# XShaderCompiler

0.06 Alpha

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# Contents

# Chapter 1

# Main Page

Welcome to the XShaderCompiler, Version 0.06 Alpha

Here is a quick start example:

```
#include <Xsc/Xsc.h>
#include <fstream>

int main()
{
    // Open input and output streams
    auto inputStream = std::make_shared<std::ifstream>("Example.hlsl");
    std::ofstream outputStream("Example.VS.vert");

    // Initialize shader input descriptor structure
    Xsc::ShaderInput inputDesc;
    {
        inputDesc.sourceCode     = inputStream;
        inputDesc.shaderVersion  = Xsc::InputShaderVersion::HLSL5
      ;
        inputDesc.entryPoint     = "VS";
        inputDesc.shaderTarget   = Xsc::ShaderTarget::VertexShader
      ;
    }

    // Initialize shader output descriptor structure
    Xsc::ShaderOutput outputDesc;
    {
        outputDesc.sourceCode    = &outputStream;
        outputDesc.shaderVersion =
      Xsc::OutputShaderVersion::GLSL330;
    }

    // Compile HLSL code into GLSL
    Xsc::StdLog log;
    bool result = Xsc::CompileShader(inputDesc, outputDesc, &log);

    // Show compilation status
    if (result)
        std::cout << "Compilation successful" << std::endl;
    else
        std::cerr << "Compilation failed" << std::endl;

    return 0;
}
```

# Chapter 2

# Namespace Index

## 2.1 Namespace List

Here is a list of all documented namespaces with brief descriptions:

# Chapter 3

# Hierarchical Index

## 3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

# Chapter 4

# Class Index

## 4.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

# Chapter 5

# Namespace Documentation

## 5.1 Xsc Namespace Reference

Main XShaderCompiler namespace.

### Namespaces

- ConsoleManip

  *Namespace for console manipulation.*
- Reflection

  *Shader code reflection namespace.*

### Classes

- struct Formatting

  *Formatting descriptor structure for the output shader.*
- class IncludeHandler

  *Interface for handling new include streams.*
- class IndentHandler

  *Indentation handler base class.*
- class Log

  *Log base class.*
- struct NameMangling

  *Name mangling descriptor structure for shader input/output variables (also referred to as "varyings"), temporary variables, and reserved keywords.*
- struct Options

  *Structure for additional translation options.*
- class Report

  *Report exception class.*
- class ScopedIndent

  *Helper class for temporary indentation.*
- struct ShaderInput

  *Shader input descriptor structure.*
- struct ShaderOutput

  *Shader output descriptor structure.*
- class StdLog

  *Standard output log (uses std::cout to submit a report).*
- struct VertexSemantic

  *Vertex shader semantic (or rather attribute) layout structure.*

### Enumerations

- enum ShaderTarget {
  ShaderTarget::Undefined, ShaderTarget::VertexShader, ShaderTarget::TessellationControlShader, Shader↩ Target::TessellationEvaluationShader,
  ShaderTarget::GeometryShader, ShaderTarget::FragmentShader, ShaderTarget::ComputeShader }

  *Shader target enumeration.*
- enum InputShaderVersion { InputShaderVersion::HLSL3 = 3, InputShaderVersion::HLSL4 = 4, InputShader↩ Version::HLSL5 = 5 }

  *Input shader version enumeration.*
- enum OutputShaderVersion {
  OutputShaderVersion::GLSL110 = 110, OutputShaderVersion::GLSL120 = 120, OutputShaderVersion::GL↩ SL130 = 130, OutputShaderVersion::GLSL140 = 140,
  OutputShaderVersion::GLSL150 = 150, OutputShaderVersion::GLSL330 = 330, OutputShaderVersion::GL↩ SL400 = 400, OutputShaderVersion::GLSL410 = 410,
  OutputShaderVersion::GLSL420 = 420, OutputShaderVersion::GLSL430 = 430, OutputShaderVersion::GL↩ SL440 = 440, OutputShaderVersion::GLSL450 = 450,
  OutputShaderVersion::GLSL = 0x0000ffff, OutputShaderVersion::ESSL100 = (0x00010000 + 100), Output↩ ShaderVersion::ESSL300 = (0x00010000 + 300), OutputShaderVersion::ESSL310 = (0x00010000 + 310),
  OutputShaderVersion::ESSL320 = (0x00010000 + 320), OutputShaderVersion::ESSL = 0x0001ffff, Output↩ ShaderVersion::VKSL450 = (0x00020000 + 450), OutputShaderVersion::VKSL = 0x0002ffff }

