

## GfX LITE Customization

This document describes how to customize Scaleform GfX to a lightweight configuration, GfX LITE.

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## Autodesk® Scaleform® 3

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# 1 Scaleform Gfx 3.3 Customization Defines

Scaleform® Gfx™ is highly customizable and allows users to exclude many modules and functionalities in order to decrease the code size. This is especially important for game consoles and the Wii™ in particular, since it has a strict limitation on executable code size. This document details how to customize and use the lightweight version of Gfx, known as "Gfx LITE" and the various options defined in this version. Using the lightweight version of Gfx, customers can build their own customized Gfx libraries and achieve significant code size reduction in their size-critical console applications.

All the possible options are represented as “defines” in the header file include/GConfig.h. Scaleform provides two variants of the Gfx library – regular (or full) and “lite”. The “lite” version doesn’t contain some features that the full version contains in order to decrease the code size.

**Since modifying these defines requires source code changes and recompilation, this type of customization is available for source code customers only.**

## 2 Building and Using the “Lite” Version

To build the “Lite” version of GfX library, it is necessary to define a symbol ‘GFC\_BUILD\_LITE’ and rebuild GfX and all corresponding libraries and source files.

If the “Lite” version of GfX library is used, it is necessary to define the symbol ‘GFC\_BUILD\_LITE’ for the application project as well. This will make sure the same set of options is consistent between the application and all related modules during compilation. Otherwise, linker or compiler errors might show up.

Note that if using GfXPlayerTiny as the GfX player in Lite configurations, customers have to convert *Bin\Samples\Window.swf* using GfXExport into GfX format for use.

```
GfXExport_Release Window.swf -i DDS -d0 -gradients
```

As a result of this conversion, these files would be created: *Window.gfx*, *Window\_G0.dds*, *Window\_G1.dds* and *Window\_G2.dds*. Use the *Window.gfx* instead of the original *Window.swf* as an input Flash file for GfXPlayerTiny for Lite configuration.

Below, each section contains a list of the options, grouped by category, along with a brief description and whether the option is defined in the regular and lite libraries.

### 2.1 General Options

#### **GFC\_NO\_THREAD SUPPORT**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Disables threading support. This option will also disable progressive loading and video playback.

#### **GFC\_NO\_STAT**

Regular GfX: Not defined

“Lite” GfX: Defined

Description: Disables statistics tracking; this is useful for the final build.

#### **GFC\_NO\_DOUBLE**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: This macro needs to be defined if it is necessary to avoid the use of the “double” type – double precision floating point type. Some platforms support only single precision – “float”. In that case, all references to “double” will be replaced by “float”. However, this substitution might cause some unexpected results in ActionScript logic, especially when arithmetic operations are followed by comparisons for equality with hardcoded values.

NOTE: By default, PS2 and PSP define this if not manually defined here.

### **GFC\_USE\_LIBJPEG**

Regular GfX: Defined

“Lite” GfX: Not defined

Description: Un-define this macro to disable use of LIBJPEG and make JPEGUtil a no-op stub.

If disabled, SWF JPEG image loading will stop functioning.

### **GFC\_CPP\_LIBJPEG**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Define this macro if the whole JPEGLIB is compiled as C++ code. By default, libjpeg is a pure C library and public names are not mangled. Though, it might be necessary to mangle jpeglib's names in order to resolve names clashing issues (for example, with XBox360's xmedia.lib).

### **GFC\_USE\_ZLIB**

Regular GfX: Defined

“Lite” GfX: Not defined

Description: Un-define this macro to disable use of ZLIB and comment out GZLibFile class. If ZLIB is disabled, compressed SWF and GFX files will no longer load, as well as the lossless images embedded into SWF files. Use this option only if GfXExport is used to extract all images from the SWF file.

### **GFC\_USE\_LIBPNG**

Regular GfX: Defined

“Lite” GfX: Not defined

Description: Enables use of LIBPNG. If disabled, SWF PNG image loading will not function.

### **GFC\_NO\_WCTYPE**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Define this macro to eliminate custom wctype tables for functions like G\_iswspace, G\_towlower, g\_towupper and so on. If this macro is defined, GfX will use system Unicode functions (which are incredibly slow on Microsoft Windows and work incorrectly on consoles).

