



Ecosystem Update

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Outline

- **SDK News**
 - **Documentation**
 - **KTX and libktx**
 - **GLU3**
- **Desktop EGL and EGL Sample Implementation**
- **Conformance**

SDK News – Documentation

- **Man pages finally updated!**
- **Separate GL 3.3 and GL 4.1 sections**
 - <http://www.khronos.org/sdk/docs/man3>
 - <http://www.khronos.org/sdk/docs/man4>
- **Thanks to Graham Sellers!**

SDK News – KTX Tools

- **KTX (Khronos TeXture) is a lightweight file format for OpenGL / OpenGL ES textures**
- **Contains all the parameters needed for texture loading in GL / ES**
- **Supports many texture target types and formats, including ETC1 texture compression**
- **libktx provides functions for writing KTX files and loading textures from KTX files**
- **<http://www.khronos.org/opengles/sdk/docs/tools/KTX> (and will be linked from the OpenGL SDK as well)**
- **Thanks to Mark Callow!**

SDK News - GLU3

- **GLU hasn't been kept up to date for modern OpenGL**
- **Mostly won't even work when using vertex shaders, or in the core profile**
- **GLU3 is an open source project intended to be a modern GLU that works in the programmable shader world**
 - **Vector/matrix math, viewing transforms, arcball controller**
 - **Shape generators (like old GLU spheres, quadrics, etc.)**
 - **Shader helper functions**
- **0.9 release for SIGGRAPH at <http://dri.freedesktop.org/glu3/>, will be linked into the OpenGL SDK soon**
- **Thanks to Ian Romanick!**

EGL Overview

- **EGL originally was just a clone of GLX with the platform-specific data types replaced, to support OpenGL ES on mobile platforms**
- **EGL 1.4 provides basic resource management**
 - **Config selection supporting one or more client APIs (OpenGL ES, OpenVG)**
 - **Surface and API context creation**
 - **Binding contexts to surfaces for rendering**
 - **Displaying rendered surfaces**
- **EGL is widespread (though not on every mobile platform)**
- **Has grown over time to support other client APIs and (via extensions) synchronizing between / sharing images among those APIs**

Desktop EGL

- **OpenGL ES is now pervasive on mobile. OpenGL ES 2.0 on the desktop will help developers targeting mobile devices**
- **Desktop EGL may also diminish need for platform-specific layers in the future**
- **Many vendors interested in this, now working on an EGL “ICD loader” for Windows and Linux**
- **Similar functionality to Windows OPENGL32.DLL and Linux libGL.so**
 - **EGL framework**
 - **Load and dispatch calls to appropriate hardware driver**
 - **Much like the existing Khronos OpenCL ICD**

Desktop EGL

- **Implements “as much of EGL 1.4 as required” (some capabilities not relevant to OpenGL / OpenGL ES)**
- **Expected to be an open source project**
 - **Deploy binaries on khronos.org / opengl.org and with vendor driver downloads**
- **Intended to support OpenGL 4.1 and OpenGL ES 2.0 initially**
 - **Note that GL 4.1 include “ES2 compatibility” which is not the same thing as an OpenGL ES 2.0 context**
- **GLX / WGL / etc. aren't going away, but new projects should consider using EGL instead**
- **OpenGL ES + EGL on the desktop should be an attractive learning / development / porting platform for mobile apps**

EGL - Mobile API Interoperability Hub

Buffers, textures and video streams flow efficiently between any combination of client APIs



Inter-API Synchronization events enable efficient resource sharing



EGL Interoperability Conformance Tests being created to ensure that client APIs can cleanly communicate

Enabling the Khronos individual APIs to interoperate as a coherent ecosystem



EGL Sample Implementation

- **Combines software renderers for EGL 1.4, many EGL interoperability extensions, OpenGL ES 2.0, OpenVG 1.1, OpenMAX IL 1.1**
- **Open source project which will deploy as a VMware image running under Ubuntu Linux**
- **On schedule, about 75% complete. Expect to release in 2-3 months**
- **Very different focus from Desktop EGL – this is a full set of Khronos mobile APIs and interoperability extensions, but is not hardware accelerated**
- **Will talk more about this in the Mobile BOF tomorrow**
- **Thanks to Greg Prisament of Lychee Software, our contractor!**

Conformance

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Conformance

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Conformance

- **We have been talking about updating conformance for a while...**
- **Quite a while...**
- **Really a very long while...**
- **Last updated for OpenGL 1.2.1 (1999), to be precise**

Conformance

- **Finally making some concrete progress**
- **OpenGL ES 2.0 conformance suite has been ported to desktop GL**
- **Started adding basic tests for new functionality already**
- **But we'll need a dedicated design / coding effort (~6-9 man-months) to complete**
- **Project funding proposal going to the Khronos Promoters at next opportunity, will be followed by an RFQ**
- **Future OpenGL ES versions will leverage this work, since they are likely to implement more desktop functionality**