

Deprecated List

Class `sf::Event::MouseWheelEvent`

This event is deprecated and potentially inaccurate. Use `MouseWheelScrolled` instead.

Member `sf::LinesStrip`

Use `LineStrip` instead.

Member `sf::RenderWindow::capture () const`

Use a `sf::Texture` and its `sf::Texture::update(const Window&)` function and `sf::Image` instead.

```
1 sf::Vector2u windowSize = window.getSize();
2 sf::Texture texture;
3 texture.create(windowSize.x, windowSize.y);
4 texture.update(window);
5 sf::Image screenshot = texture.copyToImage();
```

Member `sf::Shader::setParameter (const std::string &name, const`

Use `setUniform(const std::string&, const Glsl::Vec2&)` instead.

Member `sf::Shader::setParameter (const std::string &name, float x`

Use `setUniform(const std::string&, const Glsl::Vec2&)` instead.

Member `sf::Shader::setParameter` (const std::string &name, const

Use `setUniform(const std::string&, const Glsl::Vec3&)` instead.

Member `sf::Shader::setParameter` (const std::string &name, const

Use `setUniform(const std::string&, const Glsl::Vec4&)` instead.

Member `sf::Shader::setParameter` (const std::string &name, const

Use `setUniform(const std::string&, const Texture&)` instead.

Member `sf::Shader::setParameter` (const std::string &name, float x

Use `setUniform(const std::string&, const Glsl::Vec3&)` instead.

Member `sf::Shader::setParameter` (const std::string &name, const

Use `setUniform(const std::string&, const Glsl::Mat4&)` instead.

Member `sf::Shader::setParameter` (const std::string &name, float x

Use `setUniform(const std::string&, const Glsl::Vec4&)` instead.

Member `sf::Shader::setParameter` (const std::string &name, float x

Use `setUniform(const std::string&, float)` instead.

Member `sf::Shader::setParameter` (const std::string &name, Curre

Use `setUniform(const std::string&, CurrentTextureType)` instead.

Member `sf::Text::getColor` () const

There is now fill and outline colors instead of a single global color. Use `g` instead.

Member `sf::Text::setColor` (const Color &color)

There is now fill and outline colors instead of a single global color. Use `sf::Color` instead.

Member `sf::TrianglesFan`

Use `TriangleFan` instead

Member `sf::TrianglesStrip`

Use `TriangleStrip` instead

Modules

Here is a list of all modules:

Audio module	Sounds, streaming (musics or custom sources), recording
Graphics module	2D graphics module: sprites, text, shapes, ..
Network module	Socket-based communication, utilities and higher-level
System module	Base module of SFML, defining various utilities
Window module	Provides OpenGL-based windows, and abstractions for

Classes

Audio module

Sounds, streaming (musics or custom sources), recording, spatialization.

Classes

class `sf::AIResource`
Base class for classes that require an OpenAL context. [More...](#)

class `sf::InputSoundFile`
Provide read access to sound files. [More...](#)

class `sf::Listener`
The audio listener is the point in the scene from where all the sou

class `sf::Music`
Streamed music played from an audio file. [More...](#)

class `sf::OutputSoundFile`
Provide write access to sound files. [More...](#)

class `sf::Sound`
Regular sound that can be played in the audio environment. [More...](#)

class `sf::SoundBuffer`
Storage for audio samples defining a sound. [More...](#)

class `sf::SoundBufferRecorder`
Specialized `SoundRecorder` which stores the captured audio data

class `sf::SoundFileFactory`
Manages and instantiates sound file readers and writers. [More...](#)

class `sf::SoundFileReader`
Abstract base class for sound file decoding. [More...](#)

class `sf::SoundFileWriter`

Abstract base class for sound file encoding. [More...](#)

class `sf::SoundRecorder`
Abstract base class for capturing sound data. [More...](#)

class `sf::SoundSource`
Base class defining a sound's properties. [More...](#)

class `sf::SoundStream`
Abstract base class for streamed audio sources. [More...](#)

Detailed Description

Sounds, streaming (musics or custom sources), recording, spatialization.

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[Protected Member Functions](#) | [List of all members](#)

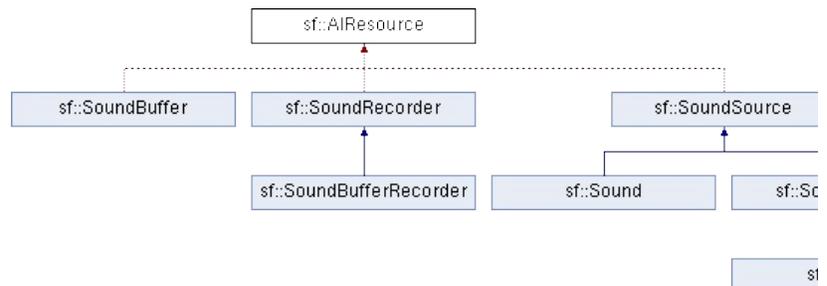
sf::AIResource Class Reference

Audio module

Base class for classes that require an OpenAL context. [More...](#)

```
#include <AIResource.hpp>
```

Inheritance diagram for sf::AIResource:



Protected Member Functions

`AIResource ()`

Default constructor. [More...](#)

`~AIResource ()`

Destructor. [More...](#)

Detailed Description

Base class for classes that require an OpenAL context.

This class is for internal use only, it must be the base of every class that r
order to work.

Definition at line [40](#) of file [AIResource.hpp](#).

Constructor & Destructor Documentation

sf::AIResource::AIResource ()

Default constructor.

sf::AIResource::~~AIResource ()

Destructor.

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

- [AIResource.hpp](#)

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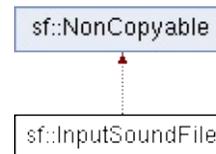
sf::InputSoundFile Class Reference

Audio module

Provide read access to sound files. [More...](#)

```
#include <InputSoundFile.hpp>
```

Inheritance diagram for sf::InputSoundFile:



Public Member Functions

`InputSoundFile ()`
Default constructor. [More...](#)

`~InputSoundFile ()`
Destructor. [More...](#)

`bool openFromFile (const std::string &filename)`
Open a sound file from the disk for reading. [More...](#)

`bool openFromMemory (const void *data, std::size_t sizeInByte)`
Open a sound file in memory for reading. [More...](#)

`bool openFromStream (InputStream &stream)`
Open a sound file from a custom stream for reading. [More...](#)

`bool openForWriting (const std::string &filename, unsigned int channels, unsigned int sampleRate)`
Open the sound file from the disk for writing. [More...](#)

`uint64_t getSampleCount () const`
Get the total number of audio samples in the file. [More...](#)

`unsigned int getChannelCount () const`
Get the number of channels used by the sound. [More...](#)

`unsigned int getSampleRate () const`
Get the sample rate of the sound. [More...](#)

`Time getDuration () const`
Get the total duration of the sound file. [More...](#)

void `seek` (Uint64 sampleOffset)
Change the current read position to the given sample offset.

void `seek` (Time timeOffset)
Change the current read position to the given time offset. [More...](#)

Uint64 `read` (Int16 *samples, Uint64 maxCount)
Read audio samples from the open file. [More...](#)

Detailed Description

Provide read access to sound files.

This class decodes audio samples from a sound file.

It is used internally by higher-level classes such as `sf::SoundBuffer` and `sf::SoundFile`. It is also useful if you want to process or analyze audio files without playing them, or if you want to create a custom version of `sf::Music` with more specific features.

Usage example:

```
// Open a sound file
sf::InputSoundFile file;
if (!file.openFromFile("music.ogg"))
    /* error */;

// Print the sound attributes
std::cout << "duration: " << file.getDuration().asSeconds() << std::endl;
std::cout << "channels: " << file.getChannelCount() << std::endl;
std::cout << "sample rate: " << file.getSampleRate() << std::endl;
std::cout << "sample count: " << file.getSampleCount() << std::endl;

// Read and process batches of samples until the end of file is reached
sf::Int16 samples[1024];
sf::Uint64 count;
do
{
    count = file.read(samples, 1024);

    // process, analyze, play, convert, or whatever
    // you want to do with the samples...
}
while (count > 0);
```

See also

`sf::SoundFileReader`, `sf::OutputSoundFile`

Definition at line 46 of file `InputSoundFile.hpp`.

Constructor & Destructor Documentation

sf::InputSoundFile::InputSoundFile ()

Default constructor.

sf::InputSoundFile::~~InputSoundFile ()

Destructor.

Member Function Documentation

unsigned int sf::InputSoundFile::getChannelCount () const

Get the number of channels used by the sound.

Returns

Number of channels (1 = mono, 2 = stereo)

Time sf::InputSoundFile::getDuration () const

Get the total duration of the sound file.

This function is provided for convenience, the duration is deduced from t

Returns

Duration of the sound file

Uint64 sf::InputSoundFile::getSampleCount () const

Get the total number of audio samples in the file.

Returns

Number of samples

```
unsigned int sf::InputSoundFile::getSampleRate ( ) const
```

Get the sample rate of the sound.

Returns

Sample rate, in samples per second

```
bool sf::InputSoundFile::openForWriting ( const std::string & filename,
                                           unsigned int      channelCount,
                                           unsigned int      sampleRate
                                           )
```

Open the sound file from the disk for writing.

Parameters

filename Path of the sound file to write
channelCount Number of channels in the sound
sampleRate Sample rate of the sound

Returns

True if the file was successfully opened

```
bool sf::InputSoundFile::openFromFile ( const std::string & filename,
```

Open a sound file from the disk for reading.

The supported audio formats are: WAV (PCM only), OGG/Vorbis, FLAC.
FLAC and WAV are 8, 16, 24 and 32 bit.

Parameters

filename Path of the sound file to load

Returns

True if the file was successfully opened

```
bool sf::InputSoundFile::openFromMemory ( const void * data,  
                                           std::size_t  sizeInBytes  
                                           )
```

Open a sound file in memory for reading.

The supported audio formats are: WAV (PCM only), OGG/Vorbis, FLAC.
FLAC and WAV are 8, 16, 24 and 32 bit.

Parameters

data Pointer to the file data in memory
sizeInBytes Size of the data to load, in bytes

Returns

True if the file was successfully opened

```
bool sf::InputSoundFile::openFromStream ( InputStream & stream )
```

Open a sound file from a custom stream for reading.

The supported audio formats are: WAV (PCM only), OGG/Vorbis, FLAC.
FLAC and WAV are 8, 16, 24 and 32 bit.

Parameters

stream Source stream to read from

Returns

True if the file was successfully opened

```
Uint64 sf::InputSoundFile::read ( Int16 * samples,  
                                  Uint64 maxCount  
                                  )
```

Read audio samples from the open file.

Parameters

samples Pointer to the sample array to fill
maxCount Maximum number of samples to read

Returns

Number of samples actually read (may be less than *maxCount*)

```
void sf::InputSoundFile::seek ( Uint64 sampleOffset )
```

Change the current read position to the given sample offset.

This function takes a sample offset to provide maximum precision. If you use the other overload.

The sample offset takes the channels into account. Offsets can be calculated as $\text{sampleRate} * \text{channelCount}$. If the given offset exceeds the total number of samples to the end of the sound file.

Parameters

sampleOffset Index of the sample to jump to, relative to the beginning

```
void sf::InputSoundFile::seek ( Time timeOffset )
```

Change the current read position to the given time offset.

Using a time offset is handy but imprecise. If you need an accurate res which takes a sample offset.

If the given time exceeds to total duration, this function jumps to the end

Parameters

timeOffset Time to jump to, relative to the beginning

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sf::Listener Class Reference

Audio module

The audio listener is the point in the scene from where all the sounds are |

```
#include <Listener.hpp>
```

Static Public Member Functions

static void `setGlobalVolume` (float volume)
Change the global volume of all the sounds and musics.

static float `getGlobalVolume` ()
Get the current value of the global volume. [More...](#)

static void `setPosition` (float x, float y, float z)
Set the position of the listener in the scene. [More...](#)

static void `setPosition` (const `Vector3f` &position)
Set the position of the listener in the scene. [More...](#)

static `Vector3f` `getPosition` ()
Get the current position of the listener in the scene. [More...](#)

static void `setDirection` (float x, float y, float z)
Set the forward vector of the listener in the scene. [More..](#)

static void `setDirection` (const `Vector3f` &direction)
Set the forward vector of the listener in the scene. [More..](#)

static `Vector3f` `getDirection` ()
Get the current forward vector of the listener in the scene

static void `setUpVector` (float x, float y, float z)
Set the upward vector of the listener in the scene. [More..](#)

static void `setUpVector` (const `Vector3f` &upVector)
Set the upward vector of the listener in the scene. [More..](#)

static `Vector3f` `getUpVector` ()

Get the current upward vector of the listener in the scene

Detailed Description

The audio listener is the point in the scene from where all the sounds are heard.

The audio listener defines the global properties of the audio environment, and musics are heard.

If `sf::View` is the eyes of the user, then `sf::Listener` is his ears (by the way, same position, orientation, etc.).

`sf::Listener` is a simple interface, which allows to setup the listener in the direction and up vector), and to adjust the global volume.

Because the listener is unique in the scene, `sf::Listener` only contains static methods to be instantiated.

Usage example:

```
// Move the listener to the position (1, 0, -5)
sf::Listener::setPosition(1, 0, -5);

// Make it face the right axis (1, 0, 0)
sf::Listener::setDirection(1, 0, 0);

// Reduce the global volume
sf::Listener::setGlobalVolume(50);
```

Definition at line 42 of file `Listener.hpp`.

Member Function Documentation

static **Vector3f** sf::Listener::getDirection ()

Get the current forward vector of the listener in the scene.

Returns

Listener's forward vector (not normalized)

See also

[setDirection](#)

static float sf::Listener::getGlobalVolume ()

Get the current value of the global volume.

Returns

Current global volume, in the range [0, 100]

See also

[setGlobalVolume](#)

static **Vector3f** sf::Listener::getPosition ()

Get the current position of the listener in the scene.

Returns

Listener's position

See also

setPosition

static **Vector3f** sf::Listener::getUpVector ()

Get the current upward vector of the listener in the scene.

Returns

Listener's upward vector (not normalized)

See also

setUpVector

static void sf::Listener::setDirection (float **x**, float **y**, float **z**)

Set the forward vector of the listener in the scene.

The direction (also called "at vector") is the vector pointing forward. Together with the up vector, it defines the 3D orientation of the listener. It doesn't have to be normalized. The default listener's direction is (0, 0, -1).

Parameters

x X coordinate of the listener's direction

y Y coordinate of the listener's direction

z Z coordinate of the listener's direction

See also

[getDirection](#), [setUpVector](#), [setPosition](#)

static void sf::Listener::setDirection (const **Vector3f** & **direction**)

Set the forward vector of the listener in the scene.

The direction (also called "at vector") is the vector pointing forward. Together with the up vector, it defines the 3D orientation of the listener. It doesn't have to be normalized. The default listener's direction is (0, 0, -1).

Parameters

direction New listener's direction

See also

[getDirection](#), [setUpVector](#), [setPosition](#)

static void sf::Listener::setGlobalVolume (float **volume**)

Change the global volume of all the sounds and musics.

The volume is a number between 0 and 100; it is combined with the music's volume. The default value for the volume is 100 (maximum).

Parameters

volume New global volume, in the range [0, 100]

See also

[getGlobalVolume](#)

```
static void sf::Listener::setPosition ( float x,  
                                       float y,  
                                       float z  
                                       )
```

Set the position of the listener in the scene.

The default listener's position is (0, 0, 0).

Parameters

x X coordinate of the listener's position

y Y coordinate of the listener's position

z Z coordinate of the listener's position

See also

[getPosition](#), [setDirection](#)

```
static void sf::Listener::setPosition ( const Vector3f & position )
```

Set the position of the listener in the scene.

The default listener's position is (0, 0, 0).

Parameters

position New listener's position

See also

[getPosition](#), [setDirection](#)

```
static void sf::Listener::setUpVector ( float x,
```

```
float y,  
float z  
)
```

Set the upward vector of the listener in the scene.

The up vector is the vector that points upward from the listener's perspective; it defines the 3D orientation of the listener in the scene. The up vector The default listener's up vector is (0, 1, 0). It is usually not necessary in most scenarios.

Parameters

- x** X coordinate of the listener's up vector
- y** Y coordinate of the listener's up vector
- z** Z coordinate of the listener's up vector

See also

[getUpVector](#), [setDirection](#), [setPosition](#)

```
static void sf::Listener::setUpVector ( const Vector3f & upVector )
```

Set the upward vector of the listener in the scene.

The up vector is the vector that points upward from the listener's perspective; it defines the 3D orientation of the listener in the scene. The up vector The default listener's up vector is (0, 1, 0). It is usually not necessary in most scenarios.

Parameters

- upVector** New listener's up vector

See also

`getUpVector`, `setDirection`, `setPosition`

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

- `Listener.hpp`

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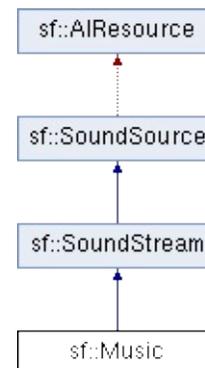
sf::Music Class Reference

Audio module

Streamed music played from an audio file. [More...](#)

```
#include <Music.hpp>
```

Inheritance diagram for sf::Music:



Public Types

enum `Status { Stopped, Paused, Playing }`
Enumeration of the sound source states. [More...](#)

Public Member Functions

`Music ()`
Default constructor. [More...](#)

`~Music ()`
Destructor. [More...](#)

`bool openFromFile (const std::string &filename)`
Open a music from an audio file. [More...](#)

`bool openFromMemory (const void *data, std::size_t sizeInByte)`
Open a music from an audio file in memory. [More...](#)

`bool openFromStream (InputStream &stream)`
Open a music from an audio file in a custom stream. [More...](#)

`Time getDuration () const`
Get the total duration of the music. [More...](#)

`void play ()`
Start or resume playing the audio stream. [More...](#)

`void pause ()`
Pause the audio stream. [More...](#)

`void stop ()`
Stop playing the audio stream. [More...](#)

`unsigned int getChannelCount () const`
Return the number of channels of the stream. [More...](#)

`unsigned int getSampleRate () const`

Get the stream sample rate of the stream. [More...](#)

Status `getStatus ()` const

Get the current status of the stream (stopped, paused, play

void `setPlayingOffset (Time timeOffset)`

Change the current playing position of the stream. [More...](#)

Time `getPlayingOffset ()` const

Get the current playing position of the stream. [More...](#)

void `setLoop (bool loop)`

Set whether or not the stream should loop after reaching th

bool `getLoop ()` const

Tell whether or not the stream is in loop mode. [More...](#)

void `setPitch (float pitch)`

Set the pitch of the sound. [More...](#)

void `setVolume (float volume)`

Set the volume of the sound. [More...](#)

void `setPosition (float x, float y, float z)`

Set the 3D position of the sound in the audio scene. [More..](#)

void `setPosition (const Vector3f &position)`

Set the 3D position of the sound in the audio scene. [More..](#)

void `setRelativeToListener (bool relative)`

Make the sound's position relative to the listener or absolut

void `setMinDistance (float distance)`

Set the minimum distance of the sound. [More...](#)

void `setAttenuation` (float attenuation)
Set the attenuation factor of the sound. [More...](#)

float `getPitch` () const
Get the pitch of the sound. [More...](#)

float `getVolume` () const
Get the volume of the sound. [More...](#)

Vector3f `getPosition` () const
Get the 3D position of the sound in the audio scene. [More..](#)

bool `isRelativeToListener` () const
Tell whether the sound's position is relative to the listener o

float `getMinDistance` () const
Get the minimum distance of the sound. [More...](#)

float `getAttenuation` () const
Get the attenuation factor of the sound. [More...](#)

Protected Member Functions

virtual bool [onGetData](#) ([Chunk](#) &data)
Request a new chunk of audio samples from the stream sou

virtual void [onSeek](#) ([Time](#) timeOffset)
Change the current playing position in the stream source. [M](#)

void [initialize](#) (unsigned int channelCount, unsigned int sampleRa
Define the audio stream parameters. [More...](#)

Protected Attributes

unsigned int `m_source`
OpenAL source identifier. [More...](#)

Detailed Description

Streamed music played from an audio file.

Musics are sounds that are streamed rather than completely loaded in memory.

This is especially useful for compressed musics that usually take half the space of uncompressed: by streaming it instead of loading it entirely, you avoid almost no loading delay. This implies that the underlying resource (file) remain valid for the lifetime of the `sf::Music` object.

Apart from that, a `sf::Music` has almost the same features as the `sf::Sound`: you can play/pause/stop it, request its parameters (channels, sample rate), change its volume, 3D position, ..., etc.

As a sound stream, a music is played in its own thread in order not to block the main thread. This means that you can leave the music alone after calling `play()`, it will manage itself.

Usage example:

```
// Declare a new music
sf::Music music;

// Open it from an audio file
if (!music.openFromFile("music.ogg"))
{
    // error...
}

// Change some parameters
music.setPosition(0, 1, 10); // change its 3D position
music.setPitch(2);          // increase the pitch
music.setVolume(50);        // reduce the volume
music.setLoop(true);        // make it loop

// Play it
music.play();
```

See also

[sf::Sound](#), [sf::SoundStream](#)

Definition at line 48 of file [Music.hpp](#).

Member Enumeration Documentation

enum sf::SoundSource::Status

Enumeration of the sound source states.

Enumerator	
Stopped	Sound is not playing.
Paused	Sound is paused.
Playing	Sound is playing.

Definition at line 50 of file `SoundSource.hpp`.

Constructor & Destructor Documentation

sf::Music::Music ()

Default constructor.

sf::Music::~~Music ()

Destructor.

Member Function Documentation

float sf::SoundSource::getAttenuation () const

Get the attenuation factor of the sound.

Returns

Attenuation factor of the sound

See also

[setAttenuation](#), [getMinDistance](#)

unsigned int sf::SoundStream::getChannelCount () const

Return the number of channels of the stream.

1 channel means a mono sound, 2 means stereo, etc.

Returns

Number of channels

Time sf::Music::getDuration () const

Get the total duration of the music.

Returns

Music duration

bool sf::SoundStream::getLoop () const

Tell whether or not the stream is in loop mode.

Returns

True if the stream is looping, false otherwise

See also

[setLoop](#)

float sf::SoundSource::getMinDistance () const

Get the minimum distance of the sound.

Returns

Minimum distance of the sound

See also

[setMinDistance](#), [getAttenuation](#)

float sf::SoundSource::getPitch () const

Get the pitch of the sound.

Returns

Pitch of the sound

See also

`setPitch`

Time `sf::SoundStream::getPlayingOffset () const`

Get the current playing position of the stream.

Returns

Current playing position, from the beginning of the stream

See also

`setPlayingOffset`

Vector3f `sf::SoundSource::getPosition () const`

Get the 3D position of the sound in the audio scene.

Returns

Position of the sound

See also

`setPosition`

unsigned int `sf::SoundStream::getSampleRate () const`

Get the stream sample rate of the stream.

