

Chromium on Wayland Desktop (brainstorm)

BlinkOn7

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Igalia



igalia

Agenda

- Who is Igalia?
- Motivation
- Background
- Discussion

Who is Igalia?

- Worker-owned, employee-run open source consultancy company, based in Spain.
 - 55 employees around the world.



- Areas
 - WebKit, Chromium/Blink and Servo expertise.
 - JavaScript engines / Compilers (V8, JSC), Multimedia, Graphics (Mesa), Networking, Accessibility.

Motivation

- Being able to run Chromium natively in Wayland-based systems will leverage its adoption in a variety of systems / environments.
 - Fedora 25 is shipping Wayland by default.
 - Major GUI Toolkits have built-in support, including Qt 5, Gtk+, Clutter, EFL.
 - Support from AGL, GENIVI (automotive industry consortium for IVI), Jolla, Raspberry Pi, Tizen.



Background

Background

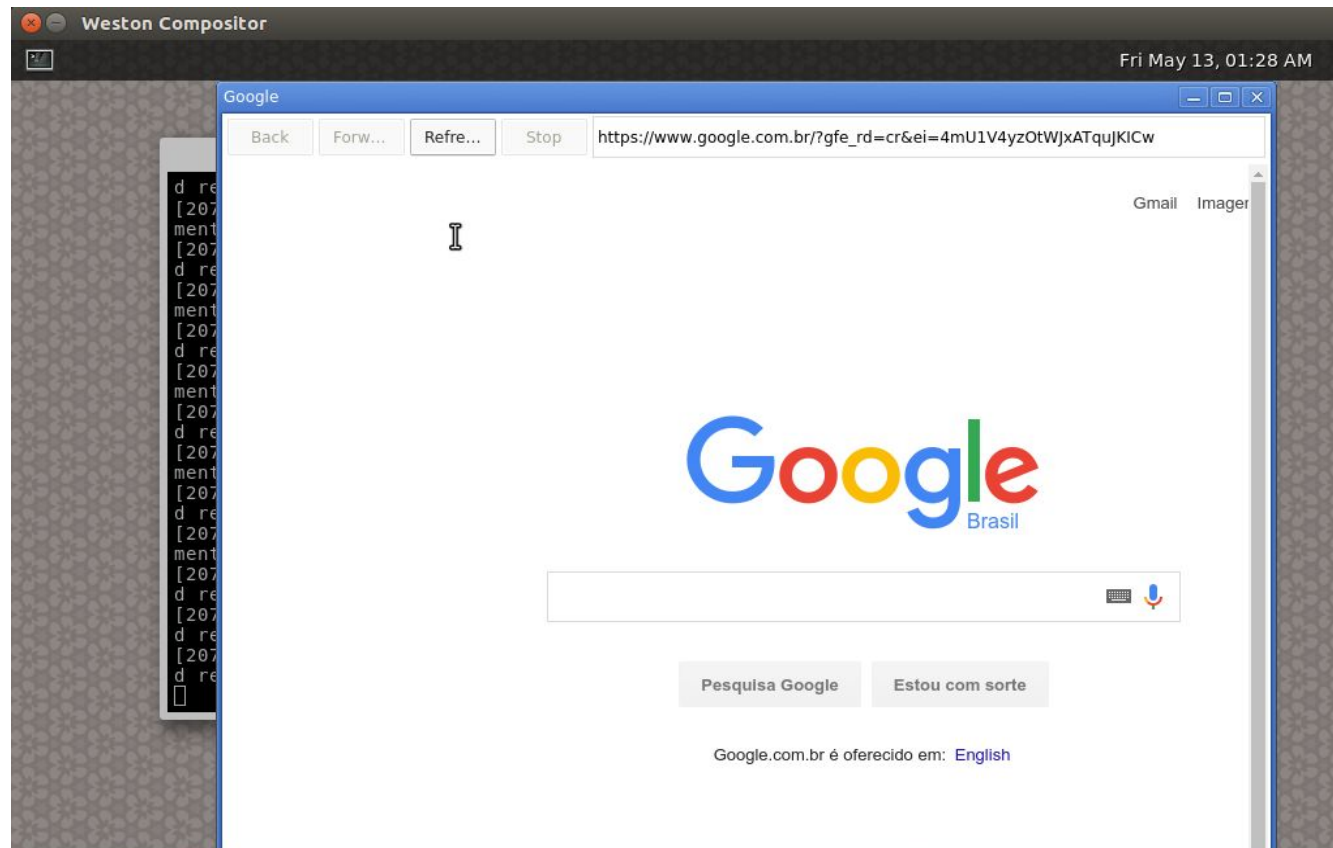
- Ozone project
 - Set of C++ classes for abstracting different window systems on Linux.
 - It provides abstraction for the construction of accelerated surfaces underlying Aura UI framework, input devices assignment and event handling.
 - `//ui/ozone/`, `//ui/events/ozone/` and `//ui/base/cursor/ozone/`
- Backends:
 - DRM/GBM
 - x11
 - wayland
 - cast
 - headless

