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Wayland driver for Wine: The story so far

Alexandros Frantzis

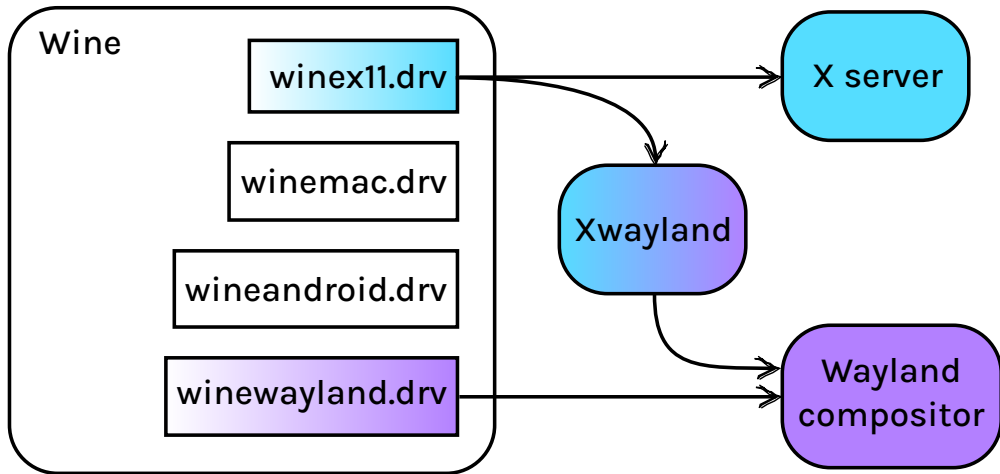
XDC 2023

Open First



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Wine driver



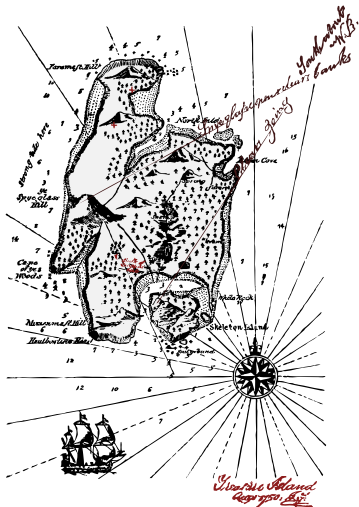
Why do we want a Wayland driver?



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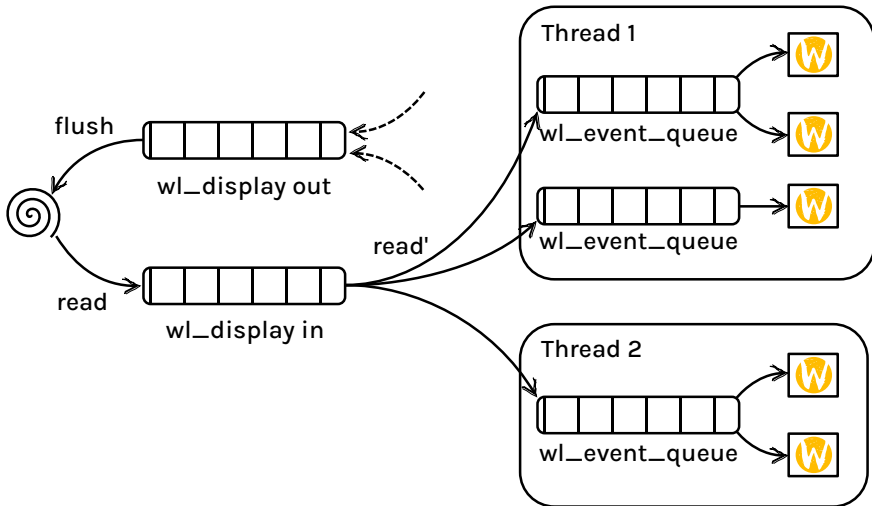
- Avoid maintenance cost of Xwayland integration
- Avoid double API translation
- Improve performance
- Use new features