  *Output shader version enumeration.*

### Functions

- XSC_EXPORT std::string ToString (const Reflection::Filter t)

  *Returns the string representation of the specified 'SamplerState::Filter' type.*
- XSC_EXPORT std::string ToString (const Reflection::TextureAddressMode t)

  *Returns the string representation of the specified 'SamplerState::TextureAddressMode' type.*
- XSC_EXPORT std::string ToString (const Reflection::ComparisonFunc t)

  *Returns the string representation of the specified 'SamplerState::ComparisonFunc' type.*
- XSC_EXPORT void PrintReflection (std::ostream &stream, const Reflection::ReflectionData &reflectionData)

  *Prints the reflection data into the output stream in a human readable format.*
- XSC_EXPORT std::string ToString (const ShaderTarget target)

  *Returns the specified shader target as string.*
- XSC_EXPORT std::string ToString (const InputShaderVersion shaderVersion)

  *Returns the specified shader input version as string.*
- XSC_EXPORT std::string ToString (const OutputShaderVersion shaderVersion)

  *Returns the specified shader output version as string.*
- XSC_EXPORT bool IsLanguageGLSL (const OutputShaderVersion shaderVersion)

  *Returns true if the shader version specifies GLSL (for OpenGL 2+).*
- XSC_EXPORT bool IsLanguageESSL (const OutputShaderVersion shaderVersion)

  *Returns true if the shader version specifies ESSL (for OpenGL ES 2+).*
- XSC_EXPORT bool IsLanguageVKSL (const OutputShaderVersion shaderVersion)

  *Returns true if the shader version specifies VKSL (for Vulkan).*
- XSC_EXPORT bool CompileShader (const ShaderInput &inputDesc, const ShaderOutput &outputDesc, Log ∗log=nullptr, Reflection::ReflectionData ∗reflectionData=nullptr)

  *Cross compiles the shader code from the specified input stream into the specified output shader code.*

## 5.1.1 Detailed Description

Main XShaderCompiler namespace.

### 5.1.2 Enumeration Type Documentation

#### 5.1.2.1 enum Xsc::InputShaderVersion `[strong]`

Input shader version enumeration.

**Enumerator**

***HLSL3*** HLSL Shader Model 3.0 (DirectX 9).

***HLSL4*** HLSL Shader Model 4.0 (DirectX 10).

***HLSL5*** HLSL Shader Model 5.0 (DirectX 11).

#### 5.1.2.2 enum Xsc::OutputShaderVersion `[strong]`

Output shader version enumeration.

**Enumerator**

***GLSL110*** GLSL 1.10 (OpenGL 2.0).

***GLSL120*** GLSL 1.20 (OpenGL 2.1).

***GLSL130*** GLSL 1.30 (OpenGL 3.0).

***GLSL140*** GLSL 1.40 (OpenGL 3.1).

***GLSL150*** GLSL 1.50 (OpenGL 3.2).

***GLSL330*** GLSL 3.30 (OpenGL 3.3).

***GLSL400*** GLSL 4.00 (OpenGL 4.0).

***GLSL410*** GLSL 4.10 (OpenGL 4.1).

***GLSL420*** GLSL 4.20 (OpenGL 4.2).

***GLSL430*** GLSL 4.30 (OpenGL 4.3).

***GLSL440*** GLSL 4.40 (OpenGL 4.4).

***GLSL450*** GLSL 4.50 (OpenGL 4.5).

***GLSL*** Auto-detect minimal required GLSL version (for OpenGL 2+).

***ESSL100*** ESSL 1.00 (OpenGL ES 2.0).

**Note**

Currently not supported!

***ESSL300*** ESSL 3.00 (OpenGL ES 3.0).

**Note**

Currently not supported!

***ESSL310*** ESSL 3.10 (OpenGL ES 3.1).

**Note**

Currently not supported!

***ESSL320*** ESSL 3.20 (OpenGL ES 3.2).

**Note**

Currently not supported!

***ESSL*** Auto-detect minimum required ESSL version (for OpenGL ES 2+).

**Note**

Currently not supported!

