

Directions in Linux OpenGL

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What we're working on

- Multisampling
- GL 3.1
- GLES 3.0
- GL 3.2+
- Performance
- What matters to GStreamer

Multisampling

- Like supersampling for antialiasing, but only runs shaders once.
- Supposed to be part of GL 3.0
- Now going to ship in GL 3.1 release.
- 4x on gen6
- 8x on gen7

GL 3.1

- ARB decided to allow 3.1 contexts to drop deprecated functionality
 - No more accum buffers!
 - No more glBegin()!
 - No more glDrawPixels()!
 - No more glTexEnv()!
- So we dropped deprecated functionality
- Texture buffer objects added
- Uniform buffer objects added

GL ES 3.0

- A mixed subset of GL 3.3
 - no geometry shaders
 - no texture buffer objects
 - no multisample texturing
- With some new stuff
 - ETC2
- Hoping to support in Q1 2013
- Testing is hard
- Looks much more like the GL you actually wanted for embedded

Performance

- Threaded GL dispatch
 - Probably will be GL 3.1 only
- Better memory mapping
 - What if you could map your textures, instead of using PBOs and hoping?
 - What if you could map your renderbuffer to do SW rendering?
 - EGL_KHR_lock_surface2
- LLVM shader compiler backend
- Windows vs Linux matchups

GL 3.2+

- Geometry shaders are a bunch of work
- Multisampled textures.
- Probably won't release ever
 - because we've done the rest of the work for getting GL 3.3!
- GL 4.0 will be a while after that.
 - Two new shader stages
 - doubles
 - subroutines

What we want from GStreamer

- Ask for GL 3.1!
 - GLX_ARB_create_context
 - Don't forget to fall back to old context creation
- Give us time to do threaded work
 - Keep asking for shader compile/link status, but delay it so we have some time to do the work in parallel.
- Use GL more!
 - It should be a large power (and hopefully performance) win over CPU-side processing for a lot of scaling/colorspace conversion/etc loads.

What we want from GStreamer

- Use EGL
 - Still gives you access to desktop GL, but also GLES.
 - Should be the same set of functionality, but more portable.
- Link up with gst-vaapi
 - vaapi can now push data to EGLImages

gst-plugins-gi next steps

- 0.10-based master branch doesn't even build
- 1.0 branch at [git://github.com/ystreet/gst-plugins-gi.git](https://github.com/ystreet/gst-plugins-gi.git)
- Let's get that merged
- `gstglwindow_x11` no longer needs a window as of GL 3.0
- `GLX_MESA_multithread_makecurrent`
 - Now you can bind your GL context in multiple threads.
 - Synchronization is up to you.

L4D2

- Valve gave us their source code
 - We fixed context creation
 - We fixed texture sampling bug
 - We can push changes back to them
- Best video game debugging interaction ever.

L4D2

- We of course gave Valve our source code
 - “This is amazing!”
 - Game developers never had visibility into why things don't work
 - or why it's so slow
 - Fast turn-around
 - debug output for app tuning 30 minutes later

L4D2 status

- Valve has reached performance parity on another driver
- Not at performance parity yet on Intel
- One known rendering bug left