

DRM-backend tests in Weston's GitLab CI

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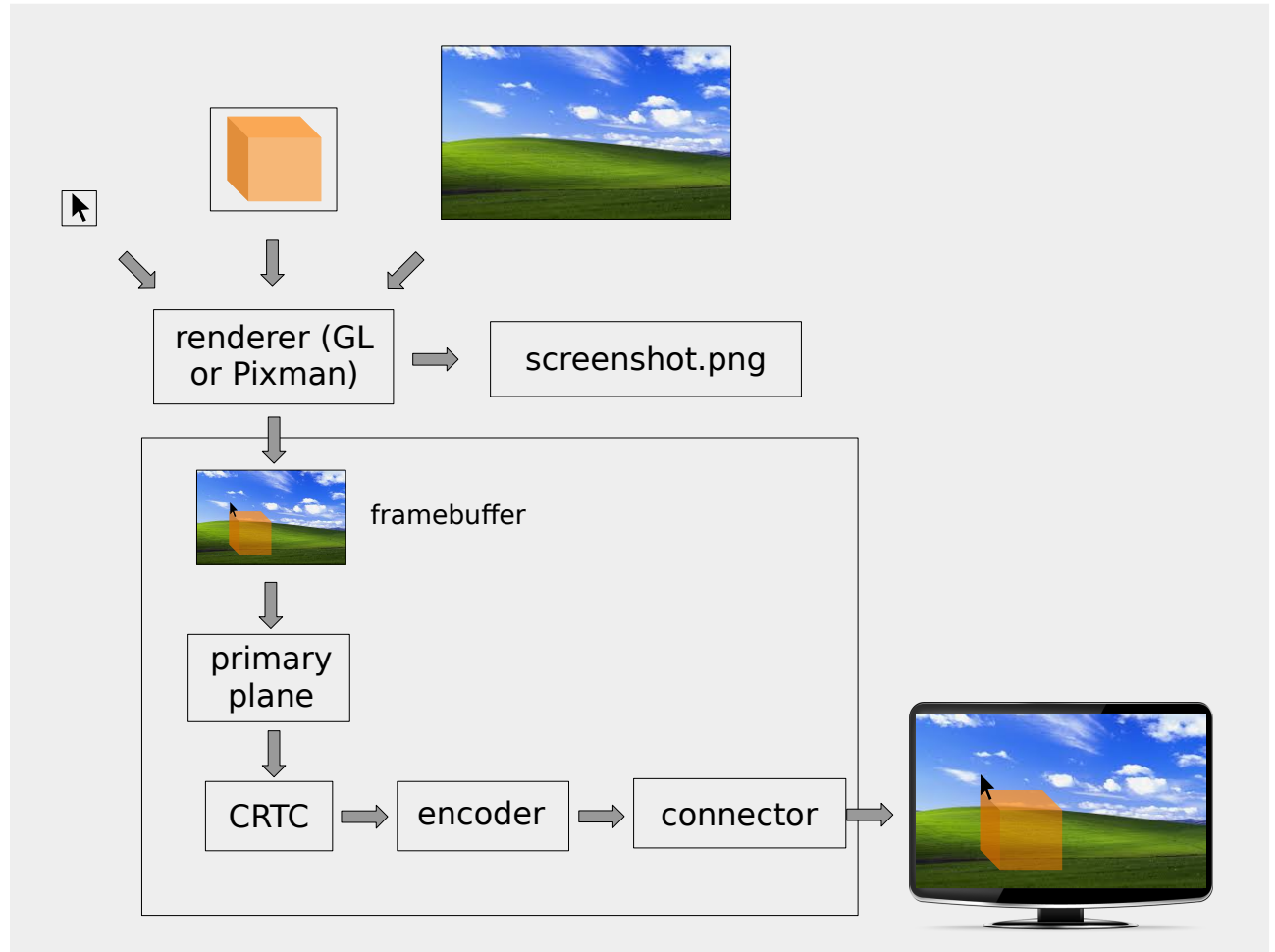
About me

- Interested in graphics and FOSS in general
- Working at Collabora since March 2020
 - Internship project in Weston
 - DRM-backend testing

