

Meet the new KernelCI



Don Zickus
Distinguished Engineer
Red Hat



Gustavo Padovan
Kernel Lead
Collabora

Linux Plumbers Conference
Vienna - September, 2024



Agenda

- About the project
- Our audience
- Testing Architecture
- Benefiting from KernelCI

About

Ensuring the quality, stability and
long-term maintenance of the **Linux kernel**

Member Companies



Premier Members



General Members



- Ensuring kernel quality, stability and long-term maintenance
- Consolidating Linux kernel testing and integration stories into a collaborative self-service workflow
- Acting as umbrella for projects, working groups and standards
- Managing resources and core test infrastructure
- Sponsoring key initiatives aligned with our goals

- Start stabilization of linux-stable much sooner
- Work with maintainers to define what tested code means to them
- Exposure to real world use cases during development through CI
- Less regressions along the way
- Speed up stabilization during downstream product integration
- Advocate for Shift Left across the CI Ecosystem

- Add tree to watcher
- **#kcibot** email cmds
- b4 test command
- Patchwork
- GitLabCI

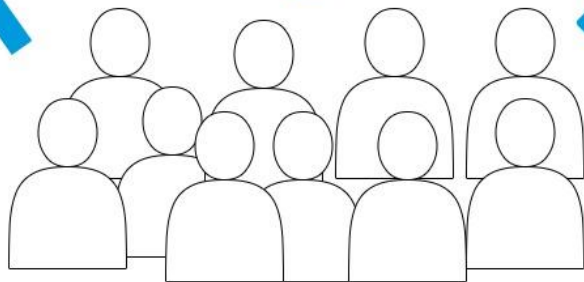
- Improve test quality
- Engage with test dev
- Track expected pass/fail
- Add testing gates to process

- Receive email notifications
- Use Web Dashboard/patchwork
- Pull results from API
- Integration with tools like b4

