



Other New OpenGL Stuff

Important stuff that doesn't fit elsewhere

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New OpenGL Functionality

- **OpenGL 1.4**
- **Enhanced Stencil Functionality**
- **Floating Point Images**



OpenGL 1.4

- **Automatic Mipmap Generation**
- **Enhanced Blending**
- **Depth Texture/Shadow Texture**
- **Point Parameters**
- **Fog Coord**
- **Secondary Color**
- **Stencil Wrap**
- **LOD Bias**
- **Mirrored Repeat**
- **Window Pos**



Enhanced Stencil Functionality

- **Vendor Specific**
 - **EXT_stencil_two_side**
 - **ATI_separate_stencil**
- **Change stencil operations**
 - **Based on face directions**
- **Primarily used for shadow volumes**
 - **Reduces to a single geometry submission**



Key Differences

- **Always on vs. Enable**
- **Active Face State**
- **Duplication of Masks and Reference Value**



Floating Point Images

- **Multiple Data Formats**
- **Textures**
- **Render Targets**



Floating Point Formats

- **32-bit**
 - Essentially IEEE single precision
 - s23e8 format
- **16-bit**
 - Reduced Range and precision
 - s10e5 format



Floating Point Textures

- **Vendor Specific Extensions**
 - **ATI_texture_float**
 - **NV_float_buffer**
- **Not filterable**
 - **Only NEAREST or NEAREST_MIPMAP_NEAREST**



Key Differences

- **ATI**
 - **Extension Supports Filtering (SW)**
 - **All Standard Texture Formats**
 - **Available in Fixed Function and Programs**
- **NVIDIA**
 - **Rectangle Textures**
 - **Vector-style Texture Formats**
 - **Available in Programs**



Floating Point Targets

- **Vendor Specific Extensions**
 - NV_float_buffer
 - ATI_pixel_format_float
- **Off-screen only**
- **Lack 'Back End Operations'**
 - No Coverage Application
 - No Alpha Test
 - No Alpha Blend
 - No Dither
 - No Logic Op



Key Differences

- **NVIDIA**
 - Available in Programs
 - Output skips 'backend' operations
 - Packs vectors
- **ATI**
 - Supports Fixed-Function and Programs
 - Most 'backend' operations still occur (SW)
 - Outputs separate vectors



Advances in the OpenGL API

- **New Core Functionality**
 - OpenGL 1.4
- **New HW Capabilities as Vendor Extensions**
 - Stencil Enhancements
 - Floating Point Images



Questions?

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