Background

- Ozone/Wayland (by Intel / 01.org)
 - Off trunk.
 - In “maintenance mode” - m49 (december/2015).
 - Good community adoption.
- Ozone/Wayland (ToT)
 - Partially upstreamed, but lacked functionality if compared to Intel’s implementation.
 - ChromeOS / mus+ash oriented.
 - (used to have an) Outdated documentation.
 - Limited buildbot coverage.

Background

- May/16 – start experimenting with Chromium/Ozone/Wayland.
 - Ported part of the code from 01.org to ToT.



Internal "investment"

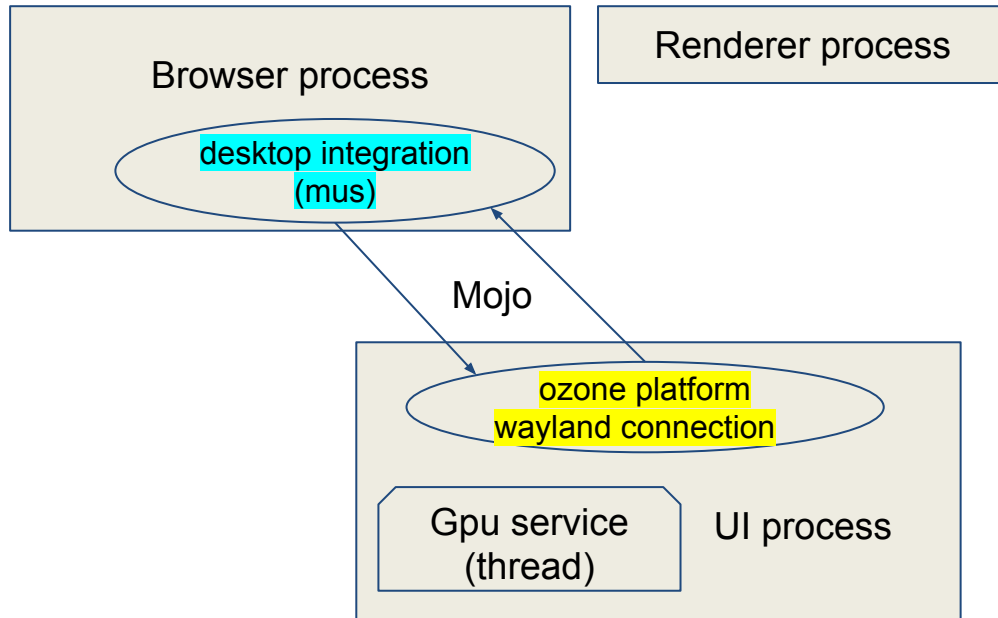
- `content_shell ozone/wayland`

Background

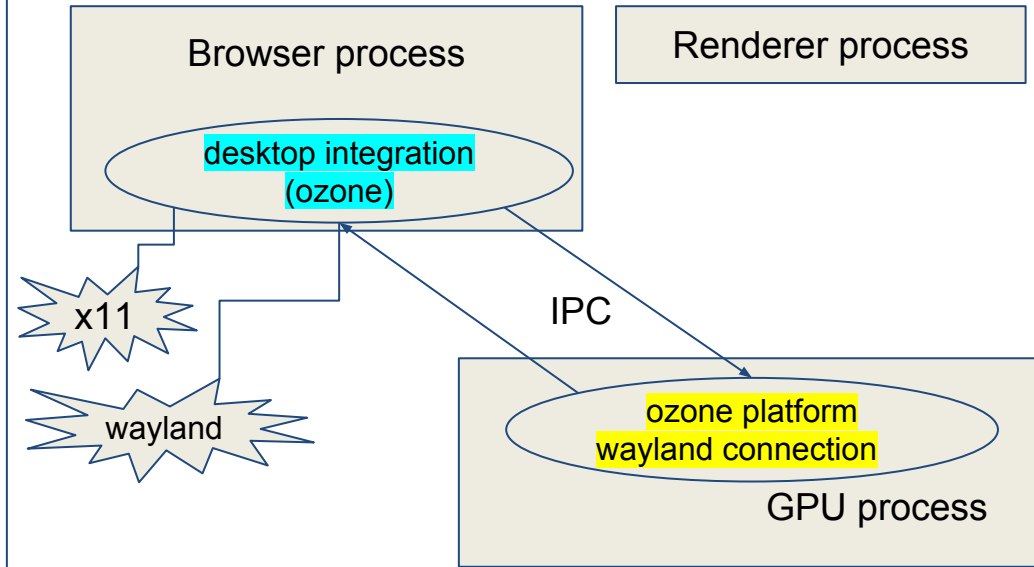
- Igalia got in touch with Google/Chromium developers to understand the plans for `ui/ozone/platforms/wayland`
 - figured about the *exosphere* project and ChromeOS plans for *mash*
 - `//components/exo/`
 - `//mash`
 - figured that the original “desktop integration” approach taken by 01.org did not comply with the way future Linux desktop Chrome was planned.

