Qualcomm & Linaro Strategic Executive Sync

April 12 2021

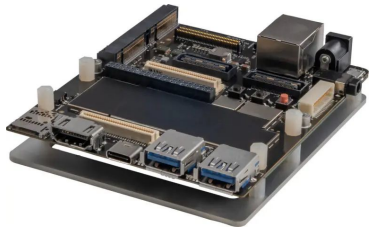
Linaro

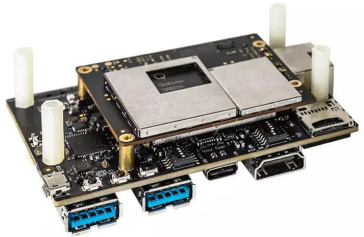
General

- Arm has extended their core membership through October 2024
- Mark Orvek has chosen to retire. Last day was March 31
- Next Member Meeting: Virtual - July 20-22 7-9am Pacific (11pm Japan)
- Connect contributions
  - Thanks to Dev Singh for his Keynote
  - Proposed keynotes at next Connect:
    - Snapdragon Ride and automotive vision by Nakul Duggal
      - Natural follow up to the Android Automotive OS LVC21 Keynote by Guru Nagarajan from Google
    - CodeLinaro by David Marr
    - Benefits of upstreaming by Sandeep
- Current renewal expires May 2022
  - Define next steps and timeline

Summary of Current OCE Strategic Collaboration

- Linaro Stratos Virtualization Project
- Linux Kernel Development Targeting Android
- Linux Kernel Quality - LTS and Android Common Kernel Validation
- Software Device Enablement (RB3 & RB5) for Android Upstream
- Optimize Linux Power and Performance on Arm
- 96Boards v2 Spec released
    - 2 Qualcomm SBCs in the top 5 most powerful dev boards in 2021





Key Updates from Developer Services

- Linaro is a Member of the Qualcomm Advantage Network
- Open Source LTE/5G Connectivity: Near completion on multiple projects including Telit/Quectel modem & SDX55
- Delivered upstream support for RB5 platform
- SC7180 ChromeOS products released fully mainline including a lot of the efforts Linaro and the LT has completed
- Engaged with Square to provide upstream Android & kernel to extend the lifetime of their payment terminals

codelinaro Status Updates

- Phase 1 complete:
  - Staging system up and an initial set of Qualcomm users have been provided access to the system, email available, GitLab available, API Interface Spec complete, testing underway by Qualcomm,
- Phase 2 complete:
  - Continued endpoint scaleout, started Website design and deployment, Service Desk up and in use. Mirroring, Groups/Subgroups access, Repository mgt (forking, creation, deletion), and Artifact service deployment
- Phase 3 complete
  - Rolled out project wikis, metrics & reporting, finalize endpoint deployment, finalize migration plan, continue Website buildout, elastic search, & begin end-user testing. Completed the Emergency Support Plan and de-dup solution
- Phase 4 development activities underway since October
  - Implemented IRC, Metrics and Reporting. Under review by Qualcomm.
  - Customer (Google) testing underway (Lahaina) with target of completion April 15th
    - Operational support included in the Customer testing activities
  - Working with QC CLO team to finalize the Phase 4 completion criteria
- First internal presentation about CodeLinaro at Qualcomm's OSS (Open Source Summit) April 1
- Targeted outreach to additional candidate CodeLinaro partner companies (under NDA)

Future Strategic Item Updates - Stratos

- Stratos - Hypervisor Abstraction
  - Demo status
    - Goal: To show Virtio I/F allows migration of workloads between hypervisors
    - Vendors coming back to share interest.
    - Is Qualcomm in a position to run the SCMI server on QC hypervisor on RB5?
  - Ongoing project support discussion
  - Mobile and Android use cases
  - Increased interest in Rust
    - Qualcomm Rust-VMM proposal
    - Google also showing interest in Rust for Android
  - Hafnium and/or OpenSynergy COQOS would be candidates for collaboration/testing in addition to Xen.

Other Future Strategic Work Items

- Updates on Windows on Arm
  - Official LLVM for Windows on Arm press release imminent
  - Started Qt PoC, targeting Qt September release
  - Arm committing 2 FTEs
  - Coordinating a joint group call with Linaro, Arm, Qualcomm and Microsoft
  - Kickoff targeting July 1 once Microsoft signs up
- Automotive Trend: consolidation of many ECUs into fewer CPUs
  - Project Stratos as hypervisor abstraction
  - Safety certified TEE as a secure communication infrastructure
  - Trusted Applications (TAs) to run safety workloads
  - Android Automotive
  - Infotainment, Telematics, Early functions as workloads in VMs
  - ASIL-B TEE workshop on 15th April, Sean Rogers and team will be participating
- Any updates on Project Treble?
- Linux Laptop momentum increasing. Any opportunities for additional Collaboration?
- Other areas Linaro can help?

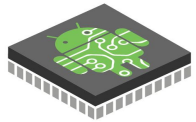
Full details on updates

Linaro

Existing Strategic Item Updates

- Virtualization / Linaro Stratos Project
- Optimize Linux Power and Performance on Arm
  - Cluster Idling, DTPM Powercap framework
- Services/Landing Team
  - Linaro has added Member Page in the Qualcomm Advantage Network
  - Reduction in out-of-tree kernel code and enabling new chipsets through Linaro Landing Team. Extended to include more IoT support.
  - CodeLinaro
  - Building on Telit modem & SDX55 - near completion with Quectel
  - RB5/Kona - near completion

Existing Strategic Item Updates - Android



- Linux Kernel Development Targeting Android
  - DMA-buff heaps - approx bi-weekly status published via email - helpful?
  - Common DMA-BUF heap logic for 5.4, 5.10 complete
  - Upstreaming in progress
- Linux Kernel Quality - LTS and Android Common Kernel Validation
  - 4.4, 4.9, 4.14, 4.19, 5.4, 5.10, Mainline on Android 8, 9, 10, 11, 12, 13
  - Doubled the number of RB3 boards used for LTS, and 5.4, 5.10 ACK Validation
  - ~500 Million tests over the past year with test results being actively triaged to improve overall quality
  - Boot time measurements recently added to Android Common Validation
- Software Device Enablement for Android Upstream
  - RB3 AOSP Reference board Activities
    - Media effort focused on v4l2_codec2 enablement
    - Continual monitoring and fixing of breakages in aosp and mainline - kABI and others
    - Android feature enablement - wifi, fake battery, virtual A/B, bootimg v3 etc
    - Mesa 20.3.4 validation and merge into AOSP
  - RB5 AOSP Reference board activities
    - Hardware not yet received

Services Updates

- Linaro is a Member of the Qualcomm Advantage Network
- Reduction in out-of-tree kernel code and enabling new chipsets through Linaro Landing Team. Extended to include more IoT support.
- Building on Telit modem & SDX55 - near completion with Quectel
- LT has provided upstream support for RB5 and initial upstream support for the Snapdragon 888 HDK
- Upstream frameworks now used in Qualcomm mobile products (phones)
  - Snapdragon 888: Bus scaling, rpmsg, nvmem, pinctrl, scm, slimbus, qrtr, regulators, clock
  - Next Premium Tier: will be adding remoteproc, thermal, cluster idling, RPMh
- SC7180 ChromeOS products released fully mainline including a lot of the efforts Linaro and the LT has completed
- Open Source LTE/5G Connectivity has been enabled by Linaro Services

Thank you

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