***VKSL450*** VKSL 4.50 (Vulkan 1.0).

***VKSL*** Auto-detect minimum required VKSL version (for Vulkan/SPIR-V).

#### 5.1.2.3 enum **Xsc::ShaderTarget** `[strong]`

Shader target enumeration.

**Enumerator**

***Undefined*** Undefined shader target.

***VertexShader*** Vertex shader.

***TessellationControlShader*** Tessellation-control (also Hull-) shader.

***TessellationEvaluationShader*** Tessellation-evaluation (also Domain-) shader.

***GeometryShader*** Geometry shader.

***FragmentShader*** Fragment (also Pixel-) shader.

***ComputeShader*** Compute shader.

### 5.1.3 Function Documentation

#### 5.1.3.1 XSC_EXPORT bool Xsc::CompileShader ( const **ShaderInput** & *inputDesc*, const **ShaderOutput** & *outputDesc*, **Log** ∗ *log* = `nullptr`, **Reflection::ReflectionData** ∗ *reflectionData* = `nullptr` )

Cross compiles the shader code from the specified input stream into the specified output shader code.

**Parameters**

| | | |
|---|---|---|
| `in` | *inputDesc* | Input shader code descriptor. |
| `in` | *outputDesc* | Output shader code descriptor. |
| `in` | *log* | Optional pointer to an output log. Inherit from the "Log" class interface. By default null. |
| `out` | *reflectionData* | Optional pointer to a code reflection data structure. By default null. |

**Returns**

True if the code has been translated successfully.

**Exceptions**

| | |
|---|---|
| *std::invalid_argument* | If either the input or output streams are null. |

**See also**

ShaderInput
ShaderOutput
Log
ReflectionData

## 5.2 Xsc::ConsoleManip Namespace Reference

Namespace for console manipulation.

#### Classes

- struct ColorFlags

    *Output stream color flags enumeration.*
- class ScopedColor

    *Helper class for scoped color stack operations.*

#### Functions

- void XSC_EXPORT Enable (bool enable)

    *Enables or disables console manipulation. By default enabled.*
- bool XSC_EXPORT IsEnabled ()

    *Returns true if console manipulation is enabled.*
- void XSC_EXPORT PushColor (std::ostream &stream, long front)

    *Push the specified front color onto the stack.*
- void XSC_EXPORT PushColor (std::ostream &stream, long front, long back)

    *Push the specified front and back color onto the stack.*
- void XSC_EXPORT PopColor (std::ostream &stream)

    *Pops the previous front and back colors from the stack.*

### 5.2.1 Detailed Description

Namespace for console manipulation.

## 5.3 Xsc::Reflection Namespace Reference

Shader code reflection namespace.

#### Classes

- struct BindingSlot

    *Binding slot of textures, constant buffers, and fragment targets.*
- struct NumThreads

    *Number of threads within each work group of a compute shader.*
- struct ReflectionData

    *Structure for shader output statistics (e.g. texture/buffer binding points).*
- struct SamplerState

    *Static sampler state descriptor structure (D3D11_SAMPLER_DESC).*

## Enumerations

- enum Filter {
**MinMagMipPoint** = 0, **MinMagPointMipLinear** = 0x1, **MinPointMagLinearMipPoint** = 0x4, **MinPoint↩ MagMipLinear** = 0x5,
**MinLinearMagMipPoint** = 0x10, **MinLinearMagPointMipLinear** = 0x11, **MinMagLinearMipPoint** = 0x14, **MinMagMipLinear** = 0x15,
**Anisotropic** = 0x55, **ComparisonMinMagMipPoint** = 0x80, **ComparisonMinMagPointMipLinear** = 0x81, **ComparisonMinPointMagLinearMipPoint** = 0x84,
**ComparisonMinPointMagMipLinear** = 0x85, **ComparisonMinLinearMagMipPoint** = 0x90, **Comparison↩ MinLinearMagPointMipLinear** = 0x91, **ComparisonMinMagLinearMipPoint** = 0x94,
**ComparisonMinMagMipLinear** = 0x95, **ComparisonAnisotropic** = 0xd5, **MinimumMinMagMipPoint** = 0x100, **MinimumMinMagPointMipLinear** = 0x101,
**MinimumMinPointMagLinearMipPoint** = 0x104, **MinimumMinPointMagMipLinear** = 0x105, **Minimum↩ MinLinearMagMipPoint** = 0x110, **MinimumMinLinearMagPointMipLinear** = 0x111,
**MinimumMinMagLinearMipPoint** = 0x114, **MinimumMinMagMipLinear** = 0x115, **MinimumAnisotropic** = 0x155, **MaximumMinMagMipPoint** = 0x180,
**MaximumMinMagPointMipLinear** = 0x181, **MaximumMinPointMagLinearMipPoint** = 0x184, **Maximum↩ MinPointMagMipLinear** = 0x185, **MaximumMinLinearMagMipPoint** = 0x190,
**MaximumMinLinearMagPointMipLinear** = 0x191, **MaximumMinMagLinearMipPoint** = 0x194, **Maximum↩ MinMagMipLinear** = 0x195, **MaximumAnisotropic** = 0x1d5 }

