OpenGL Reference Update

Graphics & Imaging > OpenGL

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Contents

Introduction to OpenGL Reference Update

This document summarizes the symbols that have been added to the OpenGL framework. The full reference documentation notes in what version a symbol was introduced, but sometimes it's useful to see only the new symbols for a given release.

If you are not familiar with this framework you should refer to the complete framework reference documentation.

Organization of This Document

Symbols are grouped by class or protocol for Objective-C and by header file for C. For each symbol there is a link to complete documentation, if available, and a brief description, if available.

See Also

For reference documentation on this framework, see *CGL Reference*.

10.5 Symbol Changes

This article lists the symbols added to `OpenGL.framework` in Mac OS X v10.5.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

CGLMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`CGL_HANDLE_ARB`	
`glBeginTransformFeedbackEXT`	
`glBindBufferBaseEXT`	
`glBindBufferOffsetEXT`	
`glBindBufferRangeEXT`	
`glBindFragDataLocationEXT`	
`glBlitFramebufferEXT`	
`glClearColorIiEXT`	
`glClearColorIuiEXT`	
`glEndTransformFeedbackEXT`	
`glFramebufferTextureEXT`	
`glFramebufferTextureFaceEXT`	
`glFramebufferTextureLayerEXT`	
`glGetBooleanIndexedvEXT`	
`glGetFragDataLocationEXT`	

glGetIntegerIndexedvEXT	
glGetObjectParameterivAPPLE	
glGetTexParameterIiuvEXT	
glGetTexParameterIivEXT	
glGetTransformFeedbackVaryingEXT	
glGetUniformBufferSizeEXT	
glGetUniformOffsetEXT	
glGetUniformuivEXT	
glGetVertexAttribIivEXT	
glGetVertexAttribIuivEXT	
glObjectPurgeableAPPLE	
glObjectUnpurgeableAPPLE	
glProgramParameteriEXT	
glRenderbufferStorageMultisampleEXT	
glTexParameterIivEXT	
glTexParameterIuivEXT	
glTransformFeedbackVaryingsEXT	
glUniform1uiEXT	
glUniform1uivEXT	
glUniform2uiEXT	
glUniform2uivEXT	
glUniform3uiEXT	
glUniform3uivEXT	
glUniform4uiEXT	
glUniform4uivEXT	
glUniformBufferEXT	
glUniformMatrix2x3fv	
glUniformMatrix2x4fv	

glUniformMatrix3x2fv	
glUniformMatrix3x4fv	
glUniformMatrix4x2fv	
glUniformMatrix4x3fv	
glVertexAttribI1iEXT	
glVertexAttribI1ivEXT	
glVertexAttribI1uiEXT	
glVertexAttribI1uivEXT	
glVertexAttribI2iEXT	
glVertexAttribI2ivEXT	
glVertexAttribI2uiEXT	
glVertexAttribI2uivEXT	
glVertexAttribI3iEXT	
glVertexAttribI3ivEXT	
glVertexAttribI3uiEXT	
glVertexAttribI3uivEXT	
glVertexAttribI4bvEXT	
glVertexAttribI4iEXT	
glVertexAttribI4ivEXT	
glVertexAttribI4svEXT	
glVertexAttribI4ubvEXT	
glVertexAttribI4uiEXT	
glVertexAttribI4uivEXT	
glVertexAttribI4usvEXT	
glVertexAttribIPointerEXT	

CGLProfilerFunctionEnum.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLFEglBlitFramebufferEXT	
kCGLFEglGetObjectParameterivAPPLE	
kCGLFEglGetRenderbufferStorageFormatOES	
kCGLFEglGetShaderPrecisionFormatOES	
kCGLFEglObjectPurgeableAPPLE	
kCGLFEglObjectUnpurgeableAPPLE	
kCGLFEglProgramEnvParameters4fvEXT	
kCGLFEglProgramLocalParameters4fvEXT	
kCGLFEglReleaseShaderCompilerOES	
kCGLFEglRenderbufferStorageMultisampleEXT	
kCGLFEglShaderBinaryOES	
kCGLFEglUniformMatrix2x3fv	
kCGLFEglUniformMatrix2x4fv	
kCGLFEglUniformMatrix3x2fv	
kCGLFEglUniformMatrix3x4fv	
kCGLFEglUniformMatrix4x2fv	
kCGLFEglUniformMatrix4x3fv	

CGLRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLRendererATIRadeonX2000ID	

kCGLRendererGeForce8xxxID	

CGLTypes.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLCPHasDrawable	
kCGLCPMPSwapsInFlight	
kCGLGOUseBuildCache	
kCGLPFAAllowOfflineRenderers	
kCGLRPOnline	

OpenGL.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

CGLGetContextRetainCount	
CGLGetPBufferRetainCount	
CGLGetPixelFormat	
CGLGetPixelFormatRetainCount	
CGLReleaseContext	
CGLReleasePBuffer	
CGLReleasePixelFormat	
CGLRetainContext	
CGLRetainPBuffer	
CGLRetainPixelFormat	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

CGL_VERSION_1_2	

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glUniformMatrix2x3fv	
glUniformMatrix2x4fv	
glUniformMatrix3x2fv	
glUniformMatrix3x4fv	
glUniformMatrix4x2fv	
glUniformMatrix4x3fv	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_COMPRESSED_SLUMINANCE	
GL_COMPRESSED_SLUMINANCE_ALPHA	
GL_COMPRESSED_SRGB	
GL_COMPRESSED_SRGB_ALPHA	
GL_CURRENT_RASTER_SECONDARY_COLOR	
GL_FLOAT_MAT2x3	
GL_FLOAT_MAT2x4	
GL_FLOAT_MAT3x2	
GL_FLOAT_MAT3x4	
GL_FLOAT_MAT4x2	

GL_FLOAT_MAT4x3	
GL_PIXEL_PACK_BUFFER	
GL_PIXEL_PACK_BUFFER_BINDING	
GL_PIXEL_UNPACK_BUFFER	
GL_PIXEL_UNPACK_BUFFER_BINDING	
GL_SLUMINANCE	
GL_SLUMINANCE8	
GL_SLUMINANCE8_ALPHA8	
GL_SLUMINANCE_ALPHA	
GL_SRGB	
GL_SRGB8	
GL_SRGB8_ALPHA8	
GL_SRGB_ALPHA	
GL_VERSION_2_1	

glext.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glBeginTransformFeedbackEXT	
glBindBufferBaseEXT	
glBindBufferOffsetEXT	
glBindBufferRangeEXT	
glBindFragDataLocationEXT	
glBlitFramebufferEXT	
glClearColorIiEXT	
glClearColorIuiEXT	
glEndTransformFeedbackEXT	

glFramebufferTextureEXT	
glFramebufferTextureFaceEXT	
glFramebufferTextureLayerEXT	
glGetBooleanIndexedvEXT	
glGetFragDataLocationEXT	
glGetIntegerIndexedvEXT	
glGetObjectParameterivAPPLE	
glGetTexParameterIiuvEXT	
glGetTexParameterIivEXT	
glGetTransformFeedbackVaryingEXT	
glGetUniformBufferSizeEXT	
glGetUniformOffsetEXT	
glGetUniformuivEXT	
glGetVertexAttribIivEXT	
glGetVertexAttribIuivEXT	
glObjectPurgeableAPPLE	
glObjectUnpurgeableAPPLE	
glProgramParameteriEXT	
glRenderbufferStorageMultisampleEXT	
glTexParameterIivEXT	
glTexParameterIuivEXT	
glTransformFeedbackVaryingsEXT	
glUniform1uiEXT	
glUniform1uivEXT	
glUniform2uiEXT	
glUniform2uivEXT	
glUniform3uiEXT	
glUniform3uivEXT	

glUniform4uiEXT	
glUniform4uivEXT	
glUniformBufferEXT	
glVertexAttribI1iEXT	
glVertexAttribI1ivEXT	
glVertexAttribI1uiEXT	
glVertexAttribI1uivEXT	
glVertexAttribI2iEXT	
glVertexAttribI2ivEXT	
glVertexAttribI2uiEXT	
glVertexAttribI2uivEXT	
glVertexAttribI3iEXT	
glVertexAttribI3ivEXT	
glVertexAttribI3uiEXT	
glVertexAttribI3uivEXT	
glVertexAttribI4bvEXT	
glVertexAttribI4iEXT	
glVertexAttribI4ivEXT	
glVertexAttribI4svEXT	
glVertexAttribI4ubvEXT	
glVertexAttribI4uiEXT	
glVertexAttribI4uivEXT	
glVertexAttribI4usvEXT	
glVertexAttribIPointerEXT	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_ALPHA16I_EXT	

GL_ALPHA16UI_EXT	
GL_ALPHA32I_EXT	
GL_ALPHA32UI_EXT	
GL_ALPHA8I_EXT	
GL_ALPHA8UI_EXT	
GL_ALPHA_INTEGER_EXT	
GL_APPLE_aux_depth_stencil	
GL_APPLE_object_purgeable	
GL_APPLE_row_bytes	
GL_ARB_half_float_pixel	
GL_AUX_DEPTH_STENCIL_APPLE	
GL_BGR_INTEGER_EXT	
GL_BGRA_INTEGER_EXT	
GL_BLUE_INTEGER_EXT	
GL_COMPRESSED_SLUMINANCE_ALPHA_EXT	
GL_COMPRESSED_SLUMINANCE_EXT	
GL_COMPRESSED_SRGB_ALPHA_EXT	
GL_COMPRESSED_SRGB_ALPHA_S3TC_DXT1_EXT	
GL_COMPRESSED_SRGB_ALPHA_S3TC_DXT3_EXT	
GL_COMPRESSED_SRGB_ALPHA_S3TC_DXT5_EXT	
GL_COMPRESSED_SRGB_EXT	
GL_COMPRESSED_SRGB_S3TC_DXT1_EXT	
GL_DRAW_FRAMEBUFFER_BINDING_EXT	
GL_DRAW_FRAMEBUFFER_EXT	
GL_EXT_bindable_uniform	
GL_EXT_framebuffer_blit	
GL_EXT_framebuffer_multisample	
GL_EXT_geometry_shader4	

GL_EXT_gpu_shader4	
GL_EXT_texture_integer	
GL_EXT_texture_sRGB	
GL_EXT_transform_feedback	
GL_FRAMEBUFFER_ATTACHMENT_LAYERED_EXT	
GL_FRAMEBUFFER_ATTACHMENT_TEXTURE_LAYER_EXT	
GL_FRAMEBUFFER_INCOMPLETE_LAYER_COUNT_EXT	
GL_FRAMEBUFFER_INCOMPLETE_LAYER_TARGETS_EXT	
GL_FRAMEBUFFER_INCOMPLETE_MULTISAMPLE_EXT	
GL_GEOMETRY_INPUT_TYPE_EXT	
GL_GEOMETRY_OUTPUT_TYPE_EXT	
GL_GEOMETRY_SHADER_EXT	
GL_GEOMETRY_VERTICES_OUT_EXT	
GL_GREEN_INTEGER_EXT	
GL_HALF_FLOAT_ARB	
GL_INT_SAMPLER_1D_ARRAY_EXT	
GL_INT_SAMPLER_1D_EXT	
GL_INT_SAMPLER_2D_ARRAY_EXT	
GL_INT_SAMPLER_2D_EXT	
GL_INT_SAMPLER_2D_RECT_EXT	
GL_INT_SAMPLER_3D_EXT	
GL_INT_SAMPLER_BUFFER_EXT	
GL_INT_SAMPLER_CUBE_EXT	
GL_INTENSITY16I_EXT	
GL_INTENSITY16UI_EXT	
GL_INTENSITY32I_EXT	
GL_INTENSITY32UI_EXT	
GL_INTENSITY8I_EXT	

GL_INTENSITY8UI_EXT	
GL_INTERLEAVED_ATTRIBS_EXT	
GL_LINE_STRIP_ADJACENCY_EXT	
GL_LINES_ADJACENCY_EXT	
GL_LUMINANCE16I_EXT	
GL_LUMINANCE16UI_EXT	
GL_LUMINANCE32I_EXT	
GL_LUMINANCE32UI_EXT	
GL_LUMINANCE8I_EXT	
GL_LUMINANCE8UI_EXT	
GL_LUMINANCE_ALPHA16I_EXT	
GL_LUMINANCE_ALPHA16UI_EXT	
GL_LUMINANCE_ALPHA32I_EXT	
GL_LUMINANCE_ALPHA32UI_EXT	
GL_LUMINANCE_ALPHA8I_EXT	
GL_LUMINANCE_ALPHA8UI_EXT	
GL_LUMINANCE_ALPHA_INTEGER_EXT	
GL_LUMINANCE_INTEGER_EXT	
GL_MAX_BINDABLE_UNIFORM_SIZE_EXT	
GL_MAX_FRAGMENT_BINDABLE_UNIFORMS_EXT	
GL_MAX_GEOMETRY_BINDABLE_UNIFORMS_EXT	
GL_MAX_GEOMETRY_OUTPUT_VERTICES_EXT	
GL_MAX_GEOMETRY_TEXTURE_IMAGE_UNITS_EXT	
GL_MAX_GEOMETRY_TOTAL_OUTPUT_COMPONENTS_EXT	
GL_MAX_GEOMETRY_UNIFORM_COMPONENTS_EXT	
GL_MAX_GEOMETRY_VARYING_COMPONENTS_EXT	
GL_MAX_PROGRAM_TEXEL_OFFSET_EXT	
GL_MAX_SAMPLES_EXT	

GL_MAX_TRANSFORM_FEEDBACK_INTERLEAVED_COMPONENTS_EXT	
GL_MAX_TRANSFORM_FEEDBACK_SEPARATE_ATTRIBS_EXT	
GL_MAX_TRANSFORM_FEEDBACK_SEPARATE_COMPONENTS_EXT	
GL_MAX_VARYING_COMPONENTS_EXT	
GL_MAX_VERTEX_BINDABLE_UNIFORMS_EXT	
GL_MAX_VERTEX_VARYING_COMPONENTS_EXT	
GL_MIN_PROGRAM_TEXEL_OFFSET_EXT	
GL_PACK_IMAGE_BYTES_APPLE	
GL_PACK_ROW_BYTES_APPLE	
GL_PRIMITIVES_GENERATED_EXT	
GL_PROGRAM_POINT_SIZE_EXT	
GL_PURGEABLE_APPLE	
GL_RASTERIZER_DISCARD_EXT	
GL_READ_FRAMEBUFFER_BINDING_EXT	
GL_READ_FRAMEBUFFER_EXT	
GL_RED_INTEGER_EXT	
GL_RELEASED_APPLE	
GL_RENDERBUFFER_SAMPLES_EXT	
GL_RETAINED_APPLE	
GL_RGB16I_EXT	
GL_RGB16UI_EXT	
GL_RGB32I_EXT	
GL_RGB32UI_EXT	
GL_RGB8I_EXT	
GL_RGB8UI_EXT	
GL_RGB_INTEGER_EXT	
GL_RGBA16I_EXT	
GL_RGBA16UI_EXT	

GL_RGBA32I_EXT	
GL_RGBA32UI_EXT	
GL_RGBA8I_EXT	
GL_RGBA8UI_EXT	
GL_RGBA_INTEGER_EXT	
GL_RGBA_INTEGER_MODE_EXT	
GL_SAMPLER_1D_ARRAY_EXT	
GL_SAMPLER_1D_ARRAY_SHADOW_EXT	
GL_SAMPLER_2D_ARRAY_EXT	
GL_SAMPLER_2D_ARRAY_SHADOW_EXT	
GL_SAMPLER_BUFFER_EXT	
GL_SAMPLER_CUBE_SHADOW_EXT	
GL_SEPARATE_ATTRIBS_EXT	
GL_SHADING_LANGUAGE_VERSION_ARB	
GL_SLUMINANCE8_ALPHA8_EXT	
GL_SLUMINANCE8_EXT	
GL_SLUMINANCE_ALPHA_EXT	
GL_SLUMINANCE_EXT	
GL_SRGB8_ALPHA8_EXT	
GL_SRGB8_EXT	
GL_SRGB_ALPHA_EXT	
GL_SRGB_EXT	
GL_TRANSFORM_FEEDBACK_BUFFER_BINDING_EXT	
GL_TRANSFORM_FEEDBACK_BUFFER_EXT	
GL_TRANSFORM_FEEDBACK_BUFFER_MODE_EXT	
GL_TRANSFORM_FEEDBACK_BUFFER_SIZE_EXT	
GL_TRANSFORM_FEEDBACK_BUFFER_START_EXT	
GL_TRANSFORM_FEEDBACK_PRIMITIVES_WRITTEN_EXT	

GL_TRANSFORM_FEEDBACK_VARYING_MAX_LENGTH_EXT	
GL_TRANSFORM_FEEDBACK_VARYINGS_EXT	
GL_TRIANGLE_STRIP_ADJACENCY_EXT	
GL_TRIANGLES_ADJACENCY_EXT	
GL_UNDEFINED_APPLE	
GL_UNIFORM_BUFFER_BINDING_EXT	
GL_UNIFORM_BUFFER_EXT	
GL_UNPACK_IMAGE_BYTES_APPLE	
GL_UNPACK_ROW_BYTES_APPLE	
GL_UNSIGNED_INT_SAMPLER_1D_ARRAY_EXT	
GL_UNSIGNED_INT_SAMPLER_1D_EXT	
GL_UNSIGNED_INT_SAMPLER_2D_ARRAY_EXT	
GL_UNSIGNED_INT_SAMPLER_2D_EXT	
GL_UNSIGNED_INT_SAMPLER_2D_RECT_EXT	
GL_UNSIGNED_INT_SAMPLER_3D_EXT	
GL_UNSIGNED_INT_SAMPLER_BUFFER_EXT	
GL_UNSIGNED_INT_SAMPLER_CUBE_EXT	
GL_UNSIGNED_INT_VEC2_EXT	
GL_UNSIGNED_INT_VEC3_EXT	
GL_UNSIGNED_INT_VEC4_EXT	
GL_VERTEX_ATTRIB_ARRAY_INTEGER_EXT	
GL_VOLATILE_APPLE	