The sample rate is the number of audio samples played per second. The

Returns

Sample rate, in number of samples per second

Status `sf::SoundStream::getStatus () const`

Get the current status of the stream (stopped, paused, playing)

Returns

Current status

float `sf::SoundSource::getVolume () const`

Get the volume of the sound.

Returns

Volume of the sound, in the range [0, 100]

See also

[setVolume](#)

void `sf::SoundStream::initialize (unsigned int channelCount, unsigned int sampleRate)`

Define the audio stream parameters.

This function must be called by derived classes as soon as they know they will play. Any attempt to manipulate the stream ([play\(\)](#), ...) before calling this function is illegal. It can be called multiple times if the settings of the audio stream change, but only when the stream is not playing.

Parameters

channelCount Number of channels of the stream
sampleRate Sample rate, in samples per second

bool sf::SoundSource::isRelativeToListener () const

Tell whether the sound's position is relative to the listener or is absolute.

Returns

True if the position is relative, false if it's absolute

See also

[setRelativeToListener](#)

virtual bool sf::Music::onGetData ([Chunk](#) & [data](#))

Request a new chunk of audio samples from the stream source.

This function fills the chunk from the next samples to read from the audio

Parameters

data Chunk of data to fill

Returns

True to continue playback, false to stop

Implements [sf::SoundStream](#).

virtual void sf::Music::onSeek ([Time](#) [timeOffset](#))

Change the current playing position in the stream source.

Parameters

timeOffset New playing position, from the beginning of the music

Implements `sf::SoundStream`.

```
bool sf::Music::openFromFile ( const std::string & filename )
```

Open a music from an audio file.

This function doesn't start playing the music (call `play()` to do so). See `sf::InputSoundFile` for the list of supported formats.

Warning

Since the music is not loaded at once but rather streamed continuously, it is not accessible until the `sf::Music` object loads a new music or is destroyed.

Parameters

filename Path of the music file to open

Returns

True if loading succeeded, false if it failed

See also

`openFromMemory`, `openFromStream`

```
bool sf::Music::openFromMemory ( const void * data,  
                                std::size_t  sizeInBytes  
                                )
```

Open a music from an audio file in memory.

This function doesn't start playing the music (call `play()` to do so) see `sf::InputSoundFile` for the list of supported formats.

Warning

Since the music is not loaded at once but rather streamed continuously it is not accessible until the `sf::Music` object loads a new music or is destroyed, the buffer right after calling this function.

Parameters

data Pointer to the file data in memory
sizeInBytes Size of the data to load, in bytes

Returns

True if loading succeeded, false if it failed

See also

`openFromFile`, `openFromStream`

`bool sf::Music::openFromStream (InputStream & stream)`

Open a music from an audio file in a custom stream.

This function doesn't start playing the music (call `play()` to do so) see `sf::InputSoundFile` for the list of supported formats.

Warning

Since the music is not loaded at once but rather streamed continuously it is not accessible until the `sf::Music` object loads a new music or is destroyed, the buffer right after calling this function.

Parameters

stream Source stream to read from

Returns

True if loading succeeded, false if it failed

See also

[openFromFile](#), [openFromMemory](#)

void sf::SoundStream::pause ()

Pause the audio stream.

This function pauses the stream if it was playing, otherwise (stream already stopped) it has no effect.

See also

[play](#), [stop](#)

void sf::SoundStream::play ()

Start or resume playing the audio stream.

This function starts the stream if it was stopped, resumes it if it was already stopped, and begins if it was already playing. This function uses its own thread so the program can continue while the stream is played.

See also

[pause](#), [stop](#)

void sf::SoundSource::setAttenuation (float **attenuation)**

Set the attenuation factor of the sound.

The attenuation is a multiplicative factor which makes the sound mo distance from the listener. An attenuation of 0 will produce a non-atten always be the same whether it is heard from near or from far. On the c such as 100 will make the sound fade out very quickly as it gets furth value of the attenuation is 1.

Parameters

attenuation New attenuation factor of the sound

See also

[getAttenuation](#), [setMinDistance](#)

void sf::SoundStream::setLoop (bool **loop)**

Set whether or not the stream should loop after reaching the end.

If set, the stream will restart from beginning after reaching the end a setLoop(false) is called. The default looping state for streams is false.

Parameters

loop True to play in loop, false to play once

See also

[getLoop](#)

void sf::SoundSource::setMinDistance (float **distance)**

Set the minimum distance of the sound.

The "minimum distance" of a sound is the maximum distance at which it Further than the minimum distance, it will start to fade out according to it

("inside the head of the listener") is an invalid value and is forbidden. The distance is 1.

Parameters

distance New minimum distance of the sound

See also

[getMinDistance](#), [setAttenuation](#)

void sf::SoundSource::setPitch (float **pitch**)

Set the pitch of the sound.

The pitch represents the perceived fundamental frequency of a sound; it can be made more acute or grave by changing its pitch. A side effect of changing the pitch is that it also changes the speed of the sound as well. The default value for the pitch is 1.

Parameters

pitch New pitch to apply to the sound

See also

[getPitch](#)

void sf::SoundStream::setPlayingOffset (**Time** **timeOffset**)

Change the current playing position of the stream.

The playing position can be changed when the stream is either paused or playing. The position when the stream is stopped has no effect, since playing the stream from that position will start from the beginning.

Parameters

timeOffset New playing position, from the beginning of the stream

See also

[getPlayingOffset](#)

```
void sf::SoundSource::setPosition ( float x,  
                                   float y,  
                                   float z  
                                   )
```

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default position is (0, 0, 0).

Parameters

- x** X coordinate of the position of the sound in the scene
- y** Y coordinate of the position of the sound in the scene
- z** Z coordinate of the position of the sound in the scene

See also

[getPosition](#)

```
void sf::SoundSource::setPosition ( const Vector3f & position )
```

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default position is (0, 0, 0).

Parameters

position Position of the sound in the scene

See also

[getPosition](#)

void sf::SoundSource::setRelativeToListener (bool **relative)**

Make the sound's position relative to the listener or absolute.

Making a sound relative to the listener will ensure that it will always be relative to the position of the listener. This can be useful for non-spatialized sounds, sounds relative to the listener, or sounds attached to it. The default value is false (position is absolute).

Parameters

relative True to set the position relative, false to set it absolute

See also

[isRelativeToListener](#)

void sf::SoundSource::setVolume (float **volume)**

Set the volume of the sound.

The volume is a value between 0 (mute) and 100 (full volume). The default value is 100.

Parameters

volume Volume of the sound

See also

[getVolume](#)

void sf::SoundStream::stop ()

Stop playing the audio stream.

This function stops the stream if it was playing or paused, and does not also resets the playing position (unlike `pause()`).

See also

`play`, `pause`

Member Data Documentation

unsigned int sf::SoundSource::m_source

OpenAL source identifier.

Definition at line 274 of file [SoundSource.hpp](#).

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

- [Music.hpp](#)

[Main Page](#) | [Related Pages](#) | [Modules](#) | [Namespaces](#) | **[Classes](#)** | [Files](#)

[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#)

[Public Member Functions](#) | [List of all members](#)

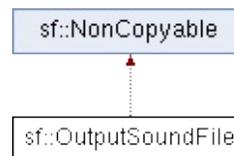
sf::OutputSoundFile Class Reference

Audio module

Provide write access to sound files. [More...](#)

```
#include <OutputSoundFile.hpp>
```

Inheritance diagram for sf::OutputSoundFile:



Public Member Functions

`OutputSoundFile ()`
Default constructor. [More...](#)

`~OutputSoundFile ()`
Destructor. [More...](#)

`bool openFromFile (const std::string &filename, unsigned int sampleRate)`
Open the sound file from the disk for writing. [More...](#)

`void write (const Int16 *samples, Uint64 count)`
Write audio samples to the file. [More...](#)

Detailed Description

Provide write access to sound files.

This class encodes audio samples to a sound file.

It is used internally by higher-level classes such as `sf::SoundBuffer`, but create audio files from custom data sources, like generated audio samples.

Usage example:

```
// Create a sound file, ogg/vorbis format, 44100 Hz, stereo
sf::OutputSoundFile file;
if (!file.openFromFile("music.ogg", 44100, 2))
    /* error */;

while (...)
{
    // Read or generate audio samples from your custom source
    std::vector<sf::Int16> samples = ...;

    // Write them to the file
    file.write(samples.data(), samples.size());
}
```

See also

`sf::SoundFileWriter`, `sf::InputSoundFile`

Definition at line 44 of file `OutputSoundFile.hpp`.

Constructor & Destructor Documentation

sf::OutputSoundFile::OutputSoundFile ()

Default constructor.

sf::OutputSoundFile::~~OutputSoundFile ()

Destructor.

Closes the file if it was still open.

Member Function Documentation

```
bool sf::OutputSoundFile::openFromFile ( const std::string & filename,
                                          unsigned int      sampleRate,
                                          unsigned int      channelCount,
                                          )
```

Open the sound file from the disk for writing.

The supported audio formats are: WAV, OGG/Vorbis, FLAC.

Parameters

filename Path of the sound file to write
sampleRate Sample rate of the sound
channelCount Number of channels in the sound

Returns

True if the file was successfully opened

```
void sf::OutputSoundFile::write ( const Int16 * samples,
                                   Uint64      count,
                                   )
```

Write audio samples to the file.

Parameters

samples Pointer to the sample array to write
count Number of samples to write

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

- [OutputSoundFile.hpp](#)

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[Public Types](#) | [Public Member Functions](#) | [Protected Attributes](#) | [List of all members](#)

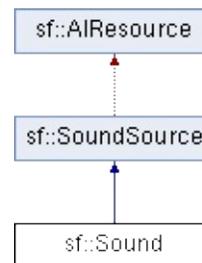
sf::Sound Class Reference

Audio module

Regular sound that can be played in the audio environment. [More...](#)

```
#include <Sound.hpp>
```

Inheritance diagram for sf::Sound:



Public Types

enum `Status` { `Stopped`, `Paused`, `Playing` }
Enumeration of the sound source states. [More...](#)

Public Member Functions

`Sound ()`

Default constructor. [More...](#)

`Sound (const SoundBuffer &buffer)`

Construct the sound with a buffer. [More...](#)

`Sound (const Sound ©)`

Copy constructor. [More...](#)

`~Sound ()`

Destructor. [More...](#)

`void play ()`

Start or resume playing the sound. [More...](#)

`void pause ()`

Pause the sound. [More...](#)

`void stop ()`

stop playing the sound [More...](#)

`void setBuffer (const SoundBuffer &buffer)`

Set the source buffer containing the audio data to p

`void setLoop (bool loop)`

Set whether or not the sound should loop after reac

`void setPlayingOffset (Time timeOffset)`

Change the current playing position of the sound. M

`const SoundBuffer * getBuffer () const`

Get the audio buffer attached to the sound. [More...](#)

bool `getLoop () const`
Tell whether or not the sound is in loop mode. [More...](#)

Time `getPlayingOffset () const`
Get the current playing position of the sound. [More...](#)

Status `getStatus () const`
Get the current status of the sound (stopped, pause...

Sound & `operator= (const Sound &right)`
Overload of assignment operator. [More...](#)

void `resetBuffer ()`
Reset the internal buffer of the sound. [More...](#)

void `setPitch (float pitch)`
Set the pitch of the sound. [More...](#)

void `setVolume (float volume)`
Set the volume of the sound. [More...](#)

void `setPosition (float x, float y, float z)`
Set the 3D position of the sound in the audio scene

void `setPosition (const Vector3f &position)`
Set the 3D position of the sound in the audio scene

void `setRelativeToListener (bool relative)`
Make the sound's position relative to the listener or

void `setMinDistance (float distance)`
Set the minimum distance of the sound. [More...](#)

void `setAttenuation` (float attenuation)
Set the attenuation factor of the sound. [More...](#)

float `getPitch` () const
Get the pitch of the sound. [More...](#)

float `getVolume` () const
Get the volume of the sound. [More...](#)

Vector3f `getPosition` () const
Get the 3D position of the sound in the audio scene

bool `isRelativeToListener` () const
Tell whether the sound's position is relative to the li

float `getMinDistance` () const
Get the minimum distance of the sound. [More...](#)

float `getAttenuation` () const
Get the attenuation factor of the sound. [More...](#)

Protected Attributes

unsigned int `m_source`
OpenAL source identifier. [More...](#)

Detailed Description

Regular sound that can be played in the audio environment.

`sf::Sound` is the class to use to play sounds.

It provides:

- Control (play, pause, stop)
- Ability to modify output parameters in real-time (pitch, volume, ...)
- 3D spatial features (position, attenuation, ...).

`sf::Sound` is perfect for playing short sounds that can fit in memory and re gun shots. For longer sounds, like background musics or long speeche based on streaming).

In order to work, a sound must be given a buffer of audio data to play. `sf::SoundBuffer`, and attached to a sound with the `setBuffer()` function. sound must remain alive as long as the sound uses it. Note that multiple buffer at the same time.

Usage example:

```
sf::SoundBuffer buffer;  
buffer.loadFromFile("sound.wav");  
  
sf::Sound sound;  
sound.setBuffer(buffer);  
sound.play();
```

See also

`sf::SoundBuffer`, `sf::Music`

Definition at line 45 of file Sound.hpp.

Member Enumeration Documentation

enum sf::SoundSource::Status

Enumeration of the sound source states.

Enumerator	
Stopped	Sound is not playing.
Paused	Sound is paused.
Playing	Sound is playing.

Definition at line 50 of file `SoundSource.hpp`.

Constructor & Destructor Documentation

sf::Sound::Sound ()

Default constructor.

sf::Sound::Sound (const **SoundBuffer & **buffer**)**

Construct the sound with a buffer.

Parameters

buffer **SoundBuffer** buffer containing the audio data to play with the sound

sf::Sound::Sound (const **Sound & **copy**)**

Copy constructor.

Parameters

copy Instance to copy

sf::Sound::~~Sound ()

Destructor.

Member Function Documentation

float sf::SoundSource::getAttenuation () const

Get the attenuation factor of the sound.

Returns

Attenuation factor of the sound

See also

[setAttenuation](#), [getMinDistance](#)

const [SoundBuffer*](#) sf::Sound::getBuffer () const

Get the audio buffer attached to the sound.

Returns

[Sound](#) buffer attached to the sound (can be NULL)

bool sf::Sound::getLoop () const

Tell whether or not the sound is in loop mode.

Returns

True if the sound is looping, false otherwise

See also

[setLoop](#)

float sf::SoundSource::getMinDistance () const

Get the minimum distance of the sound.

Returns

Minimum distance of the sound

See also

[setMinDistance](#), [getAttenuation](#)

float sf::SoundSource::getPitch () const

Get the pitch of the sound.

Returns

Pitch of the sound

See also

[setPitch](#)

Time sf::Sound::getPlayingOffset () const

Get the current playing position of the sound.

Returns

Current playing position, from the beginning of the sound

See also

[setPlayingOffset](#)

Vector3f sf::SoundSource::getPosition () const

Get the 3D position of the sound in the audio scene.

Returns

Position of the sound

See also

[setPosition](#)

Status sf::Sound::getStatus () const

Get the current status of the sound (stopped, paused, playing)

Returns

Current status of the sound

float sf::SoundSource::getVolume () const

Get the volume of the sound.

Returns

Volume of the sound, in the range [0, 100]

See also

[setVolume](#)

bool sf::SoundSource::isRelativeToListener () const

Tell whether the sound's position is relative to the listener or is absolute.

Returns

True if the position is relative, false if it's absolute

See also

[setRelativeToListener](#)

Sound& sf::Sound::operator= (const Sound & right)

Overload of assignment operator.

Parameters

right Instance to assign

Returns

Reference to self

void sf::Sound::pause ()

Pause the sound.

This function pauses the sound if it was playing, otherwise (sound already effect).

See also

[play](#), [stop](#)

void sf::Sound::play ()

Start or resume playing the sound.

This function starts the stream if it was stopped, resumes it if it was beginning if it was already playing. This function uses its own thread so the program while the sound is played.

See also

[pause](#), [stop](#)

void sf::Sound::resetBuffer ()

Reset the internal buffer of the sound.

This function is for internal use only, you don't have to use it. It is called by the sound when it is destroyed in order to prevent the sound from using

void sf::SoundSource::setAttenuation (float **attenuation)**

Set the attenuation factor of the sound.

The attenuation is a multiplicative factor which makes the sound more distant from the listener. An attenuation of 0 will produce a non-attenuated sound that will always be the same whether it is heard from near or from far. On the other hand, a value such as 100 will make the sound fade out very quickly as it gets further away. The default value of the attenuation is 1.

Parameters

attenuation New attenuation factor of the sound

See also

`getAttenuation`, `setMinDistance`

void sf::Sound::setBuffer (const `SoundBuffer` & `buffer`)

Set the source buffer containing the audio data to play.

It is important to note that the sound buffer is not copied, thus the `sf::Sound` is alive as long as it is attached to the sound.

Parameters

`buffer` `SoundBuffer` buffer to attach to the sound

See also

`getBuffer`

void sf::Sound::setLoop (bool `loop`)

Set whether or not the sound should loop after reaching the end.

If set, the sound will restart from beginning after reaching the end a `setLoop(false)` is called. The default looping state for sound is false.

Parameters

`loop` True to play in loop, false to play once

See also

`getLoop`

void sf::SoundSource::setMinDistance (float **distance)**

Set the minimum distance of the sound.

The "minimum distance" of a sound is the maximum distance at which it is still audible. Further than the minimum distance, it will start to fade out according to its attenuation curve ("inside the head of the listener") is an invalid value and is forbidden. The minimum distance is 1.

Parameters

distance New minimum distance of the sound

See also

[getMinDistance](#), [setAttenuation](#)

void sf::SoundSource::setPitch (float **pitch)**

Set the pitch of the sound.

The pitch represents the perceived fundamental frequency of a sound; it can be made more acute or grave by changing its pitch. A side effect of changing the pitch is that it also changes the speed of the sound as well. The default value for the pitch is 1.

Parameters

pitch New pitch to apply to the sound

See also

[getPitch](#)

```
void sf::Sound::setPlayingOffset ( Time timeOffset )
```

Change the current playing position of the sound.

The playing position can be changed when the sound is either paused or playing. The playing position when the sound is stopped has no effect, since playing the sound will start from the beginning.

Parameters

timeOffset New playing position, from the beginning of the sound

See also

[getPlayingOffset](#)

```
void sf::SoundSource::setPosition ( float x,  
                                   float y,  
                                   float z  
                                   )
```

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default position is (0, 0, 0).

Parameters

x X coordinate of the position of the sound in the scene

y Y coordinate of the position of the sound in the scene

z Z coordinate of the position of the sound in the scene

See also

[getPosition](#)

void sf::SoundSource::setPosition (const [Vector3f](#) & position)

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default position is (0, 0, 0).

Parameters

position Position of the sound in the scene

See also

[getPosition](#)

void sf::SoundSource::setRelativeToListener (bool relative)

Make the sound's position relative to the listener or absolute.

Making a sound relative to the listener will ensure that it will always be positioned relative to the position of the listener. This can be useful for non-spatialized sounds, sounds attached to the listener, or sounds attached to the listener. The default value is false (position is absolute).

Parameters

relative True to set the position relative, false to set it absolute

See also

[isRelativeToListener](#)

void sf::SoundSource::setVolume (float volume)

Set the volume of the sound.

The volume is a value between 0 (mute) and 100 (full volume). The default

Parameters

volume Volume of the sound

See also

[getVolume](#)

void sf::Sound::stop ()

stop playing the sound

This function stops the sound if it was playing or paused, and does not also reset the playing position (unlike [pause\(\)](#)).

See also

[play](#), [pause](#)

Member Data Documentation

unsigned int sf::SoundSource::m_source

OpenAL source identifier.

Definition at line 274 of file [SoundSource.hpp](#).

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

- [Sound.hpp](#)

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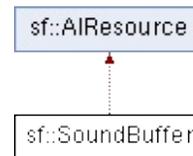
sf::SoundBuffer Class Reference

Audio module

Storage for audio samples defining a sound. [More...](#)

```
#include <SoundBuffer.hpp>
```

Inheritance diagram for sf::SoundBuffer:



Public Member Functions

`SoundBuffer ()`
Default constructor. [More...](#)

`SoundBuffer (const SoundBuffer ©)`
Copy constructor. [More...](#)

`~SoundBuffer ()`
Destructor. [More...](#)

`bool loadFromFile (const std::string &filename)`
Load the sound buffer from a file. [More...](#)

`bool loadFromMemory (const void *data, std::size_t sizeInBy)`
Load the sound buffer from a file in memory. [More...](#)

`bool loadFromStream (InputStream &stream)`
Load the sound buffer from a custom stream. [More...](#)

`bool loadFromSamples (const Int16 *samples, Uint64 sample
channelCount, unsigned int sampleRate)`
Load the sound buffer from an array of audio samples. [More...](#)

`bool saveToFile (const std::string &filename) const`
Save the sound buffer to an audio file. [More...](#)

`const Int16 * getSamples () const`
Get the array of audio samples stored in the buffer. [More...](#)

`Uint64 getSampleCount () const`
Get the number of samples stored in the buffer. [More...](#)

unsigned int `getSampleRate () const`
Get the sample rate of the sound. [More...](#)

unsigned int `getChannelCount () const`
Get the number of channels used by the sound. [More...](#)

Time `getDuration () const`
Get the total duration of the sound. [More...](#)

SoundBuffer & `operator= (const SoundBuffer &right)`
Overload of assignment operator. [More...](#)

Friends

```
class Sound
```

Detailed Description

Storage for audio samples defining a sound.

A sound buffer holds the data of a sound, which is an array of audio samples.

A sample is a 16 bits signed integer that defines the amplitude of the sound. The samples are then reconstituted by playing these samples at a high rate (for example, the standard rate used for playing CDs). In short, audio samples are like text. This is similar to a `sf::Texture`.

A sound buffer can be loaded from a file (see `loadFromFile()` for the code), from memory, from a custom stream (see `sf::InputStream`) or directly from a file. It can also be saved back to a file.

`Sound` buffers alone are not very useful: they hold the audio data but cannot be played. To use the `sf::Sound` class, which provides functions to play/pause/stop the sound and to change the way it is outputted (volume, pitch, 3D position, ...). This separation is useful for performances: indeed a `sf::SoundBuffer` is a heavy resource, and any operation on it is slow (for real-time applications). On the other side, a `sf::Sound` is a lightweight object that holds a reference to a `sf::SoundBuffer` and change the way it is played without actually reading the audio data. It is also possible to bind several `sf::Sound` instances to the same `sf::SoundBuffer`.

It is important to note that the `sf::Sound` instance doesn't copy the `sf::SoundBuffer` but holds a reference to it. Thus, a `sf::SoundBuffer` must not be destructed while it is used by a `sf::Sound`. If you write a function that uses a local `sf::SoundBuffer` instance for loading a sound, you must return a `sf::SoundBuffer` instance that is not destroyed.