The journey begins



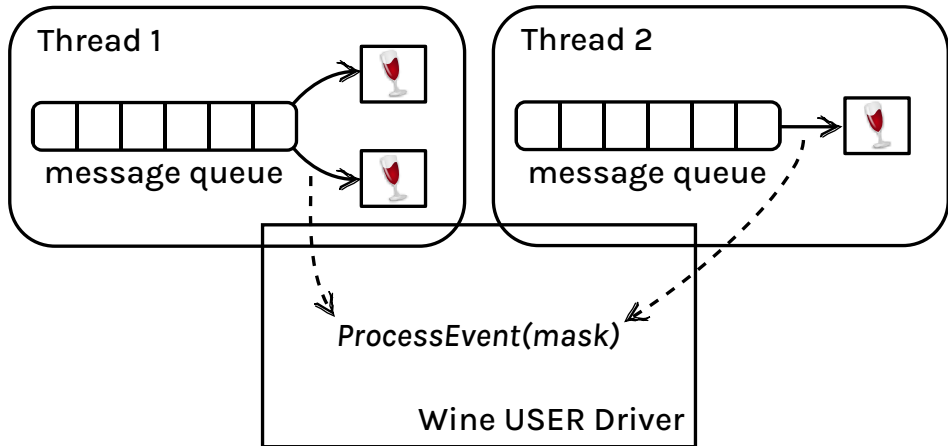


Wayland event model





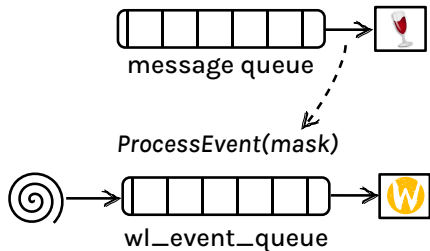
Win32 message model



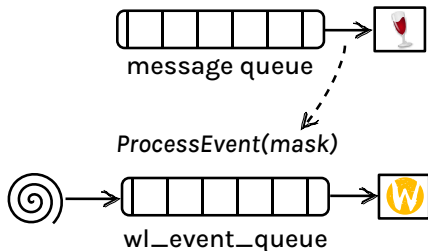


Event integration: 1st attempt

Thread 1



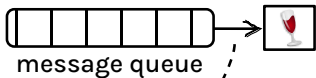
Thread 2



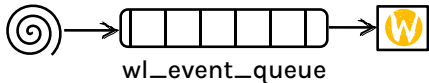


Event integration: 1st attempt

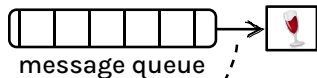
Thread 1



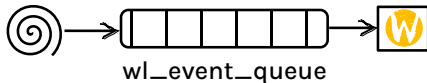
ProcessEvent(mask)



Thread 2

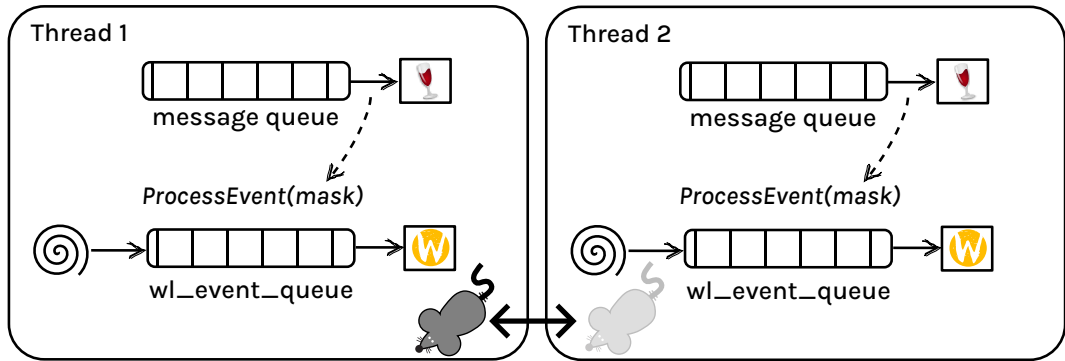


ProcessEvent(mask)