10.4 Symbol Changes

This article lists the symbols added to `OpenGL.framework` in Mac OS X v10.4.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

CGLMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`CGL_MACRO_CONTEXT_RENDERER`	
`CGL_MACRO_DECLARE_CONTEXT`	
`CGL_MACRO_DECLARE_RENDERER`	
`CGL_MACRO_DECLARE_VARIABLES`	
`CGL_MACRO_RENDERER`	
`glAttachShader`	
`glBindAttribLocation`	
`glBindFramebufferEXT`	
`glBindRenderbufferEXT`	
`glBlendEquationSeparate`	
`glBufferParameteriAPPLE`	
`glCheckFramebufferStatusEXT`	
`glCompileShader`	
`glCreateProgram`	
`glCreateShader`	

glDeleteFramebuffersEXT	
glDeleteProgram	
glDeleteRenderbuffersEXT	
glDeleteShader	
glDetachShader	
glDisableVertexAttribArray	
glDrawBuffers	
glDrawBuffersARB	
glEnableVertexAttribArray	
glFlushMappedBufferRangeAPPLE	
glFramebufferRenderbufferEXT	
glFramebufferTexture1DEXT	
glFramebufferTexture2DEXT	
glFramebufferTexture3DEXT	
glGenerateMipmapEXT	
glGenFramebuffersEXT	
glGenRenderbuffersEXT	
glGetActiveAttrib	
glGetActiveUniform	
glGetAttachedShaders	
glGetAttribLocation	
glGetFramebufferAttachmentParameterivEXT	
glGetProgramInfoLog	
glGetProgramiv	
glGetRenderbufferParameterivEXT	
glGetShaderInfoLog	
glGetShaderiv	
glGetShaderSource	

glGetUniformfv	
glGetUniformiv	
glGetUniformLocation	
glGetVertexAttribdv	
glGetVertexAttribfv	
glGetVertexAttribiv	
glGetVertexAttribPointerv	
glIsFramebufferEXT	
glIsProgram	
glIsRenderbufferEXT	
glIsShader	
glLinkProgram	
glMultiDrawElementArrayAPPLE	
glMultiDrawRangeElementArrayAPPLE	
glPointParameteri	
glPointParameteriv	
glProgramEnvParameters4fvEXT	
glProgramLocalParameters4fvEXT	
glRenderbufferStorageEXT	
glShaderSource	
glStencilFuncSeparate	
glStencilMaskSeparate	
glStencilOpSeparate	
glUniform1f	
glUniform1fv	
glUniform1i	
glUniform1iv	
glUniform2f	

glUniform2fv	
glUniform2i	
glUniform2iv	
glUniform3f	
glUniform3fv	
glUniform3i	
glUniform3iv	
glUniform4f	
glUniform4fv	
glUniform4i	
glUniform4iv	
glUniformMatrix2fv	
glUniformMatrix3fv	
glUniformMatrix4fv	
glUseProgram	
glValidateProgram	
glVertexAttrib1d	
glVertexAttrib1dv	
glVertexAttrib1f	
glVertexAttrib1fv	
glVertexAttrib1s	
glVertexAttrib1sv	
glVertexAttrib2d	
glVertexAttrib2dv	
glVertexAttrib2f	
glVertexAttrib2fv	
glVertexAttrib2s	
glVertexAttrib2sv	

glVertexAttrib3d	
glVertexAttrib3dv	
glVertexAttrib3f	
glVertexAttrib3fv	
glVertexAttrib3s	
glVertexAttrib3sv	
glVertexAttrib4bv	
glVertexAttrib4d	
glVertexAttrib4dv	
glVertexAttrib4f	
glVertexAttrib4fv	
glVertexAttrib4iv	
glVertexAttrib4Nbv	
glVertexAttrib4Niv	
glVertexAttrib4Nsv	
glVertexAttrib4Nub	
glVertexAttrib4Nubv	
glVertexAttrib4Nuiv	
glVertexAttrib4Nusv	
glVertexAttrib4s	
glVertexAttrib4sv	
glVertexAttrib4ubv	
glVertexAttrib4uiv	
glVertexAttrib4usv	
glVertexAttribPointer	

CGLProfiler.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLGOEnableBreakpoint	
kCGLGOHideObjects	
kCGLProfBreakAfter	
kCGLProfBreakBefore	

CGLProfilerFunctionEnum.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

CGLProfilerFunctionEnum	
kCGLFECGLChoosePixelFormat	
kCGLFECGLClearDrawable	
kCGLFECGLComment	
kCGLFECGLCopyContext	
kCGLFECGLCreateContext	
kCGLFECGLCreatePBuffer	
kCGLFECGLDescribePBuffer	
kCGLFECGLDescribePixelFormat	
kCGLFECGLDescribeRenderer	
kCGLFECGLDestroyContext	
kCGLFECGLDestroyPBuffer	
kCGLFECGLDestroyPixelFormat	
kCGLFECGLDestroyRendererInfo	

kCGLFECGLDisable	
kCGLFECGLEnable	
kCGLFECGLFlushDrawable	
kCGLFECGLGetCurrentContext	
kCGLFECGLGetFullScreen	
kCGLFECGLGetOffScreen	
kCGLFECGLGetOption	
kCGLFECGLGetParameter	
kCGLFECGLGetPBuffer	
kCGLFECGLGetSurface	
kCGLFECGLGetVersion	
kCGLFECGLGetVirtualScreen	
kCGLFECGLIsEnabled	
kCGLFECGLQueryRendererInfo	
kCGLFECGLSetCurrentContext	
kCGLFECGLSetFullScreen	
kCGLFECGLSetOffScreen	
kCGLFECGLSetOption	
kCGLFECGLSetParameter	
kCGLFECGLSetPBuffer	
kCGLFECGLSetSurface	
kCGLFECGLSetVirtualScreen	
kCGLFECGLTexImagePBuffer	
kCGLFECGLUpdateContext	
kCGLFEglAccum	
kCGLFEglActiveStencilFaceEXT	
kCGLFEglActiveTexture	
kCGLFEglAlphaFunc	

kCGLFEglAreTexturesResident	
kCGLFEglArrayElement	
kCGLFEglAttachObjectARB	
kCGLFEglBegin	
kCGLFEglBeginQuery	
kCGLFEglBindAttribLocationARB	
kCGLFEglBindBuffer	
kCGLFEglBindFramebufferEXT	
kCGLFEglBindProgramARB	
kCGLFEglBindRenderbufferEXT	
kCGLFEglBindTexture	
kCGLFEglBindVertexArrayEXT	
kCGLFEglBitmap	
kCGLFEglBlendColor	
kCGLFEglBlendEquation	
kCGLFEglBlendEquationSeparateEXT	
kCGLFEglBlendFunc	
kCGLFEglBlendFuncSeparate	
kCGLFEglBufferData	
kCGLFEglBufferParameteriAPPLE	
kCGLFEglBufferSubData	
kCGLFEglCallList	
kCGLFEglCallLists	
kCGLFEglCheckFramebufferStatusEXT	
kCGLFEglClear	
kCGLFEglClearAccum	
kCGLFEglClearColor	
kCGLFEglClearDepth	

kCGLFEglClearIndex	
kCGLFEglClearStencil	
kCGLFEglClientActiveTexture	
kCGLFEglClipPlane	
kCGLFEglColor3b	
kCGLFEglColor3bv	
kCGLFEglColor3d	
kCGLFEglColor3dv	
kCGLFEglColor3f	
kCGLFEglColor3fv	
kCGLFEglColor3i	
kCGLFEglColor3iv	
kCGLFEglColor3s	
kCGLFEglColor3sv	
kCGLFEglColor3ub	
kCGLFEglColor3ubv	
kCGLFEglColor3ui	
kCGLFEglColor3uiv	
kCGLFEglColor3us	
kCGLFEglColor3usv	
kCGLFEglColor4b	
kCGLFEglColor4bv	
kCGLFEglColor4d	
kCGLFEglColor4dv	
kCGLFEglColor4f	
kCGLFEglColor4fv	
kCGLFEglColor4i	
kCGLFEglColor4iv	

kCGLFEglColor4s	
kCGLFEglColor4sv	
kCGLFEglColor4ub	
kCGLFEglColor4ubv	
kCGLFEglColor4ui	
kCGLFEglColor4uiv	
kCGLFEglColor4us	
kCGLFEglColor4usv	
kCGLFEglColorMask	
kCGLFEglColorMaterial	
kCGLFEglColorPointer	
kCGLFEglColorSubTable	
kCGLFEglColorTable	
kCGLFEglColorTableParameterfv	
kCGLFEglColorTableParameteriv	
kCGLFEglCombinerInputNV	
kCGLFEglCombinerOutputNV	
kCGLFEglCombinerParameterfNV	
kCGLFEglCombinerParameterfvNV	
kCGLFEglCombinerParameteriNV	
kCGLFEglCombinerParameterivNV	
kCGLFEglCombinerStageParameterfvNV	
kCGLFEglCompileShaderARB	
kCGLFEglCompressedTexImage1D	
kCGLFEglCompressedTexImage2D	
kCGLFEglCompressedTexImage3D	
kCGLFEglCompressedTexSubImage1D	
kCGLFEglCompressedTexSubImage2D	

kCGLFEglCompressedTexSubImage3D	
kCGLFEglConvolutionFilter1D	
kCGLFEglConvolutionFilter2D	
kCGLFEglConvolutionParameterf	
kCGLFEglConvolutionParameterfv	
kCGLFEglConvolutionParameteri	
kCGLFEglConvolutionParameteriv	
kCGLFEglCopyColorSubTable	
kCGLFEglCopyColorTable	
kCGLFEglCopyConvolutionFilter1D	
kCGLFEglCopyConvolutionFilter2D	
kCGLFEglCopyPixels	
kCGLFEglCopyTexImage1D	
kCGLFEglCopyTexImage2D	
kCGLFEglCopyTexSubImage1D	
kCGLFEglCopyTexSubImage2D	
kCGLFEglCopyTexSubImage3D	
kCGLFEglCreateProgramObjectARB	
kCGLFEglCreateShaderObjectARB	
kCGLFEglCullFace	
kCGLFEglDeleteBuffers	
kCGLFEglDeleteFencesAPPLE	
kCGLFEglDeleteFramebuffersEXT	
kCGLFEglDeleteLists	
kCGLFEglDeleteObjectARB	
kCGLFEglDeleteProgramsARB	
kCGLFEglDeleteQueries	
kCGLFEglDeleteRenderbuffersEXT	

kCGLFEglDeleteTextures	
kCGLFEglDeleteVertexArraysEXT	
kCGLFEglDepthBoundsEXT	
kCGLFEglDepthFunc	
kCGLFEglDepthMask	
kCGLFEglDepthRange	
kCGLFEglDetachObjectARB	
kCGLFEglDisable	
kCGLFEglDisableClientState	
kCGLFEglDisableVertexAttribARB	
kCGLFEglDisableVertexAttribArrayARB	
kCGLFEglDrawArrays	
kCGLFEglDrawBuffer	
kCGLFEglDrawBuffersARB	
kCGLFEglDrawElementArrayAPPLE	
kCGLFEglDrawElements	
kCGLFEglDrawPixels	
kCGLFEglDrawRangeElementArrayAPPLE	
kCGLFEglDrawRangeElements	
kCGLFEglEdgeFlag	
kCGLFEglEdgeFlagPointer	
kCGLFEglEdgeFlagv	
kCGLFEglElementPointerAPPLE	
kCGLFEglEnable	
kCGLFEglEnableClientState	
kCGLFEglEnableVertexAttribARB	
kCGLFEglEnableVertexAttribArrayARB	
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kCGLFEglEvalCoord1fv	
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kCGLFEglEvalCoord2dv	
kCGLFEglEvalCoord2f	
kCGLFEglEvalCoord2fv	
kCGLFEglEvalMesh1	
kCGLFEglEvalMesh2	
kCGLFEglEvalPoint1	
kCGLFEglEvalPoint2	
kCGLFEglFeedbackBuffer	
kCGLFEglFinalCombinerInputNV	
kCGLFEglFinish	
kCGLFEglFinishFenceAPPLE	
kCGLFEglFinishObjectAPPLE	
kCGLFEglFinishRenderAPPLE	
kCGLFEglFlush	
kCGLFEglFlushMappedBufferRangeAPPLE	
kCGLFEglFlushRenderAPPLE	
kCGLFEglFlushVertexArrayRangeEXT	
kCGLFEglFogCoordd	
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kCGLFEglFogCoordf	
kCGLFEglFogCoordfv	

kCGLFEglFogCoordPointer	
kCGLFEglFogf	
kCGLFEglFogfv	
kCGLFEglFogi	
kCGLFEglFogiv	
kCGLFEglFramebufferRenderbufferEXT	
kCGLFEglFramebufferTexture1DEXT	
kCGLFEglFramebufferTexture2DEXT	
kCGLFEglFramebufferTexture3DEXT	
kCGLFEglFrontFace	
kCGLFEglFrustum	
kCGLFEglGenBuffers	
kCGLFEglGenerateMipmapEXT	
kCGLFEglGenFencesAPPLE	
kCGLFEglGenFramebuffersEXT	
kCGLFEglGenLists	
kCGLFEglGenProgramsARB	
kCGLFEglGenQueries	
kCGLFEglGenRenderbuffersEXT	
kCGLFEglGenTextures	
kCGLFEglGenVertexArraysEXT	
kCGLFEglGetActiveAttribARB	
kCGLFEglGetActiveUniformARB	
kCGLFEglGetAttachedObjectsARB	
kCGLFEglGetAttribLocationARB	
kCGLFEglGetBooleanv	
kCGLFEglGetBufferParameteriv	
kCGLFEglGetBufferPointerv	

kCGLFEglGetBufferSubData	
kCGLFEglGetClipPlane	
kCGLFEglGetColorTable	
kCGLFEglGetColorTableParameterfv	
kCGLFEglGetColorTableParameteriv	
kCGLFEglGetCombinerInputParameterfvNV	
kCGLFEglGetCombinerInputParameterivNV	
kCGLFEglGetCombinerOutputParameterfvNV	
kCGLFEglGetCombinerOutputParameterivNV	
kCGLFEglGetCombinerStageParameterfvNV	
kCGLFEglGetCompressedTexImage	
kCGLFEglGetConvolutionFilter	
kCGLFEglGetConvolutionParameterfv	
kCGLFEglGetConvolutionParameteriv	
kCGLFEglGetDoublev	
kCGLFEglGetError	
kCGLFEglGetFinalCombinerInputParameterfvNV	
kCGLFEglGetFinalCombinerInputParameterivNV	
kCGLFEglGetFloatv	
kCGLFEglGetFramebufferAttachmentParameterivEXT	
kCGLFEglGetHandleARB	
kCGLFEglGetHistogram	
kCGLFEglGetHistogramParameterfv	
kCGLFEglGetHistogramParameteriv	
kCGLFEglGetInfoLogARB	
kCGLFEglGetIntegerv	
kCGLFEglGetLightfv	
kCGLFEglGetLightiv	

kCGLFEglGetMapdv	
kCGLFEglGetMapfv	
kCGLFEglGetMapiv	
kCGLFEglGetMaterialfv	
kCGLFEglGetMaterialiv	
kCGLFEglGetMinmax	
kCGLFEglGetMinmaxParameterfv	
kCGLFEglGetMinmaxParameteriv	
kCGLFEglGetObjectParameterfvARB	
kCGLFEglGetObjectParameterivARB	
kCGLFEglGetPixelMapfv	
kCGLFEglGetPixelMapuiv	
kCGLFEglGetPixelMapusv	
kCGLFEglGetPointerv	
kCGLFEglGetPolygonStipple	
kCGLFEglGetProgramEnvParameterdvARB	
kCGLFEglGetProgramEnvParameterfvARB	
kCGLFEglGetProgramInfoLog	
kCGLFEglGetProgramiv	
kCGLFEglGetProgramivARB	
kCGLFEglGetProgramLocalParameterdvARB	
kCGLFEglGetProgramLocalParameterfvARB	
kCGLFEglGetProgramStringARB	
kCGLFEglGetQueryiv	
kCGLFEglGetQueryObjectiv	
kCGLFEglGetQueryObjectuiv	
kCGLFEglGetRenderbufferParameterivEXT	
kCGLFEglGetSeparableFilter	

kCGLFEglGetShaderInfoLog	
kCGLFEglGetShaderiv	
kCGLFEglGetShaderSourceARB	
kCGLFEglGetString	
kCGLFEglGetTexEnvfv	
kCGLFEglGetTexEnviv	
kCGLFEglGetTexGendv	
kCGLFEglGetTexGenfv	
kCGLFEglGetTexGeniv	
kCGLFEglGetTexImage	
kCGLFEglGetTexLevelParameterfv	
kCGLFEglGetTexLevelParameteriv	
kCGLFEglGetTexParameterfv	
kCGLFEglGetTexParameteriv	
kCGLFEglGetTexParameterPointervAPPLE	
kCGLFEglGetUniformfvARB	
kCGLFEglGetUniformivARB	
kCGLFEglGetUniformLocationARB	
kCGLFEglGetVertexAttribdvARB	
kCGLFEglGetVertexAttribfvARB	
kCGLFEglGetVertexAttribivARB	
kCGLFEglGetVertexAttribPointervARB	
kCGLFEglHint	
kCGLFEglHistogram	
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kCGLFEglIndexdv	
kCGLFEglIndexf	
kCGLFEglIndexfv	

kCGLFEglIndexi	
kCGLFEglIndexiv	
kCGLFEglIndexMask	
kCGLFEglIndexPointer	
kCGLFEglIndexs	
kCGLFEglIndexsv	
kCGLFEglIndexub	
kCGLFEglIndexubv	
kCGLFEglInitNames	
kCGLFEglInterleavedArrays	
kCGLFEglIsBuffer	
kCGLFEglIsEnabled	
kCGLFEglIsFenceAPPLE	
kCGLFEglIsFramebufferEXT	
kCGLFEglIsList	
kCGLFEglIsProgram	
kCGLFEglIsProgramARB	
kCGLFEglIsQuery	
kCGLFEglIsRenderbufferEXT	
kCGLFEglIsShader	
kCGLFEglIsTexture	
kCGLFEglIsVertexArrayEXT	
kCGLFEglIsVertexAttribEnabledARB	
kCGLFEglLightf	
kCGLFEglLightfv	
kCGLFEglLighti	
kCGLFEglLightiv	
kCGLFEglLightModelf	