Usage example:

```
// Declare a new sound buffer
sf::SoundBuffer buffer;
```

```
// Load it from a file
if (!buffer.loadFromFile("sound.wav"))
{
    // error...
}

// Create a sound source and bind it to the buffer
sf::Sound sound1;
sound1.setBuffer(buffer);

// Play the sound
sound1.play();

// Create another sound source bound to the same buffer
sf::Sound sound2;
sound2.setBuffer(buffer);

// Play it with a higher pitch -- the first sound remains unchanged
sound2.setPitch(2);
sound2.play();
```

See also

[sf::Sound](#), [sf::SoundBufferRecorder](#)

Definition at line 49 of file [SoundBuffer.hpp](#).

Constructor & Destructor Documentation

sf::SoundBuffer::SoundBuffer ()

Default constructor.

sf::SoundBuffer::SoundBuffer (const **SoundBuffer & **copy**)**

Copy constructor.

Parameters

copy Instance to copy

sf::SoundBuffer::~~SoundBuffer ()

Destructor.

Member Function Documentation

unsigned int sf::SoundBuffer::getChannelCount () const

Get the number of channels used by the sound.

If the sound is mono then the number of channels will be 1, 2 for stereo,

Returns

Number of channels

See also

[getSampleRate](#), [getDuration](#)

Time sf::SoundBuffer::getDuration () const

Get the total duration of the sound.

Returns

[Sound](#) duration

See also

[getSampleRate](#), [getChannelCount](#)

Uint64 sf::SoundBuffer::getSampleCount () const

Get the number of samples stored in the buffer.

The array of samples can be accessed with the `getSamples()` function.

Returns

Number of samples

See also

`getSamples`

unsigned int sf::SoundBuffer::getSampleRate () const

Get the sample rate of the sound.

The sample rate is the number of samples played per second. The h example, 44100 samples/s is CD quality).

Returns

Sample rate (number of samples per second)

See also

`getChannelCount`, `getDuration`

const Int16* sf::SoundBuffer::getSamples () const

Get the array of audio samples stored in the buffer.

The format of the returned samples is 16 bits signed integer (sf::Int16). this array is given by the `getSampleCount()` function.

Returns

Read-only pointer to the array of sound samples

See also

[getSampleCount](#)

```
bool sf::SoundBuffer::loadFromFile ( const std::string & filename )
```

Load the sound buffer from a file.

See the documentation of [sf::InputSoundFile](#) for the list of supported formats.

Parameters

filename Path of the sound file to load

Returns

True if loading succeeded, false if it failed

See also

[loadFromMemory](#), [loadFromStream](#), [loadFromSamples](#), [saveToFile](#)

```
bool sf::SoundBuffer::loadFromMemory ( const void * data,  
                                       std::size_t  sizeInBytes  
                                       )
```

Load the sound buffer from a file in memory.

See the documentation of [sf::InputSoundFile](#) for the list of supported formats.

Parameters

data Pointer to the file data in memory

sizeInBytes Size of the data to load, in bytes

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromStream](#), [loadFromSamples](#)

```
bool sf::SoundBuffer::loadFromSamples ( const Int16 * samples,
                                       Uint64      sampleCount,
                                       unsigned int channelCount,
                                       unsigned int sampleRate
                                       )
```

Load the sound buffer from an array of audio samples.

The assumed format of the audio samples is 16 bits signed integer (sf::Int16).

Parameters

samples Pointer to the array of samples in memory

sampleCount Number of samples in the array

channelCount Number of channels (1 = mono, 2 = stereo, ...)

sampleRate Sample rate (number of samples to play per second)

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromMemory](#), [saveToFile](#)

```
bool sf::SoundBuffer::loadFromStream ( InputStream & stream )
```

Load the sound buffer from a custom stream.

See the documentation of [sf::InputSoundFile](#) for the list of supported formats.

Parameters

stream Source stream to read from

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromMemory](#), [loadFromSamples](#)

SoundBuffer& sf::SoundBuffer::operator= (const SoundBuffer & right)

Overload of assignment operator.

Parameters

right Instance to assign

Returns

Reference to self

bool sf::SoundBuffer::saveToFile (const std::string & filename) const

Save the sound buffer to an audio file.

See the documentation of [sf::OutputSoundFile](#) for the list of supported formats.

Parameters

filename Path of the sound file to write

Returns

True if saving succeeded, false if it failed

See also

[loadFromFile](#), [loadFromMemory](#), [loadFromSamples](#)

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

- [SoundBuffer.hpp](#)

SFML 2.4.2

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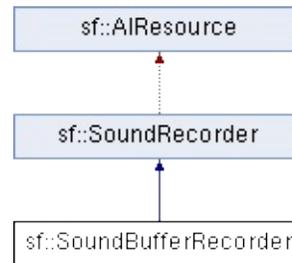
sf::SoundBufferRecorder Class Reference

Audio module

Specialized `SoundRecorder` which stores the captured audio data into a s

```
#include <SoundBufferRecorder.hpp>
```

Inheritance diagram for sf::SoundBufferRecorder:



Public Member Functions

`~SoundBufferRecorder ()`
destructor [More...](#)

`const SoundBuffer & getBuffer () const`
Get the sound buffer containing the captured audio.

`bool start (unsigned int sampleRate=44100)`
Start the capture. [More...](#)

`void stop ()`
Stop the capture. [More...](#)

`unsigned int getSampleRate () const`
Get the sample rate. [More...](#)

`bool setDevice (const std::string &name)`
Set the audio capture device. [More...](#)

`const std::string & getDevice () const`
Get the name of the current audio capture device.

`void setChannelCount (unsigned int channelCount)`
Set the channel count of the audio capture device.

`unsigned int getChannelCount () const`
Get the number of channels used by this recorder.

Static Public Member Functions

static std::vector< std::string > `getAvailableDevices ()`
Get a list of the names of all available au

static std::string `getDefaultDevice ()`
Get the name of the default audio capture

static bool `isAvailable ()`
Check if the system supports audio captu

Protected Member Functions

virtual bool `onStart ()`
Start capturing audio data. [More...](#)

virtual bool `onProcessSamples (const Int16 *samples, std::size_t sampl`
Process a new chunk of recorded samples. [More...](#)

virtual void `onStop ()`
Stop capturing audio data. [More...](#)

void `setProcessingInterval (Time interval)`
Set the processing interval. [More...](#)

Detailed Description

Specialized `SoundRecorder` which stores the captured audio data into a `sf::SoundBuffer`. `sf::SoundBufferRecorder` allows to access a recorded sound through a `sf::SoundBuffer`: it can be played, saved to a file, etc.

It has the same simple interface as its base class (`start()`, `stop()`) and returns the recorded sound buffer (`getBuffer()`).

As usual, don't forget to call the `isAvailable()` function before using this (see [more details about this](#)).

Usage example:

```
if (sf::SoundBufferRecorder::isAvailable())
{
    // Record some audio data
    sf::SoundBufferRecorder recorder;
    recorder.start();
    ...
    recorder.stop();

    // Get the buffer containing the captured audio data
    const sf::SoundBuffer& buffer = recorder.getBuffer();

    // Save it to a file (for example...)
    buffer.saveToFile("my_record.ogg");
}
```

See also

`sf::SoundRecorder`

Definition at line 44 of file `SoundBufferRecorder.hpp`.

Constructor & Destructor Documentation

sf::SoundBufferRecorder::~~SoundBufferRecorder ()

destructor

Member Function Documentation

static std::vector<std::string> sf::SoundRecorder::getAvailableDevi

Get a list of the names of all available audio capture devices.

This function returns a vector of strings, containing the names of all avail

Returns

A vector of strings containing the names

const SoundBuffer& sf::SoundBufferRecorder::getBuffer () const

Get the sound buffer containing the captured audio data.

The sound buffer is valid only after the capture has ended. This function returns the internal sound buffer, but it can be copied if you need to make any m

Returns

Read-only access to the sound buffer

unsigned int sf::SoundRecorder::getChannelCount () const

Get the number of channels used by this recorder.

Currently only mono and stereo are supported, so the value is either 1 (f

Returns

Number of channels

See also

[setChannelCount](#)

static std::string sf::SoundRecorder::getDefaultDevice ()

Get the name of the default audio capture device.

This function returns the name of the default audio capture device. If none is found, an empty string is returned.

Returns

The name of the default audio capture device

const std::string& sf::SoundRecorder::getDevice () const

Get the name of the current audio capture device.

Returns

The name of the current audio capture device

unsigned int sf::SoundRecorder::getSampleRate () const

Get the sample rate.

The sample rate defines the number of audio samples captured per second. The higher the sample rate, the better the audio quality (for example, 44100 samples/sec is CD quality).

Returns

Sample rate, in samples per second

static bool sf::SoundRecorder::isAvailable ()

Check if the system supports audio capture.

This function should always be called before using the audio capture feature. An attempt to use `sf::SoundRecorder` or one of its derived classes will fail.

Returns

True if audio capture is supported, false otherwise

virtual bool sf::SoundBufferRecorder::onProcessSamples (const Int16* samples, std::size_t sampleCount)

Process a new chunk of recorded samples.

Parameters

samples Pointer to the new chunk of recorded samples

sampleCount Number of samples pointed by *samples*

Returns

True to continue the capture, or false to stop it

Implements `sf::SoundRecorder`.

virtual bool sf::SoundBufferRecorder::onStart ()

Start capturing audio data.

Returns

True to start the capture, or false to abort it

Reimplemented from [sf::SoundRecorder](#).

virtual void sf::SoundBufferRecorder::onStop ()

Stop capturing audio data.

Reimplemented from [sf::SoundRecorder](#).

void sf::SoundRecorder::setChannelCount (unsigned int **channelC**

Set the channel count of the audio capture device.

This method allows you to specify the number of channels used for recording and 16-bit stereo are supported.

Parameters

channelCount Number of channels. Currently only mono (1) and st

See also

[getChannelCount](#)

bool sf::SoundRecorder::setDevice (const std::string & **name**)

Set the audio capture device.

This function sets the audio capture device to the device with the given name (i.e: while recording). If you do so while recording and opening the device

Parameters

name The name of the audio capture device

Returns

True, if it was able to set the requested device

See also

[getAvailableDevices](#), [getDefaultDevice](#)

```
void sf::SoundRecorder::setProcessingInterval ( Time interval )
```

Set the processing interval.

The processing interval controls the period between calls to the onProcessData method. You want to use a small interval if you want to process the recorded data in real time.

Note: this is only a hint, the actual period may vary. So don't rely on this timing.

The default processing interval is 100 ms.

Parameters

interval Processing interval

```
bool sf::SoundRecorder::start ( unsigned int sampleRate = 44100 )
```

Start the capture.

The *sampleRate* parameter defines the number of audio samples captured better the quality (for example, 44100 samples/sec is CD quality). This that it doesn't block the rest of the program while the capture runs. Please happen at the same time. You can select which capture device will be used [setDevice\(\)](#) method. If none was selected before, the default capture device list of the names of all available capture devices by calling [getAvailableDevices](#)

Parameters

sampleRate Desired capture rate, in number of samples per second

Returns

True, if start of capture was successful

See also

[stop](#), [getAvailableDevices](#)

void sf::SoundRecorder::stop ()

Stop the capture.

See also

[start](#)

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

- [SoundBufferRecorder.hpp](#)

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[Classes](#) | [Static Public Member Functions](#) | [List of all members](#)

sf::SoundFileFactory Class Reference

Audio module

Manages and instantiates sound file readers and writers. [More...](#)

```
#include <SoundFileFactory.hpp>
```

Static Public Member Functions

template<typename T >

static void **registerReader** ()
Register a new reader. [More...](#)

template<typename T >

static void **unregisterReader** ()
Unregister a reader. [More...](#)

template<typename T >

static void **registerWriter** ()
Register a new writer. [More...](#)

template<typename T >

static void **unregisterWriter** ()
Unregister a writer. [More...](#)

static **SoundFileReader** * **createReaderFromFilename** (const std::string &filename)
Instantiate the right reader for the given file on disk.

static **SoundFileReader** * **createReaderFromMemory** (const void *data, int size)
Instantiate the right codec for the given file in memory.

static **SoundFileReader** * **createReaderFromStream** (InputStream &stream)
Instantiate the right codec for the given file in a stream.

static **SoundFileWriter** * **createWriterFromFilename** (const std::string &filename)
Instantiate the right writer for the given file on disk.

Detailed Description

Manages and instantiates sound file readers and writers.

This class is where all the sound file readers and writers are registered.

You should normally only need to use its registration and unregistration functions and manipulation are wrapped into the higher-level classes `sf::InputSoundFile` and `sf::OutputSoundFile`.

To register a new reader (writer) use the `sf::SoundFileFactory::registerReader` (`registerWriter`) function. You don't have to call the `unregisterReader` (`unregisterWriter`) function to unregister a format before your application ends (typically, when a plugin is unloaded).

Usage example:

```
sf::SoundFileFactory::registerReader<MySoundFileReader>();  
sf::SoundFileFactory::registerWriter<MySoundFileWriter>();
```

See also

`sf::InputSoundFile`, `sf::OutputSoundFile`, `sf::SoundFileReader`, `sf::SoundFileWriter`

Definition at line 46 of file `SoundFileFactory.hpp`.

Member Function Documentation

**static [SoundFileReader*](#)
sf::SoundFileFactory::createReaderFromFilename** (con

Instantiate the right reader for the given file on disk.

It's up to the caller to release the returned reader

Parameters

filename Path of the sound file

Returns

A new sound file reader that can read the given file, or null if no reac

See also

[createReaderFromMemory](#), [createReaderFromStream](#)

**static [SoundFileReader*](#)
sf::SoundFileFactory::createReaderFromMemory** (

Instantiate the right codec for the given file in memory.

It's up to the caller to release the returned reader

Parameters

data Pointer to the file data in memory
sizeInBytes Total size of the file data, in bytes

Returns

A new sound file codec that can read the given file, or null if no code

See also

[createReaderFromFilename](#), [createReaderFromStream](#)

static SoundFileReader*
sf::SoundFileFactory::createReaderFromStream

Instantiate the right codec for the given file in stream.

It's up to the caller to release the returned reader

Parameters

stream Source stream to read from

Returns

A new sound file codec that can read the given file, or null if no code

See also

[createReaderFromFilename](#), [createReaderFromMemory](#)

static SoundFileWriter*
sf::SoundFileFactory::createWriterFromFilename (con.

Instantiate the right writer for the given file on disk.

It's up to the caller to release the returned writer

Parameters

filename Path of the sound file

Returns

A new sound file writer that can write given file, or null if no writer ca

```
template<typename T >
```

```
static void sf::SoundFileFactory::registerReader ( )
```

Register a new reader.

See also

[unregisterReader](#)

```
template<typename T >
```

```
static void sf::SoundFileFactory::registerWriter ( )
```

Register a new writer.

See also

[unregisterWriter](#)

```
template<typename T >
```

```
static void sf::SoundFileFactory::unregisterReader ( )
```

Unregister a reader.

See also

[registerReader](#)

template<typename T >

static void sf::SoundFileFactory::unregisterWriter ()

Unregister a writer.

See also

[registerWriter](#)

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

- [SoundFileFactory.hpp](#)

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[Classes](#) | [Public Member Functions](#) | [List of all members](#)

sf::SoundFileReader Class Reference abstract

Audio module

Abstract base class for sound file decoding. [More...](#)

```
#include <SoundFileReader.hpp>
```

Classes

struct [Info](#)

Structure holding the audio properties of a sound file. [More...](#)

Public Member Functions

virtual `~SoundFileReader ()`
Virtual destructor. [More...](#)

virtual bool `open (InputStream &stream, Info &info)=0`
Open a sound file for reading. [More...](#)

virtual void `seek (UInt64 sampleOffset)=0`
Change the current read position to the given sample offset.

virtual UInt64 `read (Int16 *samples, UInt64 maxCount)=0`
Read audio samples from the open file. [More...](#)

Detailed Description

Abstract base class for sound file decoding.

This class allows users to read audio file formats not natively supported by SFML, as well as supported readable audio formats.

A valid sound file reader must override the `open`, `seek` and `read` functions; the latter is used by SFML to find a suitable writer for a given format.

To register a new reader, use the `sf::SoundFileFactory::registerReader` template function.

Usage example:

```
class MySoundFileReader : public sf::SoundFileReader
{
public:

    static bool check(sf::InputStream& stream)
    {
        // typically, read the first few header bytes and check fields that it
        // return true if the reader can handle the format
    }

    virtual bool open(sf::InputStream& stream, Info& info)
    {
        // read the sound file header and fill the sound attributes
        // (channel count, sample count and sample rate)
        // return true on success
    }

    virtual void seek(sf::Uint64 sampleOffset)
    {
        // advance to the sampleOffset-th sample from the beginning of the sound
    }

    virtual sf::Uint64 read(sf::Int16* samples, sf::Uint64 maxCount)
    {
        // read up to 'maxCount' samples into the 'samples' array,
        // convert them (for example from normalized float) if they are not stored
        // as 16-bits signed integers in the file
        // return the actual number of samples read
    }
};
```

```
    }  
};  
sf::SoundFileFactory::registerReader<MySoundFileReader>();
```

See also

[sf::InputSoundFile](#), [sf::SoundFileFactory](#), [sf::SoundFileWriter](#)

Definition at line 43 of file [SoundFileReader.hpp](#).

Constructor & Destructor Documentation

virtual sf::SoundFileReader::~~SoundFileReader ()

Virtual destructor.

Definition at line 62 of file [SoundFileReader.hpp](#).

Member Function Documentation

```
virtual bool sf::SoundFileReader::open ( InputStream & stream,  
                                         Info & info  
                                         )
```

Open a sound file for reading.

The provided stream reference is valid as long as the `SoundFileReader` it during the whole lifetime of the reader.

Parameters

stream Source stream to read from
info Structure to fill with the properties of the loaded sound

Returns

True if the file was successfully opened

```
virtual Uint64 sf::SoundFileReader::read ( Int16 * samples,  
                                           Uint64 maxCount  
                                           )
```

Read audio samples from the open file.

Parameters

samples Pointer to the sample array to fill
maxCount Maximum number of samples to read

Returns

Number of samples actually read (may be less than *maxCount*)

virtual void sf::SoundFileReader::seek (Uint64 **sampleOffset**)

Change the current read position to the given sample offset.

The sample offset takes the channels into account. Offsets can be calculated as $\text{sampleRate} * \text{channelCount}$. If the given offset exceeds the total number of samples to the end of the file.

Parameters

sampleOffset Index of the sample to jump to, relative to the beginning of the file.

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

- [SoundFileReader.hpp](#)

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[Public Attributes](#) | [List of all members](#)

sf::SoundFileReader::Info Struct Reference

Structure holding the audio properties of a sound file. [More...](#)

```
#include <SoundFileReader.hpp>
```

Public Attributes

Uint64 `sampleCount`
Total number of samples in the file. [More...](#)

unsigned int `channelCount`
Number of channels of the sound. [More...](#)

unsigned int `sampleRate`
Samples rate of the sound, in samples per second. [More...](#)

Detailed Description

Structure holding the audio properties of a sound file.

Definition at line [51](#) of file [SoundFileReader.hpp](#).

Member Data Documentation

unsigned int sf::SoundFileReader::Info::channelCount

Number of channels of the sound.

Definition at line 54 of file [SoundFileReader.hpp](#).

Uint64 sf::SoundFileReader::Info::sampleCount

Total number of samples in the file.

Definition at line 53 of file [SoundFileReader.hpp](#).

unsigned int sf::SoundFileReader::Info::sampleRate

Samples rate of the sound, in samples per second.

Definition at line 55 of file [SoundFileReader.hpp](#).

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

- [SoundFileReader.hpp](#)

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sf::SoundFileWriter Class Reference abstract

Audio module

Abstract base class for sound file encoding. [More...](#)

```
#include <SoundFileWriter.hpp>
```

Public Member Functions

virtual `~SoundFileWriter ()`
Virtual destructor. [More...](#)

virtual bool `open (const std::string &filename, unsigned int sampleRate,`
Open a sound file for writing. [More...](#)

virtual void `write (const Int16 *samples, UInt64 count)=0`
Write audio samples to the open file. [More...](#)

Detailed Description

Abstract base class for sound file encoding.

This class allows users to write audio file formats not natively supported by SFML or of supported writable audio formats.

A valid sound file writer must override the `open` and `write` functions, as well as the `check` function; the latter is used by SFML to find a suitable writer for a given file format.

To register a new writer, use the `sf::SoundFileFactory::registerWriter` template function.

Usage example:

```
class MySoundFileWriter : public sf::SoundFileWriter
{
public:
    static bool check(const std::string& filename)
    {
        // typically, check the extension
        // return true if the writer can handle the format
    }

    virtual bool open(const std::string& filename, unsigned int sampleRate, unsigned int channelCount)
    {
        // open the file 'filename' for writing,
        // write the given sample rate and channel count to the file header
        // return true on success
    }

    virtual void write(const sf::Int16* samples, sf::Uint64 count)
    {
        // write 'count' samples stored at address 'samples',
        // convert them (for example to normalized float) if the format requires
    }
};

sf::SoundFileFactory::registerWriter<MySoundFileWriter>();
```

See also

[sf::OutputSoundFile](#), [sf::SoundFileFactory](#), [sf::SoundFileReader](#)

Definition at line 41 of file [SoundFileWriter.hpp](#).

Constructor & Destructor Documentation

virtual sf::SoundFileWriter::~~SoundFileWriter ()

Virtual destructor.

Definition at line 49 of file [SoundFileWriter.hpp](#).

Member Function Documentation

```
virtual bool sf::SoundFileWriter::open ( const std::string & filename  
                                         unsigned int      sampleF  
                                         unsigned int      channel  
                                         )
```

Open a sound file for writing.

Parameters

filename Path of the file to open
sampleRate Sample rate of the sound
channelCount Number of channels of the sound

Returns

True if the file was successfully opened

```
virtual void sf::SoundFileWriter::write ( const Int16 * samples,  
                                           Uint64      count  
                                           )
```

Write audio samples to the open file.

Parameters

samples Pointer to the sample array to write
count Number of samples to write

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

- [SoundFileWriter.hpp](#)

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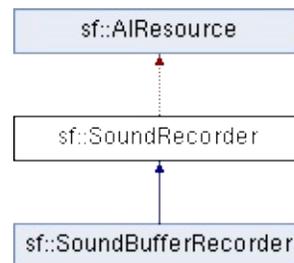
sf::SoundRecorder Class Reference abstract

Audio module

Abstract base class for capturing sound data. [More...](#)

```
#include <SoundRecorder.hpp>
```

Inheritance diagram for sf::SoundRecorder:



Public Member Functions

virtual `~SoundRecorder ()`
destructor [More...](#)

bool `start (unsigned int sampleRate=44100)`
Start the capture. [More...](#)

void `stop ()`
Stop the capture. [More...](#)

unsigned int `getSampleRate () const`
Get the sample rate. [More...](#)

bool `setDevice (const std::string &name)`
Set the audio capture device. [More...](#)

const std::string & `getDevice () const`
Get the name of the current audio capture device. [More...](#)

void `setChannelCount (unsigned int channelCount)`
Set the channel count of the audio capture device. [More...](#)

unsigned int `getChannelCount () const`
Get the number of channels used by this recorder. [More...](#)

Static Public Member Functions

static std::vector< std::string > `getAvailableDevices ()`
Get a list of the names of all available au

static std::string `getDefaultDevice ()`
Get the name of the default audio capture

static bool `isAvailable ()`
Check if the system supports audio captu

Protected Member Functions

`SoundRecorder ()`
Default constructor. [More...](#)

`void setProcessingInterval (Time interval)`
Set the processing interval. [More...](#)

`virtual bool onStart ()`
Start capturing audio data. [More...](#)

`virtual bool onProcessSamples (const Int16 *samples, std::size_t samples)`
Process a new chunk of recorded samples. [More...](#)

`virtual void onStop ()`
Stop capturing audio data. [More...](#)

Detailed Description

Abstract base class for capturing sound data.