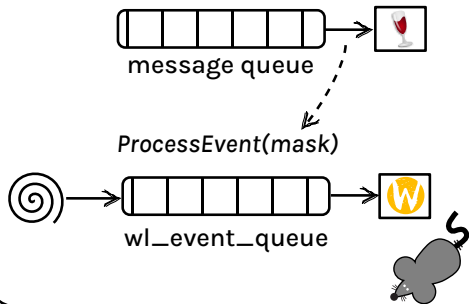
Event integration: 1st attempt



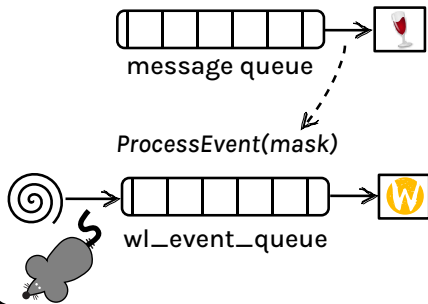


Event integration: 1st attempt

Thread 1



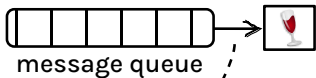
Thread 2



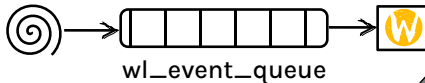


Event integration: 1st attempt

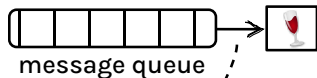
Thread 1



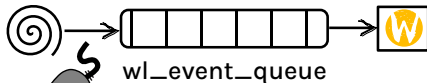
ProcessEvent(mask)



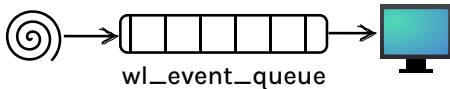
Thread 2



ProcessEvent(mask)

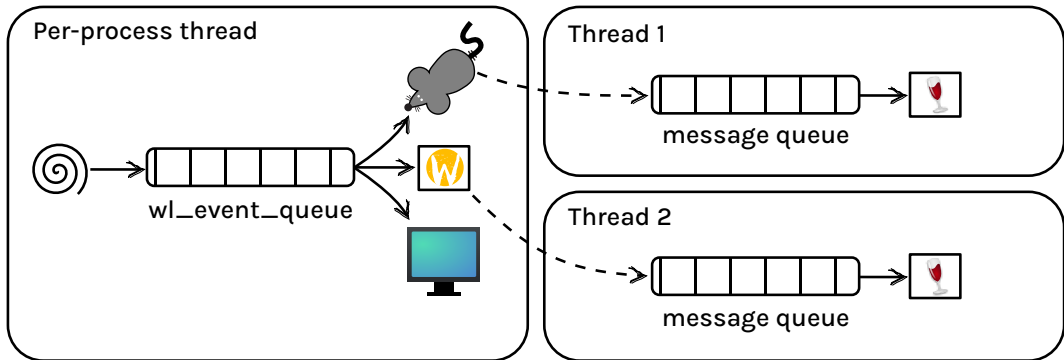


Per-process thread





Event integration: 2nd attempt

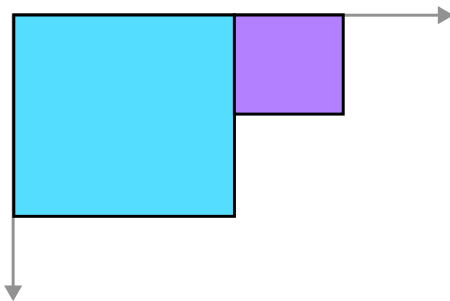




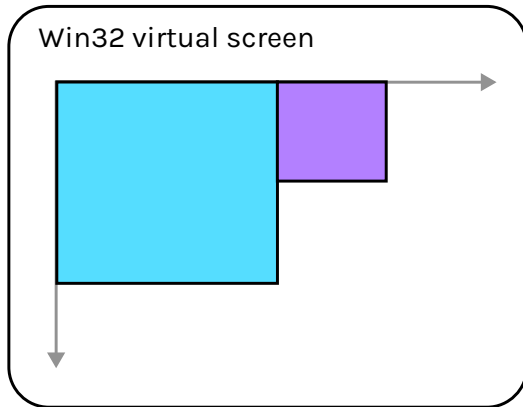
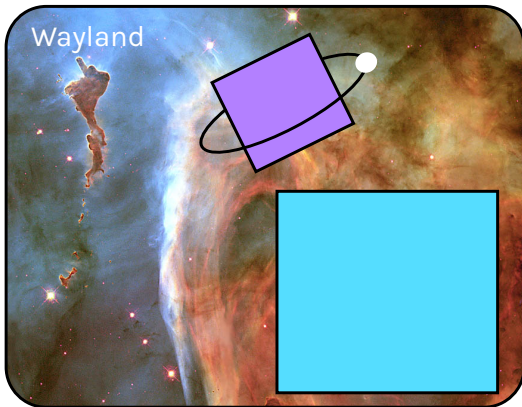
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Outputs

