



Rethinking device support for the long-term

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FOSDEM^{'23}

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About me

- Work at Collabora
 - Upstreaming kernel support for Chromebooks
 - Improving KernelCI coverage
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Upstream-focused device support

- Motivations
 - Continuous updates
 - No vendor lock-in
 - Lower maintenance cost
 - Longer lifespan
- Example: Chromebooks

Why do we need CI?

- Long-lived devices require long-term support
- Steady supply of new devices keeps demand high
- To scale and meet demand:
 - Automated regression detection → Continuous Integration (CI)
 - Enable tests early

KernelCI

- CI system for the Linux kernel
- Main instance on linux.kernelci.org
 - Other instances, like chromeos.kernelci.org
- Pipeline:
 - Monitor git branch until new revision is found
 - Build artifacts (kernel, modules, dtbs, rootfs)
 - Queue test to device in LAVA lab
 - Add test result to the dashboard
 - If a regression, report to groups.io/g/kernelci-results

KernelCI configs

- Configuration through YAML files:
 - Build: Trees/branches, config fragments, compiler/version
 - Some maintainers have a ‘for-kernelci’ branch
 - Lab: definition of labs (currently 11), filters
 - Rootfs: base OS, arch, packages, scripts, fs overlays
 - Test: test plans, rootfs, LAVA job template, parameters, device types (currently 208)
- Simple for anyone to extend the coverage

Tests on KernelCI

- Tests currently available on KernelCI:
 - Baseline (generic and machine specific tests)
 - kselftest (26 tests, including alsa, rtc, etc)
 - ltp (7 tests, including mm, crypto, etc)
 - v4l2-decoder-conformance (fluster)
 - igt (-gpu/-kms)
 - v4l2-compliance
 - lc-compliance (libcamera)
 - cros-ec
 - sleep
 - smc
 - preempt-rt
 - usb

Detecting regressions during upstreaming

- Upstreaming support for Acer Chromebook CB514-2H (MT8192-Asurada-Spherion)
- Test components, locate issues, send fixes
- Mainline is a moving target
 - Need to retest everything on every rebase
- Several issues detected by manually testing
 - Could have been detected by KernelCI!

Regression examples

- `drm/mediatek: mtk_dsi: Avoid EPROBE_DEFER loop with external bridge` ([link](#))
- `drm/mediatek: dsi: Add atomic {destroy,duplicate}_state, reset callbacks` ([link](#))
 - Display not probing. Detectable by baseline or `igt-kms` test.
- `drm/mediatek: dsi: Move mtk_dsi_stop() call back to mtk_dsi_poweroff()` ([link](#))
 - Warnings on suspend. Detectable by sleep test.
- `media: mediatek: vcodec: Drop platform_get_resource(IORESOURCE_IRQ)` ([link](#))
 - Encoder not probing. Detectable by baseline test.

MT8192-Spherion on KernelCI

- Configs enabled through fragment ([kernelci-core#1325](#), and also being upstreamed)
- Baseline(-nfs) tests enabled ([kernelci-core#1324](#))
- Device probe tests added to baseline ([bootrr#20](#))
- Next to enable:
 - also kselftest (needs to apply UCM), cros-ec-test, libcamera, v4l2-compliance, igt-kms
- Tests waiting for patches to land upstream:
 - v4l2-decoder-conformance, sleep, igt-gpu

Baseline results for MT8192-Spherion

Results for baseline: «next-20230124» on «mt8192-asurada-spherion-r0» (next / master)

Tree [next](#) — [👤](#)
Git branch [master](#) — [👤](#)
Git describe [next-20230124](#) — [🔗](#) — [🔗](#)
Plan [baseline](#) — [🔗](#)
Git URL <https://git.kernel.org/pub/scm/linux/kernel/git/next/linux-next.git>
Git commit [a54df7622717a40ddec95fd98086aff8ba7839a6](#)
Architecture [arm64](#)
Compiler [aarch64-linux-gnu-gcc \(Debian 10.2.1-6\) 10.2.1 20210110](#)
Defconfig [defconfig+arm64-chromebook](#) — [🔗](#)
Date [2023-01-24](#)
Job log [txt](#) — [html](#)

180 / 6 / 0 / 0



Test Results

All Successful Regressions Failures Unknown

25 reports per page

Filter the results

Test case path	Measurements	Status
baseline.bootrr.all-cpus-are-online	-	✓
baseline.bootrr.anx7625-3-probed	-	✓
baseline.bootrr.anx7625-7-probed	-	✗
baseline.bootrr.anx7625-driver-present	-	✓
baseline.bootrr.btusb-driver-present	-	✓
baseline.bootrr.btusb0-probed	-	✓
baseline.bootrr.btusb1-probed	-	✓
baseline.bootrr.clk-mt8192-apmixedsys-probed	-	✓
baseline.bootrr.clk-mt8192-aud-driver-present	-	✓

Where to grow KernelCI

- More subsystems (eg iio, input)
- More trees from maintainers
- More labs
- More kselftests / ltp
- Support for KUnit

Conclusion

- There's still much to be gained from the Open Source model in linux testing
 - Keep increasing git branch, codebase and device coverage
- KernelCI will enable us to:
 - respond more quickly to regressions
 - give reliable long-term support for devices

Thank you!

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