Not just Proton: Getting to know Valve’s new SteamOS compatibility layers

Since the release of the Steam Deck, Valve fans have gotten very familiar with the idea of the Proton compatibility layer that allows games written for Windows to run capably on the Linux-based SteamOS (though Valve’s efforts in this realm date back farther than that). To get more games running on the SteamOS-powered Steam Frame, though, Valve is relying on two additional compatibility layers that are new to the Steam architecture.

The first, FEX, is Valve’s port of fex-emu, an open source project that emulates x86 processor instructions on an Arm chipset. Since 2018, what started as a small cross-platform emulation project has grown to include “an advanced binary recompiler that supports all modern extensions of the x86(-64) instruction set,” according to the Fex website. The emulator can also make calls to graphics libraries like OpenGL and Vulkan to reduce overhead and uses “code caching to minimize stuttering as much as possible,” according to Steam’s own developer documentation.

While Proton was based on the pre-existing Wine conversion tool, Valve engineer Pierre-Loup Griffais told The Verge last year that the company has been funding Fex lead developer Ryan Houdek since the project was just a prototype. Back then, Valve was already anticipating that “close to a decade of work [would be] needed before [Fex-emu] would be robust enough people could rely on it for their libraries.”

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