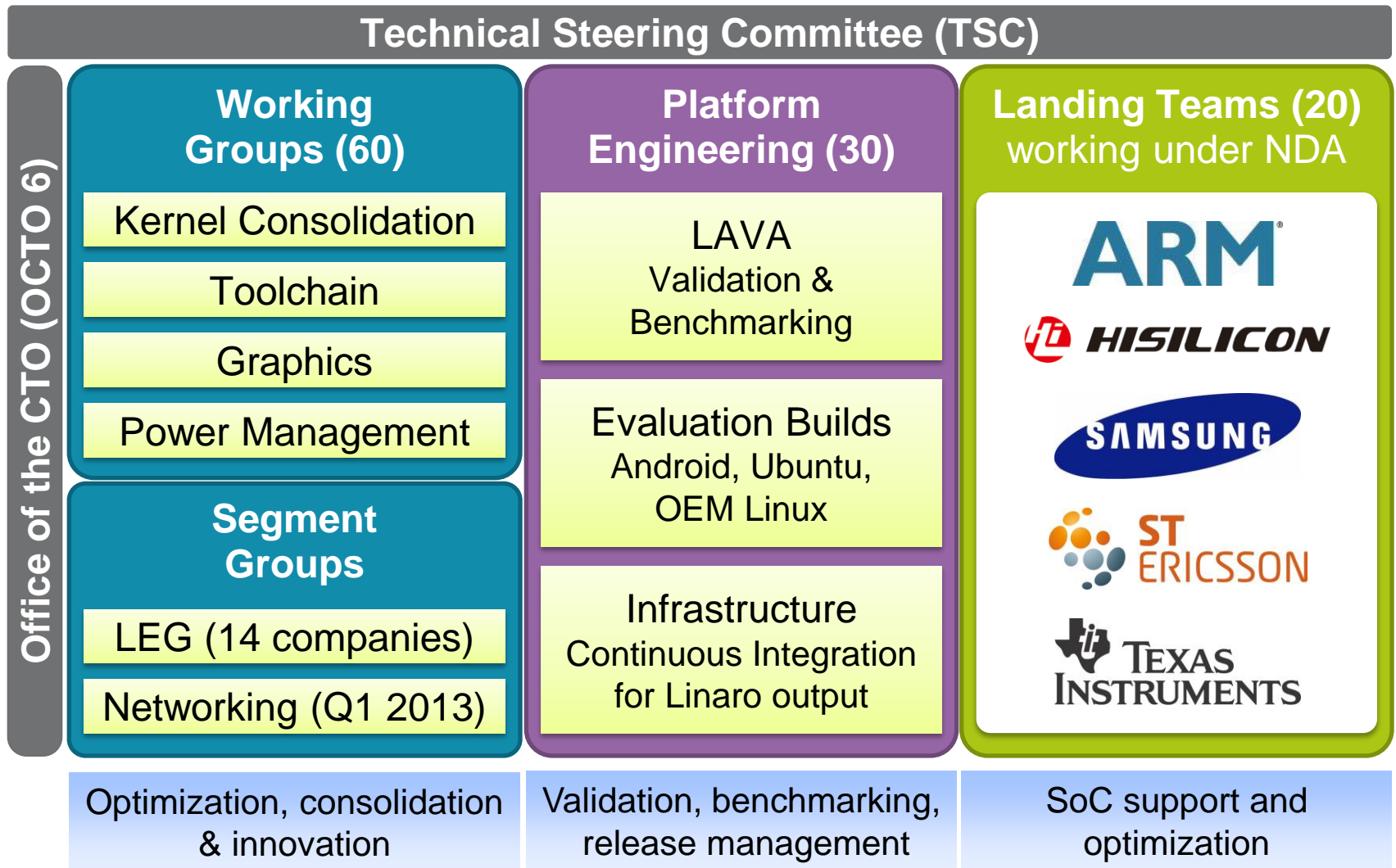


# Linaro Open Source Testing & Validation

- Open Source Software traditionally has limited testing
  - SoCs have commercial level software quality requirements
- LAVA – Linaro Automated Validation Architecture
  - An open source software test & validation platform
- Populated only by Linaro members hardware
- Provides Members
  - Continuous Integration for daily build & testing
  - Smoke, System and Regression testing
  - Web dashboard for results and trends
  - Measures distribution quality & trends
- Framework is open source
- Linaro maintaining large and expanding farm of latest Member SoC boards