kCGLFEglLightModelfv	
kCGLFEglLightModeli	
kCGLFEglLightModeliv	
kCGLFEglLineStipple	
kCGLFEglLineWidth	
kCGLFEglLinkProgramARB	
kCGLFEglListBase	
kCGLFEglLoadIdentity	
kCGLFEglLoadMatrixd	
kCGLFEglLoadMatrixf	
kCGLFEglLoadName	
kCGLFEglLoadTransposeMatrixd	
kCGLFEglLoadTransposeMatrixf	
kCGLFEglLockArraysEXT	
kCGLFEglLogicOp	
kCGLFEglMap1d	
kCGLFEglMap1f	
kCGLFEglMap2d	
kCGLFEglMap2f	
kCGLFEglMapBuffer	
kCGLFEglMapGrid1d	
kCGLFEglMapGrid1f	
kCGLFEglMapGrid2d	
kCGLFEglMapGrid2f	
kCGLFEglMapVertexAttrib1dARB	
kCGLFEglMapVertexAttrib1fARB	
kCGLFEglMapVertexAttrib2dARB	
kCGLFEglMapVertexAttrib2fARB	

kCGLFEglMaterialf	
kCGLFEglMaterialfv	
kCGLFEglMateriali	
kCGLFEglMaterialiv	
kCGLFEglMatrixMode	
kCGLFEglMinmax	
kCGLFEglMultiDrawArrays	
kCGLFEglMultiDrawElementArrayAPPLE	
kCGLFEglMultiDrawElements	
kCGLFEglMultiDrawRangeElementArrayAPPLE	
kCGLFEglMultiTexCoord1d	
kCGLFEglMultiTexCoord1dv	
kCGLFEglMultiTexCoord1f	
kCGLFEglMultiTexCoord1fv	
kCGLFEglMultiTexCoord1i	
kCGLFEglMultiTexCoord1iv	
kCGLFEglMultiTexCoord1s	
kCGLFEglMultiTexCoord1sv	
kCGLFEglMultiTexCoord2d	
kCGLFEglMultiTexCoord2dv	
kCGLFEglMultiTexCoord2f	
kCGLFEglMultiTexCoord2fv	
kCGLFEglMultiTexCoord2i	
kCGLFEglMultiTexCoord2iv	
kCGLFEglMultiTexCoord2s	
kCGLFEglMultiTexCoord2sv	
kCGLFEglMultiTexCoord3d	
kCGLFEglMultiTexCoord3dv	

kCGLFEglMultiTexCoord3f	
kCGLFEglMultiTexCoord3fv	
kCGLFEglMultiTexCoord3i	
kCGLFEglMultiTexCoord3iv	
kCGLFEglMultiTexCoord3s	
kCGLFEglMultiTexCoord3sv	
kCGLFEglMultiTexCoord4d	
kCGLFEglMultiTexCoord4dv	
kCGLFEglMultiTexCoord4f	
kCGLFEglMultiTexCoord4fv	
kCGLFEglMultiTexCoord4i	
kCGLFEglMultiTexCoord4iv	
kCGLFEglMultiTexCoord4s	
kCGLFEglMultiTexCoord4sv	
kCGLFEglMultMatrixd	
kCGLFEglMultMatrixf	
kCGLFEglMultTransposeMatrixd	
kCGLFEglMultTransposeMatrixf	
kCGLFEglNewList	
kCGLFEglNormal3b	
kCGLFEglNormal3bv	
kCGLFEglNormal3d	
kCGLFEglNormal3dv	
kCGLFEglNormal3f	
kCGLFEglNormal3fv	
kCGLFEglNormal3i	
kCGLFEglNormal3iv	
kCGLFEglNormal3s	

kCGLFEglNormal3sv	
kCGLFEglNormalPointer	
kCGLFEglOrtho	
kCGLFEglPassThrough	
kCGLFEglPixelMapfv	
kCGLFEglPixelMapuiv	
kCGLFEglPixelMapusv	
kCGLFEglPixelStoref	
kCGLFEglPixelStorei	
kCGLFEglPixelTransferf	
kCGLFEglPixelTransferi	
kCGLFEglPixelZoom	
kCGLFEglPnTrianglesfATI	
kCGLFEglPnTrianglesiATI	
kCGLFEglPointParameterf	
kCGLFEglPointParameterfv	
kCGLFEglPointParameteri	
kCGLFEglPointParameteriv	
kCGLFEglPointSize	
kCGLFEglPolygonMode	
kCGLFEglPolygonOffset	
kCGLFEglPolygonStipple	
kCGLFEglPopAttrib	
kCGLFEglPopClientAttrib	
kCGLFEglPopMatrix	
kCGLFEglPopName	
kCGLFEglPrioritizeTextures	
kCGLFEglProgramEnvParameter4dARB	

kCGLFEglProgramEnvParameter4dvARB	
kCGLFEglProgramEnvParameter4fARB	
kCGLFEglProgramEnvParameter4fvARB	
kCGLFEglProgramLocalParameter4dARB	
kCGLFEglProgramLocalParameter4dvARB	
kCGLFEglProgramLocalParameter4fARB	
kCGLFEglProgramLocalParameter4fvARB	
kCGLFEglProgramStringARB	
kCGLFEglPushAttrib	
kCGLFEglPushClientAttrib	
kCGLFEglPushMatrix	
kCGLFEglPushName	
kCGLFEglRasterPos2d	
kCGLFEglRasterPos2dv	
kCGLFEglRasterPos2f	
kCGLFEglRasterPos2fv	
kCGLFEglRasterPos2i	
kCGLFEglRasterPos2iv	
kCGLFEglRasterPos2s	
kCGLFEglRasterPos2sv	
kCGLFEglRasterPos3d	
kCGLFEglRasterPos3dv	
kCGLFEglRasterPos3f	
kCGLFEglRasterPos3fv	
kCGLFEglRasterPos3i	
kCGLFEglRasterPos3iv	
kCGLFEglRasterPos3s	
kCGLFEglRasterPos3sv	

kCGLFEglRasterPos4d	
kCGLFEglRasterPos4dv	
kCGLFEglRasterPos4f	
kCGLFEglRasterPos4fv	
kCGLFEglRasterPos4i	
kCGLFEglRasterPos4iv	
kCGLFEglRasterPos4s	
kCGLFEglRasterPos4sv	
kCGLFEglReadBuffer	
kCGLFEglReadPixels	
kCGLFEglRectd	
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kCGLFEglRectfv	
kCGLFEglRecti	
kCGLFEglRectiv	
kCGLFEglRects	
kCGLFEglRectsv	
kCGLFEglRenderbufferStorageEXT	
kCGLFEglRenderMode	
kCGLFEglResetHistogram	
kCGLFEglResetMinmax	
kCGLFEglRotated	
kCGLFEglRotatef	
kCGLFEglSampleCoverage	
kCGLFEglSamplePass	
kCGLFEglScaled	
kCGLFEglScalef	

kCGLFEglScissor	
kCGLFEglSecondaryColor3b	
kCGLFEglSecondaryColor3bv	
kCGLFEglSecondaryColor3d	
kCGLFEglSecondaryColor3dv	
kCGLFEglSecondaryColor3f	
kCGLFEglSecondaryColor3fv	
kCGLFEglSecondaryColor3i	
kCGLFEglSecondaryColor3iv	
kCGLFEglSecondaryColor3s	
kCGLFEglSecondaryColor3sv	
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kCGLFEglSecondaryColor3ubv	
kCGLFEglSecondaryColor3ui	
kCGLFEglSecondaryColor3uiv	
kCGLFEglSecondaryColor3us	
kCGLFEglSecondaryColor3usv	
kCGLFEglSecondaryColorPointer	
kCGLFEglSelectBuffer	
kCGLFEglSeparableFilter2D	
kCGLFEglSetFenceAPPLE	
kCGLFEglShadeModel	
kCGLFEglShaderSourceARB	
kCGLFEglStencilFunc	
kCGLFEglStencilFuncSeparate	
kCGLFEglStencilFuncSeparateATI	
kCGLFEglStencilMask	
kCGLFEglStencilMaskSeparate	

kCGLFEglStencilOp	
kCGLFEglStencilOpSeparateATI	
kCGLFEglTestFenceAPPLE	
kCGLFEglTestObjectAPPLE	
kCGLFEglTexCoord1d	
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kCGLFEglTexCoord1iv	
kCGLFEglTexCoord1s	
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kCGLFEglTexCoord2dv	
kCGLFEglTexCoord2f	
kCGLFEglTexCoord2fv	
kCGLFEglTexCoord2i	
kCGLFEglTexCoord2iv	
kCGLFEglTexCoord2s	
kCGLFEglTexCoord2sv	
kCGLFEglTexCoord3d	
kCGLFEglTexCoord3dv	
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kCGLFEglTexCoord3fv	
kCGLFEglTexCoord3i	
kCGLFEglTexCoord3iv	
kCGLFEglTexCoord3s	
kCGLFEglTexCoord3sv	

kCGLFEglTexCoord4d	
kCGLFEglTexCoord4dv	
kCGLFEglTexCoord4f	
kCGLFEglTexCoord4fv	
kCGLFEglTexCoord4i	
kCGLFEglTexCoord4iv	
kCGLFEglTexCoord4s	
kCGLFEglTexCoord4sv	
kCGLFEglTexCoordPointer	
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kCGLFEglTexEnvfv	
kCGLFEglTexEnvi	
kCGLFEglTexEnviv	
kCGLFEglTexGend	
kCGLFEglTexGendv	
kCGLFEglTexGenf	
kCGLFEglTexGenfv	
kCGLFEglTexGeni	
kCGLFEglTexGeniv	
kCGLFEglTexImage1D	
kCGLFEglTexImage2D	
kCGLFEglTexImage3D	
kCGLFEglTexParameterf	
kCGLFEglTexParameterfv	
kCGLFEglTexParameteri	
kCGLFEglTexParameteriv	
kCGLFEglTexSubImage1D	
kCGLFEglTexSubImage2D	

kCGLFEglTexSubImage3D	
kCGLFEglTextureRangeAPPLE	
kCGLFEglTranslated	
kCGLFEglTranslatef	
kCGLFEglUniform1fARB	
kCGLFEglUniform1fvARB	
kCGLFEglUniform1iARB	
kCGLFEglUniform1ivARB	
kCGLFEglUniform2fARB	
kCGLFEglUniform2fvARB	
kCGLFEglUniform2iARB	
kCGLFEglUniform2ivARB	
kCGLFEglUniform3fARB	
kCGLFEglUniform3fvARB	
kCGLFEglUniform3iARB	
kCGLFEglUniform3ivARB	
kCGLFEglUniform4fARB	
kCGLFEglUniform4fvARB	
kCGLFEglUniform4iARB	
kCGLFEglUniform4ivARB	
kCGLFEglUniformMatrix2fvARB	
kCGLFEglUniformMatrix3fvARB	
kCGLFEglUniformMatrix4fvARB	
kCGLFEglUnlockArraysEXT	
kCGLFEglUnmapBuffer	
kCGLFEglUseProgramObjectARB	
kCGLFEglValidateProgramARB	
kCGLFEglVertex2d	

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kCGLFEglVertex2f	
kCGLFEglVertex2fv	
kCGLFEglVertex2i	
kCGLFEglVertex2iv	
kCGLFEglVertex2s	
kCGLFEglVertex2sv	
kCGLFEglVertex3d	
kCGLFEglVertex3dv	
kCGLFEglVertex3f	
kCGLFEglVertex3fv	
kCGLFEglVertex3i	
kCGLFEglVertex3iv	
kCGLFEglVertex3s	
kCGLFEglVertex3sv	
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kCGLFEglVertex4dv	
kCGLFEglVertex4f	
kCGLFEglVertex4fv	
kCGLFEglVertex4i	
kCGLFEglVertex4iv	
kCGLFEglVertex4s	
kCGLFEglVertex4sv	
kCGLFEglVertexArrayParameteriEXT	
kCGLFEglVertexArrayRangeEXT	
kCGLFEglVertexAttrib1dARB	
kCGLFEglVertexAttrib1dvARB	
kCGLFEglVertexAttrib1fARB	

kCGLFEglVertexAttrib1fvARB	
kCGLFEglVertexAttrib1sARB	
kCGLFEglVertexAttrib1svARB	
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kCGLFEglVertexAttrib2dvARB	
kCGLFEglVertexAttrib2fARB	
kCGLFEglVertexAttrib2fvARB	
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kCGLFEglVertexAttrib4svARB	
kCGLFEglVertexAttrib4ubvARB	
kCGLFEglVertexAttrib4uivARB	
kCGLFEglVertexAttrib4usvARB	
kCGLFEglVertexAttribPointerARB	
kCGLFEglVertexBlendARB	
kCGLFEglVertexPointer	
kCGLFEglViewport	
kCGLFEglWeightbvARB	
kCGLFEglWeightdvARB	
kCGLFEglWeightfvARB	
kCGLFEglWeightivARB	
kCGLFEglWeightPointerARB	
kCGLFEglWeightsvARB	
kCGLFEglWeightubvARB	
kCGLFEglWeightuivARB	
kCGLFEglWeightusvARB	
kCGLFEglWindowPos2d	
kCGLFEglWindowPos2dv	
kCGLFEglWindowPos2f	
kCGLFEglWindowPos2fv	
kCGLFEglWindowPos2i	
kCGLFEglWindowPos2iv	
kCGLFEglWindowPos2s	
kCGLFEglWindowPos2sv	
kCGLFEglWindowPos3d	
kCGLFEglWindowPos3dv	

kCGLFEglWindowPos3f	
kCGLFEglWindowPos3fv	
kCGLFEglWindowPos3i	
kCGLFEglWindowPos3iv	
kCGLFEglWindowPos3s	
kCGLFEglWindowPos3sv	
kCGLFENumFunctions	

CGLRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLRendererATIRadeonX1000ID	Specifies the ATI Radio X1000 renderer.
kCGLRendererIntel900ID	Specifies the Intel GMA 900 renderer.

CGLTypes.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLCEMPEngine	
kCGLCPCurrentRendererID	The current renderer ID. You can get this setting.
kCGLCPGPUFragmentProcessing	The CPU is currently processing fragments with the GPU. You can get this state.
kCGLCPGPUVertexProcessing	The GPU is currently processing vertices with the GPU. You can get this state.
kCGLCPReclaimResources	Enable or disable reclaiming resources.
kCGLRPGPUFragProcCapable	
kCGLRPGPUVertProcCapable	

OpenGL.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`CGLLockContext`	Locks a CGL rendering context.
`CGLUnlockContext`	Unlocks a CGL rendering context.

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`glAttachShader`	
`glBindAttribLocation`	
`glBlendEquationSeparate`	
`glCompileShader`	
`glCreateProgram`	
`glCreateShader`	
`glDeleteProgram`	
`glDeleteShader`	
`glDetachShader`	
`glDisableVertexAttribArray`	
`glDrawBuffers`	
`glEnableVertexAttribArray`	
`glGetActiveAttrib`	
`glGetActiveUniform`	
`glGetAttachedShaders`	
`glGetAttribLocation`	

glGetProgramInfoLog	
glGetProgramiv	
glGetShaderInfoLog	
glGetShaderiv	
glGetShaderSource	
glGetUniformfv	
glGetUniformiv	
glGetUniformLocation	
glGetVertexAttribdv	
glGetVertexAttribfv	
glGetVertexAttribiv	
glGetVertexAttribPointerv	
glIsProgram	
glIsShader	
glLinkProgram	
glPointParameteri	
glPointParameteriv	
glShaderSource	
glStencilFuncSeparate	
glStencilMaskSeparate	
glStencilOpSeparate	
glUniform1f	
glUniform1fv	
glUniform1i	
glUniform1iv	
glUniform2f	
glUniform2fv	
glUniform2i	

glUniform2iv	
glUniform3f	
glUniform3fv	
glUniform3i	
glUniform3iv	
glUniform4f	
glUniform4fv	
glUniform4i	
glUniform4iv	
glUniformMatrix2fv	
glUniformMatrix3fv	
glUniformMatrix4fv	
glUseProgram	
glValidateProgram	
glVertexAttrib1d	
glVertexAttrib1dv	
glVertexAttrib1f	
glVertexAttrib1fv	
glVertexAttrib1s	
glVertexAttrib1sv	
glVertexAttrib2d	
glVertexAttrib2dv	
glVertexAttrib2f	
glVertexAttrib2fv	
glVertexAttrib2s	
glVertexAttrib2sv	
glVertexAttrib3d	
glVertexAttrib3dv	

glVertexAttrib3f	
glVertexAttrib3fv	
glVertexAttrib3s	
glVertexAttrib3sv	
glVertexAttrib4bv	
glVertexAttrib4d	
glVertexAttrib4dv	
glVertexAttrib4f	
glVertexAttrib4fv	
glVertexAttrib4iv	
glVertexAttrib4Nbv	
glVertexAttrib4Niv	
glVertexAttrib4Nsv	
glVertexAttrib4Nub	
glVertexAttrib4Nubv	
glVertexAttrib4Nuiv	
glVertexAttrib4Nusv	
glVertexAttrib4s	
glVertexAttrib4sv	
glVertexAttrib4ubv	
glVertexAttrib4uiv	
glVertexAttrib4usv	
glVertexAttribPointer	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_ACTIVE_ATTRIBUTE_MAX_LENGTH	
GL_ACTIVE_ATTRIBUTES	