Background

Mus Linux desktop integration

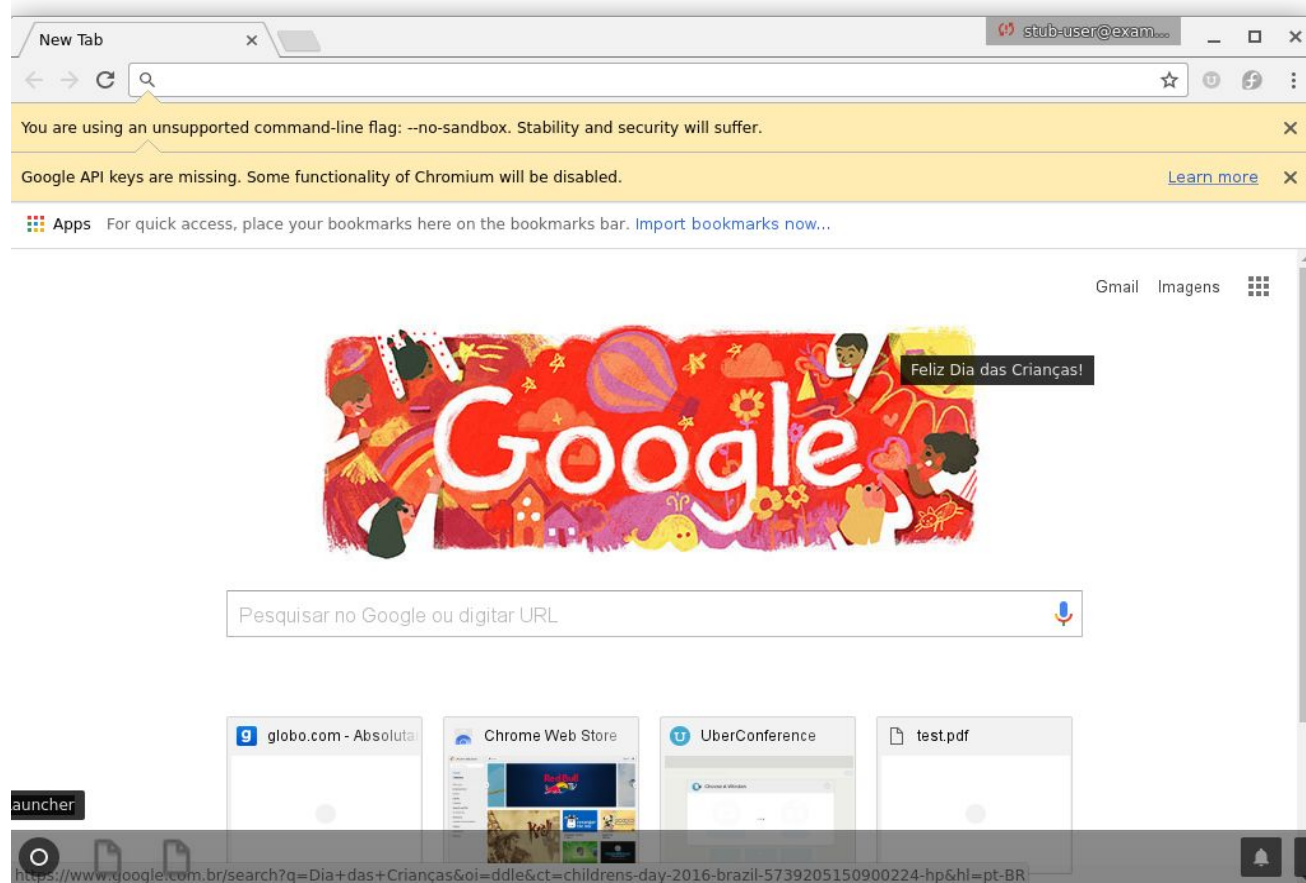


Linux desktop integration (01.org)



Background

- Sep-Oct/16
 - Bringing up of Ozone/Wayland.
 - Start experimenting with “Ozone != ChromeOS”.
