

Devboard Maintenance in AOSP

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Linaro Supported Devboards in AOSP

- Linaro is an upstream first organization that focuses on the development of open-source software including AOSP for the ARM architecture.
- Linaro supports a variety of member development boards in AOSP
 - These devboards are chosen based on factors like relevance to AOSP, popularity, availability, and community / upstream support.
- Linaro ensures that latest AOSP builds can be installed and run on them with latest LTS kernel versions.
- Linaro performs extensive testing coverage, including both functional and performance testing, as well as CTS and VTS compatibility test suits.

Linaro Supported Devboards in AOSP

- <https://android.linaro.org/lkft/>

Testing with LKQ and LKFT

- Linux Kernel Quality project, Linux Kernel Functional Testing
- **254 M** tests run on Dragonboard platforms just this year; **970 M** till date
- We test **10** kernel variants over **3** userspace images in LKFT using CTS and VTS test suites
 - Kernels: android-mainline, android14-5.15, android13-5.15, android13-5.10, android12-5.10, android12-5.4 and android11-5.4
 - Userspace: AOSP/master, Android12, Android11 (Android 13 in process of being added)
- Just this year, we've caught **21** regressions, which resulted in **12** AOSP fixes, **5** upstream fixes, while **4** are under investigation



* Dragonboards test metrics from around same time last year

Linaro Supported Devboards in AOSP

- Next set of devboard slides are shamelessly copied from our last talk from Linaro Virtual Connect 2021: Leveraging the past for the future of AOSP devboards
 - <https://resources.linaro.org/en/resource/8sjfJfUNX3qitL5MW6Tbfz>

Linaro Supported Devboards in AOSP

HiKey

- First 96board!
- Introduced 2015
- Added to AOSP early 2016
- HiSilicon Kirin 620 SoC
- 1GB/2GB RAM
- Proprietary Mali graphics
- SoC shipped in mid-range phones
- Retired in AOSP in late 2019



Added to AOSP!

Retired from AOSP!
(But still used for
testing updates to
previous Android
releases)

2015

2016

2017

2018

2019

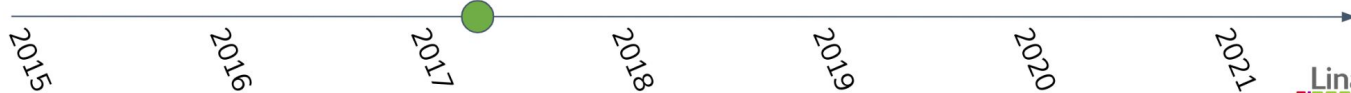
2020

2021

Linaro Supported Devboards in AOSP

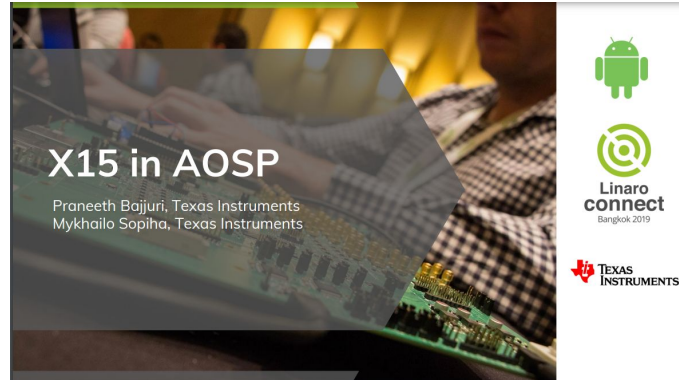
HiKey960

- Introduced in 2017
- Flagship SoC!
- In AOSP on announcement!
- HiSilicon Kirin 960 SoC
- big.LITTLE cpu architecture
- 3GB/4GB RAM
- Proprietary Mali graphics
- Shared board-level components with original HiKey
 - Bluetooth
 - Wifi
 - HDMI bridge
- [Last years update](#)



Linaro Supported Devboards in AOSP

- BeagleBoard-X15: <https://beagleboard.org/x15>
- Linaro Connect Bangkok 2019: AOSP Device Upstreaming and Development with X15
 - <https://resources.linaro.org/en/resource/5qQveQqogZ4evF6yhoL7Wx>