Win32 virtual screen



Outputs

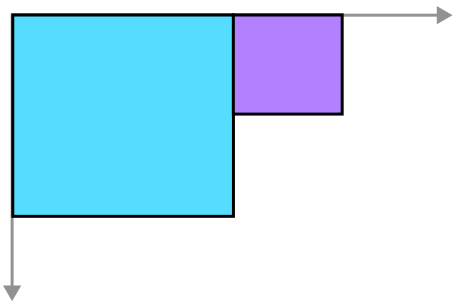




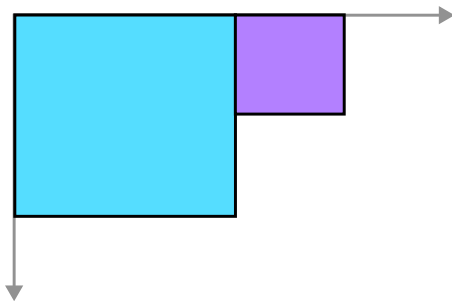
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Outputs

Wayland (logical space)

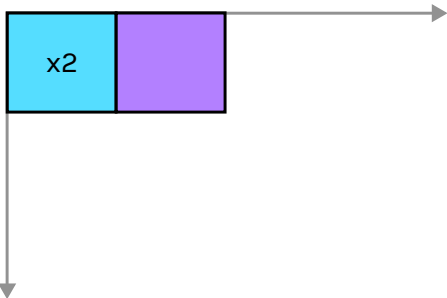


Win32 virtual screen

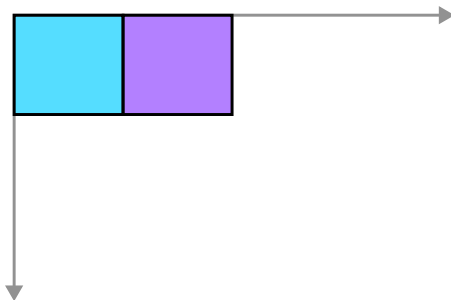


Outputs (scaling)

Wayland (logical space)

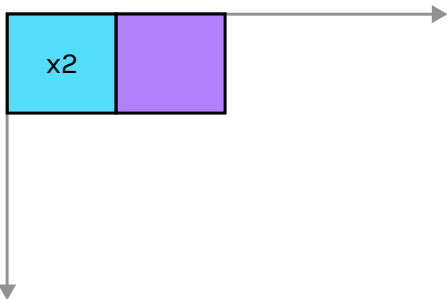


Win32 virtual screen

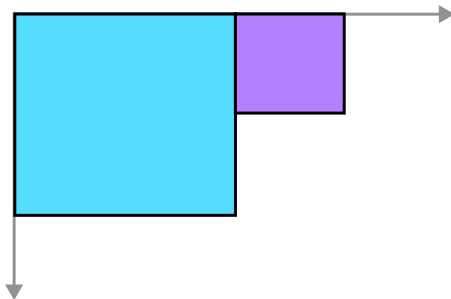


Outputs (scaling)

Wayland (logical space)



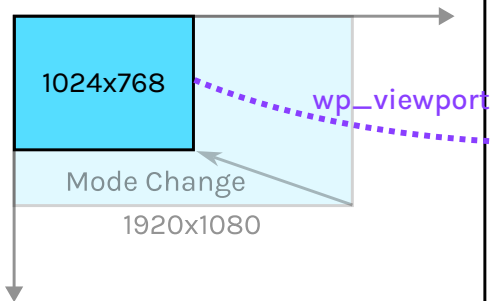
Win32 virtual screen



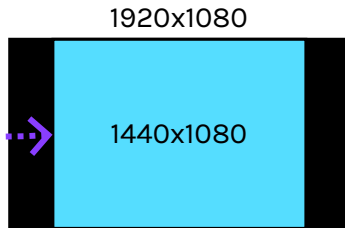


Display mode change (exp.)

