

# Getting Started With New KernelCI CLI Tools

**Automating Linux Kernel Testing and Validation**

**Arisu Tachibana**

KernelCI Infra WG member

kci-dev creator / maintainer

Gentoo Kernel leader / CIP testing member

Cybertrust Japan Co., Ltd.

## What you'll learn in 40 minutes

- How KernelCI fits into everyday kernel work
- How `kci-dev` keeps you in the terminal instead of dashboards
- A concrete workflow you can copy for your own trees
- Where we're going next with `kci-dev` + `kci-deploy`

## Who this talk is for

- Kernel developers who *don't* have time to babysit dashboards
- Maintainers juggling multiple trees and branches
- CI / lab folks who want developers to actually look at results

## Motivation: Why Kernel QA Is Hard

- Many trees, branches and configurations
- Multiple architectures, boards and toolchains
- CI dashboards are powerful but not ergonomic
- Developers still click UIs or write ad-hoc scripts
- Command-line tools keep context in the terminal

# KernelCI in One Slide

- Upstream, open testing for the Linux kernel
- Builds, boots and tests across distributed labs
- Huge amount of data, but interaction is:
  - Mostly via web UI
  - Raw REST APIs
- Need something ergonomic in the terminal

# Real-World Context: gentoo-sources & CI

- For `gentoo-sources` I already use:
  - `buildbot-try` to submit kernel builds/tests
  - `gkernelci` integration around Buildbot
- Nice properties of this workflow:
  - I stay in the terminal
  - CI is scriptable from my normal dev environment
- This experience is the main inspiration for **kci-dev**
  - “What if KernelCI felt like buildbot-try, but for any tree?”

# From `buildbot-try` to `kci-dev`

- What I like about `buildbot-try`:
  - One command: “Here is my change, please test it”
  - Results come back to the console
- KernelCI already has:
  - Distributed labs and lots of coverage
  - Dashboards and APIs
- Missing piece:
  - A developer-first CLI that feels like `buildbot-try`
- `kci-dev` is that missing piece:
  - Unified CLI for querying KernelCI jobs and tests
  - Designed from real needs on `gentoo-sources`

## How kci-dev fits into KernelCI #1

 kci-dev CLI commands

## How kci-dev fits into KernelCI #2

 kci-dev CLI commands

## How kci-dev fits into KernelCI #3

 kci-dev CLI commands

# KernelCI CLI: bringing CI into your terminal

- **kci-dev**
  - Developer-focused CLI to interact with KernelCI dashboards and Maestro
  - Installable from PyPI (`pip install kci-dev`) or development snapshots via poetry
  - Ships `results` (dashboard), Maestro, and validation commands in one binary
  - Completions bundled for bash, zsh, and fish
- **kci-deploy** (*work in progress*)
  - Tool for deploying local / internal KernelCI maestro stacks
- Goal: make KernelCI a first-class tool in your terminal

## Install & Configure Fast

- `virtualenv .venv && source .venv/bin/activate`
- `pip install kci-dev`
- `kci-dev config scaffolds ~/.config/kci-dev/kci-dev.toml` for Maestro auth
- Results-only workflows work **without** a config file
- Request API tokens via the KernelCI GitHub issue template when you need Maestro access

## Shell Completions Included

- Bash: `source /path/to/kci-dev/completions/kci-dev-completion.bash`
- Zsh: add completions directory to `$fpath` and run `compinit`
- Fish: copy `completions/kci-dev.fish` to `~/.config/fish/completions/`
- Keep completions in sync with the installed kci-dev version

# kci-dev: What You Can Do Today

## Dashboard ( results ) commands

```
kci-dev results summary --giturl <git url> --branch <branch> --history  
kci-dev results compare --giturl <git url> --branch <branch> <older> <newer>  
kci-dev results hardware summary --name <vendor,board> --origin maestro --json  
kci-dev results tests --giturl <git url> --branch <branch> --commit <sha> --filter filter.yaml
```

## Maestro commands (need config/token)

```
kci-dev checkout --branch <branch> --giturl <git url> --commit <sha> --job-filter <regex> --watch  
kci-dev testretry --nodeid <node-id>  
kci-dev watch --nodeid <node-id> --job-filter <regex>  
kci-dev maestro validate builds --all-checkouts --days 7 --table-output  
kci-dev maestro results --nodeid <node-id> --json
```