 - Design discussions with Robert Kroeger.
 - Buildbots
 - Documentation



External “investment”

Background



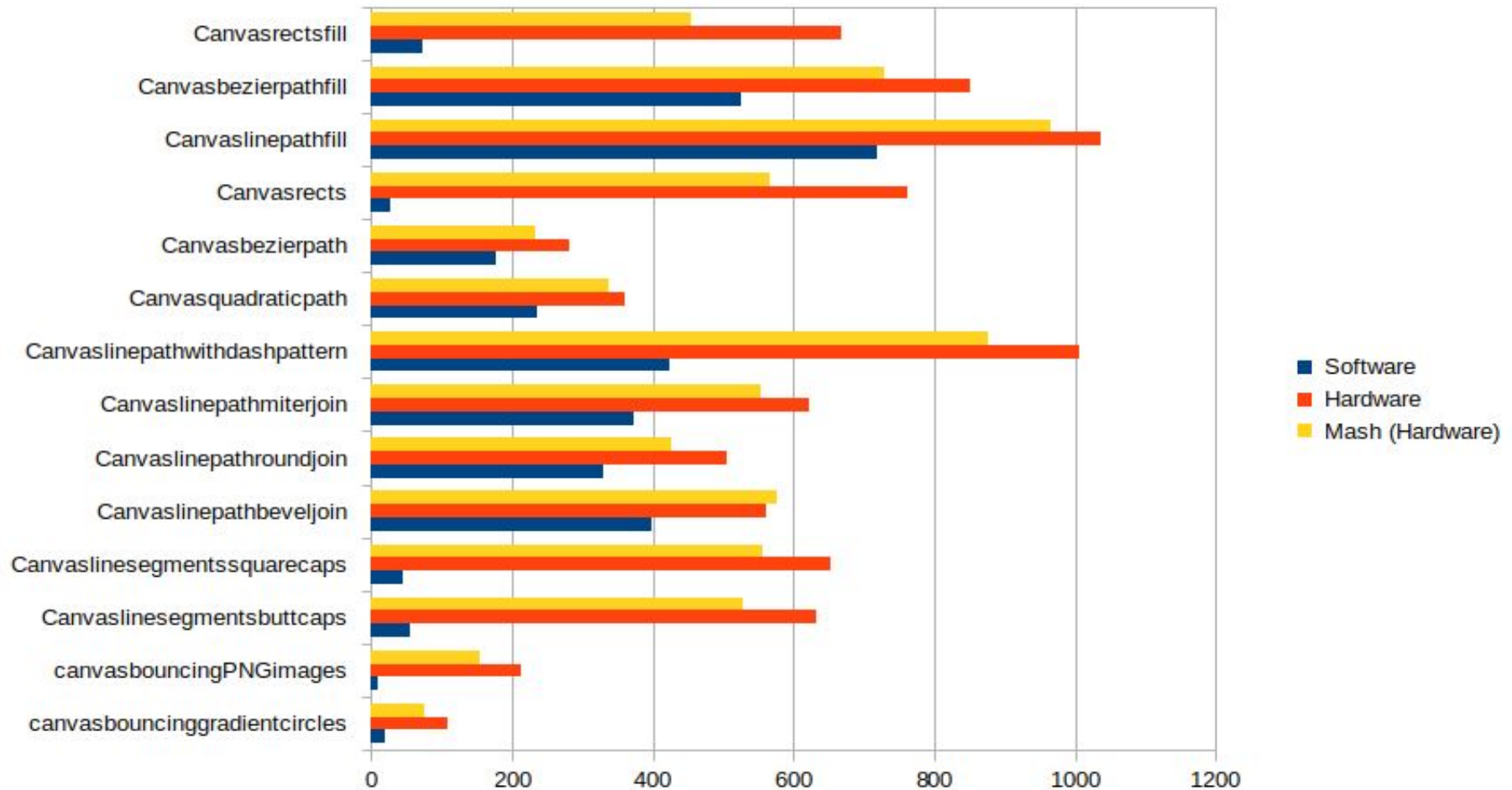
- Nov-Dec/16
 - CES demo: Linux/AGL/Wayland ; R-Car M3



