



New brightness uAPI

Replacing `/sys/class/backlight`

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Topics

- Problems with `/sys/class/backlight`
- New uAPI proposal
- Backlight handling technical debt
- Probe ordering issues



Problems with `/sys/class/backlight`

Long unsolved problem

- First gave a talk about this at XDC 2014
 - <https://wiki.freedesktop.org/xorg/Events/XDC2014/XDC2014GoedeBacklight/>
- Intel send a proposal to try and fix this in 2017:
 - <https://lore.kernel.org/all/4b17ba08-39f3-57dd-5aad-d37d844b02c6@linux.intel.com/>

Problems with current uAPI

- No way to map backlight sysfs device to display
- Often multiple backlight sysfs devices for a single display
- Leaving userspace to guess which one will work
- Brightness control requires root rights
- Meaning of value 0 is undefined

New uAPI proposal

New uAPI proposal

- Add new `display_brightness` and `display_brightness_max` properties on the `drm` connector object
- `display_brightness_max == 0` means brightness control is not supported
- `display_brightness_max` may change on hotplug events. E.g. plugging in a monitor which supports brightness control over DDC/CI

Backlight handling
technical debt

Technical debt

- Multiple laptop brightness control methods:
 - Directly by the GPU driver
 - Other driver(s) using \$random firmware interface(s)
- Current approach:
 - Just register sysfs devices for all of them
 - Userspace picks which sysfs device to use based on the type (firmware → platform → native)
 - If kernel heuristics say the native device should be preferred, unregister the others when the native one registers

Probe ordering issues

Probe ordering issue 1

- The new uAPI requires 1 backlight dev (per panel)
- The kernel heuristics cannot detect if the GPU driver will offer native control
- The heuristics will only pick native when available
- This causes the acpi_video backlight device to register before the native driver
- To fix this acpi_video backlight registration must be delayed till after the GPU drivers are done probing

Probe ordering issue 2

- Sometimes the heuristics find no known brightness control method
- Then vendor (aka other) is returned
- The vendor (dell-laptop, asus-wmi, etc) drivers typically load much later than the GPU drivers
- This causes there to be no brightness control if userspace looks at the drm connectors early
- Userspace needs hotplug brightness control support for DCC/CI anyways, so the plan is to rely on this

Questions / Discussion



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