# kci-dev: Everyday workflow (story)

## 1. Start your day in the terminal

- `kci-dev results summary --history`
- `kci-dev results hardware summary` for your key boards

## 2. Spot something suspicious

- `kci-dev results boots|tests --status fail --download-logs`
- Jump straight into logs without touching the browser

## 3. Decide: bug or infra?

- `kci-dev results compare` across commits to see real regressions
- `kci-dev testretry` / `kci-dev checkout --watch` for flaky or infra cases

## 4. Capture it for automation

- Turn the commands you just ran into a script or CI job

## kci-dev: Quality-of-Life Details

- Rich output modes: table, JSON, quiet for scripts
- `--history` summaries with pass/fail/inconclusive color coding
- `compare` highlights regressions with dashboard/log links
- `results hardware views boards + per-board summaries`
- Filters: `--filter` YAML for hardware/tests, `--arch`, `--status`
- Profiles via `--instance` / `--settings` to switch endpoints
- Designed for piping into `jq`, `fzf`, notebooks

## Dashboard Endpoint Reality Check

- `kci-dev results` currently pulls a multi-megabyte dashboard payload
- Initial download may take a few seconds; caching work is in progress
- Known upstream issue is tracked in the KernelCI dashboard repo

## kci-deploy: For Lab Owners

- Simplifies standing up a Maestro stack
- Encodes best practices for networking and storage
- Shares the same UX patterns as kci-dev
- Early previews welcome: help shape the roadmap!

# Automation Patterns

- **Pre-submit checks:** gate merges on KernelCI signal
- **Nightly reports:** email/Matrix summaries via cron
- **Release readiness:** track blockers for RCs
- **Local sanity tests:** run focused boards before shipping

# Demo: from dashboard noise to a focused terminal workflow #1

```
# Configure once
virtualenv .venv && source .venv/bin/activate
pip install kci-dev
kci-dev config      # writes ~/.config/kci-dev/kci-dev.toml

# Morning health check
kci-dev results summary \
--giturl https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git \
--branch master \
--history

kci-dev results hardware summary \
--name mediatek,mt8195 \
--origin maestro \
--json
```

## Demo: from dashboard noise to a focused terminal workflow #2

```
# Investigate a failure
kci-dev results boot --id maestro:<boot-node-id> --download-logs | less

# Nudge infra if it's flaky
kci-dev testretry --nodeid <node-id>

# Look at raw Maestro nodes when needed
kci-dev maestro-results --nodeid <node-id> --json

# (Optional) validate that dashboard & Maestro agree for the last week
kci-dev maestro validate builds --all-checkouts --days 7 --table-output
```

## Key takeaways

- KernelCI already has the data – kci-dev makes it feel local to your terminal
- You can start today with read-only results – no tokens needed
- Maestro-powered commands let you move from “observing” to “acting” on CI
- kci-deploy is the next step for making this flow the default in more trees

## Roadmap & Collaboration #1

- Deeper git integration (auto-pick branch/commit)
- Better diffing between runs
- Inline links back to dashboards
- kci-deploy installer previews in Q2
- Looking for testers, lab partners, and feedback

## Roadmap & Collaboration #2

- Caching for dashboard
- Triggering builds with local patches (uploaded somewhere)
- More distributions packages

## Documentation & Updates

- Docs: <https://kci.dev>
- Source: <https://github.com/kernelci/kci-dev>
- Token requests and issues: KernelCI GitHub templates

## Getting Started After This Talk

- Try **kci-dev** with your tree this week
- Share your top 3 pain points in Kernel QA
- Join the KernelCI community calls / Matrix
- Contribute docs, plugins, and issue reports

# Thank You !

Slides: [https://aliceinwire.github.io/presentations/OSSJ\\_2025/](https://aliceinwire.github.io/presentations/OSSJ_2025/)

X: [https://x.com/arisu\\_gyaru](https://x.com/arisu_gyaru)

Instagram: [https://www.instagram.com/gyaru\\_arisu/](https://www.instagram.com/gyaru_arisu/)

GitHub: <https://github.com/aliceinwire>

Questions welcome!

Will help shape the future of kci-dev