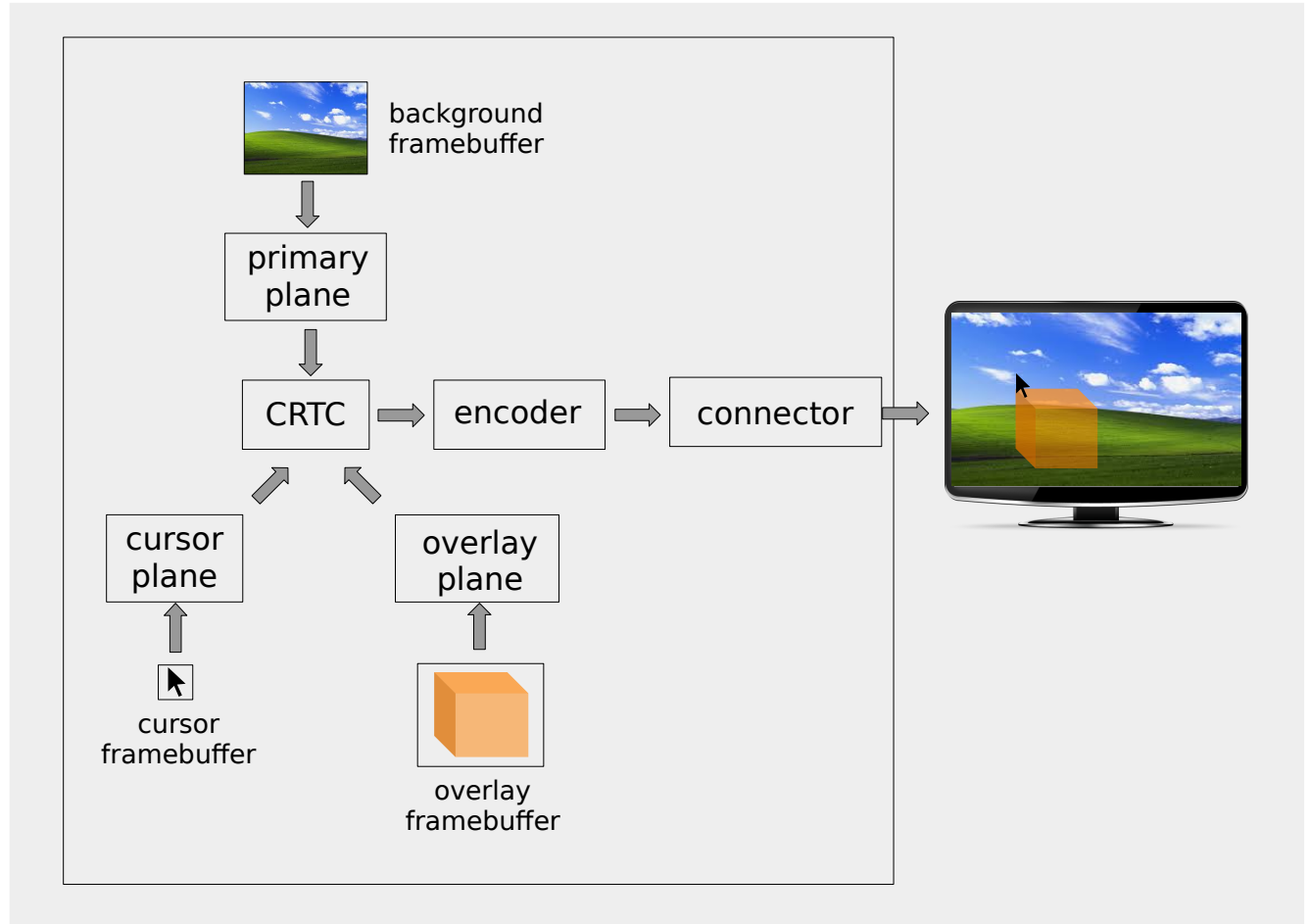
Some background

- Weston has multiple backends
- Different ways to output content
- One of them is the DRM-backend
 - It uses libdrm to:
 - Select modes (refresh rate, color depth, screen resolution)
 - Handle DRM objects (connectors, CRTC, etc)
 - Control the display pipeline

