

Polishing X11

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This may not be what you expect

It's a rubbish title. Sorry.



'Every frame must be perfect'

- Momentary glitches on the desktop aren't disastrous
- Usually it's just a tiny quick flash
- People expect it from computers anyway, they're rubbish
- But a small visual artefact can ruin someone's impression of a consumer device
- Maintaining X for a consumer device = :(



Problems

- X is not Wayland
- Window reconfiguration is brutal
- RandR reconfiguration
- Video
- Server implementation is often awful
- Composite works great, except when you don't want it
- Initial & final presentation is ugly
- Tearing (ouch)



How much is fixable?

- How strong is your gag reflex?
- Everyone hacks it to be shippable, one way or another
- Most embedded/consumer device patchsets are deeply unpleasant (if you can find them)
- The hidden ones are probably worse still



RandR problems

- Assumption: screen changing happens very rarely
- Current implementation: Sledgehammer reconfiguration at every opportunity
- No single atomic calls for complex reconfiguration -> more sledgehammer!
- 'No-one actually wants to rotate, right?'



Composite problems

- Switching between composited and uncomposited modes is punitive
- 'Don't do that then'
- An attractive argument, but one I lost



Window reconfiguration

- Specified to look hideous in the core protocol; intermediate frames are guaranteed incorrect
- Backgrounds are probably a trap
- Bit gravity is almost certainly a trap
- Composite effectively mandatory during window reconfiguration
- Apps/toolkits are heartbreakingly dumb
- Not to mention window managers
- So even when you've fixed X, it'll still look rubbish
- Everyone to the pub



Video

- Textured video eliminates colourkeying
- ... and uses all the power in the world.
- Colourkeys are generally the most hideous colours possible.
- Extreme care is required to guarantee that the colourkey is **never** shown to the user – not even a single frame.
- Most people do not take extreme care.



Tearing

- Wasn't such a problem previously
- Early devices had tiny screens, UI mostly static
- Current generation have huge screens (heading towards 720p), whizzy fast animations everywhere, texturing from the entire planet
- Either fix tearing or never do a horizontal animation
- DRI2 makes this possible \o\ \o/ /o/



Misc implementation issues

- Initial presentation – yeesh!
- At least it's not the root weave anymore.
- Shutting down looks truly hideous
- Server-side cursor rendering is not viable
- Impossible to debug rendering issues
- 'I'm getting a junk frame somewhere. Great.'
- Toolkits are wildly suboptimal, so are browsers
- But this is impossible to prove without useful traces



Merci beaucoup

Questions ?