### **GFC\_NO\_GC**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Disable garbage collection for ActionScript. Note, if garbage collection is disabled then GfX may produce memory leaks in the case of circular references.

Here is an example of code that will produce a leak in the case where garbage collection is disabled, unless one of the object references is explicitly disconnected:

```
var o1 = new Object;  
var o2 = new Object;  
o1.a = o2;  
o2.a = o1;
```

### **GFC\_ASSERT\_ON\_GRADIENT\_BITMAP\_GEN**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Define this macro to throw an assertion if any gradient texture is generated during the runtime. It helps detect potential slow-downs in these type of operations on low-end platforms.

GfXExport with the option “-gradients” should be used to avoid this assertion, if the macro is defined.

### **GFC\_ASSERT\_ON\_RENDERER\_RESAMPLING**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Define this macro to throw an assertion if any re-sampling occurred in the renderer during the runtime. It helps detect potential slow-downs on these types of operations on low-end platforms. The renderer may resample if non-power-of-2 textures are used on hardware that doesn’t support it. Use GfXExport to avoid this assertion when the macro is defined.

### **GFC\_ASSERT\_ON\_RENDERER\_MIPMAP\_GEN**

Regular GfX: Not defined

“Lite”GfX: Not defined

Description: Define this macro to throw an assertion if any mipmap level generation occurred in the renderer during the runtime. It helps detect potential slow-downs in these type of operations on low-end platforms. Use GfXExport with the option “-i dds” to pre-generate mipmaps and to avoid this assertion when the macro is defined.

### **GFC\_NO\_GRADIENT\_GEN**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Define this macro to exclude gradient generation. If this option is defined, then gradient generation code is excluded from the build. GfXExport with the option “-gradients” should be used to avoid gradient rendering problems. The option **GFC\_ASSERT\_ON\_GRADIENT\_BITMAP\_GEN** can be enabled to detect any attempts to generate gradients during run-time.



### **GFC\_NO\_SOUND**

Regular GFx: Not defined

“Lite” GFx: Not defined

Description: Define this macro to exclude sound support (in the GFx core and ActionScript).

### **GFC\_NO\_VIDEO**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Define this macro to exclude video support (in the GFx core and ActionScript). Note, video support is automatically disabled if the macro GFC\_NO\_THREADSUPPORT is defined, since video can be used only with multithreading support.

### **GFC\_NO\_CSS\_SUPPORT**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable core and ActionScript CSS (style sheets) support.

### **GFC\_NO\_XML\_SUPPORT**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable core and ActionScript XML support.

### **GFC\_NO\_IME\_SUPPORT**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable core and ActionScript IME support. If IME is disabled, then typing in Asian languages (Japanese, Korean, Chinese) will be impossible. If Asian language typing is not required (the IME library is not used) or **GFC\_NO\_TEXT\_INPUT\_SUPPORT** / **GFC\_NO\_KEYBOARD\_SUPPORT** options are enabled, then it is safe to disable IME support.

### **GFC\_NO\_BUILTIN\_KOREAN\_IME**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable the built-in core Korean IME logic. This option affects only the Windows GFx platform. Built-in Korean IME allows users to type in the Korean language without using a separate IME library. It is safe to disable this feature if Korean support is not required or if

**GFC\_NO\_TEXT\_INPUT\_SUPPORT** / **GFC\_NO\_KEYBOARD\_SUPPORT** options are enabled.

### **GFC\_NO\_TEXTFIELD\_EXTENSIONS**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable TextField ActionScript extension functions. If this option is used then the standard GfxPlayer's HUD will not work.

#### **GFC\_NO\_TEXT\_INPUT\_SUPPORT**

Regular Gfx: Not defined

“Lite” Gfx: Not defined; defined for consoles

Description: Disable text editing. Text selection will be disabled as well (since it is a part of text editing). This macro might be useful on consoles.

#### **GFC\_NO\_MORPHING\_SUPPORT**

Regular Gfx: Not defined

“Lite” Gfx: Not defined

Description: Disable morphing (shape tween) support.

#### **GFC\_NO\_DRAWTEXT\_SUPPORT**

Regular Gfx: Not defined

“Lite” Gfx: Defined

Description: Disable the DrawText API.

