

GStreamer Vulkan / VA

One year (and a half) later

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intel/libva

Libva is an implementation for VA-API (Video Acceleration API)

The window in numbers

	Vulkan	VA
Commits	245	80
Files touched	110	43
+ / - lines	+23.4k / -5.6k	+3.0k / -1.4k
Contributors	23	20
Open MRs / issues	23 / 12	16 / 42

Releases covered: **1.26.x**, **1.28.0** (Jan 2026), 1.28.x, 1.29.x
dev

GStreamer Vulkan

commits by commit date



Vulkan: headline news

- **vułkanh264enc** (merged Jul 2025, shipped in 1.28)
- **vułkanvp9dec** (Sep 2025) and **vułkanav1dec** (Oct 2025)
- **Dynamic encoder & decoder caps** generated from driver capabilities
- Big **synchronization rework** of the core library

Vulkan: decoders grew up

- VP9 and AV1 decode elements (S. Cerveau, D. Almeida)
- main-10 H.265, 10-bit formats, film-grain caps field (AV1)
- Robustness: FLUSH renegotiation, discount handling, DPB fixes, inlined session parameters

Vulkan: H.264 encoder

- Shared **gsth26xgopmapper** utility (Feb 2026)
- Rate control validated against driver capabilities
- Negotiation: profile/level handling, **getcaps()** vmethod, no spurious downstream renegotiation
- DPB pool recreation, driver SPS/PPS overrides, zero-bitrate guards

Vulkan: core library & sync

- `GstVulkanOperation`: binary semaphores, lifetime tied to fence (M. Waters)
- Timeline semaphore + barrier-state objects; atomic barrier updates
- Sync retry handled uniformly in all elements
- Fine-grained API dispatch; Vulkan 1.4 feature detection
- `VK_EXT_debug_utils` + best-practices validation
- `vktrash` fence dedup; image-view dispose races fixed

Vulkan: formats, interop, platforms

- `vulkancolorconvert`: I420, AV12, new YUV $\leftrightarrow$ RGB shaders
- Multi-planar YUV `VkImage` pool (opt-in), 4-plane download
- Android: **AHardwareBuffer** import (`vkupload-ahb`) (D. Leroux)
- macOS/iOS: MoltenVK subproject, direct linking, UIView fixes (N. Chauhan)

Vulkan: what's pending

- **!12580 vulkanh265enc** new element, in review
- **!11772** exportable external memory (VA/EGL/CUDA interop)
- **!10447** YUV → RGB using Ycbcr sampler in vulkancolorconvert
- **!12457** upload/download passthrough
- More codecs, support new Vulkan Video extensions

GStreamer VA

commits by commit date



VA: headline news

- **vaoverlaycompositor** — new element (J. Adam, Feb 2026)
- Encoder internals rework: `setup()`/`open_2()` split, `gst_va_encoder_set_coded_buffer_size()`
- Encoder robustness: corrupt/overflowing coded buffers (M. Nikolaev, He Junyan)
- dmabuf: persistent mapping, linear-modifier probing (N. Dufresne, S. Dröge)

VA: encoders & decoders

- Encoders: lazy reconstruct pool, CBR-sized coded buffers, corrupt VP9 superframes / AV1 TUs flagged, race fix, AV1 intrablock-copy + palette mode (J. Lui)
- Decoders: retry `vaSyncSurface` on HW-busy; all decoders chain parent `negotiate()` (P. Normand); gap-event negotiation
- `vapostproc`: HDR meta drop on tone-mapping, `background-color`, orientation-after-restart fix
- `vacompositor`: Intel alpha-blending fix

VA: what's pending

- !12161 / !12181 multi-VADisplay for Intel XE (V. Cheah)
- !11089 format-selection fix (spans VA/Vulkan/GL)

Shared threads

- **!10018** move `GstH264Encoder` base class into the codec library, to be shared by VA and Vulkan (draft)
- **!11089** format selection across vapostproc / videoscale / Vulkan / GL
- Same people review both stacks; sync model ideas cross-pollinate

Contributors

- **Vulkan:** Stéphane Cerveau (33), M. Waters (19), D. Leroux (14), N. Chauhan (6), Hyunjun Ko (5), P. Brzeziński, D. Nazar, A. Nurgaliev, S. Dröge, +13 more
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Q & A