`sf::SoundBuffer` provides a simple interface to access the audio recording (microphone).

As an abstract base class, it only cares about capturing sound samples. How to use them is left to the derived class. Note that SFML provides a `sf::SoundBufferRecorder` class that captures data to a sound buffer (see `sf::SoundBufferRecorder`).

A derived class has only one virtual function to override:

- `onProcessSamples` provides the new chunks of audio samples while the recording is in progress.

Moreover, two additional virtual functions can be overridden as well if needed:

- `onStart` is called before the capture happens, to perform custom initialization.
- `onStop` is called after the capture ends, to perform custom cleanup.

A derived class can also control the frequency of the `onProcessSamples` protected function. The default interval is chosen to avoid consuming too much CPU, but it can be changed to a smaller value if you need to capture audio in real time, for example.

The audio capture feature may not be supported or activated on every platform. Check its availability with the `isAvailable()` function. If it returns false, the recorder will fail.

If you have multiple sound input devices connected to your computer (for example, soundcard, webcam mic, ...) you can get a list of all available devices with the `getAvailableDevices()` function.

function. You can then select a device by calling `setDevice()` with the a default capturing device will be used.

By default the recording is in 16-bit mono. Using the `setChannelCount` method of channels used by the audio capture device to record. Note that you have to record in mono or stereo before starting the recording.

It is important to note that the audio capture happens in a separate thread of the program. In particular, the `onProcessSamples` virtual function (but not called from this separate thread. It is important to keep this in mind, because of synchronization issues if you share data between threads. Another thing to do is to call `stop()` in the destructor of your derived class, so that the recording thread is destroyed.

Usage example:

```
class CustomRecorder : public sf::SoundRecorder
{
    ~CustomRecorder()
    {
        // Make sure to stop the recording thread
        stop();
    }

    virtual bool onStart() // optional
    {
        // Initialize whatever has to be done before the capture starts
        ...

        // Return true to start playing
        return true;
    }

    virtual bool onProcessSamples(const Int16* samples, std::size_t samplesCount)
    {
        // Do something with the new chunk of samples (store them, send them,
        ...

        // Return true to continue playing
        return true;
    }

    virtual void onStop() // optional
    {
        // Clean up whatever has to be done after the capture ends
    }
}
```

```
    ...
}
}
// Usage
if (CustomRecorder::isAvailable())
{
    CustomRecorder recorder;

    if (!recorder.start())
        return -1;

    ...
    recorder.stop();
}
```

See also

[sf::SoundBufferRecorder](#)

Definition at line 45 of file [SoundRecorder.hpp](#).

Constructor & Destructor Documentation

virtual sf::SoundRecorder::~~SoundRecorder ()

destructor

sf::SoundRecorder::SoundRecorder ()

Default constructor.

This constructor is only meant to be called by derived classes.

Member Function Documentation

static std::vector<std::string> sf::SoundRecorder::getAvailableDevi

Get a list of the names of all available audio capture devices.

This function returns a vector of strings, containing the names of all avail

Returns

A vector of strings containing the names

unsigned int sf::SoundRecorder::getChannelCount () const

Get the number of channels used by this recorder.

Currently only mono and stereo are supported, so the value is either 1 (f

Returns

Number of channels

See also

[setChannelCount](#)

static std::string sf::SoundRecorder::getDefaultDevice ()

Get the name of the default audio capture device.

This function returns the name of the default audio capture device. If not returned.

Returns

The name of the default audio capture device

const std::string& sf::SoundRecorder::getDevice () const

Get the name of the current audio capture device.

Returns

The name of the current audio capture device

unsigned int sf::SoundRecorder::getSampleRate () const

Get the sample rate.

The sample rate defines the number of audio samples captured per second (for example, 44100 samples/sec is CD quality).

Returns

Sample rate, in samples per second

static bool sf::SoundRecorder::isAvailable ()

Check if the system supports audio capture.

This function should always be called before using the audio capture feature. If an attempt to use `sf::SoundRecorder` or one of its derived classes will fail.

Returns

True if audio capture is supported, false otherwise

```
virtual bool sf::SoundRecorder::onProcessSamples ( const Int16 * samples,
                                                    std::size_t sampleCount )
```

Process a new chunk of recorded samples.

This virtual function is called every time a new chunk of recorded data is then do whatever it wants with it (storing it, playing it, sending it over the

Parameters

samples Pointer to the new chunk of recorded samples
sampleCount Number of samples pointed by *samples*

Returns

True to continue the capture, or false to stop it

Implemented in [sf::SoundBufferRecorder](#).

```
virtual bool sf::SoundRecorder::onStart ( )
```

Start capturing audio data.

This virtual function may be overridden by a derived class if something before capture starts. If not, this function can be ignored; the default implementation

Returns

True to start the capture, or false to abort it

Reimplemented in [sf::SoundBufferRecorder](#).

virtual void sf::SoundRecorder::onStop ()

Stop capturing audio data.

This virtual function may be overridden by a derived class if something capture ends. If not, this function can be ignored; the default implementa

Reimplemented in [sf::SoundBufferRecorder](#).

void sf::SoundRecorder::setChannelCount (unsigned int **channelC**

Set the channel count of the audio capture device.

This method allows you to specify the number of channels used for recor and 16-bit stereo are supported.

Parameters

channelCount Number of channels. Currently only mono (1) and st

See also

[getChannelCount](#)

bool sf::SoundRecorder::setDevice (const std::string & **name)**

Set the audio capture device.

This function sets the audio capture device to the device with the given

(i.e: while recording). If you do so while recording and opening the device

Parameters

name The name of the audio capture device

Returns

True, if it was able to set the requested device

See also

[getAvailableDevices](#), [getDefaultDevice](#)

void sf::SoundRecorder::setProcessingInterval (**Time interval)**

Set the processing interval.

The processing interval controls the period between calls to the `onProcess` method. You want to use a small interval if you want to process the recorded data in real time.

Note: this is only a hint, the actual period may vary. So don't rely on this timing.

The default processing interval is 100 ms.

Parameters

interval Processing interval

bool sf::SoundRecorder::start (unsigned int **sampleRate = 44100)**

Start the capture.

The *sampleRate* parameter defines the number of audio samples captured per second.

better the quality (for example, 44100 samples/sec is CD quality). This that it doesn't block the rest of the program while the capture runs. Pleas happen at the same time. You can select which capture device will be u [setDevice\(\)](#) method. If none was selected before, the default capture de list of the names of all available capture devices by calling [getAvailableD](#)

Parameters

sampleRate Desired capture rate, in number of samples per second

Returns

True, if start of capture was successful

See also

[stop](#), [getAvailableDevices](#)

void sf::SoundRecorder::stop ()

Stop the capture.

See also

[start](#)

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

- [SoundRecorder.hpp](#)

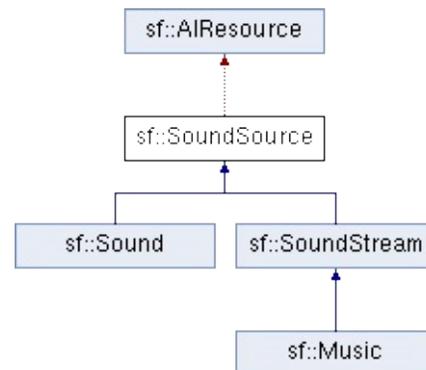
sf::SoundSource Class Reference

Audio module

Base class defining a sound's properties. [More...](#)

```
#include <SoundSource.hpp>
```

Inheritance diagram for sf::SoundSource:



Public Types

enum `Status { Stopped, Paused, Playing }`
Enumeration of the sound source states. [More...](#)

Public Member Functions

`SoundSource` (const `SoundSource` ©)
Copy constructor. [More...](#)

virtual `~SoundSource` ()
Destructor. [More...](#)

void `setPitch` (float pitch)
Set the pitch of the sound. [More...](#)

void `setVolume` (float volume)
Set the volume of the sound. [More...](#)

void `setPosition` (float x, float y, float z)
Set the 3D position of the sound in the audio scene. [More...](#)

void `setPosition` (const `Vector3f` &position)
Set the 3D position of the sound in the audio scene. [More...](#)

void `setRelativeToListener` (bool relative)
Make the sound's position relative to the listener or absolute.

void `setMinDistance` (float distance)
Set the minimum distance of the sound. [More...](#)

void `setAttenuation` (float attenuation)
Set the attenuation factor of the sound. [More...](#)

float `getPitch` () const
Get the pitch of the sound. [More...](#)

float `getVolume` () const

Get the volume of the sound. [More...](#)

Vector3f `getPosition () const`
Get the 3D position of the sound in the audio scene. [More...](#)

bool `isRelativeToListener () const`
Tell whether the sound's position is relative to the listener.

float `getMinDistance () const`
Get the minimum distance of the sound. [More...](#)

float `getAttenuation () const`
Get the attenuation factor of the sound. [More...](#)

SoundSource & `operator= (const SoundSource &right)`
Overload of assignment operator. [More...](#)

Protected Member Functions

`SoundSource ()`

Default constructor. [More...](#)

Status `getStatus () const`

Get the current status of the sound (stopped, paused, playing) **M**

Protected Attributes

unsigned int `m_source`
OpenAL source identifier. [More...](#)

Detailed Description

Base class defining a sound's properties.

`sf::SoundSource` is not meant to be used directly, it only serves as a container that can live in the audio environment.

It defines several properties for the sound: pitch, volume, position, attenuation. These can be changed at any time with no impact on performances.

See also

`sf::Sound`, `sf::SoundStream`

Definition at line 42 of file `SoundSource.hpp`.

Member Enumeration Documentation

enum sf::SoundSource::Status

Enumeration of the sound source states.

Enumerator	
Stopped	Sound is not playing.
Paused	Sound is paused.
Playing	Sound is playing.

Definition at line 50 of file `SoundSource.hpp`.

Constructor & Destructor Documentation

sf::SoundSource::SoundSource (const `SoundSource` & `copy`)

Copy constructor.

Parameters

copy Instance to copy

virtual sf::SoundSource::~~SoundSource ()

Destructor.

sf::SoundSource::SoundSource ()

Default constructor.

This constructor is meant to be called by derived classes only.

Member Function Documentation

float sf::SoundSource::getAttenuation () const

Get the attenuation factor of the sound.

Returns

Attenuation factor of the sound

See also

[setAttenuation](#), [getMinDistance](#)

float sf::SoundSource::getMinDistance () const

Get the minimum distance of the sound.

Returns

Minimum distance of the sound

See also

[setMinDistance](#), [getAttenuation](#)

float sf::SoundSource::getPitch () const

Get the pitch of the sound.

Returns

Pitch of the sound

See also

[setPitch](#)

Vector3f sf::SoundSource::getPosition () const

Get the 3D position of the sound in the audio scene.

Returns

Position of the sound

See also

[setPosition](#)

Status sf::SoundSource::getStatus () const

Get the current status of the sound (stopped, paused, playing)

Returns

Current status of the sound

float sf::SoundSource::getVolume () const

Get the volume of the sound.

Returns

Volume of the sound, in the range [0, 100]

See also

[setVolume](#)

bool sf::SoundSource::isRelativeToListener () const

Tell whether the sound's position is relative to the listener or is absolute.

Returns

True if the position is relative, false if it's absolute

See also

[setRelativeToListener](#)

SoundSource& sf::SoundSource::operator= (const SoundSource &

Overload of assignment operator.

Parameters

right Instance to assign

Returns

Reference to self

void sf::SoundSource::setAttenuation (float **attenuation)**

Set the attenuation factor of the sound.

The attenuation is a multiplicative factor which makes the sound mo distance from the listener. An attenuation of 0 will produce a non-atten

always be the same whether it is heard from near or from far. On the c such as 100 will make the sound fade out very quickly as it gets furth value of the attenuation is 1.

Parameters

attenuation New attenuation factor of the sound

See also

[getAttenuation](#), [setMinDistance](#)

void sf::SoundSource::setMinDistance (float **distance)**

Set the minimum distance of the sound.

The "minimum distance" of a sound is the maximum distance at which it Further than the minimum distance, it will start to fade out according to it ("inside the head of the listener") is an invalid value and is forbidden. T distance is 1.

Parameters

distance New minimum distance of the sound

See also

[getMinDistance](#), [setAttenuation](#)

void sf::SoundSource::setPitch (float **pitch)**

Set the pitch of the sound.

The pitch represents the perceived fundamental frequency of a sound; tl acute or grave by changing its pitch. A side effect of changing the pitch

the sound as well. The default value for the pitch is 1.

Parameters

pitch New pitch to apply to the sound

See also

[getPitch](#)

```
void sf::SoundSource::setPosition ( float x,  
                                   float y,  
                                   float z  
                                   )
```

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default value for the `z` coordinate is 0).

Parameters

x X coordinate of the position of the sound in the scene

y Y coordinate of the position of the sound in the scene

z Z coordinate of the position of the sound in the scene

See also

[getPosition](#)

```
void sf::SoundSource::setPosition ( const Vector3f & position )
```

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default value for the `z` coordinate is 0).

0).

Parameters

position Position of the sound in the scene

See also

[getPosition](#)

void sf::SoundSource::setRelativeToListener (bool **relative**)

Make the sound's position relative to the listener or absolute.

Making a sound relative to the listener will ensure that it will always be | of the position of the listener. This can be useful for non-spatialized soun the listener, or sounds attached to it. The default value is false (position i

Parameters

relative True to set the position relative, false to set it absolute

See also

[isRelativeToListener](#)

void sf::SoundSource::setVolume (float **volume**)

Set the volume of the sound.

The volume is a value between 0 (mute) and 100 (full volume). The defa

Parameters

volume Volume of the sound

See also

[getVolume](#)

Member Data Documentation

unsigned int sf::SoundSource::m_source

OpenAL source identifier.

Definition at line 274 of file [SoundSource.hpp](#).

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

- [SoundSource.hpp](#)

SFML 2.4.2

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[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#)

[Classes](#) | [Public Types](#) | [Public Member Functions](#) | [Protected Member Functions](#) | [Protected Attributes](#) | [List of all members](#)

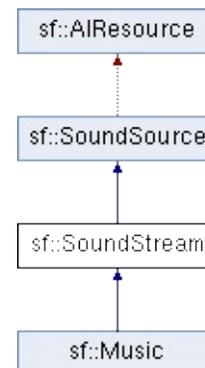
sf::SoundStream Class Reference abstract

Audio module

Abstract base class for streamed audio sources. [More...](#)

```
#include <SoundStream.hpp>
```

Inheritance diagram for sf::SoundStream:



Classes

struct [Chunk](#)

Structure defining a chunk of audio data to stream. [More...](#)

Public Types

enum `Status { Stopped, Paused, Playing }`
Enumeration of the sound source states. [More...](#)

Public Member Functions

virtual `~SoundStream ()`
Destructor. [More...](#)

void `play ()`
Start or resume playing the audio stream. [More...](#)

void `pause ()`
Pause the audio stream. [More...](#)

void `stop ()`
Stop playing the audio stream. [More...](#)

unsigned int `getChannelCount () const`
Return the number of channels of the stream. [More...](#)

unsigned int `getSampleRate () const`
Get the stream sample rate of the stream. [More...](#)

Status `getStatus () const`
Get the current status of the stream (stopped, paused, play

void `setPlayingOffset (Time timeOffset)`
Change the current playing position of the stream. [More...](#)

Time `getPlayingOffset () const`
Get the current playing position of the stream. [More...](#)

void `setLoop (bool loop)`
Set whether or not the stream should loop after reaching th

bool `getLoop () const`

Tell whether or not the stream is in loop mode. [More...](#)

void [setPitch](#) (float pitch)
Set the pitch of the sound. [More...](#)

void [setVolume](#) (float volume)
Set the volume of the sound. [More...](#)

void [setPosition](#) (float x, float y, float z)
Set the 3D position of the sound in the audio scene. [More..](#)

void [setPosition](#) (const [Vector3f](#) &position)
Set the 3D position of the sound in the audio scene. [More..](#)

void [setRelativeToListener](#) (bool relative)
Make the sound's position relative to the listener or absolut

void [setMinDistance](#) (float distance)
Set the minimum distance of the sound. [More...](#)

void [setAttenuation](#) (float attenuation)
Set the attenuation factor of the sound. [More...](#)

float [getPitch](#) () const
Get the pitch of the sound. [More...](#)

float [getVolume](#) () const
Get the volume of the sound. [More...](#)

[Vector3f](#) [getPosition](#) () const
Get the 3D position of the sound in the audio scene. [More..](#)

bool [isRelativeToListener](#) () const
Tell whether the sound's position is relative to the listener o

float `getMinDistance` () const

Get the minimum distance of the sound. [More...](#)

float `getAttenuation` () const

Get the attenuation factor of the sound. [More...](#)

Protected Member Functions

`SoundStream ()`
Default constructor. [More...](#)

void `initialize` (unsigned int channelCount, unsigned int sampleRate)
Define the audio stream parameters. [More...](#)

virtual bool `onGetData` (`Chunk` &data)=0
Request a new chunk of audio samples from the stream source.

virtual void `onSeek` (`Time` timeOffset)=0
Change the current playing position in the stream source. [More...](#)

Protected Attributes

unsigned int `m_source`
OpenAL source identifier. [More...](#)

Detailed Description

Abstract base class for streamed audio sources.

Unlike audio buffers (see `sf::SoundBuffer`), audio streams are never completely loaded into memory.

Instead, the audio data is acquired continuously while the stream is playing, so you can play sound with no loading delay, and keeps the memory consumption very low.

`Sound` sources that need to be streamed are usually big files (compressed audio files, hundreds of MB in memory) or files that would take a lot of time to be loaded from a network.

`sf::SoundStream` is a base class that doesn't care about the stream source. SFML provides a built-in specialization for big files (see `sf::Music`), but you can write your own by combining this class with the network classes.

A derived class has to override two virtual functions:

- `onGetData` fills a new chunk of audio data to be played
- `onSeek` changes the current playing position in the source

It is important to note that each `SoundStream` is played in its own separate thread, so the playback loop doesn't block the rest of the program. In particular, the `onGetData` function can sometimes be called from this separate thread. It is important to keep this in mind to take care of synchronization issues if you share data between threads.

Usage example:

```
class CustomStream : public sf::SoundStream
{
public:
```

```

bool open(const std::string& location)
{
    // Open the source and get audio settings
    ...
    unsigned int channelCount = ...;
    unsigned int sampleRate = ...;

    // Initialize the stream -- important!
    initialize(channelCount, sampleRate);
}

private:

virtual bool onGetData(Chunk& data)
{
    // Fill the chunk with audio data from the stream source
    // (note: must not be empty if you want to continue playing)
    data.samples = ...;
    data.sampleCount = ...;

    // Return true to continue playing
    return true;
}

virtual void onSeek(Uint32 timeOffset)
{
    // Change the current position in the stream source
    ...
}
}

// Usage
CustomStream stream;
stream.open("path/to/stream");
stream.play();

```

See also

[sf::Music](#)

Definition at line 45 of file [SoundStream.hpp](#).

Member Enumeration Documentation

enum sf::SoundSource::Status

Enumeration of the sound source states.

Enumerator	
Stopped	Sound is not playing.
Paused	Sound is paused.
Playing	Sound is playing.

Definition at line 50 of file `SoundSource.hpp`.

Constructor & Destructor Documentation

virtual sf::SoundStream::~~SoundStream ()

Destructor.

sf::SoundStream::SoundStream ()

Default constructor.

This constructor is only meant to be called by derived classes.

Member Function Documentation

float sf::SoundSource::getAttenuation () const

Get the attenuation factor of the sound.

Returns

Attenuation factor of the sound

See also

[setAttenuation](#), [getMinDistance](#)

unsigned int sf::SoundStream::getChannelCount () const

Return the number of channels of the stream.

1 channel means a mono sound, 2 means stereo, etc.

Returns

Number of channels

bool sf::SoundStream::getLoop () const

Tell whether or not the stream is in loop mode.

Returns

True if the stream is looping, false otherwise

See also

[setLoop](#)

float sf::SoundSource::getMinDistance () const

Get the minimum distance of the sound.

Returns

Minimum distance of the sound

See also

[setMinDistance](#), [getAttenuation](#)

float sf::SoundSource::getPitch () const

Get the pitch of the sound.

Returns

Pitch of the sound

See also

[setPitch](#)

Time sf::SoundStream::getPlayingOffset () const

Get the current playing position of the stream.

Returns

Current playing position, from the beginning of the stream

See also

[setPlayingOffset](#)

Vector3f sf::SoundSource::getPosition () const

Get the 3D position of the sound in the audio scene.

Returns

Position of the sound

See also

[setPosition](#)

unsigned int sf::SoundStream::getSampleRate () const

Get the stream sample rate of the stream.

The sample rate is the number of audio samples played per second. The

Returns

Sample rate, in number of samples per second

Status sf::SoundStream::getStatus () const

Get the current status of the stream (stopped, paused, playing)

Returns

Current status

```
float sf::SoundSource::getVolume ( ) const
```

Get the volume of the sound.

Returns

Volume of the sound, in the range [0, 100]

See also

[setVolume](#)

```
void sf::SoundStream::initialize ( unsigned int channelCount,  
                                  unsigned int sampleRate  
                                  )
```

Define the audio stream parameters.

This function must be called by derived classes as soon as they know they will play. Any attempt to manipulate the stream ([play\(\)](#), ...) before calling this function will fail. You can call this function multiple times if the settings of the audio stream change, but only when the stream is not playing.

Parameters

channelCount Number of channels of the stream

sampleRate Sample rate, in samples per second

```
bool sf::SoundSource::isRelativeToListener ( ) const
```

Tell whether the sound's position is relative to the listener or is absolute.

Returns

True if the position is relative, false if it's absolute

See also

[setRelativeToListener](#)

virtual bool sf::SoundStream::onGetData (**Chunk** & **data**)

Request a new chunk of audio samples from the stream source.

This function must be overridden by derived classes to provide the audio samples continuously by the streaming loop, in a separate thread. The source class should return false to stop the loop at any time, by returning false to the caller. If you return true (i.e. continue) that the returned array of samples is not empty; this would stop the stream.

Parameters

data **Chunk** of data to fill

Returns

True to continue playback, false to stop

Implemented in [sf::Music](#).

virtual void sf::SoundStream::onSeek (**Time** **timeOffset**)

Change the current playing position in the stream source.

This function must be overridden by derived classes to allow random seeking.

Parameters

timeOffset New playing position, relative to the beginning of the stream

Implemented in `sf::Music`.

void sf::SoundStream::pause ()

Pause the audio stream.

This function pauses the stream if it was playing, otherwise (stream already stopped) it has no effect.

