Linaro Consumer Group

Lightning Talks!

Linaro Connect LVC21-101

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Linaro Connect
VIRTUAL • SPRING 2021

Linaro Consumer Group

Agenda (25 minutes!)

Recent developments on AOSP devboards

Android boot image header v3 support in db845c

Status update on form-factor devices like PocoF1

Integrating Docker into Lava testing

Recent work on AOSP devboards

John Stultz <john.stultz@linaro.org>

Why AOSP Devboards?

Provides testing platforms for numerous kernels with the latest AOSP userland

- android-4.14, android-4.19, android*-5.4, android*-5.10, android-mainline
- Regular testing of AOSP w/ Linus's upstream tree for regressions (which we find a number!)

Also a development vehicle

- Allowed for GKI prototyping across vendor SoCs
- Utilized heavily in transition from ION to DMA-BUF Heaps
- Allows for development against mainline kernels so changes can be confidently submitted upstream

db845c / RB3

Recent efforts:

- android12-5.10 kernel support
- Regular GKI testing & kABI upkeep
- Full functionality landed upstream! (v5.11+)
- GKI module enablement mostly upstream!
- abootimg v3 support (Amit will cover)
- Proper VirtA/B support
- Mesa update to 20.3.x

In progress

- v4l2 integration in AOSP
- minigbm gralloc switch (align with cuttlefish/ChromeOS)
- Boot as recovery and fastbootd support
- Upstreaming remaining GKI module enablement

HiKey960

Recent efforts:

- android12-5.10 kernel support
- Regular GKI testing & kABI upkeep
- USB functionality finally has landed upstream
  - Additional reliability fixes submitted and in discussion
- Dynamic partitions & VirtA/B support

In progress:

- Enabling system-uncached heap in hikey960 gralloc
- Still quite a bit of out of tree code (Display/Audio)

Watch This Space!

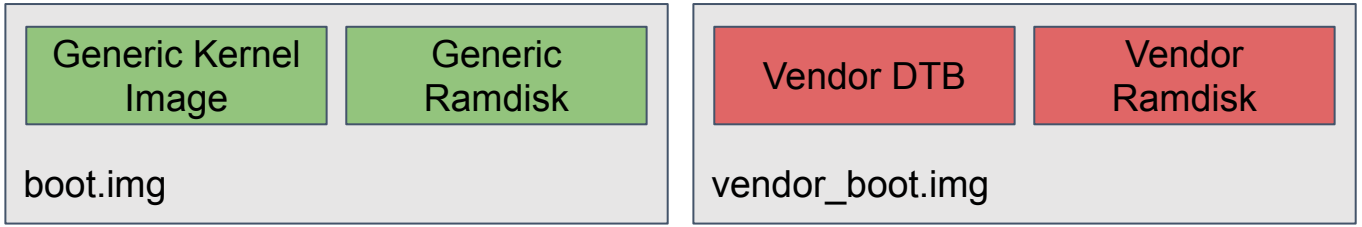
Work ongoing to enable additional devboards in AOSP

Android boot image header v3

Amit Pundir <amit.pundir@linaro.org>

Android boot image header v3

- In v3, vendor specific information is factored out of the boot image and relocated into a new vendor boot image.
  - The boot image contain the generic components like the kernel image and a ramdisk (cpio archive) with GKI modules.
  - The vendor boot image contains DTB, platform specific boot information, and a vendor ramdisk with platform specific kernel modules.



- Required for GKI compatibility
  - Must for Android devices launching with the 5.4 or newer Linux kernel

Android boot image header v3

- The bootloader will concatenate the vendor and generic ramdisks and the concatenated file is used as an initramfs during boot.
  - The GKI boot image uses an lz4-compressed generic ramdisk, so a GKI Compliant device must use an lz4-compressed vendor ramdisk.

- On db845c, we were able to reuse CodeAurora's v3 implementation from the abl/tianocore/edk2 project (LA.UM.9.12.r1-08000-SMxx50.0).
  - Shout out to Mayank Grover from QuIC/CodeAurora to help debug the page size mismatch issues.

- Recently Android boot image header v4 support landed in AOSP as well
  - Vendor boot v4 supports packaging multiple vendor ramdisks and let the bootloader select the ramdisk(s) to load at the boot time
  - [AOSP/system/tools] Add boot / vendor boot image header version 4

Status update on form-factor devices

Amit Pundir <amit.pundir@linaro.org>

Mainline on form-factor devices

We have been chasing this topic for a few years now. Please checkout our previous presentations, and blogs for the rationale and our previous efforts.

Mainline on phone form factor devices

- Running Mainline Kernel on a sdm845 phone form factor device
  - Leveraging Dragonboard 845c support in upstream AOSP, mainline kernel and Mesa project.