  *Sampler filter enumeration (D3D11_FILTER).*
- enum TextureAddressMode {
**Wrap** = 1, **Mirror** = 2, **Clamp** = 3, **Border** = 4,
**MirrorOnce** = 5 }

  *Texture address mode enumeration (D3D11_TEXTURE_ADDRESS_MODE).*
- enum ComparisonFunc {
**Never** = 1, **Less** = 2, **Equal** = 3, **LessEqual** = 4,
**Greater** = 5, **NotEqual** = 6, **GreaterEqual** = 7, **Always** = 8 }

  *Sample comparison function enumeration (D3D11_COMPARISON_FUNC).*

### 5.3.1 Detailed Description

Shader code reflection namespace.

# Chapter 6

# Class Documentation

## 6.1 Xsc::Reflection::BindingSlot Struct Reference

Binding slot of textures, constant buffers, and fragment targets.

```
#include <Reflection.h>
```

### Public Attributes

- std::string ident

  *Identifier of the binding point.*
- int location

  *Zero based binding point or location. If this is -1, the location has not been set explicitly.*

### 6.1.1 Detailed Description

Binding slot of textures, constant buffers, and fragment targets.

The documentation for this struct was generated from the following file:

- Reflection.h

## 6.2 Xsc::ConsoleManip::ColorFlags Struct Reference

Output stream color flags enumeration.

```
#include <ConsoleManip.h>
```

### Public Types

- enum {
  Red = (1 << 0), Green = (1 << 1), Blue = (1 << 2), Intens = (1 << 3),
  Black = 0, Gray = (Red | Green | Blue), White = (Gray | Intens), Yellow = (Red | Green | Intens),
  Pink = (Red | Blue | Intens), Cyan = (Green | Blue | Intens) }

### 6.2.1 Detailed Description

Output stream color flags enumeration.

### 6.2.2 Member Enumeration Documentation

#### 6.2.2.1 anonymous enum

**Enumerator**

***Red*** Red color flag.

***Green*** Green color flag.

***Blue*** Blue color flag.

***Intens*** Intensity color flag.

***Black*** Black color flag.

***Gray*** Gray color flag (Red | Green | Blue).

***White*** White color flag (Gray | Intens).

***Yellow*** Yellow color flag (Red | Green | Intens).

***Pink*** Pink color flag (Red | Blue | Intens).

***Cyan*** Cyan color flag (Green | Blue | Intens).

The documentation for this struct was generated from the following file:

- ConsoleManip.h

## 6.3 Xsc::Formatting Struct Reference

Formatting descriptor structure for the output shader.

```
#include <Xsc.h>
```

### Public Attributes

- std::string indent = " "

  *Indentation string for code generation. By default std::string(4, ' ').*
- bool blanks = true

  *If true, blank lines are allowed. By default true.*
- bool lineMarks = false

  *If true, line marks are allowed. By default false.*
- bool compactWrappers = true

  *If true, wrapper functions for special intrinsics are written in a compact formatting (i.e. all in one line). By default true.*
- bool alwaysBracedScopes = false

  *If true, scopes are always written in braces. By default false.*
- bool newLineOpenScope = true

  *If true, the '{'-braces for an open scope gets its own line. If false, braces are written like in Java coding conventions. By default true.*
- bool lineSeparation = true

  *If true, auto-formatting of line separation is allowed. By default true.*

### 6.3.1 Detailed Description

Formatting descriptor structure for the output shader.