# Linaro Org (95 “offices” in 25 countries)



# Linaro Enterprise Group (LEG)

- Members deliver optimized open-source software for ARM servers
- Reduces costs, eliminates fragmentation, accelerates product time to market
- Enables ARM Server vendors to focus on innovation and differentiated value-add



# Engineering: Steering & Management

- Member-directed engineering
  - Technical Steering Committee (TSC) provides high-level direction through requirements creation and review
  - LEG Steering Committee representative on TSC to help coordinate work between LEG and core engineering
  - Members choose what teams their engineers are assigned to: aligned with skills and strategic interests
  - Linaro engineering managers oversee day-to-day work
- Engineers assigned to Linaro join a broad talent pool, gaining technical and upstream interaction experience
  - Knowledge diffused back into the member organization, enabling more effective upstream interaction
- Linaro continuously monitors engineering activities to ensure work is valuable and directly useful to members



# Engineering: Platform Group

- The most direct short-term value Linaro provides: directly runnable, fully-enabled builds for member platforms
- Done to ensure Linaro engineering is highly effective, putting everybody on the same platform, and exercising code in production-like situations
  - Test and benchmark WG impact on member hardware
  - Keep track of what's happening in the wider upstream world
- At member's option, can be used to empower and support a community build for a specific platform
  - Monthly builds of tip Android and Linux
  - Hosting for binaries with conditional redistribution
  - Example: ST-Ericsson Snowball-focused Igloo Community website <http://igloocommunity.org>

# Linaro Member Management Partnership

- TSC meets every 2 weeks, monthly members' report, Linaro Connect 3x and members' meeting 2x per year
- Linaro provides Android and Ubuntu images every month
  - Images generated by Linaro infrastructure can be delivered automatically to member sites (or member's community sites)
  - Package update distribution available
- Kernel and toolchain provided as required
  - Latest stable kernel for boards, tested and validated in LAVA
- Cross-linking between Linaro and member sites
- Bug tracking and project management
- Escalation route(s) for kernel and toolchain issues that member sites cannot address (IRC, mail lists,...)



# Key Benefits of Linaro Membership

- Focus engineers on your differentiation, not on common infrastructure
- ROI from Linaro's 100+ expert open source engineering team, including kernel and other maintainers
- Direct Linaro engineering priorities & activities via the Linaro TSC
- Dedicated Linaro Landing Team to work on maintaining your SoC BSP support at the Linux tip
- Access to new ARM technology including Linaro's Linux kernel software for big.LITTLE product deployment (only for members at present)
- Your products used in Linaro and supported with Continuous Integration and testing in the LAVA test & validation framework
- Maintenance and support for gcc toolchain
- Kernel, Linux and Android distribution builds for your SoC(s)

# Linaro: Proven Success in Linux

- #5 contributor to Linux Kernel 3.7
- High quality ARM GCC toolchain
- Device Tree for ARM
- Facilitated arm-soc sub-architecture maintainers group
- Common kernel memory management framework (UMM)
- Continuous Integration testing using LAVA test and validation platform on member hardware



# Linaro Connect: [connect.linaro.org](http://connect.linaro.org)

- Linaro Community Technical Conference held 3x per year
- Agree technical priorities & deliver on roadmap for ARM open source
  - Focus on member requirements
- 300 attendees from 80 companies
- Week-long event
  - Up to 95 morning sessions
  - 5 afternoons of hacking in working groups

Dates	Location
<b>4 – 8 Mar 2013</b>	<b>Hong Kong</b>
8-12 Jul 2013	Dublin
Oct 2013	US (TBC)