See also

`play`, `stop`

void sf::SoundStream::play ()

Start or resume playing the audio stream.

This function starts the stream if it was stopped, resumes it if it was already playing. This function uses its own thread so the program can continue to run while the stream is played.

See also

`pause`, `stop`

void sf::SoundSource::setAttenuation (float **attenuation)**

Set the attenuation factor of the sound.

The attenuation is a multiplicative factor which makes the sound more or less audible depending on the distance from the listener. An attenuation of 0 will produce a non-attenuated sound.

always be the same whether it is heard from near or from far. On the c such as 100 will make the sound fade out very quickly as it gets furth value of the attenuation is 1.

Parameters

attenuation New attenuation factor of the sound

See also

[getAttenuation](#), [setMinDistance](#)

void sf::SoundStream::setLoop (bool **loop**)

Set whether or not the stream should loop after reaching the end.

If set, the stream will restart from beginning after reaching the end a setLoop(false) is called. The default looping state for streams is false.

Parameters

loop True to play in loop, false to play once

See also

[getLoop](#)

void sf::SoundSource::setMinDistance (float **distance**)

Set the minimum distance of the sound.

The "minimum distance" of a sound is the maximum distance at which it Further than the minimum distance, it will start to fade out according to it ("inside the head of the listener") is an invalid value and is forbidden. T distance is 1.

Parameters

distance New minimum distance of the sound

See also

[getMinDistance](#), [setAttenuation](#)

void sf::SoundSource::setPitch (float **pitch**)

Set the pitch of the sound.

The pitch represents the perceived fundamental frequency of a sound; it can be made more acute or grave by changing its pitch. A side effect of changing the pitch is that it also changes the speed of the sound as well. The default value for the pitch is 1.

Parameters

pitch New pitch to apply to the sound

See also

[getPitch](#)

void sf::SoundStream::setPlayingOffset (Time **timeOffset**)

Change the current playing position of the stream.

The playing position can be changed when the stream is either paused or playing. The playing position when the stream is stopped has no effect, since playing the stream will start from the beginning.

Parameters

timeOffset New playing position, from the beginning of the stream

See also

[getPlayingOffset](#)

```
void sf::SoundSource::setPosition ( float x,  
                                   float y,  
                                   float z  
                                   )
```

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default value is 0).

Parameters

- x** X coordinate of the position of the sound in the scene
- y** Y coordinate of the position of the sound in the scene
- z** Z coordinate of the position of the sound in the scene

See also

[getPosition](#)

```
void sf::SoundSource::setPosition ( const Vector3f & position )
```

Set the 3D position of the sound in the audio scene.

Only sounds with one channel (mono sounds) can be spatialized. The default value is 0).

Parameters

- position** Position of the sound in the scene

See also

[getPosition](#)

void sf::SoundSource::setRelativeToListener (bool **relative**)

Make the sound's position relative to the listener or absolute.

Making a sound relative to the listener will ensure that it will always be relative to the position of the listener. This can be useful for non-spatialized sounds, sounds relative to the listener, or sounds attached to it. The default value is false (position is absolute).

Parameters

relative True to set the position relative, false to set it absolute

See also

[isRelativeToListener](#)

void sf::SoundSource::setVolume (float **volume**)

Set the volume of the sound.

The volume is a value between 0 (mute) and 100 (full volume). The default value is 100.

Parameters

volume Volume of the sound

See also

[getVolume](#)

void sf::SoundStream::stop ()

Stop playing the audio stream.

This function stops the stream if it was playing or paused, and does not also resets the playing position (unlike `pause()`).

See also

`play`, `pause`

Member Data Documentation

unsigned int sf::SoundSource::m_source

OpenAL source identifier.

Definition at line 274 of file [SoundSource.hpp](#).

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

- [SoundStream.hpp](#)

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[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#) |

[Public Attributes](#) | [List of all members](#)

sf::SoundStream::Chunk Struct Reference

Structure defining a chunk of audio data to stream. [More...](#)

```
#include <SoundStream.hpp>
```

Public Attributes

`const Int16 *` `samples`
Pointer to the audio samples. [More...](#)

`std::size_t` `sampleCount`
Number of samples pointed by Samples. [More...](#)

Detailed Description

Structure defining a chunk of audio data to stream.

Definition at line [53](#) of file [SoundStream.hpp](#).

Member Data Documentation

std::size_t sf::SoundStream::Chunk::sampleCount

Number of samples pointed by Samples.

Definition at line 56 of file [SoundStream.hpp](#).

const Int16* sf::SoundStream::Chunk::samples

Pointer to the audio samples.

Definition at line 55 of file [SoundStream.hpp](#).

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

- [SoundStream.hpp](#)

Graphics module

2D graphics module: sprites, text, shapes, ... [More...](#)

Namespaces

`sf::Glsf`

Namespace with GLSL types.

Classes

class `sf::BlendMode`
Blending modes for drawing. [More...](#)

class `sf::CircleShape`
Specialized shape representing a circle. [More...](#)

class `sf::Color`
Utility class for manipulating RGBA colors. [More...](#)

class `sf::ConvexShape`
Specialized shape representing a convex polygon. [More...](#)

class `sf::Drawable`
Abstract base class for objects that can be drawn to a render target

class `sf::Font`
Class for loading and manipulating character fonts. [More...](#)

class `sf::Glyph`
Structure describing a glyph. [More...](#)

class `sf::Image`
Class for loading, manipulating and saving images. [More...](#)

class `sf::Rect< T >`
Utility class for manipulating 2D axis aligned rectangles. [More...](#)

class `sf::RectangleShape`
Specialized shape representing a rectangle. [More...](#)

class `sf::RenderStates`

Define the states used for drawing to a [RenderTarget](#). [More...](#)

class [sf::RenderTarget](#)
Base class for all render targets (window, texture, ...) [More...](#)

class [sf::RenderTexture](#)
Target for off-screen 2D rendering into a texture. [More...](#)

class [sf::RenderWindow](#)
[Window](#) that can serve as a target for 2D drawing. [More...](#)

class [sf::Shader](#)
[Shader](#) class (vertex, geometry and fragment) [More...](#)

class [sf::Shape](#)
Base class for textured shapes with outline. [More...](#)

class [sf::Sprite](#)
[Drawable](#) representation of a texture, with its own transformations

class [sf::Text](#)
Graphical text that can be drawn to a render target. [More...](#)

class [sf::Texture](#)
[Image](#) living on the graphics card that can be used for drawing. [More...](#)

class [sf::Transform](#)
Define a 3x3 transform matrix. [More...](#)

class [sf::Transformable](#)
Decomposed transform defined by a position, a rotation and a scale

class [sf::Vertex](#)
Define a point with color and texture coordinates. [More...](#)

class `sf::VertexArray`

Define a set of one or more 2D primitives. [More...](#)

class `sf::View`

2D camera that defines what region is shown on screen [More...](#)

Enumerations

```
enum sf::PrimitiveType {
    sf::Points, sf::Lines, sf::LineStrip, sf::Triangles,
    sf::TriangleStrip, sf::TriangleFan, sf::Quads, sf::LinesStrip = Lin
    sf::TrianglesStrip = TriangleStrip, sf::TrianglesFan = TriangleFa
}
```

Types of primitives that a `sf::VertexArray` can render. [More...](#)

Detailed Description

2D graphics module: sprites, text, shapes, ...

Enumeration Type Documentation

enum `sf::PrimitiveType`

Types of primitives that a `sf::VertexArray` can render.

Points and lines have no area, therefore their thickness will always be transformed and viewed.

Enumerator	
Points	List of individual points.
Lines	List of individual lines.
LineStrip	List of connected lines, a point uses the previous point
Triangles	List of individual triangles.
TriangleStrip	List of connected triangles, a point uses the two previous
TriangleFan	List of connected triangles, a point uses the common center to form a triangle.
Quads	List of individual quads (deprecated, don't work with OpenGL)

LinesStrip

Deprecated:
Use LineStrip instead

TrianglesStrip

Deprecated:
Use TriangleStrip instead

TrianglesFan

Deprecated:
Use TriangleFan instead

Definition at line 39 of file PrimitiveType.hpp.

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[Namespace List](#) | [Namespace Members](#) |

Typedefs

sf::Gls Namespace Reference

Graphics module

Namespace with GLSL types. [More...](#)

Typedefs

typedef <code>Vector2< float ></code>	<code>Vec2</code> 2D float vector (<code>vec2</code> in GLSL) More...
typedef <code>Vector2< int ></code>	<code>Ivec2</code> 2D int vector (<code>ivec2</code> in GLSL) More...
typedef <code>Vector2< bool ></code>	<code>Bvec2</code> 2D bool vector (<code>bvec2</code> in GLSL) More...
typedef <code>Vector3< float ></code>	<code>Vec3</code> 3D float vector (<code>vec3</code> in GLSL) More...
typedef <code>Vector3< int ></code>	<code>Ivec3</code> 3D int vector (<code>ivec3</code> in GLSL) More...
typedef <code>Vector3< bool ></code>	<code>Bvec3</code> 3D bool vector (<code>bvec3</code> in GLSL) More...
typedef implementation defined	<code>Vec4</code> 4D float vector (<code>vec4</code> in GLSL) More...
typedef implementation defined	<code>Ivec4</code> 4D int vector (<code>ivec4</code> in GLSL) More...
typedef implementation defined	<code>Bvec4</code> 4D bool vector (<code>bvec4</code> in GLSL) More...
typedef implementation defined	<code>Mat3</code> 3x3 float matrix (<code>mat3</code> in GLSL) More...
typedef implementation defined	<code>Mat4</code>

4x4 float matrix (`mat4` in GLSL) [More...](#)

Detailed Description

Namespace with GLSL types.

The `sf::Gsl` namespace contains types that match their equivalents in GLSL. These types are exclusively used by the `sf::Shader` class.

Types that already exist in SFML, such as `sf::Vector2<T>` and `sf::Vector3<T>`, you can use the types in this namespace as well as the original ones. For example, you can use `Gsl::Vec4` or `Gsl::Mat3`. Their actual type is an implementation detail and is not guaranteed.

All vector types support a default constructor that initializes every component to zero. They also support a constructor with one parameter for each component. The components are called x, y, z, and w.

All matrix types support a constructor with a `float*` parameter that points to an array of floats of the correct size (that is, 9 in a 3x3 matrix, 16 in a 4x4 matrix). Furthermore, they support a constructor with a `float` parameter that sets the determinant of the matrix.

See also

`sf::Shader`

Typedef Documentation

typedef `Vector2<bool>` `sf::Gsl::Bvec2`

2D bool vector (`bvec2` in GLSL)

Definition at line 76 of file `Gsl.hpp`.

typedef `Vector3<bool>` `sf::Gsl::Bvec3`

3D bool vector (`bvec3` in GLSL)

Definition at line 94 of file `Gsl.hpp`.

typedef implementation defined `sf::Gsl::Bvec4`

4D bool vector (`bvec4` in GLSL)

Definition at line 130 of file `Gsl.hpp`.

typedef `Vector2<int>` `sf::Gsl::Ivec2`

2D int vector (`ivec2` in GLSL)

Definition at line 70 of file `GlsI.hpp`.

typedef `Vector3<int>` `sf::GlsI::Ivec3`

3D int vector (`ivec3` in GLSL)

Definition at line 88 of file `GlsI.hpp`.

typedef implementation defined `sf::GlsI::Ivec4`

4D int vector (`ivec4` in GLSL)

4D int vectors can be implicitly converted from `sf::Color` instances unchanged inside the integer interval [0, 255].

```
sf::GlsI::Ivec4 zeroVector;  
sf::GlsI::Ivec4 vector(1, 2, 3, 4);  
sf::GlsI::Ivec4 color = sf::Color::Cyan;
```

Definition at line 124 of file `GlsI.hpp`.

typedef implementation defined `sf::GlsI::Mat3`

3x3 float matrix (`mat3` in GLSL)

The matrix can be constructed from an array with 3x3 elements, align example, a translation by (x, y) looks as follows:

```
float array[9] =  
{  
    1, 0, 0,
```

```
    0, 1, 0,  
    x, y, 1  
};  
  
sf::Gls1::Mat3 matrix(array);
```

Mat3 can also be implicitly converted from `sf::Transform`:

```
sf::Transform transform;  
sf::Gls1::Mat3 matrix = transform;
```

Definition at line 155 of file `Gls1.hpp`.

typedef implementation defined `sf::Gls1::Mat4`

4x4 float matrix (`mat4` in GLSL)

The matrix can be constructed from an array with 4x4 elements, an example, a translation by (x, y, z) looks as follows:

```
float array[16] =  
{  
    1, 0, 0, 0,  
    0, 1, 0, 0,  
    0, 0, 1, 0,  
    x, y, z, 1  
};  
  
sf::Gls1::Mat4 matrix(array);
```

Mat4 can also be implicitly converted from `sf::Transform`:

```
sf::Transform transform;  
sf::Gls1::Mat4 matrix = transform;
```

Definition at line 181 of file `Gls1.hpp`.

typedef `Vector2<float>` `sf::Gsl::Vec2`

2D float vector (`vec2` in GLSL)

Definition at line [64](#) of file `Gsl.hpp`.

typedef `Vector3<float>` `sf::Gsl::Vec3`

3D float vector (`vec3` in GLSL)

Definition at line [82](#) of file `Gsl.hpp`.

typedef implementation defined `sf::Gsl::Vec4`

4D float vector (`vec4` in GLSL)

4D float vectors can be implicitly converted from `sf::Color` instances. E from integers in [0, 255] to floating point values in [0, 1].

```
sf::Gsl::Vec4 zeroVector;  
sf::Gsl::Vec4 vector(1.f, 2.f, 3.f, 4.f);  
sf::Gsl::Vec4 color = sf::Color::Cyan;
```

Definition at line [110](#) of file `Gsl.hpp`.

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sf::BlendMode Class Reference

Graphics module

Blending modes for drawing. [More...](#)

```
#include <BlendMode.hpp>
```

Public Types

enum `Factor` {
 Zero, One, SrcColor, OneMinusSrcColor,
 DstColor, OneMinusDstColor, SrcAlpha, OneMinusSrcAlpha,
 DstAlpha, OneMinusDstAlpha
}
Enumeration of the blending factors. [More...](#)

enum `Equation` { `Add`, `Subtract`, `ReverseSubtract` }
Enumeration of the blending equations. [More...](#)

Public Member Functions

`BlendMode ()`

Default constructor. [More...](#)

`BlendMode (Factor sourceFactor, Factor destinationFactor, Equation`

Construct the blend mode given the factors and equation. [More...](#)

`BlendMode (Factor colorSourceFactor, Factor colorDestinationFactor,`

`Factor alphaSourceFactor, Factor alphaDestinationFactor, Equation a`

Construct the blend mode given the factors and equation. [More...](#)

Public Attributes

Factor `colorSrcFactor`
Source blending factor for the color channels. [More...](#)

Factor `colorDstFactor`
Destination blending factor for the color channels. [More...](#)

Equation `colorEquation`
Blending equation for the color channels. [More...](#)

Factor `alphaSrcFactor`
Source blending factor for the alpha channel. [More...](#)

Factor `alphaDstFactor`
Destination blending factor for the alpha channel. [More...](#)

Equation `alphaEquation`
Blending equation for the alpha channel. [More...](#)

Related Functions

(Note that these are not member functions.)

bool `operator==` (const `BlendMode` &left, const `BlendMode` &right)
Overload of the `==` operator. [More...](#)

bool `operator!=` (const `BlendMode` &left, const `BlendMode` &right)
Overload of the `!=` operator. [More...](#)

Detailed Description

Blending modes for drawing.

`sf::BlendMode` is a class that represents a blend mode.

A blend mode determines how the colors of an object you draw are mixed with the colors already in the buffer.

The class is composed of 6 components, each of which has its own public

- Color Source Factor (`colorSrcFactor`)
- Color Destination Factor (`colorDstFactor`)
- Color Blend Equation (`colorEquation`)
- Alpha Source Factor (`alphaSrcFactor`)
- Alpha Destination Factor (`alphaDstFactor`)
- Alpha Blend Equation (`alphaEquation`)

The source factor specifies how the pixel you are drawing contributes to the final color. The destination factor specifies how the pixel already drawn in the buffer contributes to the final color.

The color channels RGB (red, green, blue; simply referred to as color) can be treated separately. This separation can be useful for specific blend modes. If you don't need it and will simply treat the color as a single unit.

The blend factors and equations correspond to their OpenGL equivalents. The resulting pixel is calculated according to the following formula (`src` is the color of the source pixel, `dst` is the color of the destination pixel, the other variables correspond to the blend factors, `+` and `-` being + or - operators):

```
dst.rgb = colorSrcFactor * src.rgb (colorEquation) colorDstFactor * ds
dst.a   = alphaSrcFactor * src.a   (alphaEquation) alphaDstFactor * ds
```

All factors and colors are represented as floating point numbers between 0 and 1. The result is clamped to fit in that range.

The most common blending modes are defined as constants in the `sf::BlendMode` namespace.

```
sf::BlendMode alphaBlending      = sf::BlendAlpha;
sf::BlendMode additiveBlending  = sf::BlendAdd;
sf::BlendMode multiplicativeBlending = sf::BlendMultiply;
sf::BlendMode noBlending        = sf::BlendNone;
```

In SFML, a blend mode can be specified every time you draw a `sf::Drawable` object. It is part of the `sf::RenderStates` compound that is passed to the member function `draw`.

See also

`sf::RenderStates`, `sf::RenderTarget`

Definition at line 41 of file `BlendMode.hpp`.

Member Enumeration Documentation

enum sf::BlendMode::Equation

Enumeration of the blending equations.

The equations are mapped directly to their OpenGL equivalents, see `glBlendEquationSeparate()`.

Enumerator	
Add	$\text{Pixel} = \text{Src} * \text{SrcFactor} + \text{Dst} * \text{DstFactor}.$
Subtract	$\text{Pixel} = \text{Src} * \text{SrcFactor} - \text{Dst} * \text{DstFactor}.$
ReverseSubtract	$\text{Pixel} = \text{Dst} * \text{DstFactor} - \text{Src} * \text{SrcFactor}.$

Definition at line 69 of file `BlendMode.hpp`.

enum sf::BlendMode::Factor

Enumeration of the blending factors.

The factors are mapped directly to their OpenGL equivalents, see `glBlendFuncSeparate()`.

Enumerator	
Zero	(0, 0, 0, 0)
One	(1, 1, 1, 1)
SrcColor	(src.r, src.g, src.b, src.a)
OneMinusSrcColor	(1, 1, 1, 1) - (src.r, src.g, src.b, src.a)
DstColor	(dst.r, dst.g, dst.b, dst.a)
OneMinusDstColor	(1, 1, 1, 1) - (dst.r, dst.g, dst.b, dst.a)
SrcAlpha	(src.a, src.a, src.a, src.a)
OneMinusSrcAlpha	(1, 1, 1, 1) - (src.a, src.a, src.a, src.a)
DstAlpha	(dst.a, dst.a, dst.a, dst.a)
OneMinusDstAlpha	(1, 1, 1, 1) - (dst.a, dst.a, dst.a, dst.a)

Definition at line 49 of file [BlendMode.hpp](#).


```
Equation colorBlendEquation,  
Factor alphaSourceFactor,  
Factor alphaDestinationFactor,  
Equation alphaBlendEquation  
)
```

Construct the blend mode given the factors and equation.

Parameters

colorSourceFactor	Specifies how to compute the source factor
colorDestinationFactor	Specifies how to compute the destination factor
colorBlendEquation	Specifies how to combine the source and destination colors
alphaSourceFactor	Specifies how to compute the source alpha
alphaDestinationFactor	Specifies how to compute the destination alpha
alphaBlendEquation	Specifies how to combine the source and destination alphas

Friends And Related Function Documentatio

```
bool operator!= ( const BlendMode & left,  
                const BlendMode & right  
                )
```

Overload of the != operator.

Parameters

left Left operand
right Right operand

Returns

True if blending modes are different, false if they are equal

```
bool operator== ( const BlendMode & left,  
                 const BlendMode & right  
                 )
```

Overload of the == operator.

Parameters

left Left operand
right Right operand

Returns

True if blending modes are equal, false if they are different

Member Data Documentation

Factor `sf::BlendMode::alphaDstFactor`

Destination blending factor for the alpha channel.

Definition at line [119](#) of file [BlendMode.hpp](#).

Equation `sf::BlendMode::alphaEquation`

Blending equation for the alpha channel.

Definition at line [120](#) of file [BlendMode.hpp](#).

Factor `sf::BlendMode::alphaSrcFactor`

Source blending factor for the alpha channel.

Definition at line [118](#) of file [BlendMode.hpp](#).

Factor `sf::BlendMode::colorDstFactor`

Destination blending factor for the color channels.

Definition at line [116](#) of file [BlendMode.hpp](#).

Equation `sf::BlendMode::colorEquation`

Blending equation for the color channels.

Definition at line [117](#) of file [BlendMode.hpp](#).

Factor `sf::BlendMode::colorSrcFactor`

Source blending factor for the color channels.

Definition at line [115](#) of file [BlendMode.hpp](#).

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

- [BlendMode.hpp](#)

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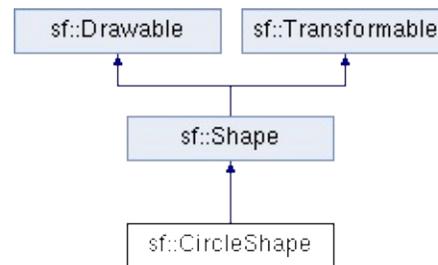
sf::CircleShape Class Reference

Graphics module

Specialized shape representing a circle. [More...](#)

```
#include <CircleShape.hpp>
```

Inheritance diagram for sf::CircleShape:



Public Member Functions

`CircleShape` (float radius=0, std::size_t pointCount=3)
Default constructor. [More...](#)

void `setRadius` (float radius)
Set the radius of the circle. [More...](#)

float `getRadius` () const
Get the radius of the circle. [More...](#)

void `setPointCount` (std::size_t count)
Set the number of points of the circle. [More...](#)

virtual std::size_t `getPointCount` () const
Get the number of points of the circle. [More...](#)

virtual `Vector2f` `getPoint` (std::size_t index) const
Get a point of the circle. [More...](#)

void `setTexture` (const `Texture` *texture, bool resetRect=false)
Change the source texture of the shape. [More...](#)

void `setTextureRect` (const `IntRect` &rect)
Set the sub-rectangle of the texture that the shape w

void `setFillColor` (const `Color` &color)
Set the fill color of the shape. [More...](#)

void `setOutlineColor` (const `Color` &color)
Set the outline color of the shape. [More...](#)

void `setOutlineThickness` (float thickness)

Set the thickness of the shape's outline. [More...](#)

const Texture * [getTexture \(\)](#) const
Get the source texture of the shape. [More...](#)

const IntRect & [getTextureRect \(\)](#) const
Get the sub-rectangle of the texture displayed by the

const Color & [getFillColor \(\)](#) const
Get the fill color of the shape. [More...](#)

const Color & [getOutlineColor \(\)](#) const
Get the outline color of the shape. [More...](#)

float [getOutlineThickness \(\)](#) const
Get the outline thickness of the shape. [More...](#)

FloatRect [getLocalBounds \(\)](#) const
Get the local bounding rectangle of the entity. [More..](#)

FloatRect [getGlobalBounds \(\)](#) const
Get the global (non-minimal) bounding rectangle of t

void [setPosition \(float x, float y\)](#)
set the position of the object [More...](#)

void [setPosition \(const Vector2f &position\)](#)
set the position of the object [More...](#)

void [setRotation \(float angle\)](#)
set the orientation of the object [More...](#)

void [setScale \(float factorX, float factorY\)](#)
set the scale factors of the object [More...](#)

void **setScale** (const **Vector2f** &factors)
set the scale factors of the object [More...](#)

void **setOrigin** (float x, float y)
set the local origin of the object [More...](#)

void **setOrigin** (const **Vector2f** &origin)
set the local origin of the object [More...](#)

const **Vector2f** & **getPosition** () const
get the position of the object [More...](#)

float **getRotation** () const
get the orientation of the object [More...](#)

const **Vector2f** & **getScale** () const
get the current scale of the object [More...](#)

const **Vector2f** & **getOrigin** () const
get the local origin of the object [More...](#)

void **move** (float offsetX, float offsetY)
Move the object by a given offset. [More...](#)

void **move** (const **Vector2f** &offset)
Move the object by a given offset. [More...](#)

void **rotate** (float angle)
Rotate the object. [More...](#)

void **scale** (float factorX, float factorY)
Scale the object. [More...](#)

void **scale** (const **Vector2f** &factor)
Scale the object. [More...](#)

const Transform & getTransform () const
get the combined transform of the object [More...](#)

const Transform & getInverseTransform () const
get the inverse of the combined transform of the object

Protected Member Functions

void `update ()`

Recompute the internal geometry of the shape. [More...](#)

Detailed Description

Specialized shape representing a circle.

