



# **The Capable Hub: Our Recent Work and Next Steps**

**26th March 2026**

*CHERI Blossoms Conference 2026*

# Our Mission

*“to improve the **availability, quality and upstream** alignment of open-source **CHERI** software.”*



# The Capable Hub

- We are a not-for-profit engineering organization
  - Funded by UKRI
  - Board of directors consisting of The Good Penguin, BayLibre and Codasip
- Delivering high calibre engineering resources
- Collaboratively working closely with the CHERI Alliance and CHERI ecosystem
- Incorporated end of November



**CHERI**  
Alliance Member



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# Our recent work

# Software Map & Technical Content

- We've surveyed the CHERI ecosystem and created a software map
- Signposts users and provides a 'state of play'
- Open-source map, anyone can update it
- Working on expanding beyond foundational software
- Along the way, we've created technical blog posts
- Find out more:
  - <https://www.thecapablehub.org/software/>
  - <https://github.com/The-Capable-Hub/software-map>
  - <https://www.thecapablehub.org/blog/>



# Continuous Integration Infrastructure

- Made available AWS backed CI for GitHub Actions
- Freely available for CHERI open-source projects
  - For repositories hosted by The Capable Hub, CHERI Alliance and organisation that installs our GitHub Application
- Actively being used in a variety of projects:
  - Including: seL4 (WIP), QEMU, Zephyr, meta-cheri, meta-morello and CheriBSD
- Our engineers have also worked on CI workflows
  - For example seL4 (upstream workflows), CheriBSD smoke tests (port cirrus matrix tests)
- Working to support wider adoption
- Find out how to use it:
  - <https://www.thecapablehub.org/docs/ci/>



# Hardware-in-Loop Testing

- Made available CHERI hardware:
  - Hardware-in-loop testing for GitHub Actions
  - Interactive remote access to CHERI hardware
- Freely available for CHERI open-source projects
  - For repositories hosted by The Capable Hub, CHERI Alliance and organisation that installs our GitHub Application
- Hardware currently supported includes Morello, Genesys2, Sonata
  - Reach out to us if you'd like us to host your hardware
- Developed workflows:
  - Genesys (CVA6): Flash (FPGA & SD), Boot, Verify Linux prompt
  - Morello (meta-morello): Build, Flash (firmware & USB), Boot, Verify Linux prompt
- Working on more boards and wider adoption
- Find out how to use it:
  - <https://www.thecapablehub.org/docs/boardfarm/>
  - <https://www.thecapablehub.org/docs/hil/>
  - <https://www.thecapablehub.org/docs/hardware/>



# Further infrastructure

- Mailman Mailing lists
- Cloudflare hosted artifact storage
- Find out more:
  - <https://www.thecapablehub.org/docs/maillinglists/>
  - <https://www.thecapablehub.org/docs/artifactstorage/>



# Delivering Engineering Effort

- We're delivering engineering effort into the community (ramping up to 8 engineers)
- The Good Penguin and Baylibre are our delivery partners
- We held our first Technical Advisory Group meeting last week - which is now directing where our efforts are best spent



# Bringing software closer to upstream

- LLVM
  - Fixed tests in Cudasip port of LLVM 19 to LLVM 20
  - Now working on rebasing to LLVM 21
- GDB
  - Rebased GDB 14.1 to GDB 17.1
- Yocto Linux
  - Updating meta-morello to support Scarthgap