GL_ACTIVE_UNIFORM_MAX_LENGTH	
GL_ACTIVE_UNIFORMS	
GL_ATTACHED_SHADERS	
GL_BLEND_EQUATION_ALPHA	
GL_BLEND_EQUATION_RGB	
GL_BOOL	
GL_BOOL_VEC2	
GL_BOOL_VEC3	
GL_BOOL_VEC4	
GL_COMPILE_STATUS	
GL_COORD_REPLACE	
GL_CURRENT_PROGRAM	
GL_CURRENT_VERTEX_ATTRIB	
GL_DELETE_STATUS	
GL_DRAW_BUFFER0	
GL_DRAW_BUFFER1	
GL_DRAW_BUFFER10	
GL_DRAW_BUFFER11	
GL_DRAW_BUFFER12	
GL_DRAW_BUFFER13	
GL_DRAW_BUFFER14	
GL_DRAW_BUFFER15	
GL_DRAW_BUFFER2	
GL_DRAW_BUFFER3	
GL_DRAW_BUFFER4	
GL_DRAW_BUFFER5	
GL_DRAW_BUFFER6	
GL_DRAW_BUFFER7	

GL_DRAW_BUFFER8	
GL_DRAW_BUFFER9	
GL_FLOAT_MAT2	
GL_FLOAT_MAT3	
GL_FLOAT_MAT4	
GL_FLOAT_VEC2	
GL_FLOAT_VEC3	
GL_FLOAT_VEC4	
GL_FRAGMENT_SHADER	
GL_FRAGMENT_SHADER_DERIVATIVE_HINT	
GL_INFO_LOG_LENGTH	
GL_INT_VEC2	
GL_INT_VEC3	
GL_INT_VEC4	
GL_LINK_STATUS	
GL_LOWER_LEFT	
GL_MAX_COMBINED_TEXTURE_IMAGE_UNITS	
GL_MAX_DRAW_BUFFERS	
GL_MAX_FRAGMENT_UNIFORM_COMPONENTS	
GL_MAX_TEXTURE_COORDS	
GL_MAX_TEXTURE_IMAGE_UNITS	
GL_MAX_VARYING_FLOATS	
GL_MAX_VERTEX_ATTRIBS	
GL_MAX_VERTEX_TEXTURE_IMAGE_UNITS	
GL_MAX_VERTEX_UNIFORM_COMPONENTS	
GL_POINT_SPRITE	
GL_POINT_SPRITE_COORD_ORIGIN	
GL_SAMPLER_1D	

GL_SAMPLER_1D_SHADOW	
GL_SAMPLER_2D	
GL_SAMPLER_2D_SHADOW	
GL_SAMPLER_3D	
GL_SAMPLER_CUBE	
GL_SHADER_SOURCE_LENGTH	
GL_SHADER_TYPE	
GL_SHADING_LANGUAGE_VERSION	
GL_STENCIL_BACK_FAIL	
GL_STENCIL_BACK_FUNC	
GL_STENCIL_BACK_PASS_DEPTH_FAIL	
GL_STENCIL_BACK_PASS_DEPTH_PASS	
GL_STENCIL_BACK_REF	
GL_STENCIL_BACK_VALUE_MASK	
GL_STENCIL_BACK_WRITEMASK	
GL_TYPEDEFS_2_0	
GL_UPPER_LEFT	
GL_VALIDATE_STATUS	
GL_VERSION_2_0	
GL_VERTEX_ATTRIB_ARRAY_ENABLED	
GL_VERTEX_ATTRIB_ARRAY_NORMALIZED	
GL_VERTEX_ATTRIB_ARRAY_POINTER	
GL_VERTEX_ATTRIB_ARRAY_SIZE	
GL_VERTEX_ATTRIB_ARRAY_STRIDE	
GL_VERTEX_ATTRIB_ARRAY_TYPE	
GL_VERTEX_PROGRAM_POINT_SIZE	
GL_VERTEX_PROGRAM_TWO_SIDE	
GL_VERTEX_SHADER	

GLchar	

glext.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glBindFramebufferEXT	
glBindRenderbufferEXT	
glBufferParameteriAPPLE	
glCheckFramebufferStatusEXT	
glDeleteFramebuffersEXT	
glDeleteRenderbuffersEXT	
glDrawBuffersARB	
glFlushMappedBufferRangeAPPLE	
glFramebufferRenderbufferEXT	
glFramebufferTexture1DEXT	
glFramebufferTexture2DEXT	
glFramebufferTexture3DEXT	
glGenerateMipmapEXT	
glGenFramebuffersEXT	
glGenRenderbuffersEXT	
glGetFramebufferAttachmentParameterivEXT	
glGetRenderbufferParameterivEXT	
glIsFramebufferEXT	
glIsRenderbufferEXT	
glMultiDrawElementArrayAPPLE	
glMultiDrawRangeElementArrayAPPLE	
glProgramEnvParameters4fvEXT	

glProgramLocalParameters4fvEXT	
glRenderbufferStorageEXT	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_ALPHA16F_ARB	
GL_ALPHA32F_ARB	
GL_ALPHA_FLOAT16_ATI	
GL_ALPHA_FLOAT32_ATI	
GL_APPLE_flush_buffer_range	
GL_ARB_draw_buffers	
GL_ARB_fragment_program_shadow	
GL_ARB_pixel_buffer_object	
GL_ARB_shader_texture_lod	
GL_ARB_texture_float	
GL_ARB_texture_rectangle	
GL_ATI_texture_float	
GL_BUFFER_FLUSHING_UNMAP_APPLE	
GL_BUFFER_SERIALIZED_MODIFY_APPLE	
GL_COLOR_ATTACHMENT0_EXT	
GL_COLOR_ATTACHMENT10_EXT	
GL_COLOR_ATTACHMENT11_EXT	
GL_COLOR_ATTACHMENT12_EXT	
GL_COLOR_ATTACHMENT13_EXT	
GL_COLOR_ATTACHMENT14_EXT	
GL_COLOR_ATTACHMENT15_EXT	
GL_COLOR_ATTACHMENT1_EXT	
GL_COLOR_ATTACHMENT2_EXT	

GL_COLOR_ATTACHMENT3_EXT	
GL_COLOR_ATTACHMENT4_EXT	
GL_COLOR_ATTACHMENT5_EXT	
GL_COLOR_ATTACHMENT6_EXT	
GL_COLOR_ATTACHMENT7_EXT	
GL_COLOR_ATTACHMENT8_EXT	
GL_COLOR_ATTACHMENT9_EXT	
GL_DEPTH24_STENCIL8_EXT	
GL_DEPTH_ATTACHMENT_EXT	
GL_DEPTH_STENCIL_EXT	
GL_DRAW_BUFFER0_ARB	
GL_DRAW_BUFFER10_ARB	
GL_DRAW_BUFFER11_ARB	
GL_DRAW_BUFFER12_ARB	
GL_DRAW_BUFFER13_ARB	
GL_DRAW_BUFFER14_ARB	
GL_DRAW_BUFFER15_ARB	
GL_DRAW_BUFFER1_ARB	
GL_DRAW_BUFFER2_ARB	
GL_DRAW_BUFFER3_ARB	
GL_DRAW_BUFFER4_ARB	
GL_DRAW_BUFFER5_ARB	
GL_DRAW_BUFFER6_ARB	
GL_DRAW_BUFFER7_ARB	
GL_DRAW_BUFFER8_ARB	
GL_DRAW_BUFFER9_ARB	
GL_EXT_framebuffer_object	
GL_EXT_gpu_program_parameters	

GL_EXT_packed_depth_stencil	
GL_EXT_texture_compression_dxt1	
GL_FRAGMENT_SHADER_DERIVATIVE_HINT_ARB	
GL_FRAMEBUFFER_ATTACHMENT_OBJECT_NAME_EXT	
GL_FRAMEBUFFER_ATTACHMENT_OBJECT_TYPE_EXT	
GL_FRAMEBUFFER_ATTACHMENT_TEXTURE_3D_ZOFFSET_EXT	
GL_FRAMEBUFFER_ATTACHMENT_TEXTURE_CUBE_MAP_FACE_EXT	
GL_FRAMEBUFFER_ATTACHMENT_TEXTURE_LEVEL_EXT	
GL_FRAMEBUFFER_BINDING_EXT	
GL_FRAMEBUFFER_COMPLETE_EXT	
GL_FRAMEBUFFER_EXT	
GL_FRAMEBUFFER_INCOMPLETE_ATTACHMENT_EXT	
GL_FRAMEBUFFER_INCOMPLETE_DIMENSIONS_EXT	
GL_FRAMEBUFFER_INCOMPLETE_DRAW_BUFFER_EXT	
GL_FRAMEBUFFER_INCOMPLETE_FORMATS_EXT	
GL_FRAMEBUFFER_INCOMPLETE_MISSING_ATTACHMENT_EXT	
GL_FRAMEBUFFER_INCOMPLETE_READ_BUFFER_EXT	
GL_FRAMEBUFFER_UNSUPPORTED_EXT	
GL_INTENSITY16F_ARB	
GL_INTENSITY32F_ARB	
GL_INTENSITY_FLOAT16_ATI	
GL_INTENSITY_FLOAT32_ATI	
GL_INVALID_FRAMEBUFFER_OPERATION_EXT	
GL_LUMINANCE16F_ARB	
GL_LUMINANCE32F_ARB	
GL_LUMINANCE_ALPHA16F_ARB	
GL_LUMINANCE_ALPHA32F_ARB	
GL_LUMINANCE_ALPHA_FLOAT16_ATI	

GL_LUMINANCE_ALPHA_FLOAT32_ATI	
GL_LUMINANCE_FLOAT16_ATI	
GL_LUMINANCE_FLOAT32_ATI	
GL_MAX_COLOR_ATTACHMENTS_EXT	
GL_MAX_DRAW_BUFFERS_ARB	
GL_MAX_PROGRAM_CALL_DEPTH_NV	
GL_MAX_PROGRAM_EXEC_INSTRUCTIONS_NV	
GL_MAX_PROGRAM_IF_DEPTH_NV	
GL_MAX_PROGRAM_LOOP_COUNT_NV	
GL_MAX_PROGRAM_LOOP_DEPTH_NV	
GL_MAX_RECTANGLE_TEXTURE_SIZE_ARB	
GL_MAX_RENDERBUFFER_SIZE_EXT	
GL_NV_fragment_program2	
GL_NV_fragment_program_option	
GL_NV_vertex_program2_option	
GL_NV_vertex_program3	
GL_PIXEL_PACK_BUFFER_ARB	
GL_PIXEL_PACK_BUFFER_BINDING_ARB	
GL_PIXEL_UNPACK_BUFFER_ARB	
GL_PIXEL_UNPACK_BUFFER_BINDING_ARB	
GL_PROXY_TEXTURE_RECTANGLE_ARB	
GL_RENDERBUFFER_ALPHA_SIZE_EXT	
GL_RENDERBUFFER_BINDING_EXT	
GL_RENDERBUFFER_BLUE_SIZE_EXT	
GL_RENDERBUFFER_DEPTH_SIZE_EXT	
GL_RENDERBUFFER_EXT	
GL_RENDERBUFFER_GREEN_SIZE_EXT	
GL_RENDERBUFFER_HEIGHT_EXT	

GL_RENDERBUFFER_INTERNAL_FORMAT_EXT	
GL_RENDERBUFFER_RED_SIZE_EXT	
GL_RENDERBUFFER_STENCIL_SIZE_EXT	
GL_RENDERBUFFER_WIDTH_EXT	
GL_RGB16F_ARB	
GL_RGB32F_ARB	
GL_RGB_FLOAT16_ATI	
GL_RGB_FLOAT32_ATI	
GL_RGBA16F_ARB	
GL_RGBA32F_ARB	
GL_RGBA_FLOAT16_ATI	
GL_RGBA_FLOAT32_ATI	
GL_STENCIL_ATTACHMENT_EXT	
GL_STENCIL_INDEX16_EXT	
GL_STENCIL_INDEX1_EXT	
GL_STENCIL_INDEX4_EXT	
GL_STENCIL_INDEX8_EXT	
GL_TEXTURE_ALPHA_TYPE_ARB	
GL_TEXTURE_BINDING_RECTANGLE_ARB	
GL_TEXTURE_BLUE_TYPE_ARB	
GL_TEXTURE_DEPTH_TYPE_ARB	
GL_TEXTURE_GREEN_TYPE_ARB	
GL_TEXTURE_INTENSITY_TYPE_ARB	
GL_TEXTURE_LUMINANCE_TYPE_ARB	
GL_TEXTURE_RECTANGLE_ARB	
GL_TEXTURE_RED_TYPE_ARB	
GL_TEXTURE_STENCIL_SIZE_EXT	
GL_UNSIGNED_INT_24_8_EXT	

GL_UNSIGNED_NORMALIZED_ARB	

10.3 Symbol Changes

This article lists the symbols added to `OpenGL.framework` in Mac OS X v10.3.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

CGLMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`glAttachObjectARB`	
`glBeginQuery`	
`glBeginQueryARB`	
`glBindAttribLocationARB`	
`glBindBuffer`	
`glBindBufferARB`	
`glBlendEquationSeparateEXT`	
`glBufferData`	
`glBufferDataARB`	
`glBufferSubData`	
`glBufferSubDataARB`	
`glCompileShaderARB`	
`glCreateProgramObjectARB`	
`glCreateShaderObjectARB`	
`glDeleteBuffers`	

glDeleteBuffersARB	
glDeleteObjectARB	
glDeleteQueries	
glDeleteQueriesARB	
glDepthBoundsEXT	
glDetachObjectARB	
glDisableVertexAttribAPPLE	
glEnableVertexAttribAPPLE	
glEndQuery	
glEndQueryARB	
glFinishRenderAPPLE	
glFlushRenderAPPLE	
glGenBuffers	
glGenBuffersARB	
glGenQueries	
glGenQueriesARB	
glGetActiveAttribARB	
glGetActiveUniformARB	
glGetAttachedObjectsARB	
glGetAttribLocationARB	
glGetBufferParameteriv	
glGetBufferParameterivARB	
glGetBufferPointerv	
glGetBufferPointervARB	
glGetBufferSubData	
glGetBufferSubDataARB	
glGetHandleARB	
glGetInfoLogARB	

glGetObjectParameterfvARB	
glGetObjectParameterivARB	
glGetQueryiv	
glGetQueryivARB	
glGetQueryObjectiv	
glGetQueryObjectivARB	
glGetQueryObjectuiv	
glGetQueryObjectuivARB	
glGetShaderSourceARB	
glGetUniformfvARB	
glGetUniformivARB	
glGetUniformLocationARB	
glIsBuffer	
glIsBufferARB	
glIsQuery	
glIsQueryARB	
glIsVertexAttribEnabledAPPLE	
glLinkProgramARB	
glMapBuffer	
glMapBufferARB	
glMapVertexAttrib1dAPPLE	
glMapVertexAttrib1fAPPLE	
glMapVertexAttrib2dAPPLE	
glMapVertexAttrib2fAPPLE	
glShaderSourceARB	
glSwapAPPLE	
glUniform1fARB	
glUniform1fvARB	

glUniform1iARB	
glUniform1ivARB	
glUniform2fARB	
glUniform2fvARB	
glUniform2iARB	
glUniform2ivARB	
glUniform3fARB	
glUniform3fvARB	
glUniform3iARB	
glUniform3ivARB	
glUniform4fARB	
glUniform4fvARB	
glUniform4iARB	
glUniform4ivARB	
glUniformMatrix2fvARB	
glUniformMatrix3fvARB	
glUniformMatrix4fvARB	
glUnmapBuffer	
glUnmapBufferARB	
glUseProgramObjectARB	
glValidateProgramARB	

CGLProfiler.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLGODisableBitmap	
kCGLGODisableCopyPixels	

kCGLGODisableCVARenderPath	
kCGLGODisableDrawPixels	
kCGLGODisableFragmentShaders_ATI	
kCGLGODisableImmediateRenderPath	
kCGLGODisableReadPixels	
kCGLGODisableTexturing	
kCGLGODisableVARRenderPath	
kCGLGOEnableDebugAttach	
kCGLGOForceSlowBitmapPath	
kCGLGOForceSlowCopyPixelsPath	
kCGLGOForceSlowDrawPixelsPath	
kCGLGOForceSlowReadPixelsPath	
kCGLGOForceSlowRenderingPath	
kCGLGOForceSoftwareTexgen	
kCGLGOForceSoftwareTransformLighting	
kCGLGOForceSoftwareTRUFORM_ATI	
kCGLGOForceSoftwareVertexShaders	
kCGLGOForceWireframeRendering	
kCGLGOMakeAllGLObjectsRequireUpdate	
kCGLGOMakeAllGLStateRequireUpdate	
kCGLGOOutlineCopyPixelsBuffer	
kCGLGOOutlineCopyPixelsBufferColor	
kCGLGOOutlineDrawPixelsBuffer	
kCGLGOOutlineDrawPixelsBufferColor	
kCGLGOOutlineReadPixelsBuffer	
kCGLGOOutlineReadPixelsBufferColor	
kCGLGOOutlineTexture	
kCGLGOOutlineTextureColor	

kCGLGOSubmitOnClearCommand	
kCGLGOSubmitOnCVARenderCommand	
kCGLGOSubmitOnImmediateRenderCommand	
kCGLGOSubmitOnVAORenderCommand	

CGLRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLRendererATIRadeon9700ID	Specifies the ATI Radeon 9700 renderer.
kCGLRendererGeForceFXID	Specifies the NVIDIA GeForceFX renderer.
kCGLRendererGenericFloatID	Specifies the floating-point software renderer.
kCGLRendererVTBladeXP2ID	Specifies the VTBook renderer.