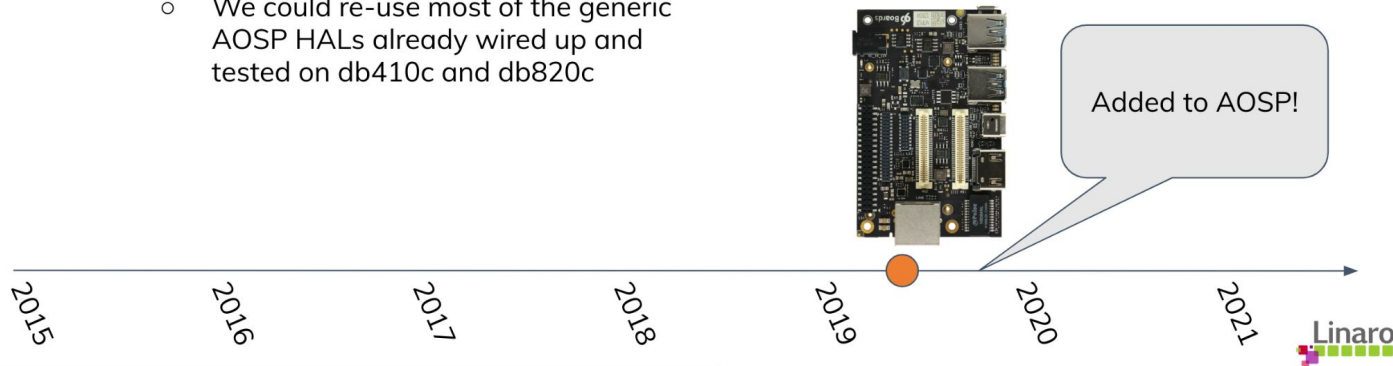


- Mostly tracked for testing 32bit AOSP builds

Linaro Supported Devboards in AOSP

RB3/Dragonboard845c

- Qcom SDA845 (flagship SoC from 2018!)
- Leveraged previous Dragonboard efforts
 - Reaped the benefits of iterative SoC blocks and upstream development
 - We could re-use most of the generic AOSP HALs already wired up and tested on db410c and db820c
- [DragonBoard 845c support landed in AOSP](#)



Linaro Supported Devboards in AOSP

Qualcomm Robotics Board RB5

- Next gen Robotics Board from Qualcomm based on QRB5165 (sm8250) SoC
- Successor to RB3 (db845c) kit
- Reusing db845c AOSP build config
 - RB5 GKI config fragments have already landed in common-android-mainline kernel
 - Userspace lunch target should hopefully land in AOSP by the time this talk is published
 - Will be supporting boot image header v3 (vendor_boot) from day 1
- Upstream support on the board was further along than anything else we had started with



GKI config fragment added in android-mainline

2015

2016

2017

2018

2019

2020

2021

Importance of Devboards in AOSP

- Combines latest upstream projects (like Linux and Mesa) with latest AOSP
 - Creates space of overlapped interests between Android and Linux Kernel developers
- Vehicle for testing for, catching and fixing regressions
 - Focused on core generic kernel functionality
 - Multiple -stable LTS releases & Mainline
 - Critical for vendor confidence in updating kernels
- Development and prototyping of new functionality for AOSP
 - GKI prototyping
 - [XDA Forum: PocoF1 running GKI kernel](#)
 - DMA-BUF Heaps
 - [Linaro Blog: DMA BUF Heap Transition in AOSP](#)
 - Development of generic HALs utilizing modern upstream kernel interfaces
 - [Linaro Blog: Supporting Multiple Devices with the same AOSP Images](#)

Devboards Maintenance in AOSP

- Keeping up with AOSP requirements
 - Boot image header versions
 - Binary blobs licensing policies
 - GKI updates
- Report or Fix AOSP and relevant Upstream project breakages
- Update AOSP external/ projects if required
- Support mini / headless (adb console only) or software rendering displays on early silicon devices.

Questions?

Thank You!