#### **GFC\_NO\_KEYBOARD\_SUPPORT**

Regular Gfx: Not defined

“Lite” Gfx: Not defined

Description: Disable keyboard support. No Key AS class will be provided, HandleEvent with GfxKeyEvent will not be supported; PAD keys on consoles will not work as well.

#### **GFC\_NO\_MOUSE\_SUPPORT**

Regular Gfx: Not defined.

“Lite” Gfx: Defined for consoles other than Wii.

Description: Disable mouse support completely. This option also disables the Mouse AS class (see **GFC\_NO\_FXPLAYER\_AS\_MOUSE**).

## ***2.2 Rendering Related Options***

#### **GFC\_NO\_FXPLAYER\_STROKER**

Regular Gfx: Not defined

“Lite” Gfx: Not defined

Description: If this macro is defined, Gfx will not use the stroker to render lines.

Note: the stroker is required to produce faux bold glyphs. If it is disabled then faux bold fonts will not be generated.

### **GFC\_NO\_FXPLAYER\_STROKERA**

Regular GFx: Not defined

“Lite” GFx: Not defined

Description: If this macro is defined, GFx will not use the anti-aliased stroker to render lines.

### **GFC\_NO\_FXPLAYER\_EDGEAA**

Regular GFx: Not defined

“Lite” GFx: Not defined

Description: If this macro is defined, GFx will not include EdgeAA (antialiasing) support.

## ***2.3 Logging Related Options***

### **GFC\_NO\_FXPLAYER\_VERBOSE\_PARSE**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Define this macro to eliminate all support for verbose parsing of input files. If this option is set, none of the verbose parse options are available, and the GFxLoader::SetVerboseParse call will have no effect. Game production release builds should probably define this option.

### **GFC\_NO\_FXPLAYER\_VERBOSE\_PARSE\_ACTION**

Regular GFx: Defined if GFC\_NO\_FXPLAYER\_VERBOSE\_PARSE is defined

“Lite” GFx: Defined

Description: Define this macro to eliminate all support for verbose parsing of actions (disables support for logging ActionScript disassembly during loading).

### **GFC\_NO\_FXPLAYER\_VERBOSE\_PARSE\_SHAPE**

Regular GFx: Not defined; defined if GFC\_NO\_FXPLAYER\_VERBOSE\_PARSE is defined

“Lite” GFx: Defined

Description: Define this macro to eliminate all support for verbose parsing of shape character structures.

### **GFC\_NO\_FXPLAYER\_VERBOSE\_PARSE\_MORPHSHAPE**

Regular GFx: Not defined; defined if GFC\_NO\_FXPLAYER\_VERBOSE\_PARSE is defined

“Lite” GFx: Defined

Description: Define this macro to eliminate all support for verbose parsing of morph shape character structures.

### **GFC\_NO\_FXPLAYER\_VERBOSE\_ACTION**

Regular GFx: Not defined in Debug and Debug Opt configuration; defined in Release configuration

“Lite” GFx: Defined

Description: Define this macro to eliminate support for verbose logging of executed ActionScript opcodes. If this macro is defined, GfxMovie::SetVerboseAction will have no effect. This option is defined by default in the Release configuration.

#### **GFC\_NO\_FXPLAYER\_VERBOSE\_ACTION\_ERRORS**

Regular Gfx: Not defined

“Lite” Gfx: Defined

Description: Define this macro to eliminate support for verbose logging of ActionScript run-time errors. If this macro is defined, GfxMovie::SetVerboseActionErrors will have no effect. Game production release builds should probably define this option.

## ***2.4 Font Related Options***

#### **GFC\_NO\_FONT\_GLYPH\_PACKER**

Regular Gfx: Not defined

“Lite” Gfx: Defined

Description: Define this macro to exclude the Font Glyph Packer. The Font Glyph Packer is used only if the static font cache is used (when `"Loader.GetFontCacheManager()->EnableDynamicCache(false);"` is used). If the dynamic font cache is in use or if GfxExport with option “-fonts” was used to produce the .gfx file with pre-rendered font textures, then the Font Glyph Packer may be excluded safely, in order to save some code size.

#### **GFC\_NO\_GLYPH\_CACHE**

Regular Gfx: Not defined

“Lite” Gfx: Not defined

Description: Define this macro to exclude the dynamic glyph cache. This option may be used if the static font cache is used (when `"Loader.GetFontCacheManager()->EnableDynamicCache(false);"`) or when GfxExport with the option “-fonts” is used to produce the .gfx file with pre-rendered font textures.