CGLTypes.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

CGLPBufferObj	Represents a pointer to an opaque pixel buffer object.
kCGLCEDisplayListOptimization	If disabled, turns off optimization for the display list.
kCGLCESurfaceBackingSize	If enabled, overrides the surface backing size.
kCGLCPDispatchTableSize	Set or get the dispatch table size.
kCGLCPSurfaceBackingSize	Set or get the height and width of the back buffer. You can use this to let the system scale an image automatically on swap to a variable size buffer. The back buffer size remains fixed at the size that you set up regardless of whether the image is resized to display larger onscreen.
kCGLCPSurfaceSurfaceVolatile	Set or get the volatile state of a surface.
kCGLCPSurfaceTexture	Set the surface texture. Supply a surface ID, target, and internal format.

kCGLMultisampleBit	Specifies multisampling.
kCGLNoError	No error.
kCGLPFAMultisample	This constant is a Boolean attribute. If it is present in the attributes array, specifies a hint to the driver to prefer multisampling. Do not supply a value with this constant because its presence in the array implies true.
kCGLPFAPBuffer	This constant is a Boolean attribute. If it is present in the attributes array, format can be used to render to a pixel buffer. Do not supply a value with this constant because its presence in the array implies true.
kCGLPFARemotePBuffer	This constant is a Boolean attribute. If it is present in the attributes array, format can be used to render offline to a pixel buffer. Do not supply a value with this constant because its presence in the array implies true.
kCGLPFASampleAlpha	This constant is a Boolean attribute. If it is present in the attributes array, request alpha filtering when multisampling. Do not supply a value with this constant because its presence in the array implies true.
kCGLPFASupersample	This constant is a Boolean attribute. If it is present in the attributes array, specifies a hint to the driver to prefer supersampling. Do not supply a value with this constant because its presence in the array implies true.
kCGLRGBA16161616Bit	Specifies a format that has 64 bits per pixel with an ARGB channel layout, and the channels located in the following bits: R=63:48, G=47:32, B=31:16, A=15:0.
kCGLRGBAFloat128Bit	Specifies a format that has 128 bits per pixel with an ARGB IEEE floating-point channel layout.
kCGLRGBAFloat256Bit	Specifies a format that has 256 bits per pixel with an ARGB IEEE double channel layout.
kCGLRGBAFloat64Bit	Specifies a format that has 64 bits per pixel with an ARGB half floating-point channel layout.
kCGLRGBFloat128Bit	Specifies a format that has 128 bits per pixel with an RGB IEEE floating-point channel layout.
kCGLRGBFloat256Bit	Specifies a format that has 256 bits per pixel with an RGB IEEE double channel layout.
kCGLRGBFloat64Bit	Specifies a format that has 64 bits per pixel with an RGB half floating-point channel layout.
kCGLRPSampleAlpha	If true, there is support for alpha sampling.
kCGLRPSampleModes	A bit field of supported sample modes.

kCGLSupersampleBit	Specifies supersampling.

OpenGL.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

CGLCreatePBuffer	Creates a pixel buffer of the specified size, compatible with the specified texture target.
CGLDescribePBuffer	Retrieves information that describes the specified pixel buffer object.
CGLDestroyPBuffer	Releases the resources associated with a pixel buffer object.
CGLGetPBuffer	Retrieves a pixel buffer and its parameters for a specified rendering context.
CGLSetPBuffer	Attaches a pixel buffer object to a rendering context.
CGLTexImagePBuffer	Binds the contents of a pixel buffer to a data source for a texture object.

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

CGL_VERSION_1_1	

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glBeginQuery	
glBindBuffer	
glBufferData	
glBufferSubData	

glDeleteBuffers	
glDeleteQueries	
glEndQuery	
glGenBuffers	
glGenQueries	
glGetBufferParameteriv	
glGetBufferPointerv	
glGetBufferSubData	
glGetQueryiv	
glGetQueryObjectiv	
glGetQueryObjectuiv	
glIsBuffer	
glIsQuery	
glMapBuffer	
glUnmapBuffer	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_ARRAY_BUFFER	
GL_ARRAY_BUFFER_BINDING	
GL_BUFFER_ACCESS	
GL_BUFFER_MAP_POINTER	
GL_BUFFER_MAPPED	
GL_BUFFER_SIZE	
GL_BUFFER_USAGE	
GL_COLOR_ARRAY_BUFFER_BINDING	
GL_CURRENT_FOG_COORD	
GL_CURRENT_QUERY	

GL_DYNAMIC_COPY	
GL_DYNAMIC_DRAW	
GL_DYNAMIC_READ	
GL_EDGE_FLAG_ARRAY_BUFFER_BINDING	
GL_ELEMENT_ARRAY_BUFFER	
GL_ELEMENT_ARRAY_BUFFER_BINDING	
GL_FOG_COORD	
GL_FOG_COORD_ARRAY	
GL_FOG_COORD_ARRAY_BUFFER_BINDING	
GL_FOG_COORD_ARRAY_POINTER	
GL_FOG_COORD_ARRAY_STRIDE	
GL_FOG_COORD_ARRAY_TYPE	
GL_FOG_COORD_SRC	
GL_FOG_COORDINATE_ARRAY_BUFFER_BINDING	
GL_INDEX_ARRAY_BUFFER_BINDING	
GL_NORMAL_ARRAY_BUFFER_BINDING	
GL_QUERY_COUNTER_BITS	
GL_QUERY_RESULT	
GL_QUERY_RESULT_AVAILABLE	
GL_READ_ONLY	
GL_READ_WRITE	
GL_SAMPLES_PASSED	
GL_SECONDARY_COLOR_ARRAY_BUFFER_BINDING	
GL_SRC0_ALPHA	
GL_SRC0_RGB	
GL_SRC1_ALPHA	
GL_SRC1_RGB	
GL_SRC2_ALPHA	

GL_SRC2_RGB	
GL_SRC3_ALPHA	
GL_SRC3_RGB	
GL_SRC4_ALPHA	
GL_SRC4_RGB	
GL_SRC5_ALPHA	
GL_SRC5_RGB	
GL_SRC6_ALPHA	
GL_SRC6_RGB	
GL_SRC7_ALPHA	
GL_SRC7_RGB	
GL_STATIC_COPY	
GL_STATIC_DRAW	
GL_STATIC_READ	
GL_STREAM_COPY	
GL_STREAM_DRAW	
GL_STREAM_READ	
GL_TEXTURE_COORD_ARRAY_BUFFER_BINDING	
GL_VERSION_1_5	
GL_VERTEX_ARRAY_BUFFER_BINDING	
GL_VERTEX_ATTRIB_ARRAY_BUFFER_BINDING	
GL_WEIGHT_ARRAY_BUFFER_BINDING	
GL_WRITE_ONLY	
GLintptr	
GLsizeiptr	

glext.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glAttachObjectARB	
glBeginQueryARB	
glBindAttribLocationARB	
glBindBufferARB	
glBlendEquationSeparateEXT	
glBufferDataARB	
glBufferSubDataARB	
glCompileShaderARB	
glCreateProgramObjectARB	
glCreateShaderObjectARB	
glDeleteBuffersARB	
glDeleteObjectARB	
glDeleteQueriesARB	
glDepthBoundsEXT	
glDetachObjectARB	
glEndQueryARB	
glFinishRenderAPPLE	
glFlushRenderAPPLE	
glGenBuffersARB	
glGenQueriesARB	
glGetActiveAttribARB	
glGetActiveUniformARB	
glGetAttachedObjectsARB	
glGetAttribLocationARB	

glGetBufferParameterivARB	
glGetBufferPointervARB	
glGetBufferSubDataARB	
glGetHandleARB	
glGetInfoLogARB	
glGetObjectParameterfvARB	
glGetObjectParameterivARB	
glGetQueryivARB	
glGetQueryObjectivARB	
glGetQueryObjectuivARB	
glGetShaderSourceARB	
glGetUniformfvARB	
glGetUniformivARB	
glGetUniformLocationARB	
glIsBufferARB	
glIsQueryARB	
glLinkProgramARB	
glMapBufferARB	
glShaderSourceARB	
glSwapAPPLE	
glUniform1fARB	
glUniform1fvARB	
glUniform1iARB	
glUniform1ivARB	
glUniform2fARB	
glUniform2fvARB	
glUniform2iARB	
glUniform2ivARB	

glUniform3fARB	
glUniform3fvARB	
glUniform3iARB	
glUniform3ivARB	
glUniform4fARB	
glUniform4fvARB	
glUniform4iARB	
glUniform4ivARB	
glUniformMatrix2fvARB	
glUniformMatrix3fvARB	
glUniformMatrix4fvARB	
glUnmapBufferARB	
glUseProgramObjectARB	
glValidateProgramARB	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_APPLE_flush_render	
GL_APPLE_pixel_buffer	
GL_ARB_fragment_shader	
GL_ARB_occlusion_query	
GL_ARB_point_sprite	
GL_ARB_shader_objects	
GL_ARB_shading_language_100	
GL_ARB_texture_non_power_of_two	
GL_ARB_vertex_buffer_object	
GL_ARB_vertex_shader	
GL_ARRAY_BUFFER_ARB	

GL_ARRAY_BUFFER_BINDING_ARB	
GL_ATI_texture_compression_3dc	
GL_BLEND_EQUATION_ALPHA_EXT	
GL_BLEND_EQUATION_RGB_EXT	
GL_BOOL_ARB	
GL_BOOL_VEC2_ARB	
GL_BOOL_VEC3_ARB	
GL_BOOL_VEC4_ARB	
GL_BUFFER_ACCESS_ARB	
GL_BUFFER_MAP_POINTER_ARB	
GL_BUFFER_MAPPED_ARB	
GL_BUFFER_OBJECT_APPLE	
GL_BUFFER_SIZE_ARB	
GL_BUFFER_USAGE_ARB	
GL_COLOR_ARRAY_BUFFER_BINDING_ARB	
GL_COLOR_MATRIX_SGI	
GL_COLOR_MATRIX_STACK_DEPTH_SGI	
GL_COMPRESSED_LUMINANCE_ALPHA_3DC_ATI	
GL_COORD_REPLACE_ARB	
GL_CURRENT_QUERY_ARB	
GL_DEPTH_BOUNDS_EXT	
GL_DEPTH_BOUNDS_TEST_EXT	
GL_DYNAMIC_COPY_ARB	
GL_DYNAMIC_DRAW_ARB	
GL_DYNAMIC_READ_ARB	
GL_EDGE_FLAG_ARRAY_BUFFER_BINDING_ARB	
GL_ELEMENT_ARRAY_BUFFER_ARB	
GL_ELEMENT_ARRAY_BUFFER_BINDING_ARB	

GL_ELEMENT_BUFFER_BINDING_APPLE	
GL_EXT_blend_equation_separate	
GL_EXT_depth_bounds_test	
GL_EXT_separate_specular_color	
GL_EXT_texture_mirror_clamp	
GL_FLOAT_MAT2_ARB	
GL_FLOAT_MAT3_ARB	
GL_FLOAT_MAT4_ARB	
GL_FLOAT_VEC2_ARB	
GL_FLOAT_VEC3_ARB	
GL_FLOAT_VEC4_ARB	
GL_FOG_COORD_ARRAY_BUFFER_BINDING_ARB	
GL_FOG_COORDINATE_ARRAY_BUFFER_BINDING_ARB	
GL_FRAGMENT_SHADER_ARB	
GL_HALF_APPLE	
GL_INDEX_ARRAY_BUFFER_BINDING_ARB	
GL_INT_VEC2_ARB	
GL_INT_VEC3_ARB	
GL_INT_VEC4_ARB	
GL_LIGHT_MODEL_COLOR_CONTROL_EXT	
GL_MAX_COLOR_MATRIX_STACK_DEPTH_SGI	
GL_MAX_COMBINED_TEXTURE_IMAGE_UNITS_ARB	
GL_MAX_FRAGMENT_UNIFORM_COMPONENTS_ARB	
GL_MAX_VARYING_FLOATS_ARB	
GL_MAX_VERTEX_TEXTURE_IMAGE_UNITS_ARB	
GL_MAX_VERTEX_UNIFORM_COMPONENTS_ARB	
GL_MIN_PBUFFER_VIEWPORT_DIMS_APPLE	
GL_MIRROR_CLAMP_EXT	

GL_MIRROR_CLAMP_TO_BORDER_EXT	
GL_MIRROR_CLAMP_TO_EDGE_EXT	
GL_NORMAL_ARRAY_BUFFER_BINDING_ARB	
GL_OBJECT_ACTIVE_ATTRIBUTE_MAX_LENGTH_ARB	
GL_OBJECT_ACTIVE_ATTRIBUTES_ARB	
GL_OBJECT_ACTIVE_UNIFORM_MAX_LENGTH_ARB	
GL_OBJECT_ACTIVE_UNIFORMS_ARB	
GL_OBJECT_ATTACHED_OBJECTS_ARB	
GL_OBJECT_COMPILE_STATUS_ARB	
GL_OBJECT_DELETE_STATUS_ARB	
GL_OBJECT_INFO_LOG_LENGTH_ARB	
GL_OBJECT_LINK_STATUS_ARB	
GL_OBJECT_SHADER_SOURCE_LENGTH_ARB	
GL_OBJECT_SUBTYPE_ARB	
GL_OBJECT_TYPE_ARB	
GL_OBJECT_VALIDATE_STATUS_ARB	
GL_POINT_SPRITE_ARB	
GL_POST_COLOR_MATRIX_ALPHA_BIAS_SGI	
GL_POST_COLOR_MATRIX_ALPHA_SCALE_SGI	
GL_POST_COLOR_MATRIX_BLUE_BIAS_SGI	
GL_POST_COLOR_MATRIX_BLUE_SCALE_SGI	
GL_POST_COLOR_MATRIX_GREEN_BIAS_SGI	
GL_POST_COLOR_MATRIX_GREEN_SCALE_SGI	
GL_POST_COLOR_MATRIX_RED_BIAS_SGI	
GL_POST_COLOR_MATRIX_RED_SCALE_SGI	
GL_PROGRAM_OBJECT_ARB	
GL_QUERY_COUNTER_BITS_ARB	
GL_QUERY_RESULT_ARB	

GL_QUERY_RESULT_AVAILABLE_ARB	
GL_READ_ONLY_ARB	
GL_READ_WRITE_ARB	
GL_SAMPLER_1D_ARB	
GL_SAMPLER_1D_SHADOW_ARB	
GL_SAMPLER_2D_ARB	
GL_SAMPLER_2D_RECT_ARB	
GL_SAMPLER_2D_RECT_SHADOW_ARB	
GL_SAMPLER_2D_SHADOW_ARB	
GL_SAMPLER_3D_ARB	
GL_SAMPLER_CUBE_ARB	
GL_SAMPLES_PASSED_ARB	
GL_SECONDARY_COLOR_ARRAY_BUFFER_BINDING_ARB	
GL_SEPARATE_SPECULAR_COLOR_EXT	
GL_SGI_color_matrix	
GL_SHADER_OBJECT_ARB	
GL_SINGLE_COLOR_EXT	
GL_STATIC_COPY_ARB	
GL_STATIC_DRAW_ARB	
GL_STATIC_READ_ARB	
GL_STORAGE_CLIENT_APPLE	
GL_STREAM_COPY_ARB	
GL_STREAM_DRAW_ARB	
GL_STREAM_READ_ARB	
GL_TEXTURE_COORD_ARRAY_BUFFER_BINDING_ARB	
GL_TEXTURE_MINIMIZE_STORAGE_APPLE	
GL_VERTEX_ARRAY_BUFFER_BINDING_ARB	
GL_VERTEX_ATTRIB_ARRAY_BUFFER_BINDING_ARB	

GL_VERTEX_ATTRIB_MAP1_APPLE	
GL_VERTEX_ATTRIB_MAP1_COEFF_APPLE	
GL_VERTEX_ATTRIB_MAP1_DOMAIN_APPLE	
GL_VERTEX_ATTRIB_MAP1_ORDER_APPLE	
GL_VERTEX_ATTRIB_MAP1_SIZE_APPLE	
GL_VERTEX_ATTRIB_MAP2_APPLE	
GL_VERTEX_ATTRIB_MAP2_COEFF_APPLE	
GL_VERTEX_ATTRIB_MAP2_DOMAIN_APPLE	
GL_VERTEX_ATTRIB_MAP2_ORDER_APPLE	
GL_VERTEX_ATTRIB_MAP2_SIZE_APPLE	
GL_VERTEX_SHADER_ARB	
GL_WEIGHT_ARRAY_BUFFER_BINDING_ARB	
GL_WRITE_ONLY_ARB	
GLcharARB	
GLhandleARB	
GLintptrARB	
GLsizeiptrARB	

10.2 Symbol Changes

This article lists the symbols added to `OpenGL.framework` in Mac OS X v10.2.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

CGLMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`glActiveStencilFaceEXT`	
`glBindProgramARB`	
`glBindVertexArrayAPPLE`	
`glBlendEquationSeparateATI`	
`glBlendFuncSeparate`	
`glBlendFuncSeparateEXT`	
`glColorSubTable`	
`glColorSubTableEXT`	
`glColorTable`	
`glColorTableEXT`	
`glColorTableParameterfv`	
`glColorTableParameteriv`	
`glCombinerInputNV`	
`glCombinerOutputNV`	
`glCombinerParameterfNV`	

glCombinerParameterfvNV	
glCombinerParameteriNV	
glCombinerParameterivNV	
glCombinerStageParameterfvNV	
glConvolutionFilter1D	
glConvolutionFilter2D	
glConvolutionParameterf	
glConvolutionParameterfv	
glConvolutionParameteri	
glConvolutionParameteriv	
glCopyColorSubTable	
glCopyColorTable	
glCopyConvolutionFilter1D	
glCopyConvolutionFilter2D	
glCopyTexSubImage3D	
glDeleteFencesAPPLE	
glDeleteProgramsARB	
glDeleteVertexArraysAPPLE	
glDisableVertexAttribARB	
glDisableVertexAttribArrayARB	
glDrawElementArrayAPPLE	
glDrawRangeElementArrayAPPLE	
glDrawRangeElementsEXT	
glElementPointerAPPLE	
glEnableVertexAttribARB	
glEnableVertexAttribArrayARB	
glFinalCombinerInputNV	
glFinishFenceAPPLE	

glFinishObjectAPPLE	
glFlushVertexArrayRangeAPPLE	
glFogCoordd	
glFogCoorddEXT	
glFogCoorddv	
glFogCoorddvEXT	
glFogCoordf	
glFogCoordfEXT	
glFogCoordfv	
glFogCoordfvEXT	
glFogCoordPointer	
glFogCoordPointerEXT	
glGenFencesAPPLE	
glGenProgramsARB	
glGenVertexArraysAPPLE	
glGetColorTable	
glGetColorTableEXT	
glGetColorTableParameterfv	
glGetColorTableParameterfvEXT	
glGetColorTableParameteriv	
glGetColorTableParameterivEXT	
glGetCombinerInputParameterfvNV	
glGetCombinerInputParameterivNV	
glGetCombinerOutputParameterfvNV	
glGetCombinerOutputParameterivNV	
glGetCombinerStageParameterfvNV	
glGetConvolutionFilter	
glGetConvolutionParameterfv	

glGetConvolutionParameteriv	
glGetFinalCombinerInputParameterfvNV	
glGetHistogram	
glGetHistogramParameterfv	
glGetHistogramParameteriv	
glGetMinmax	
glGetMinmaxParameterfv	
glGetMinmaxParameteriv	
glGetProgramEnvParameterdvARB	
glGetProgramEnvParameterfvARB	
glGetProgramivARB	
glGetProgramLocalParameterdvARB	
glGetProgramLocalParameterfvARB	
glGetProgramStringARB	
glGetSeparableFilter	
glGetTexParameterPointervAPPLE	
glGetVertexAttribdvARB	
glGetVertexAttribfvARB	
glGetVertexAttribivARB	
glGetVertexAttribPointervARB	
glHistogram	
glIsFenceAPPLE	
glIsProgramARB	
glIsVertexArrayAPPLE	
glIsVertexAttribEnabledARB	
glMapVertexAttrib1dARB	
glMapVertexAttrib1fARB	
glMapVertexAttrib2dARB	

glMapVertexAttrib2fARB	
glMinmax	
glMultiDrawArrays	
glMultiDrawArraysEXT	
glMultiDrawElements	
glMultiDrawElementsEXT	
glPNTrianglesfATI	
glPNTrianglesfATIX	
glPNTrianglesiATI	
glPNTrianglesiATIX	
glPointParameterf	
glPointParameterfARB	
glPointParameterfv	
glPointParameterfvARB	
glPointParameteriNV	
glPointParameterivNV	
glProgramEnvParameter4dARB	
glProgramEnvParameter4dvARB	
glProgramEnvParameter4fARB	
glProgramEnvParameter4fvARB	
glProgramLocalParameter4dARB	
glProgramLocalParameter4dvARB	
glProgramLocalParameter4fARB	
glProgramLocalParameter4fvARB	
glProgramStringARB	
glResetHistogram	
glResetMinmax	
glSecondaryColor3b	

glSecondaryColor3bEXT	
glSecondaryColor3bv	
glSecondaryColor3bvEXT	
glSecondaryColor3d	
glSecondaryColor3dEXT	
glSecondaryColor3dv	
glSecondaryColor3dvEXT	
glSecondaryColor3f	
glSecondaryColor3fEXT	
glSecondaryColor3fv	
glSecondaryColor3fvEXT	
glSecondaryColor3i	
glSecondaryColor3iEXT	
glSecondaryColor3iv	
glSecondaryColor3ivEXT	
glSecondaryColor3s	
glSecondaryColor3sEXT	
glSecondaryColor3sv	
glSecondaryColor3svEXT	
glSecondaryColor3ub	
glSecondaryColor3ubEXT	
glSecondaryColor3ubv	
glSecondaryColor3ubvEXT	
glSecondaryColor3ui	
glSecondaryColor3uiEXT	
glSecondaryColor3uiv	
glSecondaryColor3uivEXT	
glSecondaryColor3us	

glSecondaryColor3usEXT	
glSecondaryColor3usv	
glSecondaryColor3usvEXT	
glSecondaryColorPointer	
glSecondaryColorPointerEXT	
glSeparableFilter2D	
glSetFenceAPPLE	
glStencilFuncSeparateATI	
glStencilOpSeparateATI	
glTestFenceAPPLE	
glTestObjectAPPLE	
glTexImage3D	
glTexSubImage3D	
glTextureRangeAPPLE	
glVertexArrayParameteriAPPLE	
glVertexArrayRangeAPPLE	
glVertexAttrib1dARB	
glVertexAttrib1dvARB	
glVertexAttrib1fARB	
glVertexAttrib1fvARB	
glVertexAttrib1sARB	
glVertexAttrib1svARB	
glVertexAttrib2dARB	
glVertexAttrib2dvARB	
glVertexAttrib2fARB	
glVertexAttrib2fvARB	
glVertexAttrib2sARB	
glVertexAttrib2svARB	

glVertexAttrib3dARB	
glVertexAttrib3dvARB	
glVertexAttrib3fARB	
glVertexAttrib3fvARB	
glVertexAttrib3sARB	
glVertexAttrib3svARB	
glVertexAttrib4bvARB	
glVertexAttrib4dARB	
glVertexAttrib4dvARB	
glVertexAttrib4fARB	
glVertexAttrib4fvARB	
glVertexAttrib4ivARB	
glVertexAttrib4NbvARB	
glVertexAttrib4NivARB	
glVertexAttrib4NsvARB	
glVertexAttrib4NubARB	
glVertexAttrib4NubvARB	
glVertexAttrib4NuivARB	
glVertexAttrib4NusvARB	
glVertexAttrib4sARB	
glVertexAttrib4svARB	
glVertexAttrib4ubvARB	
glVertexAttrib4uivARB	
glVertexAttrib4usvARB	
glVertexAttribPointerARB	
glVertexBlendARB	
glWeightbvARB	
glWeightdvARB	

glWeightfvARB	
glWeightivARB	
glWeightPointerARB	
glWeightsvARB	
glWeightubvARB	
glWeightuivARB	
glWeightusvARB	
glWindowPos2d	
glWindowPos2dARB	
glWindowPos2dv	
glWindowPos2dvARB	
glWindowPos2f	
glWindowPos2fARB	
glWindowPos2fv	
glWindowPos2fvARB	
glWindowPos2i	
glWindowPos2iARB	
glWindowPos2iv	
glWindowPos2ivARB	
glWindowPos2s	
glWindowPos2sARB	
glWindowPos2sv	
glWindowPos2svARB	
glWindowPos3d	
glWindowPos3dARB	
glWindowPos3dv	
glWindowPos3dvARB	
glWindowPos3f	

glWindowPos3fARB	
glWindowPos3fv	
glWindowPos3fvARB	
glWindowPos3i	
glWindowPos3iARB	
glWindowPos3iv	
glWindowPos3ivARB	
glWindowPos3s	
glWindowPos3sARB	
glWindowPos3sv	
glWindowPos3svARB	

CGLProfiler.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLCPComment	
kCGLCPDumpState	
kCGLCPEnableForceFlush	
kCGLGOComment	
kCGLGOEnableFunctionStatistics	
kCGLGOEnableFunctionTrace	
kCGLGOPageBreak	
kCGLGOResetFunctionStatistics	
kCGLGOResetFunctionTrace	

CGLRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`kCGLRendererATIRadeon8500ID`	Specifies the ATI Radeon 8500 renderer.

CGLTypes.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`kCGLCESwapLimit`	
`kCGLCPSurfaceOpacity`	Set or get the surface opacity. A value of 1 means the surface is opaque (the default); 0 means completely transparent.
`kCGLCPSurfaceOrder`	Set or get the position of the OpenGL surface relative to the window. A value of 1 means that the position is above the window; a value of –1 specifies a position that is below the window.
`kCGLPFAAuxDepthStencil`	This constant is a Boolean attribute. If it is present in the attributes array, each auxiliary buffer has its own depth-stencil buffer. Do not supply a value with this constant because its presence in the array implies true.
`kCGLPFAColorFloat`	This constant is a Boolean attribute. If it is present in the attributes array, color buffers store floating-point pixels. Do not supply a value with this constant because its presence in the array implies true.

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`glBlendFuncSeparate`	
`glFogCoordd`	
`glFogCoorddv`	

glFogCoordf	
glFogCoordfv	
glFogCoordPointer	
glMultiDrawArrays	
glMultiDrawElements	
glPointParameterf	
glPointParameterfv	
glSecondaryColor3b	
glSecondaryColor3bv	
glSecondaryColor3d	
glSecondaryColor3dv	
glSecondaryColor3f	
glSecondaryColor3fv	
glSecondaryColor3i	
glSecondaryColor3iv	
glSecondaryColor3s	
glSecondaryColor3sv	
glSecondaryColor3ub	
glSecondaryColor3ubv	
glSecondaryColor3ui	
glSecondaryColor3uiv	
glSecondaryColor3us	
glSecondaryColor3usv	
glSecondaryColorPointer	
glWindowPos2d	
glWindowPos2dv	
glWindowPos2f	
glWindowPos2fv	

glWindowPos2i	
glWindowPos2iv	
glWindowPos2s	
glWindowPos2sv	
glWindowPos3d	
glWindowPos3dv	
glWindowPos3f	
glWindowPos3fv	
glWindowPos3i	
glWindowPos3iv	
glWindowPos3s	
glWindowPos3sv	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_BLEND_DST_ALPHA	
GL_BLEND_DST_RGB	
GL_BLEND_SRC_ALPHA	
GL_BLEND_SRC_RGB	
GL_COLOR_SUM	
GL_COMPARE_R_TO_TEXTURE	
GL_CURRENT_FOG_COORDINATE	
GL_CURRENT_SECONDARY_COLOR	
GL_DECR_WRAP	
GL_DEPTH_COMPONENT16	
GL_DEPTH_COMPONENT24	
GL_DEPTH_COMPONENT32	
GL_DEPTH_TEXTURE_MODE	

GL_FOG_COORDINATE	
GL_FOG_COORDINATE_ARRAY	
GL_FOG_COORDINATE_ARRAY_POINTER	
GL_FOG_COORDINATE_ARRAY_STRIDE	
GL_FOG_COORDINATE_ARRAY_TYPE	
GL_FOG_COORDINATE_SOURCE	
GL_FRAGMENT_DEPTH	
GL_GENERATE_MIPMAP	
GL_GENERATE_MIPMAP_HINT	
GL_INCR_WRAP	
GL_MAX_TEXTURE_LOD_BIAS	
GL_MIRRORED_REPEAT	
GL_POINT_DISTANCE_ATTENUATION	
GL_POINT_FADE_THRESHOLD_SIZE	
GL_POINT_SIZE_MAX	
GL_POINT_SIZE_MIN	
GL_SECONDARY_COLOR_ARRAY	
GL_SECONDARY_COLOR_ARRAY_POINTER	
GL_SECONDARY_COLOR_ARRAY_SIZE	
GL_SECONDARY_COLOR_ARRAY_STRIDE	
GL_SECONDARY_COLOR_ARRAY_TYPE	
GL_TEXTURE_COMPARE_FUNC	
GL_TEXTURE_COMPARE_MODE	
GL_TEXTURE_COMPRESSED_IMAGE_SIZE	
GL_TEXTURE_DEPTH_SIZE	
GL_TEXTURE_FILTER_CONTROL	
GL_TEXTURE_LOD_BIAS	
GL_VERSION_1_4	

glext.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glActiveStencilFaceEXT	
glBindProgramARB	
glBindVertexArrayAPPLE	
glBlendEquationSeparateATI	
glBlendFuncSeparateEXT	
glDeleteFencesAPPLE	
glDeleteProgramsARB	
glDeleteVertexArraysAPPLE	
glDisableVertexAttribAPPLE	
glDisableVertexAttribArrayARB	
glDrawElementArrayAPPLE	
glDrawRangeElementArrayAPPLE	
glDrawRangeElementsEXT	
glElementPointerAPPLE	
glEnableVertexAttribAPPLE	
glEnableVertexAttribArrayARB	
glFinishFenceAPPLE	
glFinishObjectAPPLE	
glFlushVertexArrayRangeAPPLE	
glFogCoorddEXT	
glFogCoorddvEXT	
glFogCoordfEXT	
glFogCoordfvEXT	
glFogCoordPointerEXT	

glGenFencesAPPLE	
glGenProgramsARB	
glGenVertexArraysAPPLE	
glGetProgramEnvParameterdvARB	
glGetProgramEnvParameterfvARB	
glGetProgramivARB	
glGetProgramLocalParameterdvARB	
glGetProgramLocalParameterfvARB	
glGetProgramStringARB	
glGetTexParameterPointervAPPLE	
glGetVertexAttribdvARB	
glGetVertexAttribfvARB	
glGetVertexAttribivARB	
glGetVertexAttribPointervARB	
glIsFenceAPPLE	
glIsProgramARB	
glIsVertexArrayAPPLE	
glIsVertexAttribEnabledAPPLE	
glMapVertexAttrib1dAPPLE	
glMapVertexAttrib1fAPPLE	
glMapVertexAttrib2dAPPLE	
glMapVertexAttrib2fAPPLE	
glMultiDrawArraysEXT	
glMultiDrawElementsEXT	
glPNTrianglesfATI	
glPNTrianglesiATI	
glPointParameterfARB	
glPointParameterfvARB	

glPointParameteriNV	
glPointParameterivNV	
glProgramEnvParameter4dARB	
glProgramEnvParameter4dvARB	
glProgramEnvParameter4fARB	
glProgramEnvParameter4fvARB	
glProgramLocalParameter4dARB	
glProgramLocalParameter4dvARB	
glProgramLocalParameter4fARB	
glProgramLocalParameter4fvARB	
glProgramStringARB	
glSetFenceAPPLE	
glStencilFuncSeparateATI	
glStencilOpSeparateATI	
glTestFenceAPPLE	
glTestObjectAPPLE	
glTextureRangeAPPLE	
glVertexArrayParameteriAPPLE	
glVertexArrayRangeAPPLE	
glVertexAttrib1dARB	
glVertexAttrib1dvARB	
glVertexAttrib1fARB	
glVertexAttrib1fvARB	
glVertexAttrib1sARB	
glVertexAttrib1svARB	
glVertexAttrib2dARB	
glVertexAttrib2dvARB	
glVertexAttrib2fARB	

glVertexAttrib2fvARB	
glVertexAttrib2sARB	
glVertexAttrib2svARB	
glVertexAttrib3dARB	
glVertexAttrib3dvARB	
glVertexAttrib3fARB	
glVertexAttrib3fvARB	
glVertexAttrib3sARB	
glVertexAttrib3svARB	
glVertexAttrib4bvARB	
glVertexAttrib4dARB	
glVertexAttrib4dvARB	
glVertexAttrib4fARB	
glVertexAttrib4fvARB	
glVertexAttrib4ivARB	
glVertexAttrib4NbvARB	
glVertexAttrib4NivARB	
glVertexAttrib4NsvARB	
glVertexAttrib4NubARB	
glVertexAttrib4NubvARB	
glVertexAttrib4NuivARB	
glVertexAttrib4NusvARB	
glVertexAttrib4sARB	
glVertexAttrib4svARB	
glVertexAttrib4ubvARB	
glVertexAttrib4uivARB	
glVertexAttrib4usvARB	
glVertexAttribPointerARB	

glVertexBlendARB	
glWeightbvARB	
glWeightdvARB	
glWeightfvARB	
glWeightivARB	
glWeightPointerARB	
glWeightsvARB	
glWeightubvARB	
glWeightuivARB	
glWeightusvARB	
glWindowPos2dARB	
glWindowPos2dvARB	
glWindowPos2fARB	
glWindowPos2fvARB	
glWindowPos2iARB	
glWindowPos2ivARB	
glWindowPos2sARB	
glWindowPos2svARB	
glWindowPos3dARB	
glWindowPos3dvARB	
glWindowPos3fARB	
glWindowPos3fvARB	
glWindowPos3iARB	
glWindowPos3ivARB	
glWindowPos3sARB	
glWindowPos3svARB	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_ACTIVE_STENCIL_FACE_EXT	
GL_ACTIVE_VERTEX_UNITS_ARB	
GL_ALPHA_BLEND_EQUATION_ATI	
GL_ALPHA_FLOAT16_APPLE	
GL_ALPHA_FLOAT32_APPLE	
GL_APPLE_element_array	
GL_APPLE_fence	
GL_APPLE_float_pixels	
GL_APPLE_packed_pixels	
GL_APPLE_texture_range	
GL_APPLE_vertex_array_object	
GL_APPLE_vertex_array_range	
GL_APPLE_vertex_program_evaluators	
GL_ARB_depth_texture	
GL_ARB_fragment_program	
GL_ARB_imaging	
GL_ARB_point_parameters	
GL_ARB_shadow	
GL_ARB_shadow_ambient	
GL_ARB_texture_env_crossbar	
GL_ARB_texture_mirrored_repeat	
GL_ARB_vertex_blend	
GL_ARB_vertex_program	
GL_ARB_window_pos	
GL_ARRAY_REV_COMPS_IN_4_BYTES_ATI	
GL_ATI_array_rev_comps_in_4_bytes	

GL_ATI_blend_equation_separate	
GL_ATI_blend_weighted_minmax	
GL_ATI_pn_triangles	
GL_ATI_point_cull_mode	
GL_ATI_separate_stencil	
GL_ATI_text_fragment_shader	
GL_ATI_texture_env_combine3	
GL_ATI_texture_mirror_once	
GL_BLEND_DST_ALPHA_EXT	
GL_BLEND_DST_RGB_EXT	
GL_BLEND_SRC_ALPHA_EXT	
GL_BLEND_SRC_RGB_EXT	
GL_COLOR_FLOAT_APPLE	
GL_COLOR_SUM_ARB	
GL_COMPARE_R_TO_TEXTURE_ARB	
GL_CONST_EYE_NV	
GL_COORD_REPLACE_NV	
GL_CULL_FRAGMENT_NV	
GL_CULL_MODES_NV	
GL_CURRENT_FOG_COORDINATE_EXT	
GL_CURRENT_MATRIX_ARB	
GL_CURRENT_MATRIX_STACK_DEPTH_ARB	
GL_CURRENT_VERTEX_ATTRIB_ARB	
GL_CURRENT_WEIGHT_ARB	
GL_DECR_WRAP_EXT	
GL_DEPENDENT_AR_TEXTURE_2D_NV	
GL_DEPENDENT_GB_TEXTURE_2D_NV	
GL_DEPENDENT_HILO_TEXTURE_2D_NV	