Display pipeline



Display pipeline

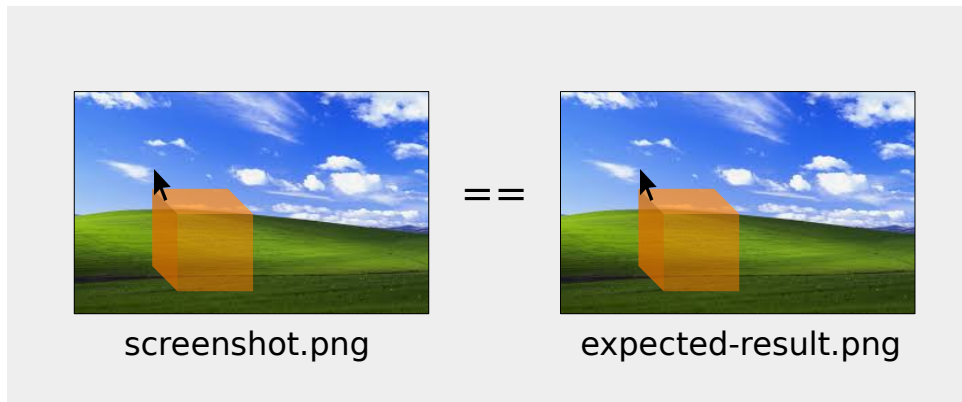


Problem statement

- Weston has a test suite that runs in GitLab CI
 - We want to test as much as possible of Weston's functionalities in an automated fashion
 - However we can't assure that the machine that will run the tests has a graphics card available
 - So how can we run DRM-backend tests in Weston's GitLab CI?

Problem statement

- Thoroughly testing the DRM-backend
 - Screenshots are very handy for testing purposes
 - We can use screenshots to compare composed images with reference images in the test suite
 - However Weston disable planes composition to take screenshots