Mainline on form factor devices

- Why emphasize on form factor devices?
  - Avoid devboard functionality gaps during development and testing
  - Helps validate the work Linaro does on the same type of platform our members are shipping to customers
  - Allows us to compare upstream solutions with vendor solutions on the same hardware
  - [Slides|Video SFO15] Mainline on form factor devices / Improving AOSP
    - https://connect.linaro.org/resources/sfo15/sfo15-401-mainline-on-form-factor-devices-improving-aosp/

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AOSP on Pixel3/PocoF1 (Running AOSP with mainline kernel on form-factor devices)

Amit Pundir | Wednesday, April 15, 2020 | 5 mins read

Android Ecosystem

d 96board) landed in AOSP. One
t to be precise) is that it is actively
g Team and supports an open
e firmware files are available in
y open-source kernel and
d from AOSP development point
d is the fact that the SDM845
king it a great starting point for
m-factor device that one can test
ges has long been a desired goal in
s we made a similar effort on the
e been covered in previous Linaro

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About Resources

SFO15 401 Mainline on form factor devices / Improving AOSP

Thursday, September 24, 2015

2:30 / 40:54

Download Video

Download Presentation

Combined session on John Stultz's Linux Plumbers Conference (LPC) presentations:

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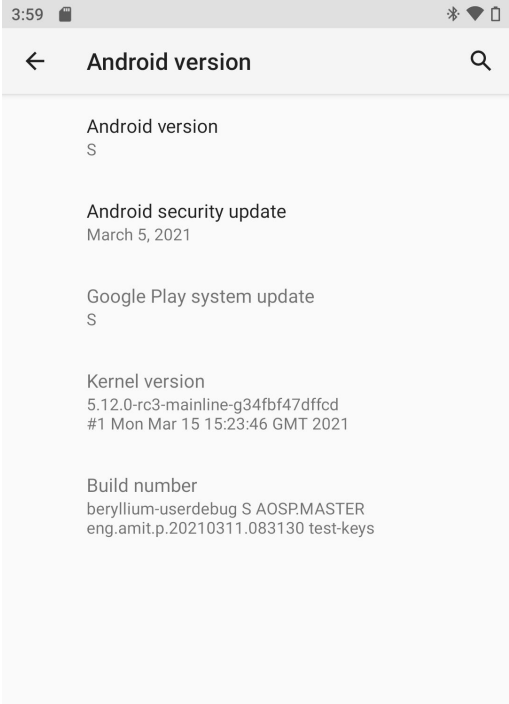
Mainline on Xiaomi Pocophone F1

As of [v5.12-rc2 tracking branch]() (with 20+ out of tree patches), we can boot AOSP to UI with working:

- WiFi (Station and Hotspot modes),
- Bluetooth (Audio and HID profiles),
- USB Gadget (ADB),
- Audio (Speakers, Mic and Headphone),
- Touch Screen,
- External SD-Card, and
- Backlight (screen brightness control) support.



Running AOSP with mainline kernel is a community driven effort

- Special mention to Linaro's QcomLT, postmarketOS, SoMainline and Mesa developers for helping us debug and enable new features.

Mainline on Xiaomi Pocophone F1

Upstreaming Status:

- Display panel dts patch
  - [v3] arm64: dts: qcom: sdm845-xiaomi-beryllium: Add DSI and panel bits
- WiFi firmware workaround
  - ath10k: Introduce a devicetree quirk to skip host cap QMI requests
- I2C GPI_DMA support required for touch screen and audio amplifiers
  - [0/7] Add and enable GPI DMA users
- Audio (Headphone and primary Mic) dts patch from Joel (postmarketOS)
  - arm64: dts: qcom: sdm845-xiaomi-beryllium: Add audio support
- Touch Screen driver from Angelo (SoMainline)
  - [v9,0/3] Add Novatek NT36xxx touchscreen driver
- Qcom WLED backlight workaround and dts patches (SoMainline) #InProgress
- Audio amplifier TAS 2559/25560 driver #ToDo

Mainline on Xiaomi Pocophone F1

In Progress:

- Support for QRTR modems for mobile data connectivity by Andrew
  - [ModemManager] Draft: Add support for QRTR modems
- Battery (pmi8998) fuel gauge driver by Joel (postmarketOS)
  - WIP basic fuel gauge driver with Battery charge, health status temperature, and charger hotplug detection working
  - power: pmi8998_fg: add pmi8998 fuel gauge driver for SDM845 devices
- Haptics driver by Caleb (postmarketOS)
  - drivers/input/pmi8998_haptics: add haptics driver for pmi8998 devices

To Do:

- Modem (voice calls) and AOSP Radio Interface Layer integration
- Camera (CAMSS), and Multimedia (Venus) support
- Getting Started
  - [GitHub] Readme.md: How to build and flash beryllium AOSP images

Integrating Docker into Lava Android testing

YongQin Liu <yongqin.liu@linaro.org>

About the Docker method:

- Improved Android Testing in LAVA with docker by Antonio Terceiro
- The exact same host environment for both local and remote(lava)
- Possible to maintain the Docker Image by the Test team

Prepare the docker image

- Install Docker Engine on Ubuntu
- Build the docker image on local host
  - The Dockerfile for LKFT Android Test: linaro-android-docker
- Upload the docker image to the Docker Hub site
  - Linaro-android-docker Image

Update the job templates:

- Detailed in Running arbitrary code with docker
- Deploy actions
  - Host side/ Two deploy actions: downloads and fastboot/Host side commands
- Test actions: replace lxc with docker
- Docker templates to refer to
  - Lkft templates for hikey/hikey960/db845c

Current Issues under discussion with Lava team:

- Failed to deploy A/B images for x15 build with the docker job
- Failed to run dmesg with the docker lava jobs

Thank you

Accelerating deployment in the Arm Ecosystem