GL_DEPENDENT_RGB_TEXTURE_3D_NV	
GL_DEPENDENT_RGB_TEXTURE_CUBE_MAP_NV	
GL_DEPTH_CLAMP_NV	
GL_DEPTH_COMPONENT16_ARB	
GL_DEPTH_COMPONENT24_ARB	
GL_DEPTH_COMPONENT32_ARB	
GL_DEPTH_TEXTURE_MODE_ARB	
GL_DOT_PRODUCT_AFFINE_DEPTH_REPLACE_NV	
GL_DOT_PRODUCT_CONST_EYE_REFLECT_CUBE_MAP_NV	
GL_DOT_PRODUCT_DEPTH_REPLACE_NV	
GL_DOT_PRODUCT_DIFFUSE_CUBE_MAP_NV	
GL_DOT_PRODUCT_NV	
GL_DOT_PRODUCT_PASS_THROUGH_NV	
GL_DOT_PRODUCT_REFLECT_CUBE_MAP_NV	
GL_DOT_PRODUCT_TEXTURE_1D_NV	
GL_DOT_PRODUCT_TEXTURE_2D_NV	
GL_DOT_PRODUCT_TEXTURE_3D_NV	
GL_DOT_PRODUCT_TEXTURE_CUBE_MAP_NV	
GL_DOT_PRODUCT_TEXTURE_RECTANGLE_NV	
GL_DRAW_PIXELS_APPLE	
GL_DS_BIAS_NV	
GL_DS_SCALE_NV	
GL_DSDT8_MAG8_INTENSITY8_NV	
GL_DSDT8_MAG8_NV	
GL_DSDT8_NV	
GL_DSDT_MAG_INTENSITY_NV	
GL_DSDT_MAG_NV	
GL_DSDT_MAG_VIB_NV	

GL_DSDT_NV	
GL_DT_BIAS_NV	
GL_DT_SCALE_NV	
GL_ELEMENT_ARRAY_APPLE	
GL_ELEMENT_ARRAY_POINTER_APPLE	
GL_ELEMENT_ARRAY_TYPE_APPLE	
GL_EXT_blend_func_separate	
GL_EXT_draw_range_elements	
GL_EXT_fog_coord	
GL_EXT_multi_draw_arrays	
GL_EXT_shadow_funcs	
GL_EXT_stencil_two_side	
GL_EXT_stencil_wrap	
GL_EYE_PLANE_ABSOLUTE_NV	
GL_EYE_RADIAL_NV	
GL_FENCE_APPLE	
GL_FOG_COORDINATE_ARRAY_EXT	
GL_FOG_COORDINATE_ARRAY_POINTER_EXT	
GL_FOG_COORDINATE_ARRAY_STRIDE_EXT	
GL_FOG_COORDINATE_ARRAY_TYPE_EXT	
GL_FOG_COORDINATE_EXT	
GL_FOG_COORDINATE_SOURCE_EXT	
GL_FOG_DISTANCE_MODE_NV	
GL_FORCE_BLUE_TO_ONE_NV	
GL_FRAGMENT_DEPTH_EXT	
GL_FRAGMENT_PROGRAM_ARB	
GL_GENERATE_MIPMAP_HINT_SGIS	
GL_GENERATE_MIPMAP_SGIS	

GL_HI_BIAS_NV	
GL_HI_SCALE_NV	
GL_HILO16_NV	
GL_HILO8_NV	
GL_HILO_NV	
GL_INCR_WRAP_EXT	
GL_INTENSITY_FLOAT16_APPLE	
GL_INTENSITY_FLOAT32_APPLE	
GL_LO_BIAS_NV	
GL_LO_SCALE_NV	
GL_LUMINANCE_ALPHA_FLOAT16_APPLE	
GL_LUMINANCE_ALPHA_FLOAT32_APPLE	
GL_LUMINANCE_FLOAT16_APPLE	
GL_LUMINANCE_FLOAT32_APPLE	
GL_MAGNITUDE_BIAS_NV	
GL_MAGNITUDE_SCALE_NV	
GL_MATRIX0_ARB	
GL_MATRIX10_ARB	
GL_MATRIX11_ARB	
GL_MATRIX12_ARB	
GL_MATRIX13_ARB	
GL_MATRIX14_ARB	
GL_MATRIX15_ARB	
GL_MATRIX16_ARB	
GL_MATRIX17_ARB	
GL_MATRIX18_ARB	
GL_MATRIX19_ARB	
GL_MATRIX1_ARB	

GL_MATRIX20_ARB	
GL_MATRIX21_ARB	
GL_MATRIX22_ARB	
GL_MATRIX23_ARB	
GL_MATRIX24_ARB	
GL_MATRIX25_ARB	
GL_MATRIX26_ARB	
GL_MATRIX27_ARB	
GL_MATRIX28_ARB	
GL_MATRIX29_ARB	
GL_MATRIX2_ARB	
GL_MATRIX30_ARB	
GL_MATRIX31_ARB	
GL_MATRIX3_ARB	
GL_MATRIX4_ARB	
GL_MATRIX5_ARB	
GL_MATRIX6_ARB	
GL_MATRIX7_ARB	
GL_MATRIX8_ARB	
GL_MATRIX9_ARB	
GL_MAX_ELEMENTS_INDICES_EXT	
GL_MAX_ELEMENTS_VERTICES_EXT	
GL_MAX_PN_TRIANGLES_TESSELATION_LEVEL_ATI	
GL_MAX_PROGRAM_ADDRESS_REGISTERS_ARB	
GL_MAX_PROGRAM_ALU_INSTRUCTIONS_ARB	
GL_MAX_PROGRAM_ATTRIBS_ARB	
GL_MAX_PROGRAM_ENV_PARAMETERS_ARB	
GL_MAX_PROGRAM_INSTRUCTIONS_ARB	

GL_MAX_PROGRAM_LOCAL_PARAMETERS_ARB	
GL_MAX_PROGRAM_MATRICES_ARB	
GL_MAX_PROGRAM_MATRIX_STACK_DEPTH_ARB	
GL_MAX_PROGRAM_NATIVE_ADDRESS_REGISTERS_ARB	
GL_MAX_PROGRAM_NATIVE_ALU_INSTRUCTIONS_ARB	
GL_MAX_PROGRAM_NATIVE_ATTRIBS_ARB	
GL_MAX_PROGRAM_NATIVE_INSTRUCTIONS_ARB	
GL_MAX_PROGRAM_NATIVE_PARAMETERS_ARB	
GL_MAX_PROGRAM_NATIVE_TEMPORARIES_ARB	
GL_MAX_PROGRAM_NATIVE_TEX_INDIRECTIONS_ARB	
GL_MAX_PROGRAM_NATIVE_TEX_INSTRUCTIONS_ARB	
GL_MAX_PROGRAM_PARAMETERS_ARB	
GL_MAX_PROGRAM_TEMPORARIES_ARB	
GL_MAX_PROGRAM_TEX_INDIRECTIONS_ARB	
GL_MAX_PROGRAM_TEX_INSTRUCTIONS_ARB	
GL_MAX_SHININESS_NV	
GL_MAX_SPOT_EXPONENT_NV	
GL_MAX_TEXTURE_COORDS_ARB	
GL_MAX_TEXTURE_IMAGE_UNITS_ARB	
GL_MAX_VERTEX_ARRAY_RANGE_ELEMENT_APPLE	
GL_MAX_VERTEX_ATTRIBS_ARB	
GL_MAX_VERTEX_UNITS_ARB	
GL_MAX_WEIGHTED_ATI	
GL_MIN_WEIGHTED_ATI	
GL_MIRROR_CLAMP_ATI	
GL_MIRROR_CLAMP_TO_EDGE_ATI	
GL_MIRRORED_REPEAT_ARB	
GL_MODELVIEW0_ARB	

GL_MODELVIEW10_ARB	
GL_MODELVIEW11_ARB	
GL_MODELVIEW12_ARB	
GL_MODELVIEW13_ARB	
GL_MODELVIEW14_ARB	
GL_MODELVIEW15_ARB	
GL_MODELVIEW16_ARB	
GL_MODELVIEW17_ARB	
GL_MODELVIEW18_ARB	
GL_MODELVIEW19_ARB	
GL_MODELVIEW1_ARB	
GL_MODELVIEW20_ARB	
GL_MODELVIEW21_ARB	
GL_MODELVIEW22_ARB	
GL_MODELVIEW23_ARB	
GL_MODELVIEW24_ARB	
GL_MODELVIEW25_ARB	
GL_MODELVIEW26_ARB	
GL_MODELVIEW27_ARB	
GL_MODELVIEW28_ARB	
GL_MODELVIEW29_ARB	
GL_MODELVIEW2_ARB	
GL_MODELVIEW30_ARB	
GL_MODELVIEW31_ARB	
GL_MODELVIEW3_ARB	
GL_MODELVIEW4_ARB	
GL_MODELVIEW5_ARB	
GL_MODELVIEW6_ARB	

GL_MODELVIEW7_ARB	
GL_MODELVIEW8_ARB	
GL_MODELVIEW9_ARB	
GL_MODULATE_ADD_ATI	
GL_MODULATE_SIGNED_ADD_ATI	
GL_MODULATE_SUBTRACT_ATI	
GL_MULTISAMPLE_FILTER_HINT_NV	
GL_NV_depth_clamp	
GL_NV_fog_distance	
GL_NV_light_max_exponent	
GL_NV_multisample_filter_hint	
GL_NV_point_sprite	
GL_NV_texture_shader	
GL_NV_texture_shader2	
GL_NV_texture_shader3	
GL_OFFSET_HILO_PROJECTIVE_TEXTURE_2D_NV	
GL_OFFSET_HILO_PROJECTIVE_TEXTURE_RECTANGLE_NV	
GL_OFFSET_HILO_TEXTURE_2D_NV	
GL_OFFSET_HILO_TEXTURE_RECTANGLE_NV	
GL_OFFSET_PROJECTIVE_TEXTURE_2D_NV	
GL_OFFSET_PROJECTIVE_TEXTURE_2D_SCALE_NV	
GL_OFFSET_PROJECTIVE_TEXTURE_RECTANGLE_NV	
GL_OFFSET_PROJECTIVE_TEXTURE_RECTANGLE_SCALE_NV	
GL_OFFSET_TEXTURE_2D_BIAS_NV	
GL_OFFSET_TEXTURE_2D_MATRIX_NV	
GL_OFFSET_TEXTURE_2D_NV	
GL_OFFSET_TEXTURE_2D_SCALE_NV	
GL_OFFSET_TEXTURE_BIAS_NV	

GL_OFFSET_TEXTURE_MATRIX_NV	
GL_OFFSET_TEXTURE_RECTANGLE_NV	
GL_OFFSET_TEXTURE_RECTANGLE_SCALE_NV	
GL_OFFSET_TEXTURE_SCALE_NV	
GL_PASS_THROUGH_NV	
GL_PN_TRIANGLES_ATI	
GL_PN_TRIANGLES_NORMAL_MODE_ATI	
GL_PN_TRIANGLES_NORMAL_MODE_LINEAR_ATI	
GL_PN_TRIANGLES_NORMAL_MODE_QUADRATIC_ATI	
GL_PN_TRIANGLES_POINT_MODE_ATI	
GL_PN_TRIANGLES_POINT_MODE_CUBIC_ATI	
GL_PN_TRIANGLES_POINT_MODE_LINEAR_ATI	
GL_PN_TRIANGLES_TESSELATION_LEVEL_ATI	
GL_POINT_CULL_CENTER_ATI	
GL_POINT_CULL_CLIP_ATI	
GL_POINT_CULL_MODE_ATI	
GL_POINT_DISTANCE_ATTENUATION_ARB	
GL_POINT_FADE_THRESHOLD_SIZE_ARB	
GL_POINT_SIZE_MAX_ARB	
GL_POINT_SIZE_MIN_ARB	
GL_POINT_SPRITE_NV	
GL_POINT_SPRITE_R_MODE_NV	
GL_PREVIOUS_TEXTURE_INPUT_NV	
GL_PROGRAM_ADDRESS_REGISTERS_ARB	
GL_PROGRAM_ALU_INSTRUCTIONS_ARB	
GL_PROGRAM_ATTRIBS_ARB	
GL_PROGRAM_BINDING_ARB	
GL_PROGRAM_ERROR_POSITION_ARB	

GL_PROGRAM_ERROR_STRING_ARB	
GL_PROGRAM_FORMAT_ARB	
GL_PROGRAM_FORMAT_ASCII_ARB	
GL_PROGRAM_INSTRUCTIONS_ARB	
GL_PROGRAM_LENGTH_ARB	
GL_PROGRAM_NAME_ARB	
GL_PROGRAM_NATIVE_ADDRESS_REGISTERS_ARB	
GL_PROGRAM_NATIVE_ALU_INSTRUCTIONS_ARB	
GL_PROGRAM_NATIVE_ATTRIBS_ARB	
GL_PROGRAM_NATIVE_INSTRUCTIONS_ARB	
GL_PROGRAM_NATIVE_PARAMETERS_ARB	
GL_PROGRAM_NATIVE_TEMPORARIES_ARB	
GL_PROGRAM_NATIVE_TEX_INDIRECTIONS_ARB	
GL_PROGRAM_NATIVE_TEX_INSTRUCTIONS_ARB	
GL_PROGRAM_PARAMETERS_ARB	
GL_PROGRAM_STRING_ARB	
GL_PROGRAM_TEMPORARIES_ARB	
GL_PROGRAM_TEX_INDIRECTIONS_ARB	
GL_PROGRAM_TEX_INSTRUCTIONS_ARB	
GL_PROGRAM_UNDER_NATIVE_LIMITS_ARB	
GL_RGB_FLOAT16_APPLE	
GL_RGB_FLOAT32_APPLE	
GL_RGBA_FLOAT16_APPLE	
GL_RGBA_FLOAT32_APPLE	
GL_RGBA_UNSIGNED_DOT_PRODUCT_MAPPING_NV	
GL_SGIS_generate_mipmap	
GL_SGIS_texture_lod	
GL_SHADER_CONSISTENT_NV	

GL_SHADER_OPERATION_NV	
GL_SIGNED_ALPHA8_NV	
GL_SIGNED_ALPHA_NV	
GL_SIGNED_HILO16_NV	
GL_SIGNED_HILO8_NV	
GL_SIGNED_HILO_NV	
GL_SIGNED_INTENSITY8_NV	
GL_SIGNED_INTENSITY_NV	
GL_SIGNED_LUMINANCE8_ALPHA8_NV	
GL_SIGNED_LUMINANCE8_NV	
GL_SIGNED_LUMINANCE_ALPHA_NV	
GL_SIGNED_LUMINANCE_NV	
GL_SIGNED_RGB8_NV	
GL_SIGNED_RGB8_UNSIGNED_ALPHA8_NV	
GL_SIGNED_RGB_NV	
GL_SIGNED_RGB_UNSIGNED_ALPHA_NV	
GL_SIGNED_RGBA8_NV	
GL_SIGNED_RGBA_NV	
GL_STENCIL_BACK_FAIL_ATI	
GL_STENCIL_BACK_FUNC_ATI	
GL_STENCIL_BACK_PASS_DEPTH_FAIL_ATI	
GL_STENCIL_BACK_PASS_DEPTH_PASS_ATI	
GL_STENCIL_TEST_TWO_SIDE_EXT	
GL_STORAGE_CACHED_APPLE	
GL_STORAGE_PRIVATE_APPLE	
GL_STORAGE_SHARED_APPLE	
GL_TEXT_FRAGMENT_SHADER_ATI	
GL_TEXTURE_BASE_LEVEL_SGIS	

GL_TEXTURE_BORDER_VALUES_NV	
GL_TEXTURE_COMPARE_FAIL_VALUE_ARB	
GL_TEXTURE_COMPARE_FUNC_ARB	
GL_TEXTURE_COMPARE_MODE_ARB	
GL_TEXTURE_COMPRESSED_IMAGE_SIZE_ARB	
GL_TEXTURE_DEPTH_SIZE_ARB	
GL_TEXTURE_DS_SIZE_NV	
GL_TEXTURE_DT_SIZE_NV	
GL_TEXTURE_HI_SIZE_NV	
GL_TEXTURE_LO_SIZE_NV	
GL_TEXTURE_MAG_SIZE_NV	
GL_TEXTURE_MAX_LEVEL_SGIS	
GL_TEXTURE_MAX_LOD_SGIS	
GL_TEXTURE_MIN_LOD_SGIS	
GL_TEXTURE_RANGE_LENGTH_APPLE	
GL_TEXTURE_RANGE_POINTER_APPLE	
GL_TEXTURE_SHADER_NV	
GL_TEXTURE_STORAGE_HINT_APPLE	
GL_TRANSPOSE_CURRENT_MATRIX_ARB	
GL_UNSIGNED_INT_8_8_S8_S8_REV_NV	
GL_UNSIGNED_INT_S8_S8_8_8_NV	
GL_VERTEX_ARRAY_BINDING_APPLE	
GL_VERTEX_ARRAY_RANGE_APPLE	
GL_VERTEX_ARRAY_RANGE_LENGTH_APPLE	
GL_VERTEX_ARRAY_RANGE_POINTER_APPLE	
GL_VERTEX_ARRAY_STORAGE_HINT_APPLE	
GL_VERTEX_ATTRIB_ARRAY_ENABLED_ARB	
GL_VERTEX_ATTRIB_ARRAY_NORMALIZED_ARB	

GL_VERTEX_ATTRIB_ARRAY_POINTER_ARB	
GL_VERTEX_ATTRIB_ARRAY_SIZE_ARB	
GL_VERTEX_ATTRIB_ARRAY_STRIDE_ARB	
GL_VERTEX_ATTRIB_ARRAY_TYPE_ARB	
GL_VERTEX_ATTRIB_MAP1_ARB	
GL_VERTEX_ATTRIB_MAP1_COEFF_ARB	
GL_VERTEX_ATTRIB_MAP1_DOMAIN_ARB	
GL_VERTEX_ATTRIB_MAP1_ORDER_ARB	
GL_VERTEX_ATTRIB_MAP1_SIZE_ARB	
GL_VERTEX_ATTRIB_MAP2_ARB	
GL_VERTEX_ATTRIB_MAP2_COEFF_ARB	
GL_VERTEX_ATTRIB_MAP2_DOMAIN_ARB	
GL_VERTEX_ATTRIB_MAP2_ORDER_ARB	
GL_VERTEX_ATTRIB_MAP2_SIZE_ARB	
GL_VERTEX_BLEND_ARB	
GL_VERTEX_PROGRAM_ARB	
GL_VERTEX_PROGRAM_POINT_SIZE_ARB	
GL_VERTEX_PROGRAM_TWO_SIDE_ARB	
GL_VIBRANCE_BIAS_NV	
GL_VIBRANCE_SCALE_NV	
GL_WEIGHT_ARRAY_ARB	
GL_WEIGHT_ARRAY_POINTER_ARB	
GL_WEIGHT_ARRAY_SIZE_ARB	
GL_WEIGHT_ARRAY_STRIDE_ARB	
GL_WEIGHT_ARRAY_TYPE_ARB	
GL_WEIGHT_SUM_UNITY_ARB	

10.1 Symbol Changes

This article lists the symbols added to `OpenGL.framework` in Mac OS X v10.1.

