



Contribution ID: 250

Type: **not specified**

Enabling AMD 2D Hardware Acceleration for Video API and Applications

Friday 12 December 2025 17:45 (45 minutes)

Abstract:

In modern Linux video applications—including players, conferencing tools, and editors—GPU-based video post-processing is the norm. Tasks such as scaling, color conversion, rotation/flipping, and blending are typically offloaded to the GPU for performance reasons. While efficient in terms of speed, this approach often comes with a higher power cost compared to using fixed-function 2D hardware acceleration blocks.

This presentation showcases our efforts to enable 2D hardware acceleration for video post-processing in Linux, using AMD's VPE (Video Processing Engine). We will walk through the kernel driver support, the integration with user-space components including VA-API and Mesa, and the plumbing required to bridge these layers together.

We'll also share practical results from modifying open-source video applications to take advantage of this 2D pipeline, and demonstrate measurable improvements in power consumption. This talk aims to provide insight into both the technical implementation and the potential benefits of moving away from general-purpose GPU usage in specific video use cases.

Presentation outline:

1. Introduction: Why 2D Acceleration Matters
2. Real-World Use Cases
3. Overview of AMD 2D Hardware Acceleration
4. Plumbing Work in the Software Stack
5. Enabling Applications to Use the Pipeline
6. Results & Power Efficiency Improvements
7. Challenges & Lessons Learned

Speaker Bio:

Solomon Chiu is a software developer at AMD, working on display and multimedia enablement for Linux. His current focus is on bringing up 2D fixed-function hardware acceleration for video processing pipelines, optimizing power efficiency, and improving integration across the Linux graphics stack.

At AMD, he collaborates across kernel, Mesa, and user-space layers to enable features of video post-processing hardware. He is actively involved in enabling open-source video APIs, including VA-API, and Vulkan...etc to make these capabilities accessible to Linux applications.

He is passionate about low-level systems development and believes in contributing to open standards that benefit the broader Linux ecosystem. This is his first time presenting at LPC, where he looks forward to engaging with the community and sharing lessons from AMD's recent work on video acceleration.

Primary author: CHIU, Solomon

Presenter: CHIU, Solomon

Session Classification: LPC Refereed Track

Track Classification: LPC Refereed Track