

Update on AMD DRM modifiers

Bas Nieuwenhuizen <bas@basnieuwenhuizen.nl>
2020-09-18

Why modifiers?

- Image imports on Vulkan
 - Compositors using Vulkan
 - Gamescope needs hacks currently :(
 - Zero-copy video playing
- Compression for non-fullscreen windows
- Overlay/underlay planes
 - Compositors uncertain without modifiers

Implementation

Modifier: injection uint64_t -> texture layout

Typically use ~3 texture layouts on AMD

Implementation

Modifier: injection uint64_t -> texture layout

Typically use ~3 texture layouts on AMD

```
#define DRM_FORMAT_MOD_LINEAR 0
#define DRM_FORMAT_MOD_AMD_DISPLAYABLE 1
#define DRM_FORMAT_MOD_AMD_NON_DISPLAYABLE 2
```

Done?

GPU, driver differences

- Texturing layout changes in every new chip ...
- Some driver only data in texture memory

- Add Chip ID as parameter?
 - Chips with same texture layout will result in duplicate modifiers ...

- Add parameters to completely identify texture layout?
 - Gets quite detailed & complicated

Approach

- Sent first RFC 1+ years ago
- Got a bunch of pushback
 - Total modifier info was almost 40 bits
 - Some people questioned my source data on parameters.

- New approach: Only GFX9+ (RX Vega, Raven APUs)
 - Clean break in texture layouts (simpler!)
 - Can iterate quickly
 - More interesting with compression
 - Have almost complete HW collection to test

Status

Complete implementation:

- GL: https://gitlab.freedesktop.org/mesa/mesa/-/merge_requests/6176
 - In good shape
- Kernel: <https://patchwork.freedesktop.org/series/80262/>
 - Could use more feedback

To do:

- Publish Vulkan support
- Add IGT tests
- Add names to drm_info

Personal repo for issues/ideas: <https://gitlab.freedesktop.org/bnieuwhuizen/mesa/-/issues/4>