Khronos and OpenGL ES Status

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Khronos News – SIGGRAPH 2006
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All active members of OpenGL ARB have joined / joining
Intel and Samsung have seats on Board of Promoters – Apple will soon
Khronos now driving dynamic media standards for embedded and desktop
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Used by all major authoring tools as 3D asset exchange standard
Adopted as an import format by Google Earth
Essential to OpenGL and OpenGL ES for FX Framework and authoring
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Defining a complete native API set for handheld media applications
Like DirectX for cell phones – except cross-platform and an open standard
Gaining strong support from Wireless Operators – Vodafone joins Khronos
Includes OpenGL ES for 2D/3D graphics
Khronos Dynamic Media Ecosystem
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2D/3D

Vector 2D

Streaming Media

Enhanced Audio

Embedded Media Acceleration APIs
Khronos Dynamic Media Ecosystem

Includes mixed media acceleration and OS portability APIs

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Embedded Media Acceleration

APIs

Dynamic Media Authoring Standards

COLLADA

3D Authoring

OpenML

Dynamic Media Authoring

OpenVL

Streaming Media

OpenMAX

Enhanced Audio

OpenCL

2D/3D
c

Vector

2D

OpenKODE

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Khronos Dynamic Media Ecosystem

Cross-platform graphics authoring/acceleration Ecosystem

OpenGL
Cross platform 2D/3D

COLLADA
3D Authoring

Dynamic Media Authoring Standards

Dynamic Media Authoring

OpenML

Embedded Media Acceleration APIs

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Includes mixed media acceleration and OS portability APIs

OpenGL ES
2D/3D

OpenVG
Vector 2D

OpenMAX
Streaming Media

OpenSL ES
Enhanced Audio

OpenCODE

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OpenGL ES – Two Track Standard

- Two tracks - manage mobile graphics through programmable transition
  - With maximized portability and minimized platform costs
- OpenGL ES 2.0 ruthlessly eliminates redundancy – just like 1.X
  - Deprecates all fixed functionality that can be replaced by shaders
  - Significant reduction in engine cost and driver complexity
- Platforms can ship either or both 1.X and 2.X libraries
  - Cheaper, more flexible than one large driver with both fixed and programmable functions
  - With full backwards compatibility maintained in each track
- OpenGL ES 2.X does NOT replace OpenGL ES 1.X
  - Will always need lowest cost, non-programmable hardware for certain high-volume devices
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OpenGL ES 1.X – Fixed Function Acceleration
OpenGL ES 1.1
- For software and fixed functionality hardware
- All 1.X specifications are backwards compatible

OpenGL ES 2.X – Programmable Acceleration
OpenGL ES 2.0
- Vertex & pixel shaders through GLSL ES shading language
- All 2.X specifications will be backwards compatible
OpenGL ES 1.x Current Work & Roadmap

• Future versions (1.2) on hold until demonstrated market need exists
  - OpenGL ES 1.x content marketplace best served by stability
  - OpenGL ES 1.1 Extension Pack (2005) provides future direction for those that need it
  - Will release OpenGL ES 1.2 when and if it is needed

• Actively supporting OpenGL ES 1.1 and create healthy content market
  - Spec clarifications and bug fixes
  - Improvements to conformance tests
    - Drive more consistent behavior and more reliable implementations
  - Documentation
    - Implementer’s Guide (Mark Callow, HI Corp)
    - Man Pages (Ross Thompson, NVIDIA)
  - Education: Khronos Developer University worldwide series
  - Building Community
    - Programming contest
    - Support for Open Source (Hans-Martin Will, Vincent)
    - Encouraging tools and infrastructure – gDEBugger from Graphic Remedy
OpenGL ES 2.0 Status

• Final specification planned for 4Q06
  - OpenGL ES 2.0 provisional specification released at SIGGRAPH 2005

• Making sure the standard is rock solid when released
  - Conformance tests will ship with the final specification
  - Requiring two working implementations to shake out the spec

• Raising the bar for OES extensions
  - Require conformance test before promotion to OES status
  - Require one working implementation
OpenGL in Khronos

- Can synergize resources and outreach
  - Common Conformance tests, marketing and web-site, tool chains etc.

- API collaboration
  - OpenGL, OpenGL ES, COLLADA, OpenKODE (EGL and debugging), OpenVG

- OpenGL and OpenGL ES Working Groups will remain independent
  - Both groups will be able to make decisions that best serve their own markets
  - OpenGL Working Group for desktop graphics
  - OpenGL ES Working Group for embedded graphics
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OpenGL Roadmap Synergy

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- “OpenGL 3.0” could use OpenGL ES 2.0 design for lean and mean core
  - Add nexgen performance, shaders (geometry, sample, uniforms), tool integration, object model
- Both APIs can share same conformance test foundation
  - Significant recent investment in OpenGL ES conformance tests by Khronos
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