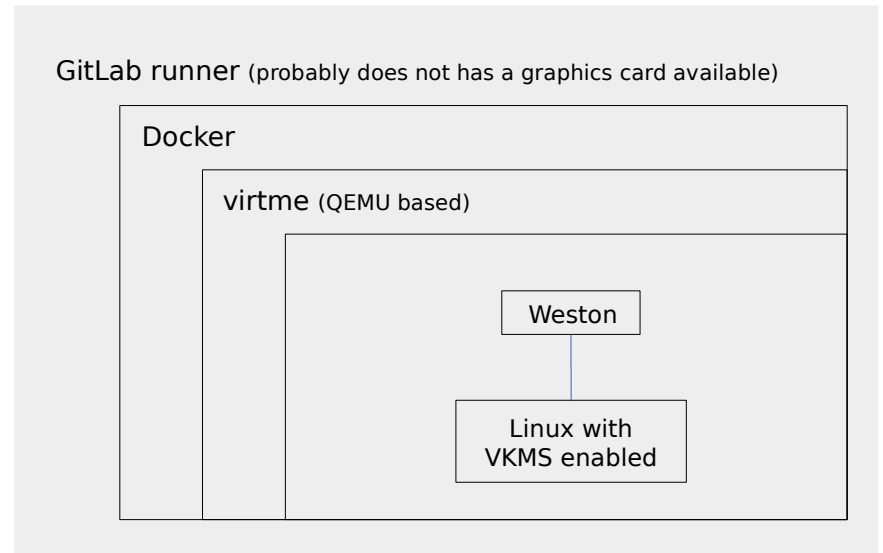


Proposed solution

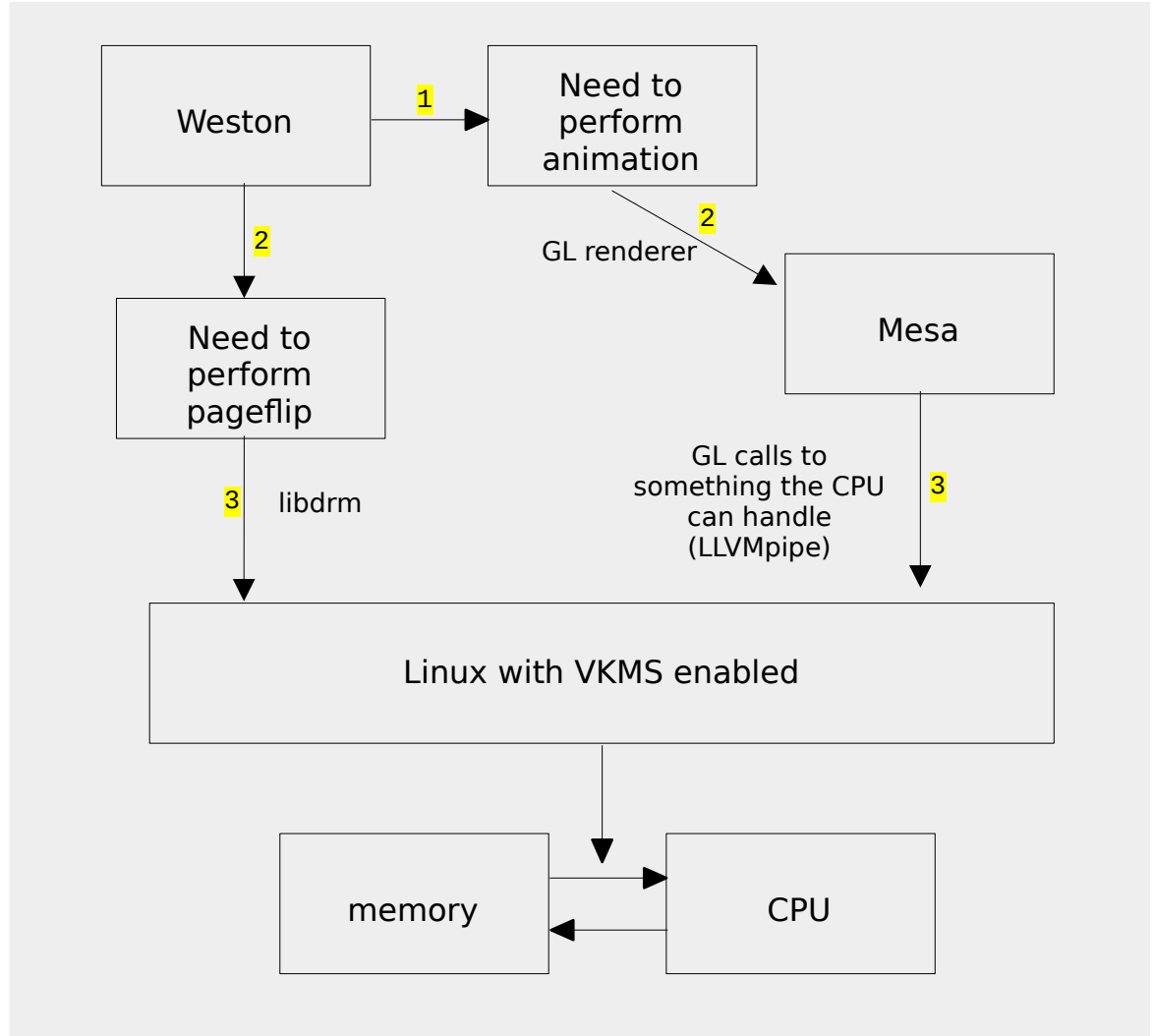
- Automated DRM-backend tests in Weston
 - For the rendering part, we don't need to modify anything
 - Mesa has support for software rendering drivers (e.g. LLVMpipe)
 - They are automatically selected in the absence of real hardware
 - For the KMS part, we can use VKMS (Virtual KMS)
 - We can run Weston on top of it
 - Some modifications in the test suite are necessary