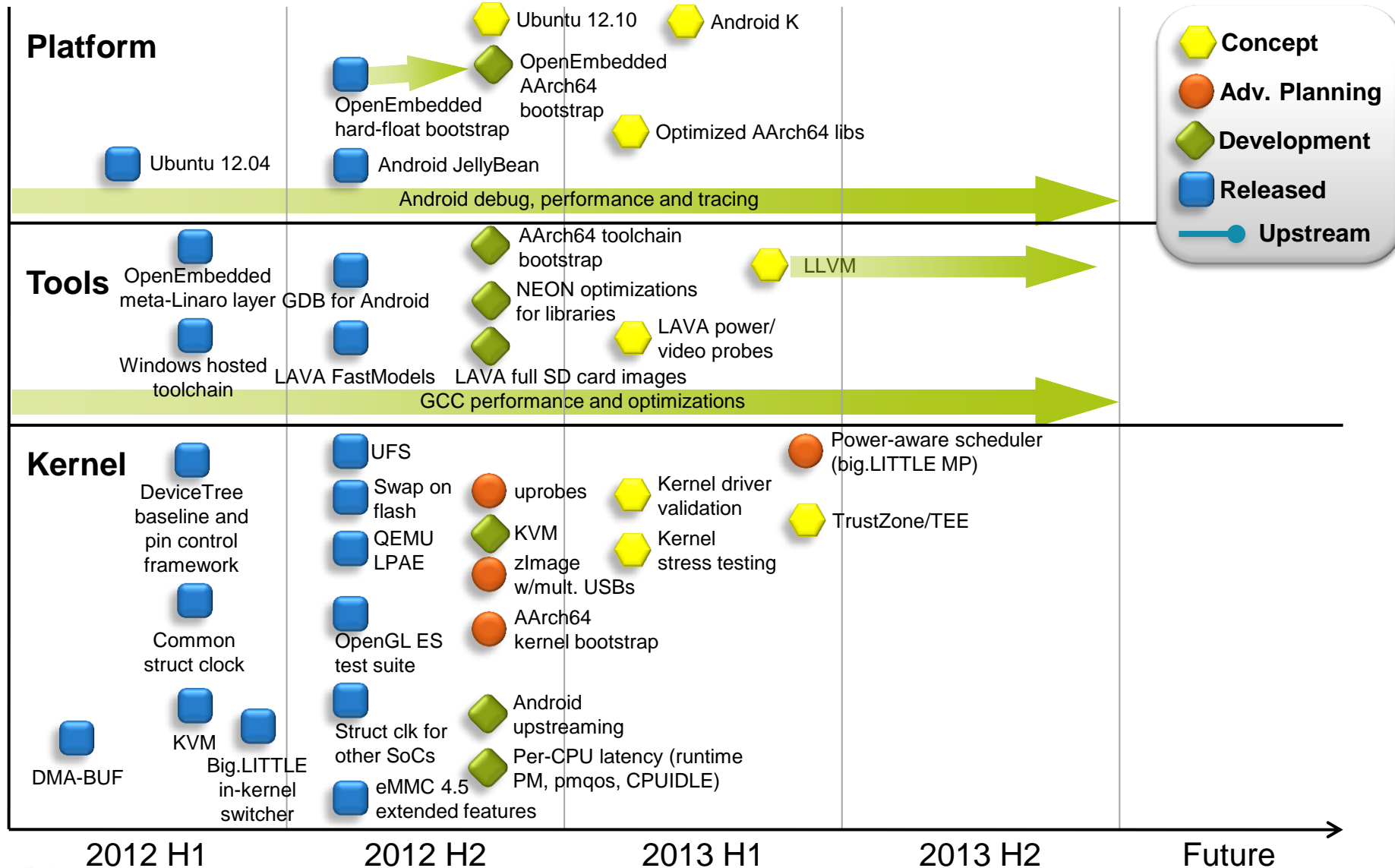
# Linaro Public Roadmaps v1.0

Q4 2012, agreed at LCE12 and LEG-SC

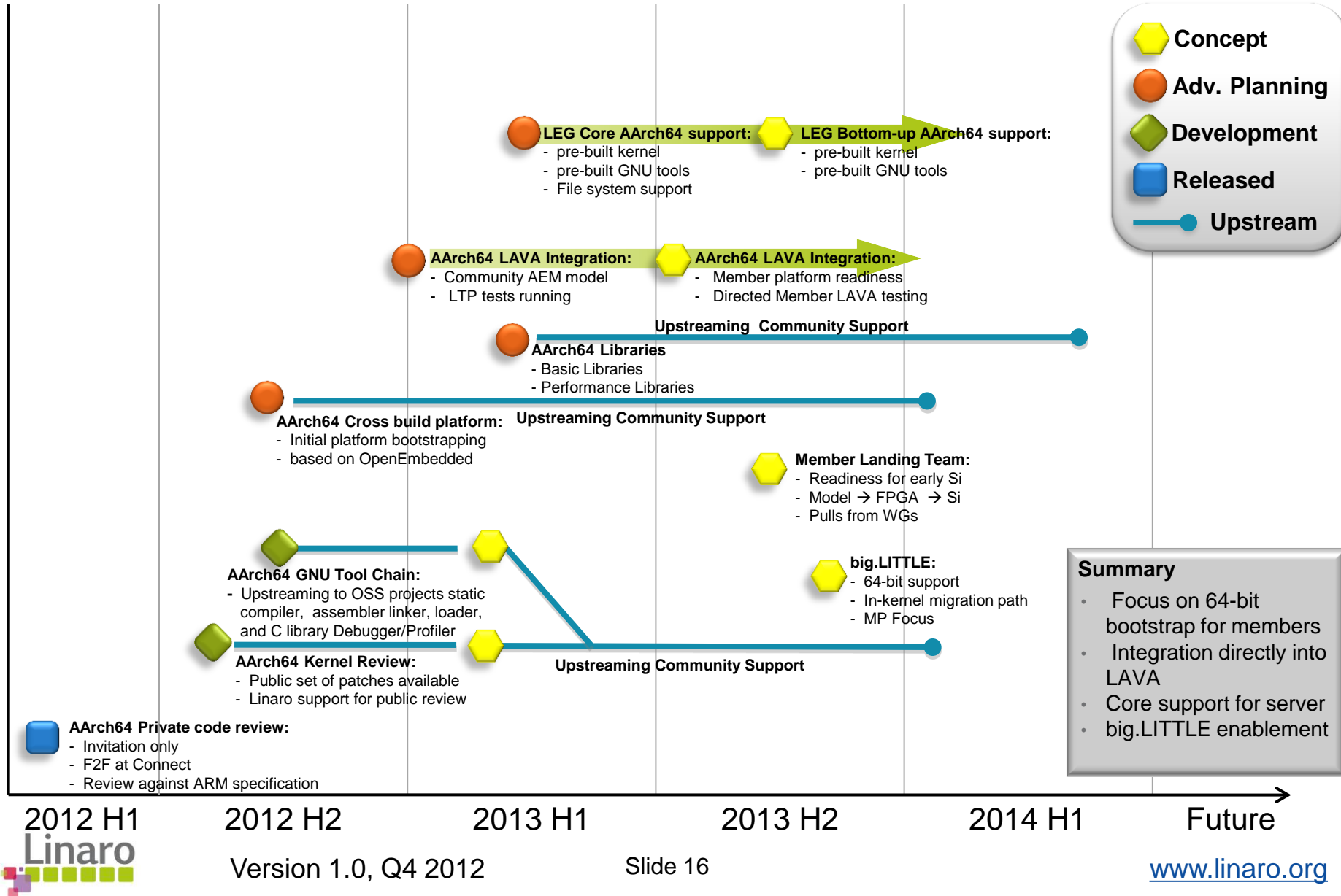


Group photograph at Linaro Connect in Copenhagen  
