

Linux Plumbers Conference 2025



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Rust MC

Rust is a systems programming language that is making great strides in becoming the next big one in the domain. Rust for Linux is the project adding support for the Rust language to the Linux kernel.

Rust has a key property that makes it very interesting as the second language in the kernel: it guarantees no undefined behavior takes place (as long as unsafe code is sound). This includes no use-after-free mistakes, no double frees, no data races, etc. It also provides other important benefits, such as improved error handling, stricter typing, sum types, pattern matching, privacy, closures, generics, etc.

This microconference intends to cover talks and discussions on both Rust for Linux as well as other non-kernel Rust topics.

Possible Rust for Linux topics:

- Rust in the kernel: status updates and discussion on next steps.
- Use cases for Rust around the kernel: subsystems, drivers, other modules...
- Developing-related discussions: how to abstract existing subsystems safely and API design, coding guidelines, safety guidelines...
- Upstreaming process: guidance on how to get into mainline, strategies that have worked for Rust code in the past, getting involved...
- Maintenance: the new subentries and branches, the proposed cross-subsystem subteams (e.g. the safety team), scaling work for the future, any cross-subsystem issues...
- Infrastructure: build system, documentation, testing and CIs, maintenance, unstable features, architecture support, stable/LTS releases, Rust versioning, third-party crates...
- klint.
- pinned-init.
- The future of GCC builds.

Possible Rust topics:

- Language and standard library: discussion on upcoming features, stabilization of the remaining features the kernel needs, memory model, the 2024 edition...
- Compilers and codegen: rustc improvements, LLVM and Rust, rustc_codegen_gcc, gccrs...
- Other tooling and new ideas: Coccinelle for Rust, bindgen, Compiler Explorer, Cargo, Clippy, Miri...
- Educational material.
- Any other Rust topic within the Linux ecosystem.

Last year was the third edition of the Rust MC and the focus was on discussing the ongoing efforts by different parties that are upstreaming new Rust abstractions and drivers (Giving Rust a chance for in-kernel codecs, hrtimer Rust Abstractions, Atomic and memory model for Rust code in kernel). We also had a topic related to improving the ergonomics and tooling around Rust in the kernel (Coccinelle for Rust) and a tutorial session to help others learn Rust (Introduction to Rust: Quality of Life Beyond Memory Safety), as well as a “Birds of a Feather” slot for open discussion on other topics.

Since the MC last year, it is easy to notice how Rust work around the kernel is accelerating: patches and contributors keep growing, new MAINTAINERS entries have been created and new maintainers have stepped

up, new use cases have been developed and/or merged (e.g. the AMCC QT2025 PHY driver and Android ashmem), new projects have been announced (e.g. Tyr)... Even some end users of Linux distributions have already interacted with Rust kernel code in the wild (via the QR code panic screen). This all signifies success, but also poses new challenges ahead.

Note that this year submissions for the Rust MC should aim to be more discussion oriented.

Suggested attendees: the Rust for Linux team (Miguel Ojeda, Boqun Feng, Gary Guo, Benno Lossin, Andreas Hindborg, Alice Ryhl, Trevor Gross, Danilo Krummrich), Abdiel Janulgue, Alexandre Courbot, Alistair Francis, Arnaldo Carvalho de Melo, Bjorn Helgaas, Burak Emir, Christian Brauner, Christian Schrefl, Daniel Almeida, Dave Airlie, David Gow, Dirk Behme, Fiona Behrens, Frederic Weisbecker, FUJITA Tomonori, Greg Kroah-Hartman, Igor Korotin, Ingo Molnar, Jocelyn Falempé, Joel Fernandes, Kees Cook, Liam R. Howlett, Lorenzo Stoakes, Luis Chamberlain, Lyude Paul, Masahiro Yamada, Matthew Maurer, Nathan Chancellor, Paolo Bonzini, Paul E. McKenney, Peter Zijlstra, Remo Senekowitsch, Rob Herring, Robin Murphy, Sami Tolvanen, Stephen Boyd, Tamir Duberstein, Tejun Heo, Thomas Gleixner, Viresh Kumar, Will Deacon, Yury Norov...

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