

wlroots frame scheduling

A tale of disaster and chaos

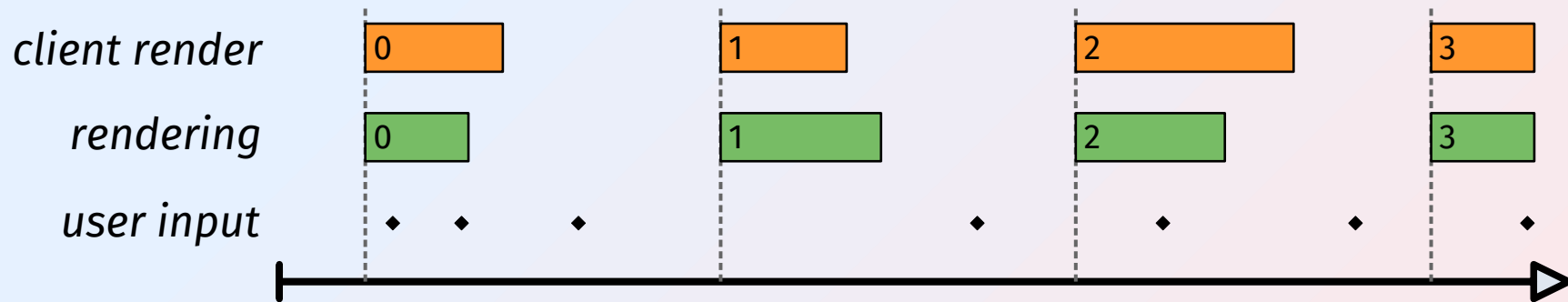
Put the funny here

- I spent summer Doing Useful Work On Software 👍👍
- I am going to talk to you about it
- If you are a wlroots user then pay very close attention



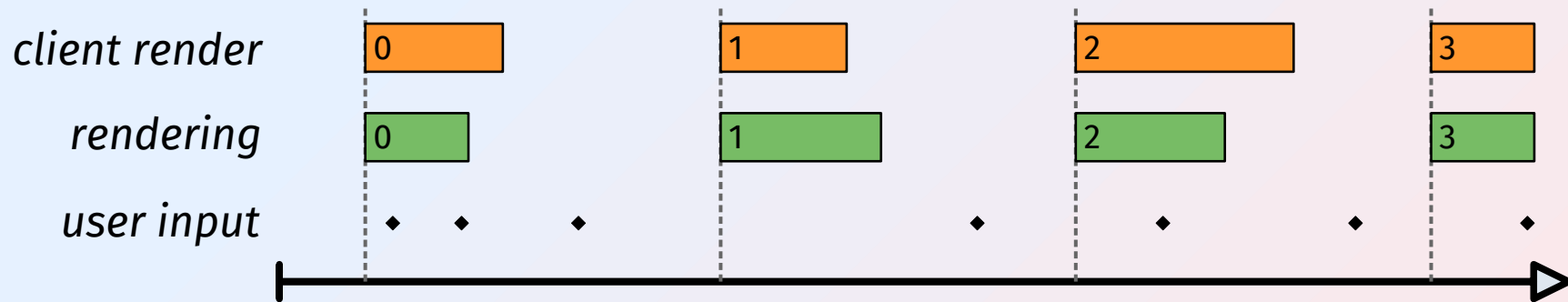
The Endless Cycle

- Outputs (typically) refresh at fixed intervals
- The real world does not!
- Rendering takes variable time
- Client rendering takes variable time but in a much more sinister way^(compositor-specific)



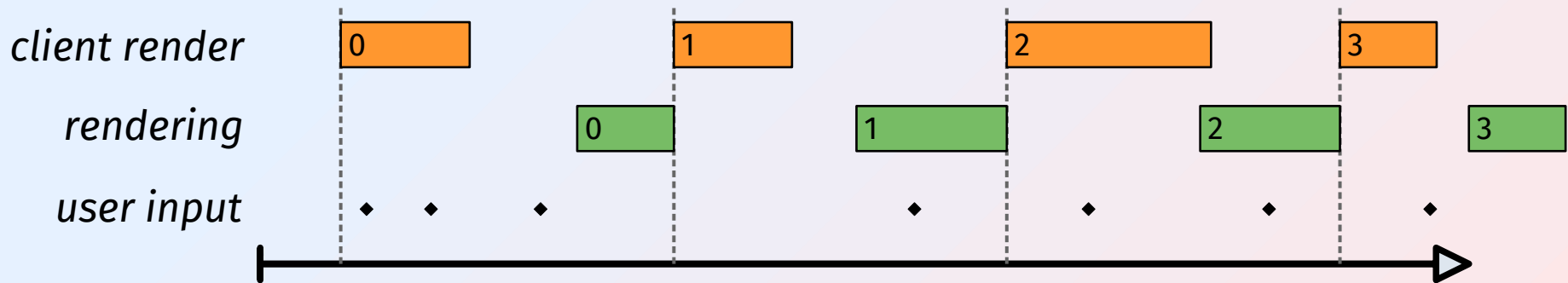
wlroots in days gone by

- Most wlroots users have this timeline
- It's kind of encouraged by wlroots' interface and examples
- Frame callbacks are sent when rendering starts (oh no!)



Ideally

- Rendering finishes just in time to present – no wasted time
- Can collect both user inputs and client frames
- Less latency!



Young and Naive

- First patch tried to add pre-render delay to the existing frame scheduling
- I thought I knew it all
- Learning by failure
- The GSoC “get your bearings” period is during my exams
- Thanks Kenny love you

Git lab

14147

rose

Patch :

Kenny

not how that works

rose

oh

Winning the Lottery

- We want to finish rendering as close to the deadline as possible
- We can't know how long rendering will take... but we can learn from previous frames

Timer? I hardly know her!

- Next on the agenda is render timers
- If we want to learn from previous frames, we better have measured them
- `wlr_render_timer, yay`

Winning the Lottery

- We want to finish rendering as close to the deadline as possible
- We can't know how long rendering will take... but we can learn from previous frames
- If only we had a tool that could show us, the developers, frame time behaviour
- That sure would be neat

Unforeseen Consequences

- Turns out writing compositors is hard
- `wlr_output_schedule_frame` makes a frame event happen “at some point”
- This is a lot more complicated than it sounds

Success, finally?

- Say goodbye to `wlr_output_schedule_frame`
- Enter the new frame scheduler interface
- The interface abstracts over presentation-feedback-based scheduling, `wl_surface.frame-based scheduling`, etc.
- Along with the render timer interface I think this is the only part of the project that didn't fail 😎
- MR !4307 genuinely sitting on the finish line right now
- One day we will have an implementation that supports firing frame a certain interval after present! (one day...)

But Not Today

- In the meantime, users get to handle the breakage of new frame scheduling for no benefit :)
- Enjoy your new and shiny render timers
- Thanks to Simon for putting up with me and my fullbright forehead
- Thanks to you for coming! `#ffffff`
- Pray you don't see me again next summer