#### **GFC\_NO\_FONTCOMPACTOR\_SUPPORT**

Regular Gfx: Not defined

“Lite” Gfx: Defined

Description: Disable the font compactor (compaction during the run-time). Fonts compacted by the GfxExport (with option “-fc”) will work.

#### **GFC\_NO\_COMPACTED\_FONT\_SUPPORT**

Regular Gfx: Not defined

“Lite” Gfx: Not defined

Description: Disable usage of compacted fonts (fonts, compacted by GfxExport (option “-fc”).

### **GFC\_ASSERT\_ON\_FONT\_BITMAP\_GEN**

Regular GfX: Not defined

“Lite” GfX: Not defined

Description: Define this macro to throw an assertion if any font texture is generated during the runtime. This option is useful to detect any run-time font texture generation for low-end platforms. GfXExport with the option “-fonts” should be used to avoid this assertion, if the macro is defined.

## ***2.5 ActionScript Related Options***

### **GFC\_NO\_FXPLAYER\_AS\_FILTERS**

Regular GfX: Not defined

“Lite” GfX: Defined

Description: Disable filter classes support, such as ‘flash.filters.DropShadowFilter’, ‘flash.filters.BlurFilter’, ‘flash.filters.BitmapFilter’, ‘flash.filters.GlowFilter’. Note, currently these classes are supported only for TextFields.

### **GFC\_NO\_FXPLAYER\_AS\_DATE**

Regular GfX: Not defined

“Lite” GfX: Defined

Description: Disable 'Date' ActionScript class support.

### **GFC\_NO\_FXPLAYER\_AS\_POINT**

Regular GfX: Not defined

“Lite” GfX: Defined

Description: Disable 'flash.geom.Point' ActionScript class support. If the 'Point' class is used by another class (for example by 'flash.geom.Rectangle') then it will be replaced by a regular Object with the members “x” and “y” set.

### **GFC\_NO\_FXPLAYER\_AS\_RECTANGLE**

Regular GfX: Not defined

“Lite” GfX: Defined

Description: Disable 'flash.geom.Rectangle' ActionScript class support. If the 'Rectangle' class is used by another class (for example by 'Stage') then it will be replaced by a regular Object with the members “x”, “y”, “width”, “height” set.

### **GFC\_NO\_FXPLAYER\_AS\_TRANSFORM**

Regular GfX: Not defined

“Lite” GfX: Defined

Description: Disable 'flash.geom.Transform' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_COLORTRANSFORM**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'flash.geom.ColorTransform' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_MATRIX**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'flash.geom.Matrix' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_TEXTSNAPSHOT**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'TextSnapshot' class support.

**GFC\_NO\_FXPLAYER\_AS\_SHAREDOBJECT**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'SharedObject' class support.

**GFC\_NO\_FXPLAYER\_AS\_MOVIECLIPLOADER**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'MovieClipLoader' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_LOADVARS**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'LoadVars' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_BITMAPDATA**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'flash.display.BitmapData' ActionScript class support. Note, if the 'BitmapData' class is disabled then textfield will not support <IMG> HTML tags and image substitutions; 'MovieClip.attachBitmap' won't work as well.

**GFC\_NO\_FXPLAYER\_AS\_CAPABILITES**

Regular GFx: Not defined

“Lite”GFx: Defined

Description: Disable 'System.capabilites' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_COLOR**

Regular GFx: Not defined.

“Lite” GFx: Defined

Description: Disable 'Color' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_TEXTFORMAT**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'TextFormat' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_SELECTION**

Regular GFx: Not defined

“Lite” GFx: Defined

Description: Disable 'Selection' ActionScript class support.

**GFC\_NO\_FXPLAYER\_AS\_STAGE**

Regular GFx: Not defined

“Lite” GFx: Not defined

Description: Disable 'Stage' ActionScript class support. Stage.height and Stage.width will not be supported as well.

**GFC\_NO\_FXPLAYER\_AS\_MOUSE**

Regular GFx: Not defined

“Lite” GFx: Defined only for consoles other than Wii

Description: Disable 'Mouse' ActionScript class support.