

media decode and 2D composition

Daniel Stone  
<http://fooishbar.org>



not dmabuf ...



presentation issues for media



formats

atomicity

timing

misc



current video state of the art  
combine EGLImage and OpenMAX  
display with GLES, or X11's Xv



EGL is a disaster

image\_external prevents useful scaling

no timing information

conversion/filtering not as good as overlays



let's use overlays everywhere  
(or planes, sprites, cursors)  
... but how?



format negotiation

how hard can it be?





GStreamer:  
MIME type and FourCC

V4L:  
FourCC

DRM:  
different FourCC



Wayland formats are per-protocol

e.g. wl\_drm uses DRM FourCC



esoteric tiled planar YUV

YUV full vs. clamped range

RGB colourspaces

MIME type is really handy for these



atomicity

think: scrolling content with video



Wayland supports this with subsurfaces  
'lock' a surface tree for atomic updates



KMS nuclear pageflip

implementation extant, not merged

next steps unclear



timing

queuing / feedback / domains



accuracy is crucial in media/broadcast

one frame out every 24 hours





queuing

provide list of future flips & target times

cancel queued flips (requires event)

or supercede / revise?



some hardware provides a 'carousel'  
automatic switching between slots every 16ms  
cannot reliably implement this w/o carousel  
frame miss penalty: jump backwards



prior art: EGL\_NV\_present\_video

target timing ranges

arbitrary range of 'video slots'

only GLX/WGL



nothing in Wayland or KMS for this (yet)

nuclear pageflip could be a good base?



feedback

assuming the worst:  
we will miss sometimes

crucial to mitigate impact



current DRM vblank events suffice

work underway in Wayland

EGL has none at all (and no events)



domains

which time domain do we use?

hardware time bases are useless w/o query

light queryable timer required for A/V sync



currently require `CLOCK_MONOTONIC`

would be brilliant to get hw timers ...





wildcard: colourkeying

falling back when you open a menu sucks

required for STB



wildcard: interlaced video

?!

perhaps nuclear pageflip again?



wildcard: sync/fences

discussed tomorrow in Android Graphics

need query/event to avoid blocking compositor



wildcard: carousels

strict 16ms switching between slots



thanks