Background

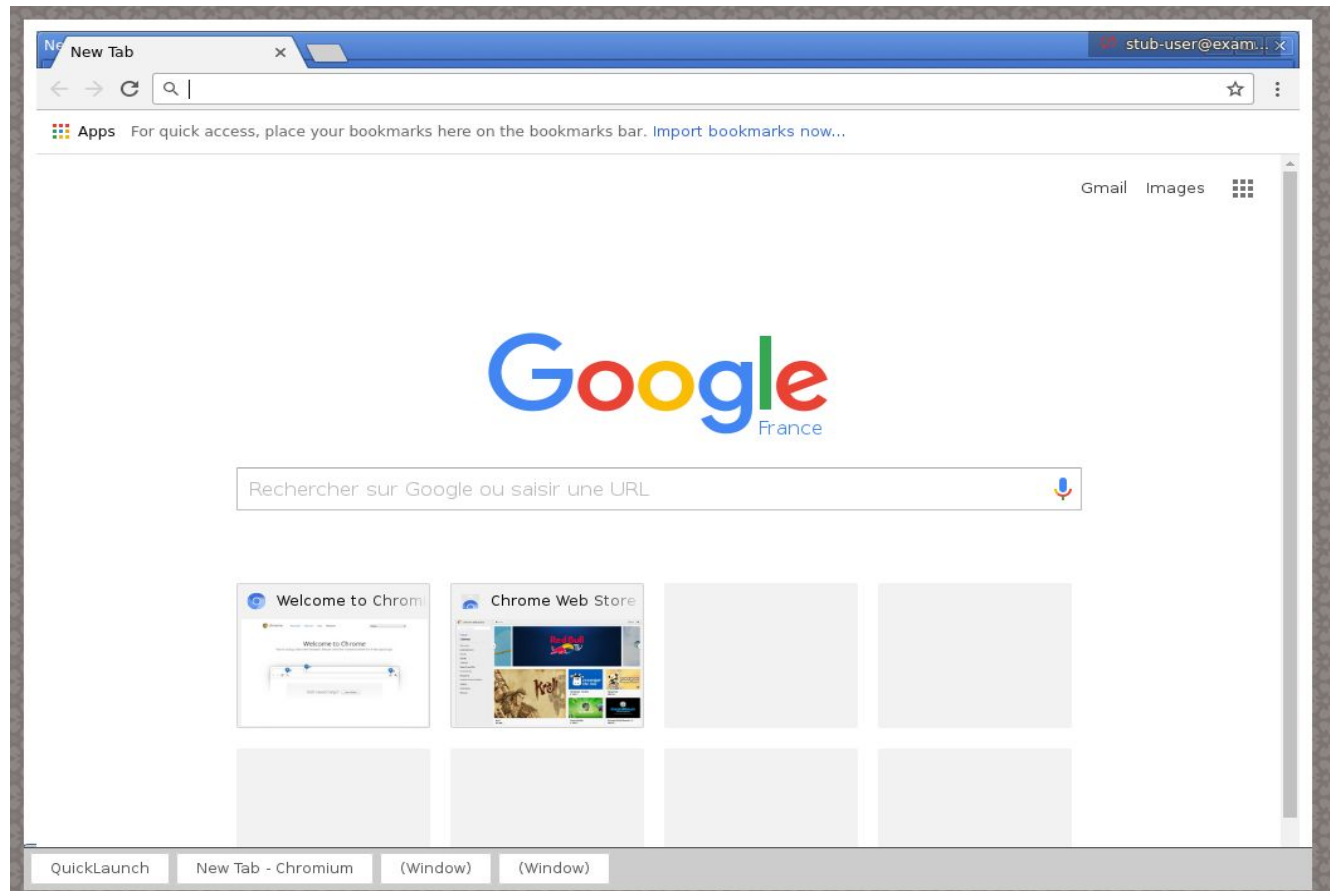


- Nov-Dec/16
 - Performance on BrowserBench GPU tests



Background

- Since Jan/17
 - //mash/simple_wm
 - [analysis of window classes](#)



Discussions

Discussion: Internal vs External

- Internal-window mode
 - All the aura windows in the system end up sharing a single display.
 - All the ash and Chrome aura windows are embedded within a single top-level acceleratedWidget.
- External-window mode
 - What is the status today?
 - robert: unsure if code works/builds today.
 - Where is this in the code?
 - robert: entry point is WindowTreeHostFactory class
 - Do we have existing tests?
 - robert: No. mus_demo needs to be extended.

Discussion: Internal vs External

- Robert proposes a two-steps approach:
 - Implementing external window mode in ChromeOS/Ozone.
 - Expand the support for non-ChromeOS Ozone builds.

After talking to sky@ et al, it was agreed with rjkroege@ that this is not the best way to approach the problem. Alternatively, sky@ proposed to work this out directly on LinuxOS/Ozone builds.

Discussion: Internal vs External

- LinuxOS
 - 1 “accelerated widget” per top-level mus window
 - chrome/mus
 - Create a new “desktop-stub” replacement for Ash?
 - Desktop integration.