Proposed solution

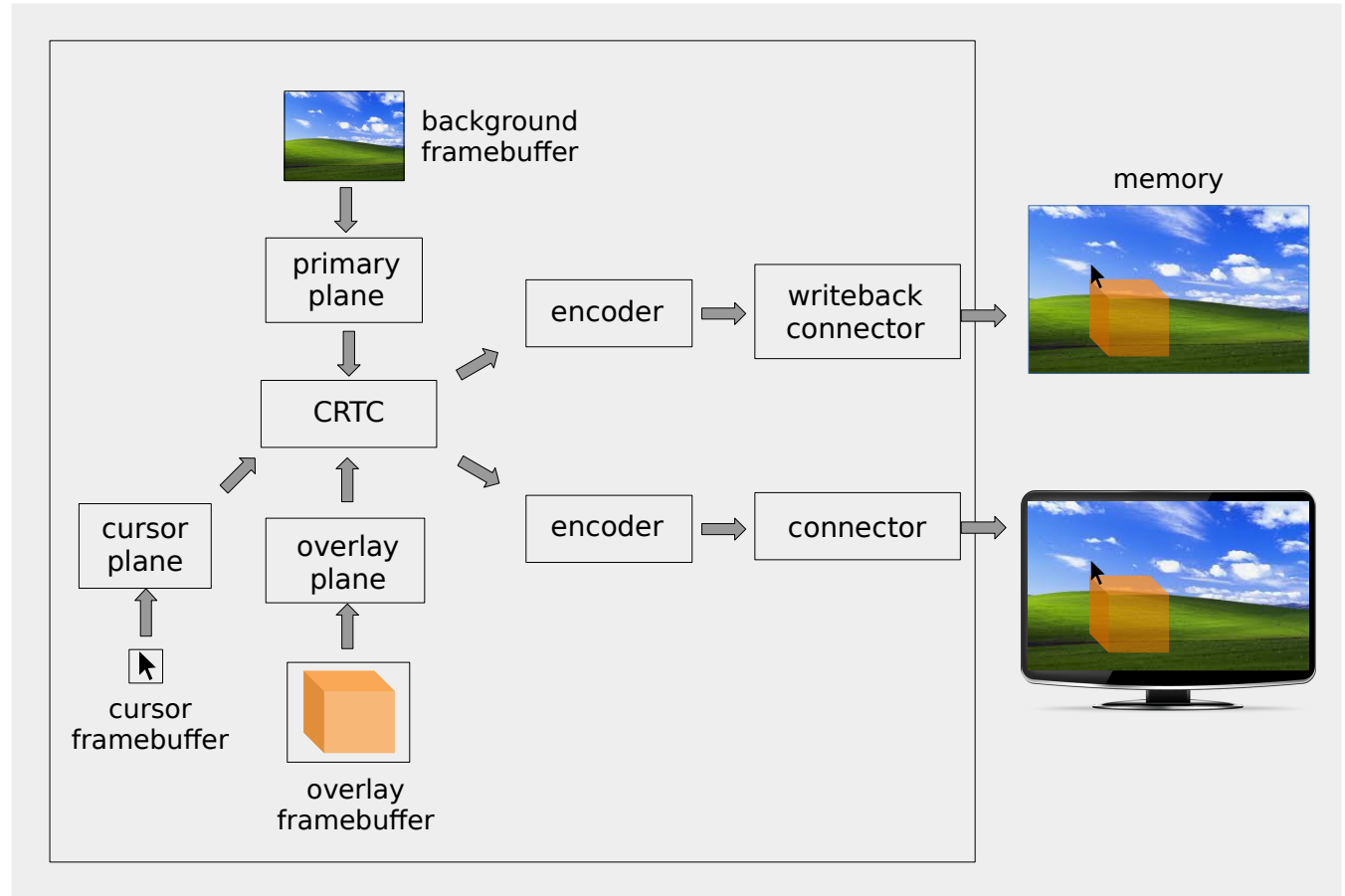
- Changes in Weston's GitLab CI
 - Compile a Linux image with VKMS enabled
 - Run a virtual machine using virtme (QEMU based) and the Linux image that we've compiled
 - Run tests inside the virtual machine
 - Very simple DRM-backend test introduced