Request testing

Add and improve tests

Evaluate test results



Maintainers

Upstream
Developers

HW vendors

Product
makers

Our audience

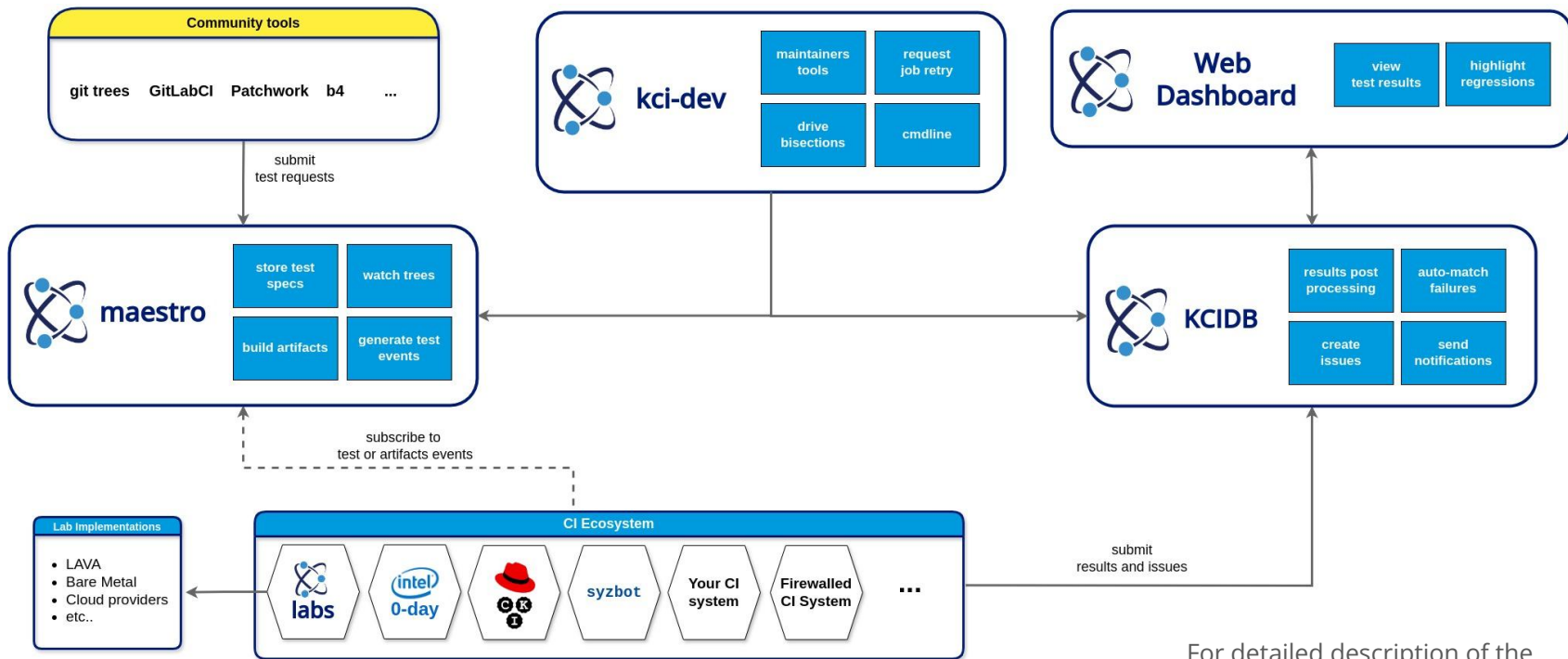
Culture shift

Above all, there is ecosystem behaviour challenge ahead. It's not only a complex technical challenge for kernel testing. **A cultural shift is necessary!**

Testing & Validation tends to be internal and closed source, but Open Source software should have Open Source testing & validation.

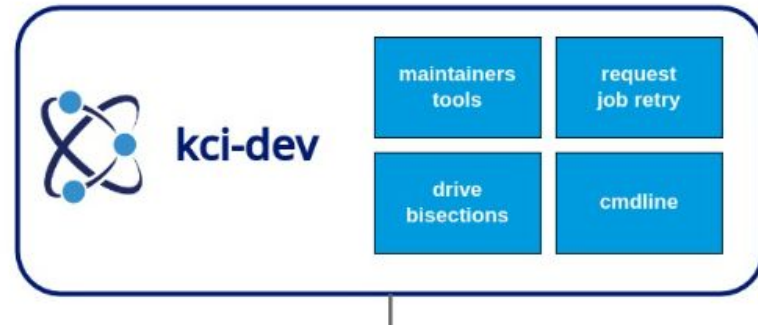
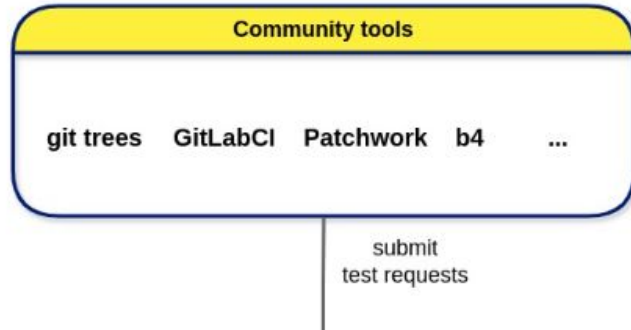
The kernel community should keep evolving upstream testing and integration to achieve the product-level quality expectations of industry.

