

Linux Plumbers Conference 2025



Contribution ID: 9

Type: **not specified**

Live Update MC

CFP ends on September 10th (CLOSED)

Live Update is a specialized reboot process where selected devices are kept operational and kernel state is preserved and recreated across a kexec. For devices, DMA and interrupts may continue during the reboot.

The primary use-case of Live Update is to enable hypervisor updates in cloud environments with minimal disruption to running virtual machines. During a Live Update, a VM can pause and its state is stored to memory while the hypervisor reboots. PCIe devices attached to those VMs (such as GPUs, NICs, and SSDs), are kept running during the Live Update. After the reboot, VMs are recreated and restored from memory, reattached to devices, and resumed. The disruption is limited to the time it takes to complete this entire process.

With Live Update infrastructure in place, other use-cases may emerge, like for example preserving the state of GPU doing LLM, freezing running containers with CRIO, and preserving large in-memory databases.

The Live Update and state persistence functionality touch on different parts of the kernel and this microconference aims to bring together people from different subsystems. Upstream support for Live Updates is still in its infancy and there are a lot of unsolved aspects that will benefit from direct communication.

Key problems that will be discussed:

- Support for memfd/guest_memfd/hugetlb/tmpfs
- Preserving the state of VFIO, IOMMUFD, and IOMMU drivers.
- Kernel <-> userspace interaction during Live Update
- Integration of Live Update with PCI and Device Model
- Persistence of movable memory
- Leveraging suspend/resume functionality for device state preservation
- Optimizing kernel shutdown and boot times
- Automated Testing of Live Updates

Key attendees:

- Pasha Tatashin
- David Matlack
- David Rientjes
- Chris Li
- Bjorn Helgaas
- Samiullah Khawaja
- Vipin Sharma
- Josh Hilke
- Changyuan Lyu
- Alex Graf
- David Woodhouse
- James Gowans
- Pratyush Yadav
- Jason Gunthorpe
- Mike Rapoport
- Alex Williamson
- Zhu Yanjun

Primary authors: GRAF, Alexander; MATLACK, David (Google); RAPOPORT, Mike; TATASHIN, Pasha

Presenters: GRAF, Alexander; MATLACK, David (Google); RAPOPORT, Mike; TATASHIN, Pasha