This class inherits all the functions of `sf::Transformable` (position, rotation functions of `sf::Shape` (outline, color, texture, ...)).

Usage example:

```
sf::CircleShape circle;
circle.setRadius(150);
circle.setOutlineColor(sf::Color::Red);
circle.setOutlineThickness(5);
circle.setPosition(10, 20);
...
window.draw(circle);
```

Since the graphics card can't draw perfect circles, we have to fake them to each other. The "points count" property of `sf::CircleShape` defines how and therefore defines the quality of the circle.

The number of points can also be used for another purpose; with small number of points you can draw a polygon shape: equilateral triangle, square, pentagon, hexagon, ...

See also

`sf::Shape`, `sf::RectangleShape`, `sf::ConvexShape`

Definition at line 41 of file `CircleShape.hpp`.

Constructor & Destructor Documentation

```
sf::CircleShape::CircleShape ( float      radius = 0,  
                                std::size_t pointCount = 30  
                                )
```

Default constructor.

Parameters

radius Radius of the circle

pointCount Number of points composing the circle

Member Function Documentation

const Color& sf::Shape::getFillColor () const

Get the fill color of the shape.

Returns

Fill color of the shape

See also

[setFillColor](#)

FloatRect sf::Shape::getGlobalBounds () const

Get the global (non-minimal) bounding rectangle of the entity.

The returned rectangle is in global coordinates, which means that all transformations (translation, rotation, scale, ...) that are applied to the entity are taken into account. The function returns the bounds of the shape in the global 2D world's coordinate system.

This function does not necessarily return the *minimal* bounding rectangle. The returned rectangle covers all the vertices (but possibly more). This allows for a fast bounds check; you may want to use more precise checks on top of this.

Returns

Global bounding rectangle of the entity

const Transform& sf::Transformable::getInverseTransform () const

get the inverse of the combined transform of the object

Returns

Inverse of the combined transformations applied to the object

See also

[getTransform](#)

FloatRect sf::Shape::getLocalBounds () const

Get the local bounding rectangle of the entity.

The returned rectangle is in local coordinates, which means that (translation, rotation, scale, ...) that are applied to the entity. In other bounds of the entity in the entity's coordinate system.

Returns

Local bounding rectangle of the entity

const Vector2f& sf::Transformable::getOrigin () const

get the local origin of the object

Returns

Current origin

See also

[setOrigin](#)

const [Color](#)& sf::Shape::getOutlineColor () const

Get the outline color of the shape.

Returns

Outline color of the shape

See also

[setOutlineColor](#)

float sf::Shape::getOutlineThickness () const

Get the outline thickness of the shape.

Returns

Outline thickness of the shape

See also

[setOutlineThickness](#)

virtual [Vector2f](#) sf::CircleShape::getPoint (std::size_t [index](#)) const

Get a point of the circle.

The returned point is in local coordinates, that is, the shape's transforms taken into account. The result is undefined if *index* is out of the valid range.

Parameters

[index](#) Index of the point to get, in range [0 .. [getPointCount\(\)](#) - 1]

Returns

index-th point of the shape

Implements [sf::Shape](#).

virtual std::size_t sf::CircleShape::getPointCount () const

Get the number of points of the circle.

Returns

Number of points of the circle

See also

[setPointCount](#)

Implements [sf::Shape](#).

const [Vector2f](#)& sf::Transformable::getPosition () const

get the position of the object

Returns

Current position

See also

[setPosition](#)

float sf::CircleShape::getRadius () const

Get the radius of the circle.

Returns

Radius of the circle

See also

[setRadius](#)

float sf::Transformable::getRotation () const

get the orientation of the object

The rotation is always in the range [0, 360].

Returns

Current rotation, in degrees

See also

[setRotation](#)

const [Vector2f](#)& sf::Transformable::getScale () const

get the current scale of the object

Returns

Current scale factors

See also

[setScale](#)

const [Texture](#)* sf::Shape::getTexture () const

Get the source texture of the shape.

If the shape has no source texture, a NULL pointer is returned. This means that you can't modify the texture when you retrieve it with this function.

Returns

Pointer to the shape's texture

See also

[setTexture](#)

```
const IntRect& sf::Shape::getTextureRect ( ) const
```

Get the sub-rectangle of the texture displayed by the shape.

Returns

[Texture](#) rectangle of the shape

See also

[setTextureRect](#)

```
const Transform& sf::Transformable::getTransform ( ) const
```

get the combined transform of the object

Returns

[Transform](#) combining the position/rotation/scale/origin of the object

See also

[getInverseTransform](#)

```
void sf::Transformable::move ( float offsetX,  
                             float offsetY  
                             )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
sf::Vector2f pos = object.getPosition();  
object.setPosition(pos.x + offsetX, pos.y + offsetY);
```

Parameters

offsetX X offset

offsetY Y offset

See also

[setPosition](#)

```
void sf::Transformable::move ( const Vector2f & offset )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
object.setPosition(object.getPosition() + offset);
```

Parameters

offset Offset

See also

[setPosition](#)

void sf::Transformable::rotate (float **angle**)

Rotate the object.

This function adds to the current rotation of the object, unlike `setRotation` equivalent to the following code:

```
object.setRotation(object.getRotation() + angle);
```

Parameters

angle Angle of rotation, in degrees

void sf::Transformable::scale (float **factorX**, float **factorY**)

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factorX, scale.y * factorY);
```

Parameters

factorX Horizontal scale factor

factorY Vertical scale factor

See also

[setScale](#)

void sf::Transformable::scale (const **Vector2f** & **factor**)

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();
object.setScale(scale.x * factor.x, scale.y * factor.y);
```

Parameters

factor Scale factors

See also

[setScale](#)

void sf::Shape::setFillColor (const **Color** & **color**)

Set the fill color of the shape.

This color is modulated (multiplied) with the shape's texture if any. It can also change its global opacity. You can use `sf::Color::Transparent` to make the shape transparent, and have the outline alone. By default, the shape's fill color is the same as its outline color.

Parameters

color New color of the shape

See also

[getFillColor](#), [setOutlineColor](#)

```
void sf::Transformable::setOrigin ( float x,  
                                   float y  
                                   )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transformable is (0, 0).

Parameters

- x** X coordinate of the new origin
- y** Y coordinate of the new origin

See also

[getOrigin](#)

```
void sf::Transformable::setOrigin ( const Vector2f & origin )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transformable is (0, 0).

Parameters

- origin** New origin

See also

`getOrigin`

`void sf::Shape::setOutlineColor (const Color & color)`

Set the outline color of the shape.

By default, the shape's outline color is opaque white.

Parameters

`color` New outline color of the shape

See also

`getOutlineColor`, `setFillColor`

`void sf::Shape::setOutlineThickness (float thickness)`

Set the thickness of the shape's outline.

Note that negative values are allowed (so that the outline expands toward the center). Using zero disables the outline. By default, the outline thickness is 0.

Parameters

`thickness` New outline thickness

See also

`getOutlineThickness`

`void sf::CircleShape::setPointCount (std::size_t count)`

Set the number of points of the circle.

Parameters

count New number of points of the circle

See also

[getPointCount](#)

```
void sf::Transformable::setPosition ( float x,  
                                     float y  
                                     )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

x X coordinate of the new position

y Y coordinate of the new position

See also

[move](#), [getPosition](#)

```
void sf::Transformable::setPosition ( const Vector2f & position )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

position New position

See also

[move](#), [getPosition](#)

void sf::CircleShape::setRadius (float **radius**)

Set the radius of the circle.

Parameters

radius New radius of the circle

See also

[getRadius](#)

void sf::Transformable::setRotation (float **angle**)

set the orientation of the object

This function completely overwrites the previous rotation. See the [rotate](#) function on the previous rotation instead. The default rotation of a transformable object is 0 degrees.

Parameters

angle New rotation, in degrees

See also

[rotate](#), [getRotation](#)

)

Change the source texture of the shape.

The *texture* argument refers to a texture that must exist as long as the shape doesn't store its own copy of the texture, but rather keeps a pointer to it. If the source texture is destroyed and the shape tries to use it, the *texture* can be NULL to disable texturing. If *resetRect* is true, the *textureRect* is automatically adjusted to the size of the new texture. If it is false, the texture rect remains the same.

Parameters

texture New texture

resetRect Should the texture rect be reset to the size of the new texture?

See also

[getTexture](#), [setTextureRect](#)

void sf::Shape::setTextureRect (const [IntRect](#) & **rect)**

Set the sub-rectangle of the texture that the shape will display.

The texture rect is useful when you don't want to display the whole texture. By default, the texture rect covers the entire texture.

Parameters

rect Rectangle defining the region of the texture to display

See also

[getTextureRect](#), [setTexture](#)

void sf::Shape::update ()

Recompute the internal geometry of the shape.

This function must be called by the derived class everytime the shape's either `getPointCount` or `getPoint` is different).

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

- [CircleShape.hpp](#)

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[Public Member Functions](#) | [Public Attributes](#) | [Static Public Attributes](#) | [Related Functions](#) | [List of all members](#)

sf::Color Class Reference

Graphics module

Utility class for manipulating RGBA colors. [More...](#)

```
#include <Color.hpp>
```

Public Member Functions

`Color ()`

Default constructor. [More...](#)

`Color (Uint8 red, Uint8 green, Uint8 blue, Uint8 alpha=255)`

Construct the color from its 4 RGBA components. [More...](#)

`Color (Uint32 color)`

Construct the color from 32-bit unsigned integer. [More...](#)

`Uint32 toInteger () const`

Retrieve the color as a 32-bit unsigned integer. [More...](#)

Public Attributes

UInt8 **r**
Red component. [More...](#)

UInt8 **g**
Green component. [More...](#)

UInt8 **b**
Blue component. [More...](#)

UInt8 **a**
Alpha (opacity) component. [More...](#)

Static Public Attributes

static const **Color** **Black**
Black predefined color. [More...](#)

static const **Color** **White**
White predefined color. [More...](#)

static const **Color** **Red**
Red predefined color. [More...](#)

static const **Color** **Green**
Green predefined color. [More...](#)

static const **Color** **Blue**
Blue predefined color. [More...](#)

static const **Color** **Yellow**
Yellow predefined color. [More...](#)

static const **Color** **Magenta**
Magenta predefined color. [More...](#)

static const **Color** **Cyan**
Cyan predefined color. [More...](#)

static const **Color** **Transparent**
Transparent (black) predefined color. [More...](#)

Related Functions

(Note that these are not member functions.)

`bool operator== (const Color &left, const Color &right)`
Overload of the == operator. [More...](#)

`bool operator!= (const Color &left, const Color &right)`
Overload of the != operator. [More...](#)

`Color operator+ (const Color &left, const Color &right)`
Overload of the binary + operator. [More...](#)

`Color operator- (const Color &left, const Color &right)`
Overload of the binary - operator. [More...](#)

`Color operator* (const Color &left, const Color &right)`
Overload of the binary * operator. [More...](#)

`Color & operator+= (Color &left, const Color &right)`
Overload of the binary += operator. [More...](#)

`Color & operator-= (Color &left, const Color &right)`
Overload of the binary -= operator. [More...](#)

`Color & operator*-= (Color &left, const Color &right)`
Overload of the binary *= operator. [More...](#)

Detailed Description

Utility class for manipulating RGBA colors.

`sf::Color` is a simple color class composed of 4 components:

- Red
- Green
- Blue
- Alpha (opacity)

Each component is a public member, an unsigned integer in the range 0-255, which can be constructed and manipulated very easily:

```
sf::Color color(255, 0, 0); // red
color.r = 0;                // make it black
color.b = 128;              // make it dark blue
```

The fourth component of colors, named "alpha", represents the opacity (transparency) of the color. An alpha value of 255 will be fully opaque, while an alpha value of 0 will make a color fully transparent. The value of the other components is.

The most common colors are already defined as static variables:

```
sf::Color black      = sf::Color::Black;
sf::Color white      = sf::Color::White;
sf::Color red        = sf::Color::Red;
sf::Color green      = sf::Color::Green;
sf::Color blue       = sf::Color::Blue;
sf::Color yellow     = sf::Color::Yellow;
sf::Color magenta    = sf::Color::Magenta;
sf::Color cyan       = sf::Color::Cyan;
sf::Color transparent = sf::Color::Transparent;
```

Colors can also be added and modulated (multiplied) using the overloads

Definition at line 40 of file `Color.hpp`.

Constructor & Destructor Documentation

sf::Color::Color ()

Default constructor.

Constructs an opaque black color. It is equivalent to `sf::Color(0, 0, 0, 255)`.

sf::Color::Color (Uint8 red, Uint8 green, Uint8 blue, Uint8 alpha = 255)

Construct the color from its 4 RGBA components.

Parameters

red Red component (in the range [0, 255])

green Green component (in the range [0, 255])

blue Blue component (in the range [0, 255])

alpha Alpha (opacity) component (in the range [0, 255])

sf::Color::Color (Uint32 color)

Construct the color from 32-bit unsigned integer.

Parameters

color Number containing the RGBA components (in that order)

Member Function Documentation

Uin32 sf::Color::toInteger () const

Retrieve the color as a 32-bit unsigned integer.

Returns

`Color` represented as a 32-bit unsigned integer

Friends And Related Function Documentatio

```
bool operator!= ( const Color & left,  
                const Color & right  
                )
```

Overload of the != operator.

This operator compares two colors and check if they are different.

Parameters

left Left operand

right Right operand

Returns

True if colors are different, false if they are equal

```
Color operator* ( const Color & left,  
                const Color & right  
                )
```

Overload of the binary * operator.

This operator returns the component-wise multiplication (also calle
Components are then divided by 255 so that the result is still in the range

Parameters

left Left operand

right Right operand

Returns

Result of *left * right*

```
Color & operator*= ( Color & left,  
                    const Color & right  
                    )
```

Overload of the binary *= operator.

This operator returns the component-wise multiplication (also called "component-wise multiplication") and assigns the result to the left operand. Components are then divided by 2 and clamped to the range [0, 255].

Parameters

left Left operand

right Right operand

Returns

Reference to *left*

```
Color operator+ ( const Color & left,  
                 const Color & right  
                 )
```

Overload of the binary + operator.

This operator returns the component-wise sum of two colors. Components are clamped to 255.

Parameters

left Left operand
right Right operand

Returns

Result of *left + right*

```
Color & operator+= ( Color & left,  
                    const Color & right  
                    )
```

Overload of the binary += operator.

This operator computes the component-wise sum of two colors, and an operand. Components that exceed 255 are clamped to 255.

Parameters

left Left operand
right Right operand

Returns

Reference to *left*

```
Color operator- ( const Color & left,  
                 const Color & right  
                 )
```

Overload of the binary - operator.

This operator returns the component-wise subtraction of two colors. Components that are less than 0 are clamped to 0.

Parameters

left Left operand
right Right operand

Returns

Result of *left - right*

```
Color & operator-=( Color & left,  
                    const Color & right  
                    )
```

Overload of the binary -= operator.

This operator computes the component-wise subtraction of two colors, *right* is the right operand. Components below 0 are clamped to 0.

Parameters

left Left operand
right Right operand

Returns

Reference to *left*

```
bool operator==( const Color & left,  
                 const Color & right  
                 )
```

Overload of the == operator.

This operator compares two colors and check if they are equal.

Parameters

left Left operand

right Right operand

Returns

True if colors are equal, false if they are different

Member Data Documentation

Uint8 sf::Color::a

Alpha (opacity) component.

Definition at line 99 of file [Color.hpp](#).

Uint8 sf::Color::b

Blue component.

Definition at line 98 of file [Color.hpp](#).

const [Color](#) sf::Color::Black

Black predefined color.

Definition at line 83 of file [Color.hpp](#).

const [Color](#) sf::Color::Blue

Blue predefined color.

Definition at line 87 of file [Color.hpp](#).

const Color sf::Color::Cyan

Cyan predefined color.

Definition at line 90 of file Color.hpp.

Uint8 sf::Color::g

Green component.

Definition at line 97 of file Color.hpp.

const Color sf::Color::Green

Green predefined color.

Definition at line 86 of file Color.hpp.

const Color sf::Color::Magenta

Magenta predefined color.

Definition at line 89 of file Color.hpp.

Uint8 sf::Color::r

Red component.

Definition at line 96 of file [Color.hpp](#).

const [Color](#) sf::Color::Red

Red predefined color.

Definition at line 85 of file [Color.hpp](#).

const [Color](#) sf::Color::Transparent

Transparent (black) predefined color.

Definition at line 91 of file [Color.hpp](#).

const [Color](#) sf::Color::White

White predefined color.

Definition at line 84 of file [Color.hpp](#).

const [Color](#) sf::Color::Yellow

Yellow predefined color.

Definition at line 88 of file [Color.hpp](#).

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

- [Color.hpp](#)

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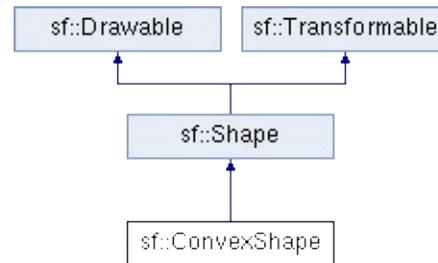
sf::ConvexShape Class Reference

Graphics module

Specialized shape representing a convex polygon. [More...](#)

```
#include <ConvexShape.hpp>
```

Inheritance diagram for sf::ConvexShape:



Public Member Functions

`ConvexShape` (`std::size_t` pointCount=0)
Default constructor. [More...](#)

`void` `setPointCount` (`std::size_t` count)
Set the number of points of the polygon. [More...](#)

`virtual std::size_t` `getPointCount` () `const`
Get the number of points of the polygon. [More...](#)

`void` `setPoint` (`std::size_t` index, `const Vector2f` &point)
Set the position of a point. [More...](#)

`virtual Vector2f` `getPoint` (`std::size_t` index) `const`
Get the position of a point. [More...](#)

`void` `setTexture` (`const Texture` *texture, `bool` resetRect=false)
Change the source texture of the shape. [More...](#)

`void` `setTextureRect` (`const IntRect` &rect)
Set the sub-rectangle of the texture that the shape w

`void` `setFillColor` (`const Color` &color)
Set the fill color of the shape. [More...](#)

`void` `setOutlineColor` (`const Color` &color)
Set the outline color of the shape. [More...](#)

`void` `setOutlineThickness` (`float` thickness)
Set the thickness of the shape's outline. [More...](#)

`const Texture` * `getTexture` () `const`

Get the source texture of the shape. [More...](#)

`const IntRect & getTextureRect () const`
Get the sub-rectangle of the texture displayed by the

`const Color & getFillColor () const`
Get the fill color of the shape. [More...](#)

`const Color & getOutlineColor () const`
Get the outline color of the shape. [More...](#)

`float getOutlineThickness () const`
Get the outline thickness of the shape. [More...](#)

`FloatRect getLocalBounds () const`
Get the local bounding rectangle of the entity. [More..](#)

`FloatRect getGlobalBounds () const`
Get the global (non-minimal) bounding rectangle of t

`void setPosition (float x, float y)`
set the position of the object [More...](#)

`void setPosition (const Vector2f &position)`
set the position of the object [More...](#)

`void setRotation (float angle)`
set the orientation of the object [More...](#)

`void setScale (float factorX, float factorY)`
set the scale factors of the object [More...](#)

`void setScale (const Vector2f &factors)`
set the scale factors of the object [More...](#)

void `setOrigin` (float x, float y)
set the local origin of the object [More...](#)

void `setOrigin` (const `Vector2f` &origin)
set the local origin of the object [More...](#)

const `Vector2f` & `getPosition` () const
get the position of the object [More...](#)

float `getRotation` () const
get the orientation of the object [More...](#)

const `Vector2f` & `getScale` () const
get the current scale of the object [More...](#)

const `Vector2f` & `getOrigin` () const
get the local origin of the object [More...](#)

void `move` (float offsetX, float offsetY)
Move the object by a given offset. [More...](#)

void `move` (const `Vector2f` &offset)
Move the object by a given offset. [More...](#)

void `rotate` (float angle)
Rotate the object. [More...](#)

void `scale` (float factorX, float factorY)
Scale the object. [More...](#)

void `scale` (const `Vector2f` &factor)
Scale the object. [More...](#)

const `Transform` & `getTransform` () const
get the combined transform of the object [More...](#)

```
const Transform & getInverseTransform () const  
    get the inverse of the combined transform of the obje
```

Protected Member Functions

void `update` ()

Recompute the internal geometry of the shape. [More...](#)

Detailed Description

Specialized shape representing a convex polygon.

This class inherits all the functions of [sf::Transformable](#) (position, rotation functions of [sf::Shape](#) (outline, color, texture, ...)).

It is important to keep in mind that a convex shape must always be... drawn correctly. Moreover, the points must be defined in order; using a incorrect shape.

Usage example:

```
sf::ConvexShape polygon;
polygon.setPointCount(3);
polygon.setPoint(0, sf::Vector2f(0, 0));
polygon.setPoint(1, sf::Vector2f(0, 10));
polygon.setPoint(2, sf::Vector2f(25, 5));
polygon.setOutlineColor(sf::Color::Red);
polygon.setOutlineThickness(5);
polygon.setPosition(10, 20);
...
window.draw(polygon);
```

See also

[sf::Shape](#), [sf::RectangleShape](#), [sf::CircleShape](#)

Definition at line 42 of file [ConvexShape.hpp](#).