The documentation for this struct was generated from the following file:

- Xsc.h

## 6.4 Xsc::IncludeHandler Class Reference

Interface for handling new include streams.

```
#include <IncludeHandler.h>
```

### Public Member Functions

- virtual std::unique_ptr< std::istream > Include (const std::string &filename, bool useSearchPathsFirst)

  *Returns an input stream for the specified filename.*

### Public Attributes

- std::vector< std::string > searchPaths

  *List of search paths.*

### 6.4.1 Detailed Description

Interface for handling new include streams.

**Remarks**

The default implementation will read the files from an std::ifstream.

### 6.4.2 Member Function Documentation

#### 6.4.2.1 virtual std::unique_ptr<std::istream> Xsc::IncludeHandler::Include ( const std::string & *filename*, bool *useSearchPathsFirst* ) [virtual]

Returns an input stream for the specified filename.

**Parameters**

| | | |
|---|---|---|
| in | *includeName* | Specifies the include filename. |
| in | *useSearchPathsFirst* | Specifies whether to first use the search paths to find the file. |

**Returns**

Unique pointer to the new input stream.

The documentation for this class was generated from the following file:

- IncludeHandler.h

## 6.5 Xsc::IndentHandler Class Reference

Indentation handler base class.

```
#include <IndentHandler.h>
```

### Public Member Functions

- **IndentHandler** (const std::string &initialIndent=std::string(2, ' '))
- void SetIndent (const std::string &indent)

  *Sets the next indentation string. By default two spaces.*
- void IncIndent ()

  *Increments the indentation.*
- void DecIndent ()

  *Decrements the indentation.*
- const std::string & FullIndent () const

  *Returns the current full indentation string.*

### 6.5.1 Detailed Description

Indentation handler base class.

The documentation for this class was generated from the following file:

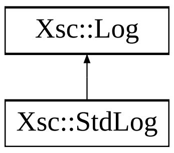
- IndentHandler.h

## 6.6 Xsc::Log Class Reference

Log base class.

```
#include <Log.h>
```

Inheritance diagram for Xsc::Log:



#### Public Member Functions

- virtual void SumitReport (const Report &report)=0

  *Submits the specified report.*
- void SetIndent (const std::string &indent)

  *Sets the next indentation string. By default two spaces.*
- void IncIndent ()

  *Increments the indentation.*
- void DecIndent ()

  *Decrements the indentation.*

#### Protected Member Functions

- const std::string & FullIndent () const

  *Returns the current full indentation string.*

### 6.6.1 Detailed Description

Log base class.

The documentation for this class was generated from the following file:

- Log.h

## 6.7 Xsc::NameMangling Struct Reference

Name mangling descriptor structure for shader input/output variables (also referred to as "varyings"), temporary variables, and reserved keywords.

```
#include <Xsc.h>
```

#### Public Attributes

- std::string inputPrefix = "xsv_"

  *Name mangling prefix for shader input variables. By default "xsv_".*
- std::string outputPrefix = "xsv_"

  *Name mangling prefix for shader output variables. By default "xsv_".*
- std::string reservedWordPrefix = "xsr_"

  *Name mangling prefix for reserved words (such as "texture", "main", "sin" etc.). By default "xsr_".*
- std::string temporaryPrefix = "xst_"

  *Name mangling prefix for temporary variables. By default "xst_".*
- bool useAlwaysSemantics = false

### 6.7.1 Detailed Description

Name mangling descriptor structure for shader input/output variables (also referred to as "varyings"), temporary variables, and reserved keywords.

### 6.7.2 Member Data Documentation

#### 6.7.2.1 std::string Xsc::NameMangling::reservedWordPrefix = "xsr_"

Name mangling prefix for reserved words (such as "texture", "main", "sin" etc.). By default "xsr_".

**Remarks**

This must not be equal to any of the other prefixes and it must not be empty.

#### 6.7.2.2 std::string Xsc::NameMangling::temporaryPrefix = "xst_"

Name mangling prefix for temporary variables. By default "xst_".

**Remarks**

This must not be equal to any of the other prefixes and it must not be empty.

#### 6.7.2.3 bool Xsc::NameMangling::useAlwaysSemantics = false

If true, shader input/output variables are always renamed to their semantics, even for vertex input and fragment output. Otherwise, their original identifiers are used.