Win32 virtual screen



Wayland





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Window management

Win32

Prescriptive



Wayland

Descriptive



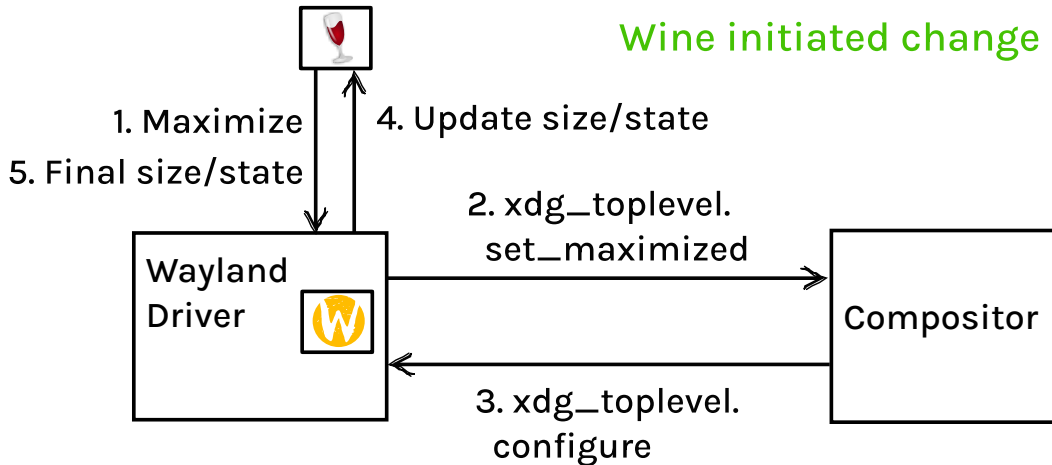
Win32 toplevel windows

- Backed by `xdg_toplevel`
- Interactive move and resize actions are forwarded to compositor
- State and size synchronization
- Coarse position synchronization (exp.)



Window management

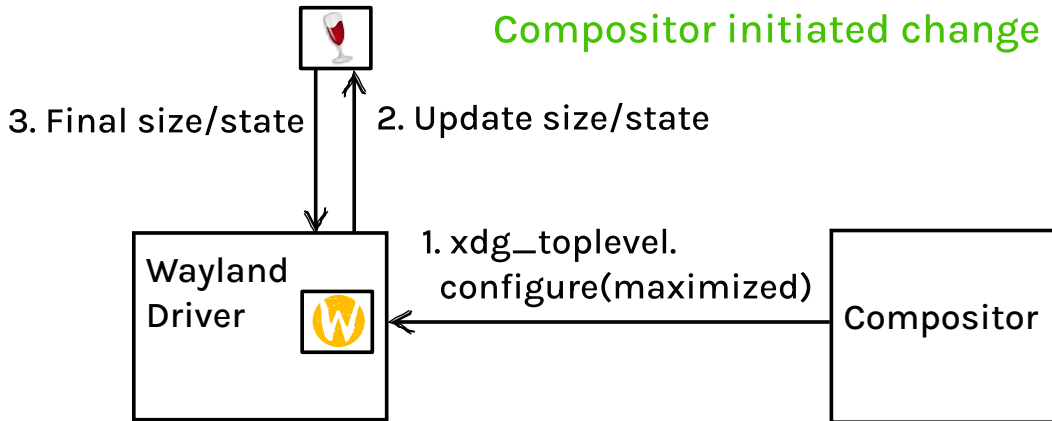
Wine initiated change





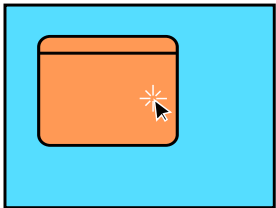
Window management

Compositor initiated change

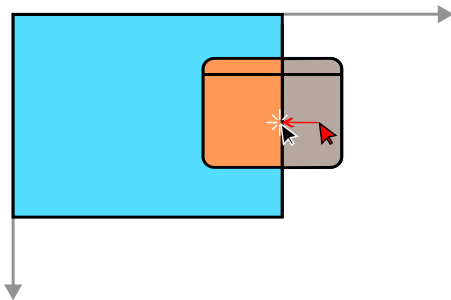


Window management

Wayland



Win32 virtual screen





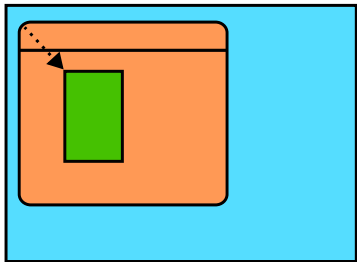
Window management

Win32 transient windows (exp.)