Constructor & Destructor Documentation

sf::ConvexShape::ConvexShape (std::size_t `pointCount` = 0)

Default constructor.

Parameters

pointCount Number of points of the polygon

Member Function Documentation

const Color& sf::Shape::getFillColor () const

Get the fill color of the shape.

Returns

Fill color of the shape

See also

[setFillColor](#)

FloatRect sf::Shape::getGlobalBounds () const

Get the global (non-minimal) bounding rectangle of the entity.

The returned rectangle is in global coordinates, which means that transformations (translation, rotation, scale, ...) that are applied to the entity returns the bounds of the shape in the global 2D world's coordinate system.

This function does not necessarily return the *minimal* bounding rectangle; the returned rectangle covers all the vertices (but possibly more). This allows to use `getGlobalBounds` as a first check; you may want to use more precise checks on top of it.

Returns

Global bounding rectangle of the entity

const Transform& sf::Transformable::getInverseTransform () const

get the inverse of the combined transform of the object

Returns

Inverse of the combined transformations applied to the object

See also

[getTransform](#)

FloatRect sf::Shape::getLocalBounds () const

Get the local bounding rectangle of the entity.

The returned rectangle is in local coordinates, which means that (translation, rotation, scale, ...) that are applied to the entity. In other bounds of the entity in the entity's coordinate system.

Returns

Local bounding rectangle of the entity

const Vector2f& sf::Transformable::getOrigin () const

get the local origin of the object

Returns

Current origin

See also

[setOrigin](#)

const [Color](#)& sf::Shape::getOutlineColor () const

Get the outline color of the shape.

Returns

Outline color of the shape

See also

[setOutlineColor](#)

float sf::Shape::getOutlineThickness () const

Get the outline thickness of the shape.

Returns

Outline thickness of the shape

See also

[setOutlineThickness](#)

virtual [Vector2f](#) sf::ConvexShape::getPoint (std::size_t [index](#)) const

Get the position of a point.

The returned point is in local coordinates, that is, the shape's transforms taken into account. The result is undefined if *index* is out of the valid range.

Parameters

[index](#) Index of the point to get, in range [0 .. [getPointCount\(\)](#) - 1]

Returns

Position of the index-th point of the polygon

See also

[setPoint](#)

Implements [sf::Shape](#).

virtual std::size_t sf::ConvexShape::getPointCount () const

Get the number of points of the polygon.

Returns

Number of points of the polygon

See also

[setPointCount](#)

Implements [sf::Shape](#).

const [Vector2f](#)& sf::Transformable::getPosition () const

get the position of the object

Returns

Current position

See also

[setPosition](#)

`float sf::Transformable::getRotation () const`

get the orientation of the object

The rotation is always in the range [0, 360].

Returns

Current rotation, in degrees

See also

[setRotation](#)

`const Vector2f& sf::Transformable::getScale () const`

get the current scale of the object

Returns

Current scale factors

See also

[setScale](#)

`const Texture* sf::Shape::getTexture () const`

Get the source texture of the shape.

If the shape has no source texture, a NULL pointer is returned. This means that you can't modify the texture when you retrieve it with this function.

Returns

Pointer to the shape's texture

See also

[setTexture](#)

const `IntRect`& sf::Shape::getTextureRect () const

Get the sub-rectangle of the texture displayed by the shape.

Returns

`Texture` rectangle of the shape

See also

[setTextureRect](#)

const `Transform`& sf::Transformable::getTransform () const

get the combined transform of the object

Returns

`Transform` combining the position/rotation/scale/origin of the object

See also

[getInverseTransform](#)

void sf::Transformable::move (float `offsetX`, float `offsetY`)

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
sf::Vector2f pos = object.getPosition();  
object.setPosition(pos.x + offsetX, pos.y + offsetY);
```

Parameters

offsetX X offset

offsetY Y offset

See also

[setPosition](#)

```
void sf::Transformable::move ( const Vector2f & offset )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
object.setPosition(object.getPosition() + offset);
```

Parameters

offset Offset

See also

[setPosition](#)

```
void sf::Transformable::rotate ( float angle )
```

Rotate the object.

This function adds to the current rotation of the object, unlike `setRotation` equivalent to the following code:

```
object.setRotation(object.getRotation() + angle);
```

Parameters

angle Angle of rotation, in degrees

```
void sf::Transformable::scale ( float factorX,  
                               float factorY  
                               )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factorX, scale.y * factorY);
```

Parameters

factorX Horizontal scale factor

factorY Vertical scale factor

See also

`setScale`

```
void sf::Transformable::scale ( const Vector2f & factor )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();
object.setScale(scale.x * factor.x, scale.y * factor.y);
```

Parameters

factor Scale factors

See also

`setScale`

```
void sf::Shape::setFillColor ( const Color & color )
```

Set the fill color of the shape.

This color is modulated (multiplied) with the shape's texture if any. It can also change its global opacity. You can use `sf::Color::Transparent` to be transparent, and have the outline alone. By default, the shape's fill color is black.

Parameters

color New color of the shape

See also

`getFillColor`, `setOutlineColor`

```
void sf::Transformable::setOrigin ( float x,
                                     float y
                                     )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

- x** X coordinate of the new origin
- y** Y coordinate of the new origin

See also

[getOrigin](#)

```
void sf::Transformable::setOrigin ( const Vector2f & origin )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

- origin** New origin

See also

[getOrigin](#)

```
void sf::Shape::setOutlineColor ( const Color & color )
```

Set the outline color of the shape.

By default, the shape's outline color is opaque white.

Parameters

color New outline color of the shape

See also

[getOutlineColor](#), [setFillColor](#)

```
void sf::Shape::setOutlineThickness ( float thickness )
```

Set the thickness of the shape's outline.

Note that negative values are allowed (so that the outline expands toward the interior). Using zero disables the outline. By default, the outline thickness is 0.

Parameters

thickness New outline thickness

See also

[getOutlineThickness](#)

```
void sf::ConvexShape::setPoint ( std::size_t index,  
                                const Vector2f & point  
                                )
```

Set the position of a point.

Don't forget that the polygon must remain convex, and the points need to be called first in order to set the total number of points. The result must be in the valid range.

Parameters

index Index of the point to change, in range [0 .. [getPointCount\(\)](#) - 1]

point New position of the point

See also

[getPoint](#)

```
void sf::ConvexShape::setPointCount ( std::size_t count )
```

Set the number of points of the polygon.

count must be greater than 2 to define a valid shape.

Parameters

count New number of points of the polygon

See also

[getPointCount](#)

```
void sf::Transformable::setPosition ( float x,  
                                     float y  
                                     )
```

set the position of the object

This function completely overwrites the previous position. See the [move](#) on the previous position instead. The default position of a transformable

Parameters

x X coordinate of the new position

y Y coordinate of the new position

See also

[move](#), [getPosition](#)

void sf::Transformable::setPosition (const [Vector2f](#) & [position](#))

set the position of the object

This function completely overwrites the previous position. See the [move](#) on the previous position instead. The default position of a transformable

Parameters

[position](#) New position

See also

[move](#), [getPosition](#)

void sf::Transformable::setRotation (float [angle](#))

set the orientation of the object

This function completely overwrites the previous rotation. See the [rotate](#) on the previous rotation instead. The default rotation of a transformable c

Parameters

[angle](#) New rotation, in degrees

See also

[rotate](#), [getRotation](#)

**void sf::Transformable::setScale (float [factorX](#),
float [factorY](#))**

)

set the scale factors of the object

This function completely overwrites the previous scale. See the `scale` function for more information. If you want to keep the previous scale instead. The default scale of a transformable object is `(1, 1)`.

Parameters

factorX New horizontal scale factor

factorY New vertical scale factor

See also

`scale`, `getScale`

```
void sf::Transformable::setScale ( const Vector2f & factors )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the `scale` function for more information. If you want to keep the previous scale instead. The default scale of a transformable object is `(1, 1)`.

Parameters

factors New scale factors

See also

`scale`, `getScale`

```
void sf::Shape::setTexture ( const Texture * texture,  
                             bool resetRect = false  
                             )
```

Change the source texture of the shape.

The *texture* argument refers to a texture that must exist as long as the shape doesn't store its own copy of the texture, but rather keeps a pointer to the texture. If the source texture is destroyed and the shape tries to use the *texture*, it can be NULL to disable texturing. If *resetRect* is true, the *textureRect* is automatically adjusted to the size of the new texture. If it is false, the *textureRect* is not adjusted.

Parameters

texture New texture

resetRect Should the texture rect be reset to the size of the new texture

See also

[getTexture](#), [setTextureRect](#)

```
void sf::Shape::setTextureRect ( const IntRect & rect )
```

Set the sub-rectangle of the texture that the shape will display.

The texture rect is useful when you don't want to display the whole texture. By default, the texture rect covers the entire texture.

Parameters

rect Rectangle defining the region of the texture to display

See also

[getTextureRect](#), [setTexture](#)

```
void sf::Shape::update ( )
```

Recompute the internal geometry of the shape.

This function must be called by the derived class everytime the shape's either `getPointCount` or `getPoint` is different).

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

- [ConvexShape.hpp](#)

SFML 2.4.2

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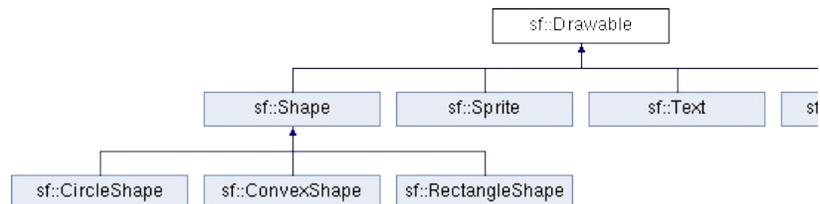
sf::Drawable Class Reference abstract

Graphics module

Abstract base class for objects that can be drawn to a render target. [More](#)

```
#include <Drawable.hpp>
```

Inheritance diagram for sf::Drawable:



Public Member Functions

virtual `~Drawable ()`
Virtual destructor. [More...](#)

Protected Member Functions

virtual void `draw` (`RenderTarget` &target, `RenderStates` states) const =0
Draw the object to a render target. [More...](#)

Friends

```
class RenderTarget
```

Detailed Description

Abstract base class for objects that can be drawn to a render target.

`sf::Drawable` is a very simple base class that allows objects of derived classes to be drawn to a `sf::RenderTarget`.

All you have to do in your derived class is to override the `draw` virtual function.

Note that inheriting from `sf::Drawable` is not mandatory, but it allows this syntax: `object.draw(window)`, rather than `object.draw(window)`, which is more consistent with other SFML classes.

Example:

```
class MyDrawable : public sf::Drawable
{
public:
    ...
private:
    virtual void draw(sf::RenderTarget& target, sf::RenderStates states)
    {
        // You can draw other high-level objects
        target.draw(m_sprite, states);

        // ... or use the low-level API
        states.texture = &m_texture;
        target.draw(m_vertices, states);

        // ... or draw with OpenGL directly
        glBegin(GL_QUADS);
        ...
        glEnd();
    }

    sf::Sprite m_sprite;
    sf::Texture m_texture;
    sf::VertexArray m_vertices;
};
```

See also

[sf::RenderTarget](#)

Definition at line 44 of file [Drawable.hpp](#).

Constructor & Destructor Documentation

virtual sf::Drawable::~~Drawable ()

Virtual destructor.

Definition at line 52 of file [Drawable.hpp](#).

Member Function Documentation

```
virtual void sf::Drawable::draw ( RenderTarget & target,  
                                RenderStates states  
                                ) const
```

Draw the object to a render target.

This is a pure virtual function that has to be implemented by the derived class. The object should be drawn.

Parameters

- target** Render target to draw to
- states** Current render states

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

- [Drawable.hpp](#)

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sf::Font Class Reference

Graphics module

Class for loading and manipulating character fonts. [More...](#)

```
#include <Font.hpp>
```

Classes

struct [Info](#)

Holds various information about a font. [More...](#)

Public Member Functions

`Font ()`
Default constructor. [More...](#)

`Font (const Font ©)`
Copy constructor. [More...](#)

`~Font ()`
Destructor. [More...](#)

`bool loadFromFile (const std::string &filename)`
Load the font from a file. [More...](#)

`bool loadFromMemory (const void *data, std::size_t sizeInBytes)`
Load the font from a file in memory. [More...](#)

`bool loadFromStream (InputStream &stream)`
Load the font from a custom stream. [More...](#)

`const Info & getInfo () const`
Get the font information. [More...](#)

`const Glyph & getGlyph (UInt32 codePoint, unsigned int characterSize, unsigned int outlineThickness=0) const`
Retrieve a glyph of the font. [More...](#)

`float getKerning (UInt32 first, UInt32 second, unsigned int characterSize)`
Get the kerning offset of two glyphs. [More...](#)

`float getLineSpacing (unsigned int characterSize) const`
Get the line spacing. [More...](#)

float `getUnderlinePosition` (unsigned int characterSize) const
Get the position of the underline. [More...](#)

float `getUnderlineThickness` (unsigned int characterSize) const
Get the thickness of the underline. [More...](#)

const `Texture` & `getTexture` (unsigned int characterSize) const
Retrieve the texture containing the loaded glyphs of a c

`Font` & `operator=` (const `Font` &right)
Overload of assignment operator. [More...](#)

Detailed Description

Class for loading and manipulating character fonts.

Fonts can be loaded from a file, from memory or from a custom stream types of fonts.

See the `loadFromFile` function for the complete list of supported formats.

Once it is loaded, a `sf::Font` instance provides three types of information a

- Global metrics, such as the line spacing
- Per-glyph metrics, such as bounding box or kerning
- Pixel representation of glyphs

Fonts alone are not very useful: they hold the font data but cannot make need to use the `sf::Text` class, which is able to properly output text with size, style, color, position, rotation, etc. This separation allows more flexibility indeed a `sf::Font` is a heavy resource, and any operation on it is slow (in applications). On the other side, a `sf::Text` is a lightweight object which uses metrics of a `sf::Font` to display any text on a render target. Note that it creates `sf::Text` instances to the same `sf::Font`.

It is important to note that the `sf::Text` instance doesn't copy the font that it uses. Thus, a `sf::Font` must not be destructed while it is used by a `sf::Text` (the `sf::Text` uses a local `sf::Font` instance for creating a text).

Usage example:

```
// Declare a new font
sf::Font font;
```

```
// Load it from a file
if (!font.loadFromFile("arial.ttf"))
{
    // error...
}

// Create a text which uses our font
sf::Text text1;
text1.setFont(font);
text1.setCharacterSize(30);
text1.setStyle(sf::Text::Regular);

// Create another text using the same font, but with different parameters
sf::Text text2;
text2.setFont(font);
text2.setCharacterSize(50);
text2.setStyle(sf::Text::Italic);
```

Apart from loading font files, and passing them to instances of `sf::Text`, deal directly with this class. However, it may be useful to access the font for advanced usage.

Note that if the font is a bitmap font, it is not scalable, thus not all requests need to be taken into consideration when using `sf::Text`. If you need to make sure the corresponding bitmap font that supports that size is used.

See also

`sf::Text`

Definition at line 50 of file `Font.hpp`.

Constructor & Destructor Documentation

sf::Font::Font ()

Default constructor.

This constructor defines an empty font

sf::Font::Font (const **Font & **copy**)**

Copy constructor.

Parameters

copy Instance to copy

sf::Font::~~Font ()

Destructor.

Cleans up all the internal resources used by the font

Member Function Documentation

```
const Glyph& sf::Font::getGlyph ( Uint32      codePoint,  
                                unsigned int characterSize,  
                                bool         bold,  
                                float        outlineThickness =  
                                )          const
```

Retrieve a glyph of the font.

If the font is a bitmap font, not all character sizes might be available. If requested size, an empty glyph is returned.

Be aware that using a negative value for the outline thickness will cause

Parameters

codePoint	Unicode code point of the character to get
characterSize	Reference character size
bold	Retrieve the bold version or the regular one?
outlineThickness	Thickness of outline (when != 0 the glyph will not

Returns

The glyph corresponding to *codePoint* and *characterSize*

```
const Info& sf::Font::getInfo ( ) const
```

Get the font information.

Returns

A structure that holds the font information

```
float sf::Font::getKerning ( Uint32      first,  
                             Uint32      second,  
                             unsigned int characterSize  
                             )           const
```

Get the kerning offset of two glyphs.

The kerning is an extra offset (negative) to apply between two glyphs w/ pair look more "natural". For example, the pair "AV" have a special ke other characters. Most of the glyphs pairs have a kerning offset of zero, t

Parameters

first Unicode code point of the first character
second Unicode code point of the second character
characterSize Reference character size

Returns

Kerning value for *first* and *second*, in pixels

```
float sf::Font::getLineSpacing ( unsigned int characterSize ) const
```

Get the line spacing.

Line spacing is the vertical offset to apply between two consecutive lines

Parameters

characterSize Reference character size

Returns

Line spacing, in pixels

```
const Texture& sf::Font::getTexture ( unsigned int characterSize ) c
```

Retrieve the texture containing the loaded glyphs of a certain size.

The contents of the returned texture changes as more glyphs are requested. It is mainly used internally by `sf::Text`.

Parameters

characterSize Reference character size

Returns

`Texture` containing the glyphs of the requested size

```
float sf::Font::getUnderlinePosition ( unsigned int characterSize ) c
```

Get the position of the underline.

Underline position is the vertical offset to apply between the baseline and the underline.

Parameters

characterSize Reference character size

Returns

Underline position, in pixels

See also

`getUnderlineThickness`

float sf::Font::getUnderlineThickness (unsigned int `characterSize`)

Get the thickness of the underline.

Underline thickness is the vertical size of the underline.

Parameters

`characterSize` Reference character size

Returns

Underline thickness, in pixels

See also

[getUnderlinePosition](#)

bool sf::Font::loadFromFile (const std::string & `filename`)

Load the font from a file.

The supported font formats are: TrueType, Type 1, CFF, OpenType, BDF, PFR and Type 42. Note that this function know nothing about the user's system, thus you can't load them directly.

Warning

SFML cannot preload all the font data in this function, so the file has `sf::Font` object loads a new font or is destroyed.

Parameters

`filename` Path of the font file to load

Returns

True if loading succeeded, false if it failed

See also

[loadFromMemory](#), [loadFromStream](#)

```
bool sf::Font::loadFromMemory ( const void * data,  
                               std::size_t  sizeInBytes  
                               )
```

Load the font from a file in memory.

The supported font formats are: TrueType, Type 1, CFF, OpenType, BDF, PFR and Type 42.

Warning

SFML cannot preload all the font data in this function, so the buffer is not valid until the [sf::Font](#) object loads a new font or is destroyed.

Parameters

data Pointer to the file data in memory
sizeInBytes Size of the data to load, in bytes

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromStream](#)

```
bool sf::Font::loadFromStream ( InputStream & stream )
```

Load the font from a custom stream.

The supported font formats are: TrueType, Type 1, CFF, OpenType, BDF, PFR and Type 42. Warning: SFML cannot preload all the font data of *stream* have to remain valid as long as the font is used.

Warning

SFML cannot preload all the font data in this function, so the stream the `sf::Font` object loads a new font or is destroyed.

Parameters

stream Source stream to read from

Returns

True if loading succeeded, false if it failed

See also

`loadFromFile`, `loadFromMemory`

Font& sf::Font::operator= (const Font & right)

Overload of assignment operator.

Parameters

right Instance to assign

Returns

Reference to self

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

- `Font.hpp`

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[Public Attributes](#) | [List of all members](#)

sf::Font::Info Struct Reference

Holds various information about a font. [More...](#)

```
#include <Font.hpp>
```

Public Attributes

std::string **family**
The font family. [More...](#)

Detailed Description

Holds various information about a font.

Definition at line 58 of file [Font.hpp](#).

Member Data Documentation

`std::string sf::Font::Info::family`

The font family.

Definition at line 60 of file `Font.hpp`.

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

- `Font.hpp`

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sf::Glyph Class Reference

Graphics module

Structure describing a glyph. [More...](#)

```
#include <Glyph.hpp>
```

Public Member Functions

`Glyph ()`

Default constructor. [More...](#)

Public Attributes

float **advance**
Offset to move horizontally to the next character. [More...](#)

FloatRect **bounds**
Bounding rectangle of the glyph, in coordinates relative to the

IntRect **textureRect**
Texture coordinates of the glyph inside the font's texture. [Mor](#)

Detailed Description

Structure describing a glyph.

A glyph is the visual representation of a character.

The `sf::Glyph` structure provides the information needed to handle the glyph

- its coordinates in the font's texture
- its bounding rectangle
- the offset to apply to get the starting position of the next glyph

See also

`sf::Font`

Definition at line 41 of file `Glyph.hpp`.

Constructor & Destructor Documentation

sf::Glyph::Glyph ()

Default constructor.

Definition at line 49 of file [Glyph.hpp](#).

Member Data Documentation

float sf::Glyph::advance

Offset to move horizontally to the next character.

Definition at line 54 of file [Glyph.hpp](#).

FloatRect sf::Glyph::bounds

Bounding rectangle of the glyph, in coordinates relative to the baseline.

Definition at line 55 of file [Glyph.hpp](#).

IntRect sf::Glyph::textureRect

[Texture](#) coordinates of the glyph inside the font's texture.

Definition at line 56 of file [Glyph.hpp](#).

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

- [Glyph.hpp](#)

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sf::Image Class Reference

Graphics module

Class for loading, manipulating and saving images. [More...](#)

```
#include <Image.hpp>
```

Public Member Functions

`Image ()`
Default constructor. [More...](#)

`~Image ()`
Destructor. [More...](#)

`void create (unsigned int width, unsigned int height, const Color)`
Create the image and fill it with a unique color. [More...](#)

`void create (unsigned int width, unsigned int height, const Uint8*`
Create the image from an array of pixels. [More...](#)

`bool loadFromFile (const std::string &filename)`
Load the image from a file on disk. [More...](#)

`bool loadFromMemory (const void *data, std::size_t size)`
Load the image from a file in memory. [More...](#)

`bool loadFromStream (InputStream &stream)`
Load the image from a custom stream. [More...](#)

`bool saveToFile (const std::string &filename) const`
Save the image to a file on disk. [More...](#)

`Vector2u getSize () const`
Return the size (width and height) of the image. [More...](#)

`void createMaskFromColor (const Color &color, Uint8 alpha=0)`
Create a transparency mask from a specified color-key. [More...](#)

`copy (const Image &source, unsigned int destX, unsigned int destY)`

void &sourceRect=IntRect(0, 0, 0, 0), bool applyAlpha=false)
Copy pixels from another image onto this one. [More...](#)

void [setPixel](#) (unsigned int x, unsigned int y, const [Color](#) &color
Change the color of a pixel. [More...](#)

[Color](#) [getPixel](#) (unsigned int x, unsigned int y) const
Get the color of a pixel. [More...](#)

const Uint8 * [getPixelsPtr](#) () const
Get a read-only pointer to the array of pixels. [More...](#)

void [flipHorizontally](#) ()
Flip the image horizontally (left <-> right) [More...](#)

void [flipVertically](#) ()
Flip the image vertically (top <-> bottom) [More...](#)

Detailed Description

Class for loading, manipulating and saving images.