Monday 29 Oct 2012

# Linaro Core Roadmap

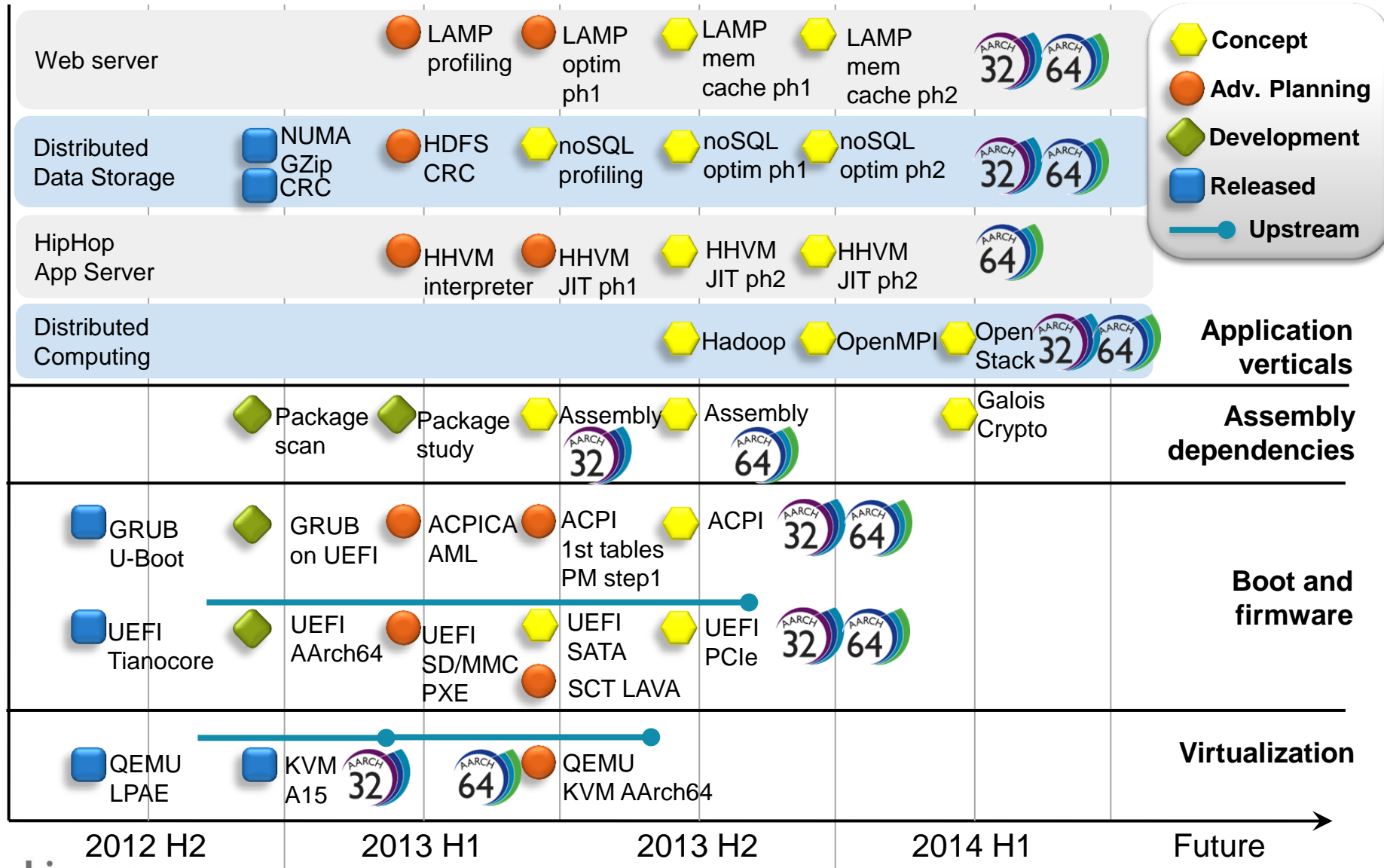


# Linaro AArch64 Roadmap





# Linaro Enterprise Group (LEG) Roadmap





More about Linaro: <http://www.linaro.org/about/>

More about Linaro engineering: <http://www.linaro.org/engineering/>

How to join: <http://www.linaro.org/about/how-to-join>