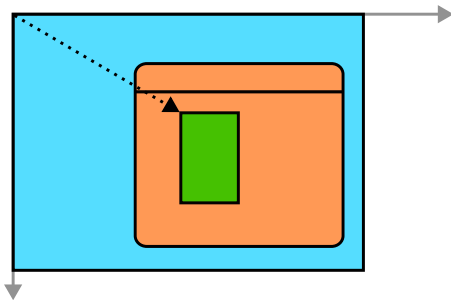
- Backed by `wl_subsurface`
- Positioned relatively to their parent surface
- Heuristics to select windows in this category and parent surface

Window management

Wayland



Win32 virtual screen





Input

Mouse

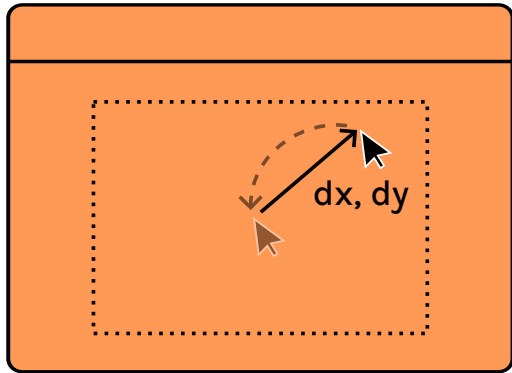
- Translate surface-local to virtual screen coordinates
- Cursors from bitmap data or theme (exp.)
- Relative motion (exp.)



Input

Mouse

- Translate surface-local to virtual screen coordinates
- Cursors from bitmap data or theme (exp.)
- Relative motion (exp.)

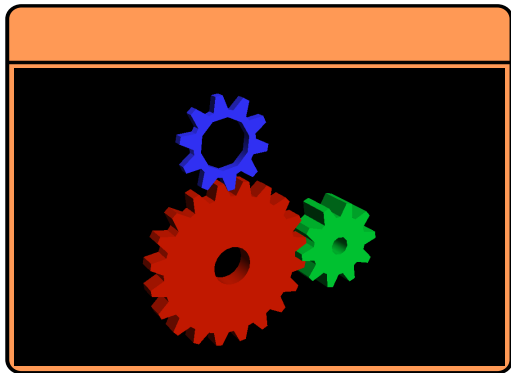


Keyboard (exp.)

- Keymap mapping to win32.

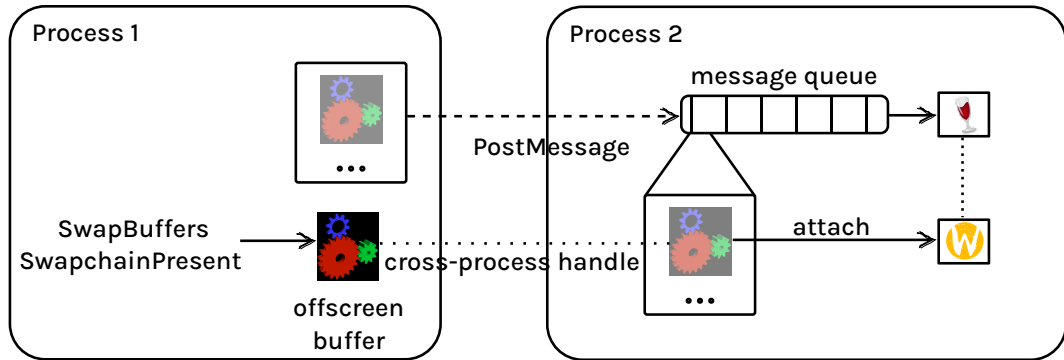
- Translate between WSIs
- Subsurface for GL/Vulkan content
- GL front buffer rendering

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- Subsurface for GL/Vulkan content
- GL front buffer rendering





Cross-process rendering (exp.)



The journey continues...



Thanks

- Contributors and brave experimental testers
- Wine upstream (esp. Rémi Bernon)
- Google