



Kolloquium zur Masterarbeit

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“Platform-based approach for Avionics Application Software“

In the avionic software domain, application development pace is comparatively slow while verification cost is high. Moreover, through reliance on expensive standards and software, entering the market is connected with a significant burden. This work explores the establishment of a practical APEX ARINC 653 development platform. Improving the overall development experience, pace, safety, openness as well as code reusability are the goals in this endeavor implemented in the Rust programming language.

A Rust native APEX API was designed, assuring compatibility to C-language based hypervisors along with Rusts safety guarantees. Further, grouping APEX functionality into a set of traits, an APEX port extension library was developed for ascertaining powerful extensibility. For fast prototyping and the exploration of the APEX API, an almost ARINC 653 part 4 compliant hypervisor was developed. It relies solely on Linux kernel features for uncomplicated usage and features built-in support for our Rust native APEX API. As a last step, partitions were developed utilizing our APEX API and extension library. By executing them on our as well as the proprietary XNG hypervisor, portability was proven.

Demonstrating portability of generic extensions libraries and partitions, the potentiality of code-reuse is shown. Likewise, our hypervisor displayed functionality equaling XNG whereas requiring less setup. Enforcing memory safety related practices by default, Rust especially implores to a safety critical domain like avionics. These results suggest that a Rust based platform for avionic development may serve as the entry point for a flourishing ecosystem.

Mittwoch, 09.11.2022, 14:00 Uhr

Videokonferenz: BBB <https://webconf.tu-clausthal.de/b/umu-2ey-ekt>