The documentation for this struct was generated from the following file:

- Xsc.h

## 6.8 Xsc::Reflection::NumThreads Struct Reference

Number of threads within each work group of a compute shader.

```
#include <Reflection.h>
```

### Public Attributes

- int **x** = 0
- int **y** = 0
- int **z** = 0

### 6.8.1 Detailed Description

Number of threads within each work group of a compute shader.

The documentation for this struct was generated from the following file:

- Reflection.h

## 6.9 Xsc::Options Struct Reference

Structure for additional translation options.

`#include <Xsc.h>`

### Public Attributes

- bool warnings = false

    *True if warnings are allowed. By default false.*
- bool optimize = false

    *If true, little code optimizations are performed. By default false.*
- bool preprocessOnly = false

    *If true, only the preprocessed source code will be written out. By default false.*
- bool validateOnly = false

    *If true, the source code is only validated, but no output code will be generated. By default false.*
- bool allowExtensions = false

    *If true, the shader output may contain GLSL extensions, if the target shader version is too low. By default false.*
- bool explicitBinding = false

    *If true, explicit binding slots are enabled. By default false.*
- bool preserveComments = false

    *If true, commentaries are preserved for each statement. By default false.*
- bool preferWrappers = false

    *If true, intrinsics are prefered to be implemented as wrappers (instead of inlining). By default false.*
- bool unrollArrayInitializers = false

    *If true, array initializations will be unrolled. By default false.*
- bool rowMajorAlignment = false

    *If true, matrices have row-major alignment. Otherwise the matrices have column-major alignment. By default false.*
- bool obfuscate = false

    *If true, code obfuscation is performed. By default false.*
- bool showAST = false

    *If true, the AST (Abstract Syntax Tree) will be written to the log output. By default false.*
- bool showTimes = false

    *If true, the timings of the different compilation processes are written to the log output. By default false.*

### 6.9.1 Detailed Description

Structure for additional translation options.

The documentation for this struct was generated from the following file:

- Xsc.h

## 6.10 Xsc::Reflection::ReflectionData Struct Reference

Structure for shader output statistics (e.g. texture/buffer binding points).

`#include <Reflection.h>`

### Public Attributes

- std::vector< std::string > macros

  *All defined macros after pre-processing.*
- std::vector< BindingSlot > textures

  *Texture bindings.*
- std::vector< BindingSlot > storageBuffers

  *Storage buffer bindings.*
- std::vector< BindingSlot > constantBuffers

  *Constant buffer bindings.*
- std::vector< BindingSlot > inputAttributes

  *Shader input attributes.*
- std::vector< BindingSlot > outputAttributes

  *Shader output attributes.*
- std::map< std::string, SamplerState > samplerStates

  *Static sampler states (identifier, states).*
- NumThreads numThreads

  *'numthreads' attribute of a compute shader.*

### 6.10.1 Detailed Description

Structure for shader output statistics (e.g. texture/buffer binding points).

The documentation for this struct was generated from the following file:

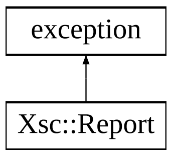
- Reflection.h

## 6.11 Xsc::Report Class Reference

Report exception class.

```
#include <Report.h>
```

Inheritance diagram for Xsc::Report:



### Public Types

- enum Types { Types::Info, Types::Warning, Types::Error }

  *Report types enumeration.*

### Public Member Functions

- **Report** (const Report &)=default
- Report & **operator=** (const Report &)=default
- **Report** (const Types type, const std::string &message, const std::string &context="")
- **Report** (const Types type, const std::string &message, const std::string &line, const std::string &marker, const std::string &context="")
- const char ∗ what () const override throw ()

  *Overrides the 'std::exception::what' function.*
- void TakeHints (std::vector< std::string > &&hints)

  *Moves the specified hints into this report.*
- Types Type () const

  *Returns the type of this report.*
- const std::string & Context () const

  *Returns the context description string (e.g. a function name where the report occured). This may also be empty.*
- const std::string & Message () const

  *Returns the message string.*
- const std::string & Line () const

  *Returns the line string where the report occured. This line never has new-line characters at its end.*
- const std::string & Marker () const

  *Returns the line marker string to highlight the area where the report occured.*
- const std::vector< std::string > & GetHints () const

  *Returns the list of optional hints of the report.*
- bool HasLine () const

  *Returns true if this report has a line with line marker.*

## 6.11.1 Detailed Description

Report exception class.

