Evolution of the Reference Software Platform Project

Presented by
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Date
BKK16-100: March 7, 2016

Event
Linaro Connect BKK16
Agenda

- Update since previous Connect
- Overview of the past releases
- Next steps and future plans
- Questions
Linaro Connect SFO15

- Reference Software Platform Lead Project announced
  - Reviewed by TSC, approved in October
- Goals:
  - Open Source Reference Software for 96Boards, Linaro member and community ARM hardware
  - Reduce engineering effort and time to market for derivative products
  - Used by engineering, product teams and community
  - End-to-end use cases
  - Upstreaming and documentation
Reference Platform Workflow

SoC Vendors

Components

96Boards
LEG
LNG
LHG
LMG
CORE

Delivery/Upstream

Requirements

Reference Platform Builds
Hosted publicly on 96Boards.org

Linaro Teams
Proposed Milestones

● Quarterly releases, starting with a release preview:
  ○ 15.10 - Preview, 15.12 and 16.03

● Deliverables:
  ○ Reference Platform Builds (RPB) for 96Boards Consumer and Enterprise Editions (inc. Member Enterprise hardware)
  ○ Binary and Source for the Reference Components
  ○ Release, including QA and test automation
  ○ Documentation
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15.10 Alpha - Goals

- Bootstrap the project and CI infrastructure
- Define the release process
- Release documentation
- Understanding image differences, gaps, upstreaming status and planning
- CE AOSP RPB for HiKey (Marshmallow 6.0)
- CE Debian RPB for both HiKey and DragonBoard410c
- Challenges:
  - Unified kernel (4.3) for both boards
15.10 Alpha - Release (Nov 7/15)

- Project documentation in the 96Boards wiki (github)
- CI jobs for every build and component used
- Single kernel repository, based on 4.3 but not yet unified (adv7511 conflicts, branches per board)
- CE Debian RPB (HiKey and DB410c):
  - Debian 8.2 "Jessie", 4.3 Kernel
  - Common rootfs build process, not yet unified
- CE AOSP RPB (HiKey):
  - 3.18 Kernel
  - AOSP Marshmallow 6.0
15.10 Alpha - Lessons Learned

- Need to reduce maintenance of older kernel trees
- Lack of a clear picture on pieces missing upstreaming
- Too many forks, confusing for our users
- Firmware licensing blocks a single rootfs image
  - HiKey Mali driver needs click through
- Need to work closer with debian backports
15.12 - Goals

- Bootstrap the Enterprise Reference Platform
- Husky delayed, focus moved to D02 and Overdrive
- At least one target with open source firmware
  - UEFI/EDK2 TianoCore and OpenPlatformPkg
- Single kernel for Enterprise, ACPI support only
- Network Installers for both Debian 8.2 and CentOS 7.2
- Components: OpenStack, Docker, ODPi, OpenJDK
- Consumer Edition:
  - 4.1 kernel for CE AOSP RPB (HiKey)
  - Bootstrap CE OE/Yocto
15.12 - Release (Dec 23/15)

- UEFI/EDK2 + OpenPlatformPkg for D02 (SATA only)
- Single 4.4-rc4 kernel, including ACPI support
- Network Installers:
  - Debian 8.2 "Jessie"
  - CentOS 7.2 1503 (alpha)
- Components: OpenStack Liberty, Docker 1.9.1, ODPi BigTop and OpenJDK 8
- CE AOSP RPB (HiKey) now using a 4.1 kernel
- CE OE/Yocto: meta-rpb and manifest, early stage
15.12 - Lessons Learned

- Documentation for Enterprise is just too spread out, and also not necessarily up-to-date
- Teams maintaining their own kernel and firmware
- Kernel uses Device Tree by default, needs upstream discussion to also enable ACPI without extra arguments
- LAVA installer automation as critical requirement for CI
- Lack of a strong vanilla OpenStack packaging solution that is compatible with both Debian and CentOS
- Kernel maintenance policy required
16.03 - Goals - Consumer

- Add support for HiKey and DB410c in the same kernel used by Enterprise. Single branch, single kernel config and single kernel package build.
- CE Debian RPB:
  - Improve hardware acceleration support
  - Use the unified kernel
- CE AOSP RPB:
  - First developer preview for DB410c, using Mesa and Freedreno
16.03 - Goals - Enterprise

- Update kernel to 4.4.0, including support for X-Gene Mustang and HP m400
- D02: EDK2 supporting SAS and PCIe
- Supporting ACPI, KVM and PCIe by default
- Extend support for CentOS 7
- Platform used by the Developer Cloud Project
  - Great end-to-end use case
16.03 - Release (Mar 5/16) - Common

- Unified 4.4 kernel shared between CE and EE
  - Supporting HiKey, DragonBoard410c, D02, Overdrive, X-Gene Mustang, HP m400
  - Device Tree for the CE builds
  - ACPI for Enterprise
  - Single kernel config and package
16.03 - Release (Mar 5/16) - Consumer

- **CE Debian RPB:**
  - Debian 8.3 "Jessie"
  - Unified 4.4 Kernel
  - Mesa 11.1.2 and Xserver 1.17.3
  - Supporting Freedreno (DB410c)

- **CE AOSP RPB:**
  - First Developer Preview for DB410c, using Mesa and Freedreno.
  - Kernel 4.1 for HiKey and 4.4 for DB410c
16.03 - Release (Mar 5/16) - Enterprise

- Additional hardware platform support:
  - X-Gene Mustang, Overdrive A0 and HP m400
- D02: EDK2 supporting SAS and PCIe
- Network Installers:
  - Debian 8.3 "Jessie"
  - CentOS 7.2 1511
- ACPI, KVM and PCIe supported by all platforms
- Components: OpenStack Liberty, Docker 1.9.1, ODPi
  BigTop and OpenJDK 8
16.03 - Lessons Learned

- Unified kernel helped revealing core issues and conflicts between different platforms. Amit to cover at BKK16-501 - Kernel and bootloader consolidation and upstreaming.
- Performance / stress testing needed, now that the builds are functional
- Release cadence might be too aggressive for Enterprise
- More participation from different segment groups
Project Lessons Learned

- Real need to fill the gap between upstreaming and distributions, providing a complete end-to-end use case
- We need to work closer with the supported distributions:
  - Reduce maintenance, show commitment
  - Upstreaming support is key
- Need a strong upstreaming policy, with constant reports
- Use as a way to reduce duplication in the organization, avoiding forks and working all together as a big team
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Future Plans

● Continue pushing for upstream support, aggressive bug fixing, including constant review and status reports
● Enabling additional 96boards, member and community hardware platforms
● Default mechanism for Linaro Collaborative engineering output
● Specification evolution to cover the reference platform needs from the other Linaro Segment Groups
Goals for Linaro Connect BKK16

● Project review with key stakeholders
● Segment groups requirement capture
● Planning for the future milestones to cater for segment needs
● Clear understanding of the 16.06 and 16.09 milestone goals
Questions?