

Invited talk: High velocity kernel modules in Rust with Bento

Monday, 13 September 2021 11:00 (45 minutes)

High development velocity is critical for modern systems. Linux is facing increased development pressure from new hardware and new demands on the operating system, particularly from cloud providers. However, high velocity Linux kernel development is challenging due to the ease of introducing bugs, the difficulty of testing and debugging, and the lack of support for redeployment without service disruption. Existing approaches to high-velocity development of large Linux modules have major downsides, such as the high performance penalty for FUSE file systems.

In this talk, I'll discuss our work on Bento, a framework for faster development in the Linux kernel. Bento kernel modules are written in safe Rust, reducing the potential for bugs, and can be upgraded without interruption. We have implemented the Bento framework for file system modules and used it to implement a file system with performance similar to ext4 that can be upgraded without unmounting and with only 15ms of downtime. We're currently working on expanding Bento to support custom TCP/IP stacks.

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Session Classification: Kangrejos