## 6.11.2 Member Enumeration Documentation

### 6.11.2.1 enum **Xsc::Report::Types** `[strong]`

Report types enumeration.

**Enumerator**

***Info*** Standard information.

***Warning*** Warning message.

***Error*** Error message.

### 6.11.3 Member Function Documentation

#### 6.11.3.1 bool Xsc::Report::HasLine ( ) const [inline]

Returns true if this report has a line with line marker.

**See also**

Line
Marker

The documentation for this class was generated from the following file:

- Report.h

## 6.12 Xsc::Reflection::SamplerState Struct Reference

Static sampler state descriptor structure (D3D11_SAMPLER_DESC).

`#include <Reflection.h>`

### Public Attributes

- Filter **filter** = Filter::MinMagMipLinear
- TextureAddressMode **addressU** = TextureAddressMode::Clamp
- TextureAddressMode **addressV** = TextureAddressMode::Clamp
- TextureAddressMode **addressW** = TextureAddressMode::Clamp
- float **mipLODBias** = 0.0f
- unsigned int **maxAnisotropy** = 1u
- ComparisonFunc **comparisonFunc** = ComparisonFunc::Never
- float **borderColor** [4] = { 0.0f, 0.0f, 0.0f, 0.0f }
- float **minLOD** = -std::numeric_limits<float>::max()
- float **maxLOD** = std::numeric_limits<float>::max()

### 6.12.1 Detailed Description

Static sampler state descriptor structure (D3D11_SAMPLER_DESC).

**Remarks**

All members and enumerations have the same values like the one in the "D3D11_SAMPLER_DESC" structure respectively. Thus, they can all be statically casted from and to the original D3D11 values.

**See also**

https://msdn.microsoft.com/en-us/library/windows/desktop/ff476207(v=vs.↩
85).aspx

The documentation for this struct was generated from the following file:

- Reflection.h

## 6.13 Xsc::ConsoleManip::ScopedColor Class Reference

Helper class for scoped color stack operations.

```
#include <ConsoleManip.h>
```

### Public Member Functions

- ScopedColor (std::ostream &stream, long front)

  *Constructor with output stream and front color flags.*
- ScopedColor (std::ostream &stream, long front, long back)

  *Constructor with output stream, and front- and back color flags.*
- ∼ScopedColor ()

  *Destructor which will reset the previous color from the output stream.*

### 6.13.1 Detailed Description

Helper class for scoped color stack operations.

### 6.13.2 Constructor & Destructor Documentation

#### 6.13.2.1 Xsc::ConsoleManip::ScopedColor::ScopedColor ( std::ostream & *stream,* long *front* ) [inline]

Constructor with output stream and front color flags.

**Parameters**

| | | |
|---|---|---|
| in,out | *stream* | Specifies the output stream for which the scope is to be changed. This is only used for Unix systems. |
| in | *front* | Specifies the front color flags. This can be a bitwise OR combination of the entries of the ColorFlags enumeration. |

**See also**

ColorFlags
PushColor(std::ostream&, long)

#### 6.13.2.2 Xsc::ConsoleManip::ScopedColor::ScopedColor ( std::ostream & *stream,* long *front,* long *back* ) [inline]

Constructor with output stream, and front- and back color flags.

**Parameters**

| | | |
|---|---|---|
| in,out | *stream* | Specifies the output stream for which the scope is to be changed. This is only used for Unix systems. |
| in | *front* | Specifies the front color flags. This can be a bitwise OR combination of the entries of the ColorFlags enumeration. |
| in | *back* | Specifies the back color flags. This can be a bitwise OR combination of the entries of the ColorFlags enumeration. |

**See also**

ColorFlags
PushColor(std::ostream&, long, long)

#### 6.13.2.3 Xsc::ConsoleManip::ScopedColor::∼ScopedColor ( ) `[inline]`

Destructor which will reset the previous color from the output stream.

**See also**

PopColor

The documentation for this class was generated from the following file:

- ConsoleManip.h

## 6.14 Xsc::ScopedIndent Class Reference

Helper class for temporary indentation.

`#include <IndentHandler.h>`

### Public Member Functions

- **ScopedIndent** (IndentHandler &handler)

### 6.14.1 Detailed Description

Helper class for temporary indentation.

