

SteamOS and its impact on the Linux Ecosystem

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SteamOS

A very incomplete timeline

- 1998: Half-Life
- 2013: 1.0 released (Debian-based)
- 2015: 2.0 released
- 2021: 3.0 released (rebased on Arch Linux)
- latest stable release: 3.6.24
- 3.7 is just around the corner

Steam Deck (Feb 2022)



Steam Deck OLED (Nov 2023)



Lenovo Legion Go S (May 2025)



Contributions across the stack

- Mesa drivers
- Conformance testing for Vulkan
- Vulkan video
- GStreamer maintenance
- Proton maintenance
- Base OS, atomic updates, desktop
- ...

Kernel contributions

- CPU scheduler
- DRM scheduler
- HDR and KMS color management
- DRM atomic uAPI improvements

CPU scheduler

- Default: EEVDF (Earliest Eligible Virtual Deadline First), claims to be completely fair
- The `sched_ext` framework to write custom schedulers using BPF
- LAVD (Latency-criticality Aware Virtual Deadline) for gaming
- Windows games running on top of Proton/Wine
- Favour latency criticality over short-term fairness

LAVD demo



DRM scheduler

- Resolve dependencies and balance userspace requests for GPU resources.
- Fair DRM scheduler proposal.
- DRM scheduling cgroup proposal.
- Prioritise focused windows / de-prioritise background applications.

HDR and DRM/KMS color management

- Generic KMS API.
- Offload color transformations to dedicated display hardware blocks.
- AMDGPU driver now exposes driver-specific properties.
- OLED Steam Deck with full HDR support.
- Display Next Hackfest held in May 2024 in A Coruña.

OS integration

- HD encryption.
- XDG desktop portals.

HD encryption

- Not available out of the box.
- Need to support encrypting an existing drive.
- `fscrypt` to encrypt selected directories.
- security/UX compromise.
- `dirlock`, a new tool written in Rust that provides a CLI, a PAM module and a D-Bus interface.

XDG desktop portals

- Existing portal backends not suitable for a gaming session.
- New gamescope backend implements the Screenshot and ScreenCast interfaces.
- No user interaction.

Conclusion

- Many contributions across the stack.
- Benefits the entire ecosystem.
- Sound upstream-first approach.

Questions?

Thank you!

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