C Symbols

All of the header files with new symbols are listed alphabetically, with their new symbols described.

CGLMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`glActiveTexture`	
`glBlendColor`	
`glBlendEquation`	
`glClientActiveTexture`	
`glCompressedTexImage1D`	
`glCompressedTexImage1DARB`	
`glCompressedTexImage2D`	
`glCompressedTexImage2DARB`	
`glCompressedTexImage3D`	
`glCompressedTexImage3DARB`	
`glCompressedTexSubImage1D`	
`glCompressedTexSubImage1DARB`	
`glCompressedTexSubImage2D`	
`glCompressedTexSubImage2DARB`	
`glCompressedTexSubImage3D`	

glCompressedTexSubImage3DARB	
glDrawRangeElements	
glGetCompressedTexImage	
glGetCompressedTexImageARB	
glLoadTransposeMatrixd	
glLoadTransposeMatrixdARB	
glLoadTransposeMatrixf	
glLoadTransposeMatrixfARB	
glMultiTexCoord1d	
glMultiTexCoord1dv	
glMultiTexCoord1f	
glMultiTexCoord1fv	
glMultiTexCoord1i	
glMultiTexCoord1iv	
glMultiTexCoord1s	
glMultiTexCoord1sv	
glMultiTexCoord2d	
glMultiTexCoord2dv	
glMultiTexCoord2f	
glMultiTexCoord2fv	
glMultiTexCoord2i	
glMultiTexCoord2iv	
glMultiTexCoord2s	
glMultiTexCoord2sv	
glMultiTexCoord3d	
glMultiTexCoord3dv	
glMultiTexCoord3f	
glMultiTexCoord3fv	

glMultiTexCoord3i	
glMultiTexCoord3iv	
glMultiTexCoord3s	
glMultiTexCoord3sv	
glMultiTexCoord4d	
glMultiTexCoord4dv	
glMultiTexCoord4f	
glMultiTexCoord4fv	
glMultiTexCoord4i	
glMultiTexCoord4iv	
glMultiTexCoord4s	
glMultiTexCoord4sv	
glMultTransposeMatrixd	
glMultTransposeMatrixdARB	
glMultTransposeMatrixf	
glMultTransposeMatrixfARB	
glSampleCoverage	
glSampleCoverageARB	
glSamplePass	
glSamplePassARB	

CGLRenderers.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

kCGLRendererGeForce2MXID	Specifies the NVIDIA GeForce2MX renderer.
kCGLRendererGeForce3ID	Specifies the NVIDIA GeForce3 renderer.

CGLTypes.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`kCGLPFASampleBuffers`	The number of multisample buffers. The associated value is a nonnegative integer that indicates the number of existing independent sample buffers. Typically, the value is 0 if no multi-sample buffer exists or 1. This attribute is not useful in the attribute array.
`kCGLPFASamples`	The number of samples per multisample buffer. The associated value is a nonnegative integer that indicates the desired number of samples that can be taken within a single pixel. The smallest sample buffer with at least the specified number of samples is preferred.
`kCGLRPMaxSampleBuffers`	The associated value is the maximum number of independent sample buffers supported by the renderer. Typically, the value is 0 if no multisample buffer exists, or 1 if one exists.
`kCGLRPMaxSamples`	The associated value is the maximum number of samples per pixel that the renderer supports.

gl.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`glActiveTexture`	
`glClientActiveTexture`	
`glCompressedTexImage1D`	
`glCompressedTexImage2D`	
`glCompressedTexImage3D`	
`glCompressedTexSubImage1D`	
`glCompressedTexSubImage2D`	
`glCompressedTexSubImage3D`	
`glGetCompressedTexImage`	
`glLoadTransposeMatrixd`	

glLoadTransposeMatrixf	
glMultiTexCoord1d	
glMultiTexCoord1dv	
glMultiTexCoord1f	
glMultiTexCoord1fv	
glMultiTexCoord1i	
glMultiTexCoord1iv	
glMultiTexCoord1s	
glMultiTexCoord1sv	
glMultiTexCoord2d	
glMultiTexCoord2dv	
glMultiTexCoord2f	
glMultiTexCoord2fv	
glMultiTexCoord2i	
glMultiTexCoord2iv	
glMultiTexCoord2s	
glMultiTexCoord2sv	
glMultiTexCoord3d	
glMultiTexCoord3dv	
glMultiTexCoord3f	
glMultiTexCoord3fv	
glMultiTexCoord3i	
glMultiTexCoord3iv	
glMultiTexCoord3s	
glMultiTexCoord3sv	
glMultiTexCoord4d	
glMultiTexCoord4dv	
glMultiTexCoord4f	

glMultiTexCoord4fv	
glMultiTexCoord4i	
glMultiTexCoord4iv	
glMultiTexCoord4s	
glMultiTexCoord4sv	
glMultTransposeMatrixd	
glMultTransposeMatrixf	
glSampleCoverage	
glSamplePass	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_ACTIVE_TEXTURE	
GL_ADD_SIGNED	
GL_ALIASED_LINE_WIDTH_RANGE	
GL_ALIASED_POINT_SIZE_RANGE	
GL_CLAMP_TO_BORDER	
GL_CLIENT_ACTIVE_TEXTURE	
GL_COMBINE	
GL_COMBINE_ALPHA	
GL_COMBINE_RGB	
GL_COMPRESSED_ALPHA	
GL_COMPRESSED_INTENSITY	
GL_COMPRESSED_LUMINANCE	
GL_COMPRESSED_LUMINANCE_ALPHA	
GL_COMPRESSED_RGB	
GL_COMPRESSED_RGBA	
GL_COMPRESSED_TEXTURE_FORMATS	

GL_CONSTANT	
GL_CONSTANT_BORDER	
GL_CONVOLUTION_BORDER_COLOR	
GL_DOT3_RGB	
GL_DOT3_RGBA	
GL_INTERPOLATE	
GL_LIGHT_MODEL_COLOR_CONTROL	
GL_MAX_CUBE_MAP_TEXTURE_SIZE	
GL_MAX_ELEMENTS_INDICES	
GL_MAX_ELEMENTS_VERTICES	
GL_MAX_TEXTURE_UNITS	
GL_MULTISAMPLE	
GL_MULTISAMPLE_BIT	
GL_NORMAL_MAP	
GL_NUM_COMPRESSED_TEXTURE_FORMATS	
GL_OPERAND0_ALPHA	
GL_OPERAND0_RGB	
GL_OPERAND1_ALPHA	
GL_OPERAND1_RGB	
GL_OPERAND2_ALPHA	
GL_OPERAND2_RGB	
GL_OPERAND3_ALPHA	
GL_OPERAND3_RGB	
GL_OPERAND4_ALPHA	
GL_OPERAND4_RGB	
GL_OPERAND5_ALPHA	
GL_OPERAND5_RGB	
GL_OPERAND6_ALPHA	

GL_OPERAND6_RGB	
GL_OPERAND7_ALPHA	
GL_OPERAND7_RGB	
GL_POST_COLOR_MATRIX_ALPHA_BIAS	
GL_PREVIOUS	
GL_PRIMARY_COLOR	
GL_PROXY_TEXTURE_CUBE_MAP	
GL_REFLECTION_MAP	
GL_REPLICATE_BORDER	
GL_RGB_SCALE	
GL_SAMPLE_ALPHA_TO_COVERAGE	
GL_SAMPLE_ALPHA_TO_ONE	
GL_SAMPLE_BUFFERS	
GL_SAMPLE_COVERAGE	
GL_SAMPLE_COVERAGE_INVERT	
GL_SAMPLE_COVERAGE_VALUE	
GL_SAMPLES	
GL_SEPARATE_SPECULAR_COLOR	
GL_SINGLE_COLOR	
GL_SMOOTH_LINE_WIDTH_GRANULARITY	
GL_SMOOTH_LINE_WIDTH_RANGE	
GL_SMOOTH_POINT_SIZE_GRANULARITY	
GL_SMOOTH_POINT_SIZE_RANGE	
GL_SOURCE0_ALPHA	
GL_SOURCE0_RGB	
GL_SOURCE1_ALPHA	
GL_SOURCE1_RGB	
GL_SOURCE2_ALPHA	

GL_SOURCE2_RGB	
GL_SOURCE3_ALPHA	
GL_SOURCE3_RGB	
GL_SOURCE4_ALPHA	
GL_SOURCE4_RGB	
GL_SOURCE5_ALPHA	
GL_SOURCE5_RGB	
GL_SOURCE6_ALPHA	
GL_SOURCE6_RGB	
GL_SOURCE7_ALPHA	
GL_SOURCE7_RGB	
GL_SUBTRACT	
GL_TEXTURE0	
GL_TEXTURE1	
GL_TEXTURE10	
GL_TEXTURE11	
GL_TEXTURE12	
GL_TEXTURE13	
GL_TEXTURE14	
GL_TEXTURE15	
GL_TEXTURE16	
GL_TEXTURE17	
GL_TEXTURE18	
GL_TEXTURE19	
GL_TEXTURE2	
GL_TEXTURE20	
GL_TEXTURE21	
GL_TEXTURE22	

GL_TEXTURE23	
GL_TEXTURE24	
GL_TEXTURE25	
GL_TEXTURE26	
GL_TEXTURE27	
GL_TEXTURE28	
GL_TEXTURE29	
GL_TEXTURE3	
GL_TEXTURE30	
GL_TEXTURE31	
GL_TEXTURE4	
GL_TEXTURE5	
GL_TEXTURE6	
GL_TEXTURE7	
GL_TEXTURE8	
GL_TEXTURE9	
GL_TEXTURE_BINDING_3D	
GL_TEXTURE_BINDING_CUBE_MAP	
GL_TEXTURE_COMPRESSED	
GL_TEXTURE_COMPRESSION_HINT	
GL_TEXTURE_CUBE_MAP	
GL_TEXTURE_CUBE_MAP_NEGATIVE_X	
GL_TEXTURE_CUBE_MAP_NEGATIVE_Y	
GL_TEXTURE_CUBE_MAP_NEGATIVE_Z	
GL_TEXTURE_CUBE_MAP_POSITIVE_X	
GL_TEXTURE_CUBE_MAP_POSITIVE_Y	
GL_TEXTURE_CUBE_MAP_POSITIVE_Z	
GL_TEXTURE_IMAGE_SIZE	

GL_TRANSPOSE_COLOR_MATRIX	
GL_TRANSPOSE_MODELVIEW_MATRIX	
GL_TRANSPOSE_PROJECTION_MATRIX	
GL_TRANSPOSE_TEXTURE_MATRIX	
GL_VERSION_1_3	

glext.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

glCombinerStageParameterfvNV	
glFinishTexture	
glGetCombinerStageParameterfvNV	
glPNTrianglesfATIX	
glPNTrianglesiATIX	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GL_ADD_SIGNED_ARB	
GL_APPLE_client_address_range	
GL_APPLE_client_storage	
GL_APPLE_ycbcr_422	
GL_ARB_texture_border_clamp	
GL_ARB_texture_env_combine	
GL_ARB_texture_env_dot3	
GL_ATIX_pn_triangles	
GL_CLAMP_TO_BORDER_ARB	

GL_COMBINE_ALPHA_ARB	
GL_COMBINE_ARB	
GL_COMBINE_RGB_ARB	
GL_CONSTANT_ARB	
GL_DOT3_RGB_ARB	
GL_DOT3_RGBA_ARB	
GL_EXT_texture_compression_s3tc	
GL_EXT_texture_rectangle	
GL_INTERPOLATE_ARB	
GL_MAX_PN_TRIANGLES_TESSELATION_LEVEL_ATIX	
GL_MAX_RECTANGLE_TEXTURE_SIZE_EXT	
GL_NV_register_combiners2	
GL_NV_vertex_program	
GL_OPERAND0_ALPHA_ARB	
GL_OPERAND0_RGB_ARB	
GL_OPERAND1_ALPHA_ARB	
GL_OPERAND1_RGB_ARB	
GL_OPERAND2_ALPHA_ARB	
GL_OPERAND2_RGB_ARB	
GL_OPERAND3_ALPHA_ARB	
GL_OPERAND3_RGB_ARB	
GL_OPERAND4_ALPHA_ARB	
GL_OPERAND4_RGB_ARB	
GL_OPERAND5_ALPHA_ARB	
GL_OPERAND5_RGB_ARB	
GL_OPERAND6_ALPHA_ARB	
GL_OPERAND6_RGB_ARB	
GL_OPERAND7_ALPHA_ARB	

GL_OPERAND7_RGB_ARB	
GL_PER_STAGE_CONSTANTS_NV	
GL_PN_TRIANGLES_ATIX	
GL_PN_TRIANGLES_NORMAL_MODE_ATIX	
GL_PN_TRIANGLES_NORMAL_MODE_LINEAR_ATIX	
GL_PN_TRIANGLES_NORMAL_MODE_QUADRATIC_ATIX	
GL_PN_TRIANGLES_POINT_MODE_ATIX	
GL_PN_TRIANGLES_POINT_MODE_CUBIC_ATIX	
GL_PN_TRIANGLES_POINT_MODE_LINEAR_ATIX	
GL_PN_TRIANGLES_TESSELATION_LEVEL_ATIX	
GL_PREVIOUS_ARB	
GL_PRIMARY_COLOR_ARB	
GL_PROXY_TEXTURE_RECTANGLE_EXT	
GL_RGB_SCALE_ARB	
GL_SOURCE0_ALPHA_ARB	
GL_SOURCE0_RGB_ARB	
GL_SOURCE1_ALPHA_ARB	
GL_SOURCE1_RGB_ARB	
GL_SOURCE2_ALPHA_ARB	
GL_SOURCE2_RGB_ARB	
GL_SOURCE3_ALPHA_ARB	
GL_SOURCE3_RGB_ARB	
GL_SOURCE4_ALPHA_ARB	
GL_SOURCE4_RGB_ARB	
GL_SOURCE5_ALPHA_ARB	
GL_SOURCE5_RGB_ARB	
GL_SOURCE6_ALPHA_ARB	
GL_SOURCE6_RGB_ARB	

GL_SOURCE7_ALPHA_ARB	
GL_SOURCE7_RGB_ARB	
GL_SUBTRACT_ARB	
GL_TEXTURE_BINDING_RECTANGLE_EXT	
GL_TEXTURE_RECTANGLE_EXT	
GL_UNPACK_CLIENT_ADDRESS_MAX_APPLE	
GL_UNPACK_CLIENT_ADDRESS_MIN_APPLE	
GL_UNPACK_CLIENT_STORAGE_APPLE	
GL_UNSIGNED_SHORT_8_8_APPLE	
GL_UNSIGNED_SHORT_8_8_REV_APPLE	
GL_YCBCR_422_APPLE	

glu.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

gluBuild1DMipmapLevels	
gluBuild2DMipmapLevels	
gluBuild3DMipmapLevels	
gluBuild3DMipmaps	
gluCheckExtension	
gluNurbsCallbackData	
gluUnProject4	

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

GLU_NURBS_BEGIN	

GLU_NURBS_BEGIN_DATA	
GLU_NURBS_COLOR	
GLU_NURBS_COLOR_DATA	
GLU_NURBS_END	
GLU_NURBS_END_DATA	
GLU_NURBS_ERROR	
GLU_NURBS_MODE	
GLU_NURBS_NORMAL	
GLU_NURBS_NORMAL_DATA	
GLU_NURBS_RENDERER	
GLU_NURBS_TESSELLATOR	
GLU_NURBS_TEXTURE_COORD	
GLU_NURBS_TEXTURE_COORD_DATA	
GLU_NURBS_VERTEX	
GLU_NURBS_VERTEX_DATA	
GLU_OBJECT_PARAMETRIC_ERROR	
GLU_OBJECT_PATH_LENGTH	
GLU_VERSION_1_3	

gluContext.h

Functions

All of the new functions in this header file are listed alphabetically, with links to documentation and abstracts, if available.

gluBuild1DMipmapLevelsCTX	
gluBuild2DMipmapLevelsCTX	
gluBuild3DMipmapLevelsCTX	
gluBuild3DMipmapsCTX	

gluMacro.h

Data Types & Constants

All of the new data types and constants in this header file are listed alphabetically, with links to documentation and abstracts, if available.

`gluBuild1DMipmapLevels`	
`gluBuild2DMipmapLevels`	
`gluBuild3DMipmapLevels`	
`gluBuild3DMipmaps`	

Document Revision History

This table describes the changes to *OpenGL Reference Update*.

Date	Notes
2007-07-18	Updated with the symbols added to the OpenGL framework in Mac OS X v10.5.
2005-04-29	New document that summarizes the symbols added to the OpenGL framework in Mac OS X v10.4.