Testing Architecture



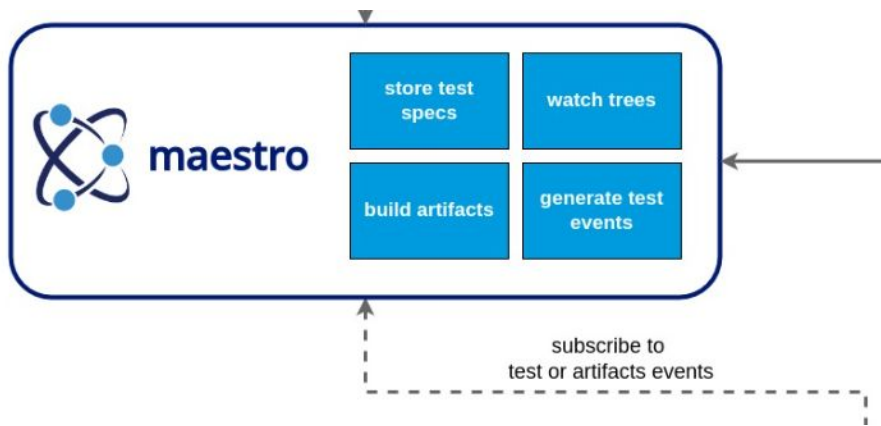
For detailed description of the technical architecture please refer to our [documentation](#).

Test submission



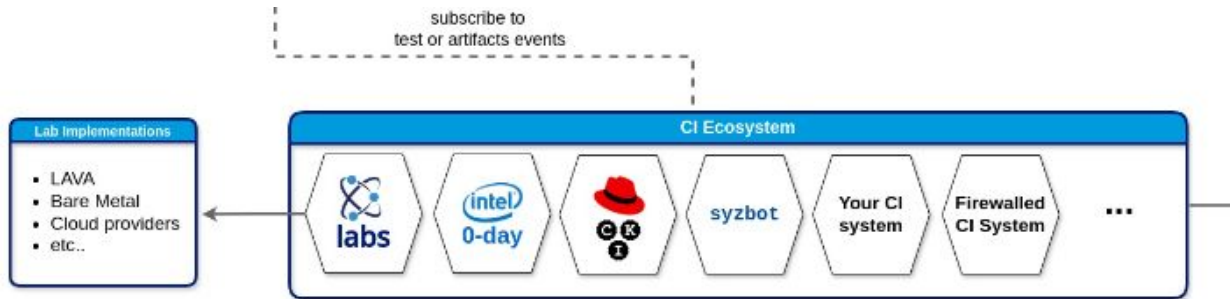
- Different ways to get your code tested by the KernelCI Ecosystem
- Maintainers can register branches in KernelCI
 - eg -next and for-kernelci branches
- kci-dev cmdline for community to interact with KernelCI
- Request for you tree and tests to be added [HERE](#)

Test events



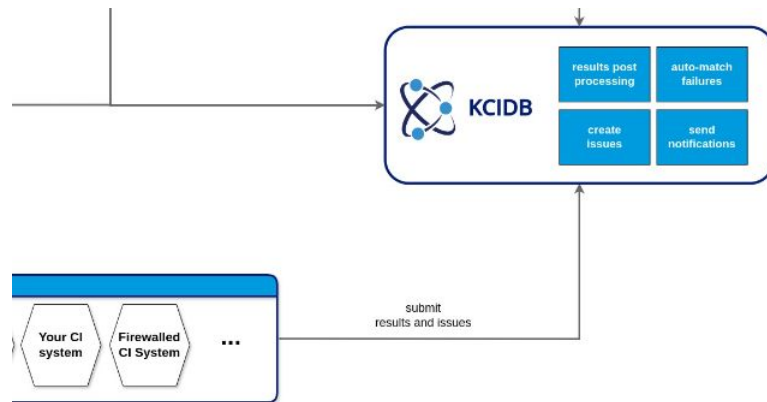
- Specification for defining / storing test info
- Generate test jobs based on the test specs
- Create subscribable events for test jobs when code changes are posted
- Create and maintain rootfs images
- Receive external test requests from other systems
- CI systems can listen to events and pull test artifacts as well

