

Linux Plumbers Conference 2025



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One Config to Rule Them All: From systemd to Reliable Embedded Upgrades

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Systemd, Debian, and Red Hat already use layered configuration models—/usr defaults, /etc overrides, and /run for ephemeral state—that make packaging, updates, and administration safer and more predictable. Systemd implements this directly, and tools like systemd-confext extend it for versioned, read-only /etc overlays, while Debian and Fedora generalize the idea through conf.d directories for configuration fragments. Yet most embedded, edge, and appliance build systems still follow whatever each upstream project provides. This session explores how build systems could rely on sane defaults in /usr and user-supplied fragments in /etc/conf.d to support read-only root filesystems, easy factory resets, and reliable full-system upgrades—capabilities that are increasingly essential for critical infrastructure deployments and regulatory compliance under frameworks like the EU Cyber Resilience Act (CRA). It will also discuss how applications themselves—even outside of systemd—could adopt the same layered approach to make configuration handling more consistent and resilient across the Linux ecosystem. The goal is to explore unifying these proven patterns into a consistent, ecosystem-wide configuration model for embedded and related Linux use cases.

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