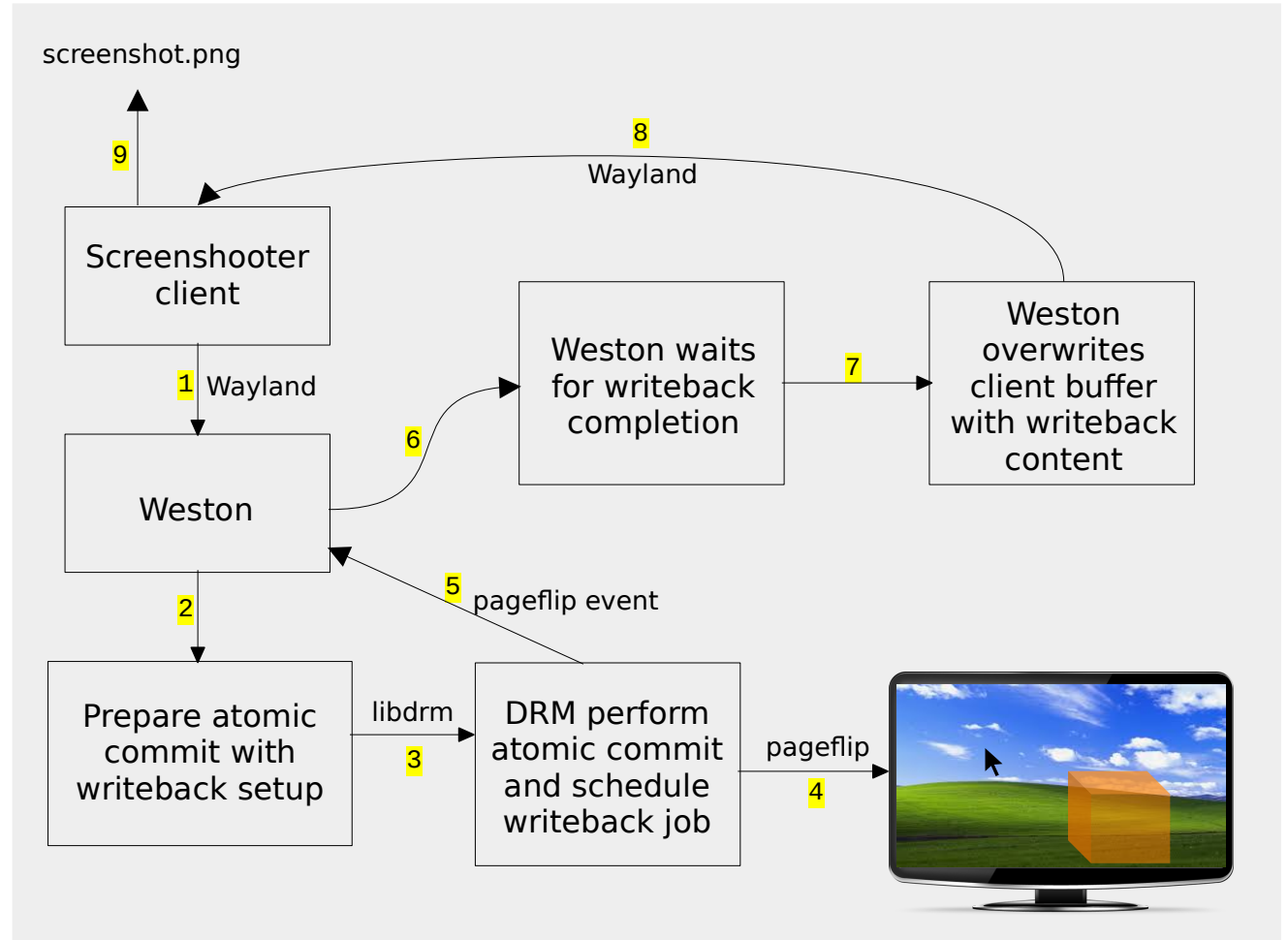
Weston's test suite



Writeback connectors



Writeback screenshotter





**Writeback
screenshooter**



References

- [\[PATCH v6 0/3\] drm/vkms: Introduces writeback support](#)
- [Weston MR: VKMS support](#)
- [Weston MR: Writeback connector support](#)
- [Weston MR: Writeback connector screenshooter](#)
- [The DRM/KMS subsystem from a newbie's point of view](#)
- [Kernel DOCS: KMS \(Kernel Mode Setting\)](#)
- [Kernel DOCS: Writeback connectors](#)

Summary

- Need to automatically test Weston's planes functionality in the absence of real hardware
- Run Weston on top of VKMS in GitLab CI
- Add support for writeback connectors in VKMS and Weston
- Add writeback screenshotter in Weston
- Tests are basic at the moment, but the plan is to extend the test coverage as VKMS extends its functionalities