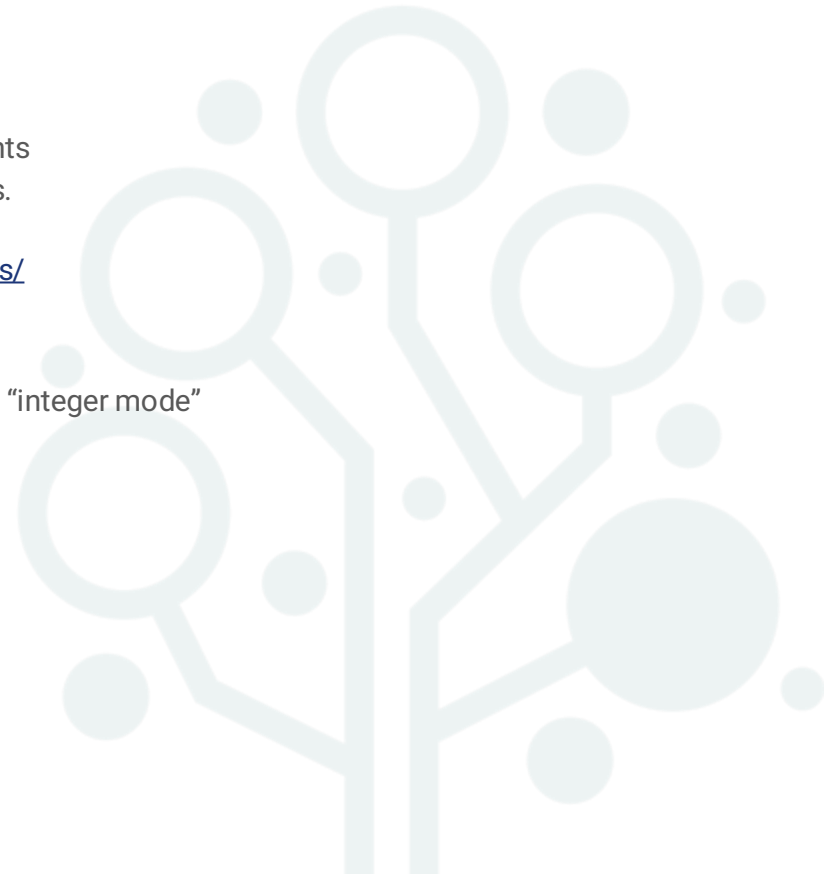
# Cherifying Software

- Adding support for syzcaller, ftrace, utrace, ktrace (in progress)
- Integrating CTSRD PostgreSQL 15 to meta-cheri for Linux



# Simplifying Building

- Created tch-containers
  - Dockerfiles and images suitable for re-use within CI environments
    - Or to create SDKs to pull together complete sets of tools.
  - Find out more:
    - <https://www.thecapablehub.org/software/tch-containers/>
    - <https://hub.docker.com/u/capablehub>
- Improving Yocto Linux distribution
  - meta-cheri: Yocto multi-lib support, allows to run applications in “integer mode”
  - meta-cheri: updating perl to 5.38.1 (from 5.34.1)
  - meta-cheri: updating GDB to 17.1 (from 14.1)
  - meta-cheri: adding Postgresql 15
  - meta-cheri: refactoring, bug fixing and updating
  - Working towards converging meta-morello with meta-cheri



# Spreading the Message

- Attendance at conferences such as CHERITech and CHERI Blossoms
- Exhibiting on the CHERI Alliance stand at Embedded World



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# Next steps

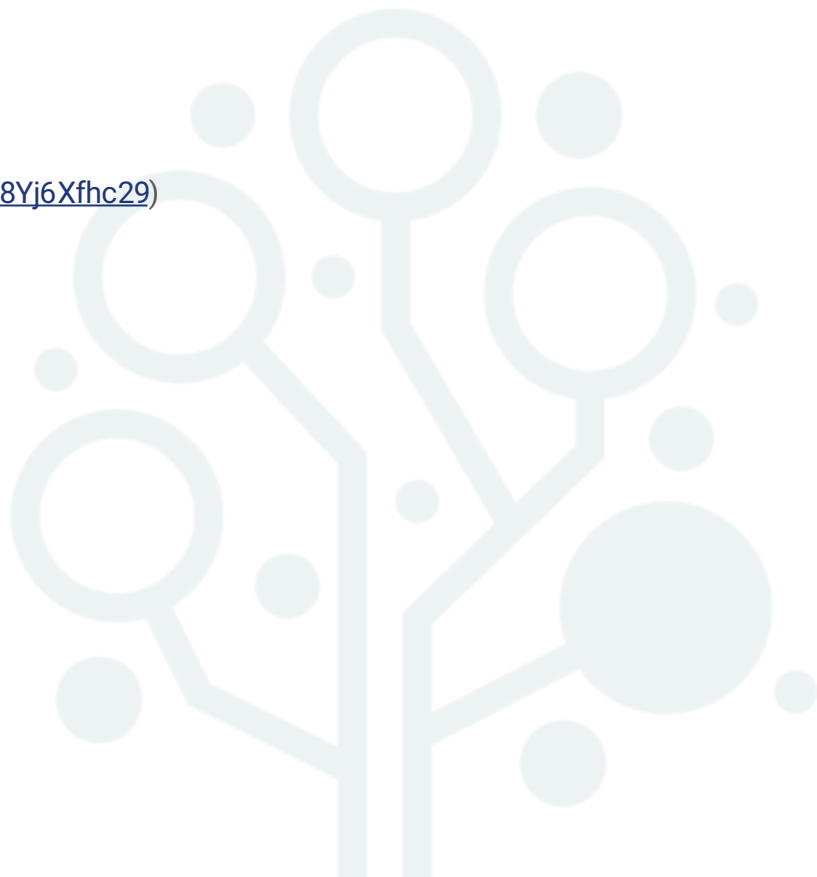
# We're just getting started

- Funding is being continued
- Engineering team continuing to ramp up in capability, pace and relationships
  - We're already submitting (trivial) patches upstream
- Continued focus on ensuring foundational open-source is aligned with or is upstream, and that software is ready for industry
- Further attention to validation via CI and Hardware-in-loop testing
- Improved support for new users (tooling, blog posts, binary artifacts)
- Continued engagement with our Technical Advisory Group



# Call to Action

- Let us know where we should focus our time
  - Reach out to us
  - Join our Technical Advisory Group (<https://forms.gle/RQ7nPmg8Yj6Xfhc29>)
- Contribute to our software-map
- Make use of our infrastructure
  - Board farm, Hardware-in-loop testing, CI, Artifact storage, etc
  - Donate your CHERI hardware to our farm





# Thank you

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