The documentation for this class was generated from the following file:

- IndentHandler.h

## 6.15 Xsc::ShaderInput Struct Reference

Shader input descriptor structure.

`#include <Xsc.h>`

## Public Attributes

- std::string filename

  *Specifies the filename of the input shader code. This is an optional attribute, and only a hint to the compiler.*
- std::shared_ptr< std::istream > sourceCode

  *Specifies the input stream. This must be valid HLSL code.*
- InputShaderVersion shaderVersion = InputShaderVersion::HLSL5

  *Specifies the input shader version (e.g. InputShaderVersion::HLSL5 for "HLSL 5"). By default InputShaderVersion↩ ::HLSL5.*
- ShaderTarget shaderTarget = ShaderTarget::Undefined

  *Specifies the target shader (Vertex, Fragment etc.). By default ShaderTarget::Undefined.*
- std::string entryPoint

  *Specifies the HLSL shader entry point.*
- std::string secondaryEntryPoint

  *Specifies the secondary HLSL shader entry point.*
- IncludeHandler ∗ includeHandler = nullptr

  *Optional pointer to the implementation of the "IncludeHandler" interface. By default null.*

## 6.15.1 Detailed Description

Shader input descriptor structure.

## 6.15.2 Member Data Documentation

### 6.15.2.1 IncludeHandler∗ Xsc::ShaderInput::includeHandler = nullptr

Optional pointer to the implementation of the "IncludeHandler" interface. By default null.

**Remarks**

If this is null, the default include handler will be used, which will include files with the STL input file streams.

### 6.15.2.2 std::string Xsc::ShaderInput::secondaryEntryPoint

Specifies the secondary HLSL shader entry point.

**Remarks**

This is only used for a Tessellation-Control Shader (alias Hull Shader) entry point, when a Tessellation-↩ Control Shader (alias Domain Shader) is the output target. This is required to translate all Tessellation-Control attributes (i.e. "partitioning" and "outputtopology") to the Tessellation-Evaluation output shader. If this is empty, the default values for these attributes are used.

The documentation for this struct was generated from the following file:

- Xsc.h

## 6.16 Xsc::ShaderOutput Struct Reference

Shader output descriptor structure.

```
#include <Xsc.h>
```

### Public Attributes

- std::string filename

  *Specifies the filename of the output shader code. This is an optional attribute, and only a hint to the compiler.*
- std::ostream ∗ sourceCode = nullptr

  *Specifies the output stream. This will contain the output GLSL code. This must not be null when passed to the "CompileShader" function!*
- OutputShaderVersion shaderVersion = OutputShaderVersion::GLSL

  *Specifies the output shader version. By default OutputShaderVersion::GLSL (to auto-detect minimum required version).*
- std::vector< VertexSemantic > vertexSemantics

  *Optional list of vertex semantic layouts, to bind a vertex attribute (semantic name) to a location index (only used when 'explicitBinding' is true).*
- Options options

  *Additional options to configure the code generation.*
- Formatting formatting

  *Output code formatting descriptor.*
- NameMangling nameMangling

  *Specifies the options for name mangling.*

### 6.16.1 Detailed Description

Shader output descriptor structure.

The documentation for this struct was generated from the following file:

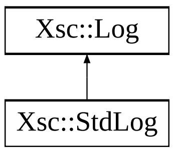
- Xsc.h

## 6.17 Xsc::StdLog Class Reference

Standard output log (uses std::cout to submit a report).

```
#include <Log.h>
```

Inheritance diagram for Xsc::StdLog:



### Public Member Functions

- void SumitReport (const Report &report) override

  *Implements the base class interface.*
- void PrintAll (bool verbose=true, bool warnings=true)

  *Prints all submitted reports to the standard output.*

### Additional Inherited Members

### 6.17.1 Detailed Description

Standard output log (uses std::cout to submit a report).

The documentation for this class was generated from the following file:

- Log.h

## 6.18 Xsc::VertexSemantic Struct Reference

Vertex shader semantic (or rather attribute) layout structure.

```
#include <Xsc.h>
```

### Public Attributes

- std::string **semantic**
- int **location**

### 6.18.1 Detailed Description

Vertex shader semantic (or rather attribute) layout structure.

The documentation for this struct was generated from the following file:

- Xsc.h

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