 - In essence, a subset of functionality currently provided by Ash is delegated to the native window system.
 - //src/mash/simple_wm ?
 - robert: no.
 - new flag, sibling to –mash?
 - robert: yes

Discussion: Mus/LinuxOS status

- Today
 - Ozone == ChromeOS
 - mus+ash == ChromeOS
- TBD
 - On LinuxOS, Ozone != mus+ash
 - Chrome/Mus
 - USE_X11 not to be defined
 - it ~works: builds / launches
 - mix of `_mus` and `_ozone` classes are being used

Discussion: Mus/LinuxOS plan

- Change Mus demo to work on external window mode.
 - **Ongoing: Frederic / Antonio.**
 - services/ui/demo/ (help from @kylechar)
 - WindowTreeHostFactory
 - ScreenManagerOzoneExternal (no delegate)
 - ui::Service creates ws::Display
 - rework internal window mode assumptions in the code.
- Change Chrome to launch in Mus external window mode.
 - Chrome today launches the same way it ought to, for Chrome/Mus.
- Continue with desktop integration work (feature completion).

Discussion: UI / GPU split

- chrome --mash still runs the UI and GPU components in the same process but separate threads.
 - Future: musws and musgpu in separate processes
 - <https://crbug.com/643746>
- Mojo-fication of Ozone/Wayland
 - Use similar approach than Ozone DRM/GBM (ChromeOS)?
 - GBM surface
 - robert: to be discussed later.