CI Services and HW Labs



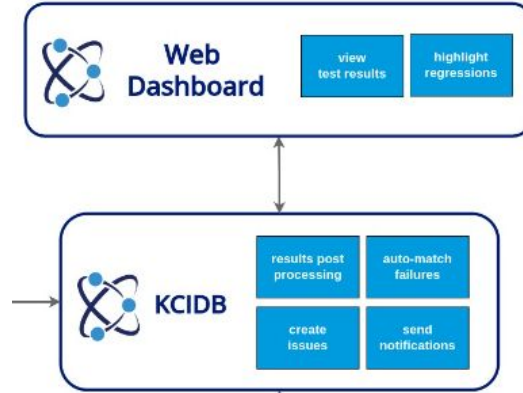
- CI systems can listen to test events and execute tests they want
- Labs can connect to KernelCI through KernelCI labs or maestro's test events
- Drive specifications to integrate the test/CI ecosystem
- Want to bring your HW Lab and/or CI system? Send us an [email!](#)

Common Results Database



- KCIDB is the central database for test results
- All CI systems can contribute the database
- DB schema as standard for the results submission
- Powerful post processing possibilities
- [Send your data to KCIDB!](#)

Results Analysis



- Reduce overwhelming noise through intelligent post-processing
- Automatic aggregation of issues through log parsing and attribute matching
- Filter and expose known regressions
- Highly configurable email notifications
- Web Dashboard to analyze data further (Demo!)
 - Access it at dashboard.kernelci.org
- Try it and give us feedback via kernelci@lists.linux.dev!

In a **nutshell**

- Architecture envisioned to support an Ecosystem of test systems
- Reduce duplication and increase kernel integration quality across the board
- Contribute to the development of standards and common APIs
- Take complexity out of the community, turning it into a service you can trust
- Not an one-size-fit-all solution!

Benefiting from KernelCI

Getting started

- Request your [tree to be added](#)
- Bring your [tests](#) in
- Submit your results to [KCIDB](#)
- Use our dashboards to check the results
 - dashboard.kernelci.org
 - grafana.kernelci.org
- Setup email notifications
- GIVE US FEEDBACK!!!

Talk to us at kernelci@lists.linux.dev

Community Engagement

- We are now onboarding maintainers in KernelCI!
- Dedicated team to support the kernel community
- Tell us your requirements!
- How do you want to see the results?
 - Customization of dashboards
 - Customization of email notifications
- Which tests do you need?
- Which trees, platforms, SoC families, etc do you care about?

Talk to us at kernelci@lists.linux.dev



Testing Quality WG

- Issues from low quality tests is overwhelming
- Working Group started to develop better tests
- Focus on coverage, speed, portability, maintainability, etc
- Advocating for sending tests for mainline integration
- Bi-weekly meeting Thursdays 1pm UTC
- Want to contribute? [Join us!](#)

KernelCI Ambassador



"KernelCI is the place where testing needs are consolidating for the entire Linux kernel ecosystem. As a kernel subsystem maintainer, reliable testing is important in catching regressions and bugs in new code sooner before it hits a released kernel. You should consider joining with KernelCI to help collaborate on the unification of the testing efforts to ensure that the kernel community can keep developing and maintaining the codebase which the world relies on to be stable and secure."

- **Greg KH**

THURSDAY

- 3pm-6pm - KernelCI booth in the hallway track
- 7pm - KernelCI Happy Hour - [The View Cafe-Bar](#) (25 mins walk)

FRIDAY

- 12:30pm - [Towards common mainline device testing](#) [Testing MC]
- 1pm - [Interacting with kernel test results](#) [Testing MC]
- 3:30pm - [Boot time testing with ftrace](#) [IoT/Embedded MC]
- 5pm - [BoF: Continuously testing the Linux kernel](#)

A better future for Linux kernel integration is coming.

We need your engagement and feedback!

- Mailing list: kernelci@lists.linux.dev
- IRC: #kernelci on libera.chat
- Community meeting every Thursday 11am UTC

Thank you!



 kernelci.org
kernelci-members@groups.io