`sf::Image` is an abstraction to manipulate images as bidimensional arrays

The class provides functions to load, read, write and save pixels, as well as

`sf::Image` can handle a unique internal representation of pixels, which is pixel must be composed of 8 bits red, green, blue and alpha channels. Functions that return an array of pixels follow this rule, and all parameters of functions (such as `loadFromMemory`) must use this representation as well

A `sf::Image` can be copied, but it is a heavy resource and if possible references to pass or return them to avoid useless copies.

Usage example:

```
// Load an image file from a file
sf::Image background;
if (!background.loadFromFile("background.jpg"))
    return -1;

// Create a 20x20 image filled with black color
sf::Image image;
image.create(20, 20, sf::Color::Black);

// Copy image1 on image2 at position (10, 10)
image.copy(background, 10, 10);

// Make the top-left pixel transparent
sf::Color color = image.getPixel(0, 0);
color.a = 0;
image.setPixel(0, 0, color);

// Save the image to a file
if (!image.saveToFile("result.png"))
    return -1;
```

See also

[sf::Texture](#)

Definition at line 46 of file [Image.hpp](#).

Constructor & Destructor Documentation

sf::Image::Image ()

Default constructor.

Creates an empty image.

sf::Image::~~Image ()

Destructor.

Member Function Documentation

```
void sf::Image::copy ( const Image & source,
                      unsigned int destX,
                      unsigned int destY,
                      const IntRect & sourceRect = IntRect(0, 0, 0, 0),
                      bool applyAlpha = false
                    )
```

Copy pixels from another image onto this one.

This function does a slow pixel copy and should not be used intensively to create a complex static image from several others, but if you need this kind of feature, use `sf::RenderTexture`.

If *sourceRect* is empty, the whole image is copied. If *applyAlpha* is set to `true`, the alpha channel of the source image is applied. If it is false, the pixels are copied unchanged with their original alpha values.

Parameters

source Source image to copy
destX X coordinate of the destination position
destY Y coordinate of the destination position
sourceRect Sub-rectangle of the source image to copy
applyAlpha Should the copy take into account the source transparency

```
void sf::Image::create ( unsigned int width,
                       unsigned int height,
                       const Color & color = color(0, 0, 0)
                     )
```

```
)
```

Create the image and fill it with a unique color.

Parameters

width Width of the image

height Height of the image

color Fill color

```
void sf::Image::create ( unsigned int width,  
                        unsigned int height,  
                        const Uint8 * pixels  
                        )
```

Create the image from an array of pixels.

The *pixel* array is assumed to contain 32-bits RGBA pixels, and have the same size as the image. If this is not the case, this is an undefined behavior. If *pixels* is null, an empty image is created.

Parameters

width Width of the image

height Height of the image

pixels Array of pixels to copy to the image

```
void sf::Image::createMaskFromColor ( const Color & color,  
                                     Uint8 alpha = 0  
                                     )
```

Create a transparency mask from a specified color-key.

This function sets the alpha value of every pixel matching the given color. They become transparent.

Parameters

color Color to make transparent

alpha Alpha value to assign to transparent pixels

void sf::Image::flipHorizontally ()

Flip the image horizontally (left <-> right)

void sf::Image::flipVertically ()

Flip the image vertically (top <-> bottom)

Color sf::Image::getPixel (unsigned int *x*, unsigned int *y*) const

Get the color of a pixel.

This function doesn't check the validity of the pixel coordinates, using out-of-range coordinates results in undefined behavior.

Parameters

x X coordinate of pixel to get

y Y coordinate of pixel to get

Returns

Color of the pixel at coordinates (x, y)

See also

setPixel

const Uint8* sf::Image::getPixelsPtr () const

Get a read-only pointer to the array of pixels.

The returned value points to an array of RGBA pixels made of 8 bits in the array is $\text{width} * \text{height} * 4$ (`getSize().x * getSize().y * 4`). Warning: this pointer is invalid if you modify the image, so you should never store it for too long.

Returns

Read-only pointer to the array of pixels

Vector2u sf::Image::getSize () const

Return the size (width and height) of the image.

Returns

Size of the image, in pixels

bool sf::Image::loadFromFile (const std::string & filename)

Load the image from a file on disk.

The supported image formats are bmp, png, tga, jpg, gif, psd, hdr and pnm.

supported, like progressive jpeg. If this function fails, the image is left un

Parameters

filename Path of the image file to load

Returns

True if loading was successful

See also

[loadFromMemory](#), [loadFromStream](#), [saveToFile](#)

```
bool sf::Image::loadFromMemory ( const void * data,  
                                std::size_t size  
                                )
```

Load the image from a file in memory.

The supported image formats are bmp, png, tga, jpeg, gif, psd, hdr and p supported, like progressive jpeg. If this function fails, the image is left un

Parameters

data Pointer to the file data in memory

size Size of the data to load, in bytes

Returns

True if loading was successful

See also

[loadFromFile](#), [loadFromStream](#)

```
bool sf::Image::loadFromStream ( InputStream & stream )
```

Load the image from a custom stream.

The supported image formats are bmp, png, tga, jpg, gif, psd, hdr and pnm. All formats are supported, like progressive jpeg. If this function fails, the image is left unchanged.

Parameters

stream Source stream to read from

Returns

True if loading was successful

See also

[loadFromFile](#), [loadFromMemory](#)

```
bool sf::Image::saveToFile ( const std::string & filename ) const
```

Save the image to a file on disk.

The format of the image is automatically deduced from the extension. The supported formats are bmp, png, tga and jpg. The destination file is overwritten if it already exists. If the image is empty, the file is not saved.

Parameters

filename Path of the file to save

Returns

True if saving was successful

See also

[create](#), [loadFromFile](#), [loadFromMemory](#)

```
void sf::Image::setPixel ( unsigned int  x,  
                           unsigned int  y,  
                           const Color & color  
                           )
```

Change the color of a pixel.

This function doesn't check the validity of the pixel coordinates, using an undefined behavior.

Parameters

- x** X coordinate of pixel to change
- y** Y coordinate of pixel to change
- color** New color of the pixel

See also

[getPixel](#)

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

- [Image.hpp](#)

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[Public Member Functions](#) | [Public Attributes](#) | [Related Functions](#) | [List of all members](#)

sf::Rect< T > Class Template Reference

Graphics module

Utility class for manipulating 2D axis aligned rectangles. [More...](#)

```
#include <Rect.hpp>
```

Public Member Functions

`Rect ()`

Default constructor. [More...](#)

`Rect (T rectLeft, T rectTop, T rectWidth, T rectHeight)`

Construct the rectangle from its coordinates. [More...](#)

`Rect (const Vector2< T > &position, const Vector2< T > &size)`

Construct the rectangle from position and size. [More...](#)

`template<typename U >`

`Rect (const Rect< U > &rectangle)`

Construct the rectangle from another type of rectangle. [More...](#)

`bool contains (T x, T y) const`

Check if a point is inside the rectangle's area. [More...](#)

`bool contains (const Vector2< T > &point) const`

Check if a point is inside the rectangle's area. [More...](#)

`bool intersects (const Rect< T > &rectangle) const`

Check the intersection between two rectangles. [More...](#)

`bool intersects (const Rect< T > &rectangle, Rect< T > &intersection) const`

Check the intersection between two rectangles. [More...](#)

Public Attributes

T **left**
Left coordinate of the rectangle. [More...](#)

T **top**
Top coordinate of the rectangle. [More...](#)

T **width**
Width of the rectangle. [More...](#)

T **height**
Height of the rectangle. [More...](#)

Related Functions

(Note that these are not member functions.)

```
template<typename T >  
bool operator== (const Rect< T > &left, const Rect< T > &right)  
    Overload of binary operator ==. More...
```

```
template<typename T >  
bool operator!= (const Rect< T > &left, const Rect< T > &right)  
    Overload of binary operator !=. More...
```

Detailed Description

```
template<typename T>
class sf::Rect< T >
```

Utility class for manipulating 2D axis aligned rectangles.

A rectangle is defined by its top-left corner and its size.

It is a very simple class defined for convenience, so its member variables are public and can be accessed directly, just like the vector classes ([Vector2](#) and [Vector3](#)).

To keep things simple, [sf::Rect](#) doesn't define functions to emulate the [std::rect](#) members (such as `right`, `bottom`, `center`, etc.), it rather only provides `intersect` and `contains`.

[sf::Rect](#) uses the usual rules for its boundaries:

- The left and top edges are included in the rectangle's area
- The right (left + width) and bottom (top + height) edges are excluded from the area

This means that `sf::IntRect(0, 0, 1, 1)` and `sf::IntRect(1, 1, 1, 1)` don't intersect.

[sf::Rect](#) is a template and may be used with any numeric type, but for simplicity, the `IntRect` and `FloatRect` classes in SFML are typedef'd:

- `sf::Rect<int>` is `sf::IntRect`
- `sf::Rect<float>` is `sf::FloatRect`

So that you don't have to care about the template syntax.

Usage example:

```
// Define a rectangle, located at (0, 0) with a size of 20x5
sf::IntRect r1(0, 0, 20, 5);

// Define another rectangle, located at (4, 2) with a size of 18x10
sf::Vector2i position(4, 2);
sf::Vector2i size(18, 10);
sf::IntRect r2(position, size);

// Test intersections with the point (3, 1)
bool b1 = r1.contains(3, 1); // true
bool b2 = r2.contains(3, 1); // false

// Test the intersection between r1 and r2
sf::IntRect result;
bool b3 = r1.intersects(r2, result); // true
// result == (4, 2, 16, 3)
```

Definition at line 42 of file Rect.hpp.

Constructor & Destructor Documentation

```
template<typename T>
```

```
sf::Rect< T >::Rect ( )
```

Default constructor.

Creates an empty rectangle (it is equivalent to calling Rect(0, 0, 0, 0)).

```
template<typename T>
```

```
sf::Rect< T >::Rect ( T rectLeft,  
                    T rectTop,  
                    T rectWidth,  
                    T rectHeight  
                    )
```

Construct the rectangle from its coordinates.

Be careful, the last two parameters are the width and height, not the right

Parameters

rectLeft Left coordinate of the rectangle

rectTop Top coordinate of the rectangle

rectWidth Width of the rectangle

rectHeight Height of the rectangle

```
template<typename T>
```

```
sf::Rect< T >::Rect ( const Vector2< T > & position,  
                    const Vector2< T > & size  
                    )
```

Construct the rectangle from position and size.

Be careful, the last parameter is the size, not the bottom-right corner!

Parameters

position Position of the top-left corner of the rectangle

size Size of the rectangle

```
template<typename T>
```

```
template<typename U >
```

```
sf::Rect< T >::Rect ( const Rect< U > & rectangle )
```

Construct the rectangle from another type of rectangle.

This constructor doesn't replace the copy constructor, it's called on constructor will fail to compile if U is not convertible to T.

Parameters

rectangle Rectangle to convert

Member Function Documentation

```
template<typename T>
```

```
bool sf::Rect< T >::contains ( T x,  
                               T y  
                               ) const
```

Check if a point is inside the rectangle's area.

This check is non-inclusive. If the point lies on the edge of the rectangle,

Parameters

x X coordinate of the point to test

y Y coordinate of the point to test

Returns

True if the point is inside, false otherwise

See also

[intersects](#)

```
template<typename T>
```

```
bool sf::Rect< T >::contains ( const Vector2< T > & point ) const
```

Check if a point is inside the rectangle's area.

This check is non-inclusive. If the point lies on the edge of the rectangle,

Parameters

point Point to test

Returns

True if the point is inside, false otherwise

See also

[intersects](#)

```
template<typename T>
```

```
bool sf::Rect< T >::intersects ( const Rect< T > & rectangle ) const
```

Check the intersection between two rectangles.

Parameters

rectangle Rectangle to test

Returns

True if rectangles overlap, false otherwise

See also

[contains](#)

```
template<typename T>
```

```
bool sf::Rect< T >::intersects ( const Rect< T > & rectangle,  
                                Rect< T > & intersection  
                                ) const
```

Check the intersection between two rectangles.

This overload returns the overlapped rectangle in the *intersection* param

Parameters

rectangle Rectangle to test

intersection Rectangle to be filled with the intersection

Returns

True if rectangles overlap, false otherwise

See also

[contains](#)

Friends And Related Function Documentatio

```
template<typename T >
```

```
bool operator!= ( const Rect< T > & left,  
                 const Rect< T > & right  
                 )
```

Overload of binary operator !=.

This operator compares strict difference between two rectangles.

Parameters

left Left operand (a rectangle)

right Right operand (a rectangle)

Returns

True if *left* is not equal to *right*

```
template<typename T >
```

```
bool operator== ( const Rect< T > & left,  
                 const Rect< T > & right  
                 )
```

Overload of binary operator ==.

This operator compares strict equality between two rectangles.

Parameters

left Left operand (a rectangle)

right Right operand (a rectangle)

Returns

True if *left* is equal to *right*

Member Data Documentation

template<typename T>

T sf::Rect< T >::height

Height of the rectangle.

Definition at line 160 of file Rect.hpp.

template<typename T>

T sf::Rect< T >::left

Left coordinate of the rectangle.

Definition at line 157 of file Rect.hpp.

template<typename T>

T sf::Rect< T >::top

Top coordinate of the rectangle.

Definition at line 158 of file Rect.hpp.

template<typename T>

T sf::Rect< T >::width

Width of the rectangle.

Definition at line [159](#) of file [Rect.hpp](#).

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

- [Rect.hpp](#)

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[Public Member Functions](#) | [Protected Member Functions](#) | [List of all members](#)

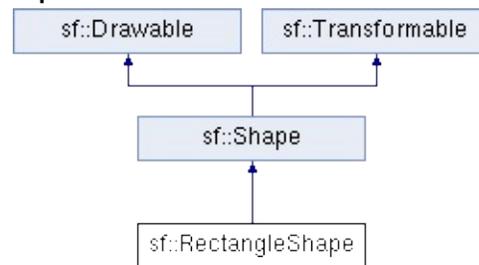
sf::RectangleShape Class Reference

Graphics module

Specialized shape representing a rectangle. [More...](#)

```
#include <RectangleShape.hpp>
```

Inheritance diagram for sf::RectangleShape:



Public Member Functions

`RectangleShape` (`const Vector2f &size=Vector2f(0, 0)`)
Default constructor. [More...](#)

`void` `setSize` (`const Vector2f &size`)
Set the size of the rectangle. [More...](#)

`const Vector2f &` `getSize` () `const`
Get the size of the rectangle. [More...](#)

`virtual std::size_t` `getPointCount` () `const`
Get the number of points defining the shape. [More...](#)

`virtual Vector2f` `getPoint` (`std::size_t index`) `const`
Get a point of the rectangle. [More...](#)

`void` `setTexture` (`const Texture *texture`, `bool resetRect=false`)
Change the source texture of the shape. [More...](#)

`void` `setTextureRect` (`const IntRect &rect`)
Set the sub-rectangle of the texture that the shape will use. [More...](#)

`void` `setFillColor` (`const Color &color`)
Set the fill color of the shape. [More...](#)

`void` `setOutlineColor` (`const Color &color`)
Set the outline color of the shape. [More...](#)

`void` `setOutlineThickness` (`float thickness`)
Set the thickness of the shape's outline. [More...](#)

`const Texture *` `getTexture` () `const`

Get the source texture of the shape. [More...](#)

`const IntRect & getTextureRect () const`
Get the sub-rectangle of the texture displayed by the

`const Color & getFillColor () const`
Get the fill color of the shape. [More...](#)

`const Color & getOutlineColor () const`
Get the outline color of the shape. [More...](#)

`float getOutlineThickness () const`
Get the outline thickness of the shape. [More...](#)

`FloatRect getLocalBounds () const`
Get the local bounding rectangle of the entity. [More..](#)

`FloatRect getGlobalBounds () const`
Get the global (non-minimal) bounding rectangle of t

`void setPosition (float x, float y)`
set the position of the object [More...](#)

`void setPosition (const Vector2f &position)`
set the position of the object [More...](#)

`void setRotation (float angle)`
set the orientation of the object [More...](#)

`void setScale (float factorX, float factorY)`
set the scale factors of the object [More...](#)

`void setScale (const Vector2f &factors)`
set the scale factors of the object [More...](#)

void `setOrigin` (float x, float y)
set the local origin of the object [More...](#)

void `setOrigin` (const `Vector2f` &origin)
set the local origin of the object [More...](#)

const `Vector2f` & `getPosition` () const
get the position of the object [More...](#)

float `getRotation` () const
get the orientation of the object [More...](#)

const `Vector2f` & `getScale` () const
get the current scale of the object [More...](#)

const `Vector2f` & `getOrigin` () const
get the local origin of the object [More...](#)

void `move` (float offsetX, float offsetY)
Move the object by a given offset. [More...](#)

void `move` (const `Vector2f` &offset)
Move the object by a given offset. [More...](#)

void `rotate` (float angle)
Rotate the object. [More...](#)

void `scale` (float factorX, float factorY)
Scale the object. [More...](#)

void `scale` (const `Vector2f` &factor)
Scale the object. [More...](#)

const `Transform` & `getTransform` () const
get the combined transform of the object [More...](#)

```
const Transform & getInverseTransform () const  
    get the inverse of the combined transform of the obje
```

Protected Member Functions

void `update` ()

Recompute the internal geometry of the shape. [More...](#)

Detailed Description

Specialized shape representing a rectangle.

This class inherits all the functions of [sf::Transformable](#) (position, rotation functions of [sf::Shape](#) (outline, color, texture, ...)).

Usage example:

```
sf::RectangleShape rectangle;
rectangle.setSize(sf::Vector2f(100, 50));
rectangle.setOutlineColor(sf::Color::Red);
rectangle.setOutlineThickness(5);
rectangle.setPosition(10, 20);
...
window.draw(rectangle);
```

See also

[sf::Shape](#), [sf::CircleShape](#), [sf::ConvexShape](#)

Definition at line 41 of file [RectangleShape.hpp](#).

Constructor & Destructor Documentation

```
sf::RectangleShape::RectangleShape ( const Vector2f & size = vect
```

Default constructor.

Parameters

size Size of the rectangle

Member Function Documentation

const Color& sf::Shape::getFillColor () const

Get the fill color of the shape.

Returns

Fill color of the shape

See also

[setFillColor](#)

FloatRect sf::Shape::getGlobalBounds () const

Get the global (non-minimal) bounding rectangle of the entity.

The returned rectangle is in global coordinates, which means that transformations (translation, rotation, scale, ...) that are applied to the entity returns the bounds of the shape in the global 2D world's coordinate system.

This function does not necessarily return the *minimal* bounding rectangle. The returned rectangle covers all the vertices (but possibly more). This allows to use the bounds as a first check; you may want to use more precise checks on top.

Returns

Global bounding rectangle of the entity

const Transform& sf::Transformable::getInverseTransform () const

get the inverse of the combined transform of the object

Returns

Inverse of the combined transformations applied to the object

See also

[getTransform](#)

FloatRect sf::Shape::getLocalBounds () const

Get the local bounding rectangle of the entity.

The returned rectangle is in local coordinates, which means that (translation, rotation, scale, ...) that are applied to the entity. In other bounds of the entity in the entity's coordinate system.

Returns

Local bounding rectangle of the entity

const Vector2f& sf::Transformable::getOrigin () const

get the local origin of the object

Returns

Current origin

See also

[setOrigin](#)

const Color& sf::Shape::getOutlineColor () const

Get the outline color of the shape.

Returns

Outline color of the shape

See also

[setOutlineColor](#)

float sf::Shape::getOutlineThickness () const

Get the outline thickness of the shape.

Returns

Outline thickness of the shape

See also

[setOutlineThickness](#)

virtual Vector2f sf::RectangleShape::getPoint (std::size_t index) const

Get a point of the rectangle.

The returned point is in local coordinates, that is, the shape's transforms taken into account. The result is undefined if *index* is out of the valid range.

Parameters

index Index of the point to get, in range [0 .. 3]

Returns

index-th point of the shape

Implements [sf::Shape](#).

virtual std::size_t sf::RectangleShape::getPointCount () const

Get the number of points defining the shape.

Returns

Number of points of the shape. For rectangle shapes, this number is

Implements [sf::Shape](#).

const [Vector2f](#)& sf::Transformable::getPosition () const

get the position of the object

Returns

Current position

See also

[setPosition](#)

float sf::Transformable::getRotation () const

get the orientation of the object

The rotation is always in the range [0, 360].

Returns

Current rotation, in degrees

See also

[setRotation](#)

const [Vector2f](#)& sf::Transformable::getScale () const

get the current scale of the object

Returns

Current scale factors

See also

[setScale](#)

const [Vector2f](#)& sf::RectangleShape::getSize () const

Get the size of the rectangle.

Returns

Size of the rectangle

See also

[setSize](#)

const [Texture](#)* sf::Shape::getTexture () const

Get the source texture of the shape.

If the shape has no source texture, a NULL pointer is returned. This means that you can't modify the texture when you retrieve it with this function.

Returns

Pointer to the shape's texture

See also

[setTexture](#)

```
const IntRect& sf::Shape::getTextureRect ( ) const
```

Get the sub-rectangle of the texture displayed by the shape.

Returns

[Texture](#) rectangle of the shape

See also

[setTextureRect](#)

```
const Transform& sf::Transformable::getTransform ( ) const
```

get the combined transform of the object

Returns

[Transform](#) combining the position/rotation/scale/origin of the object

See also

[getInverseTransform](#)

```
void sf::Transformable::move ( float offsetX,
```

```
float offsetY  
)
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
sf::Vector2f pos = object.getPosition();  
object.setPosition(pos.x + offsetX, pos.y + offsetY);
```

Parameters

offsetX X offset

offsetY Y offset

See also

[setPosition](#)

```
void sf::Transformable::move ( const Vector2f & offset )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
object.setPosition(object.getPosition() + offset);
```

Parameters

offset Offset

See also

[setPosition](#)

```
void sf::Transformable::rotate ( float angle )
```

Rotate the object.

This function adds to the current rotation of the object, unlike `setRotation` equivalent to the following code:

```
object.setRotation(object.getRotation() + angle);
```

Parameters

angle Angle of rotation, in degrees

```
void sf::Transformable::scale ( float factorX,  
                               float factorY  
                               )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factorX, scale.y * factorY);
```

Parameters

factorX Horizontal scale factor

factorY Vertical scale factor

See also

[setScale](#)

void sf::Transformable::scale (const [Vector2f](#) & factor)

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factor.x, scale.y * factor.y);
```

Parameters

factor Scale factors

See also

[setScale](#)

void sf::Shape::setFillColor (const [Color](#) & color)

Set the fill color of the shape.

This color is modulated (multiplied) with the shape's texture if any. It can also change its global opacity. You can use `sf::Color::Transparent` to make the shape transparent, and have the outline alone. By default, the shape's fill color is the same as its outline color.

Parameters

color New color of the shape

See also

[getFillColor](#), [setOutlineColor](#)

```
void sf::Transformable::setOrigin ( float x,  
                                     float y  
                                     )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

x X coordinate of the new origin

y Y coordinate of the new origin

See also

[getOrigin](#)

```
void sf::Transformable::setOrigin ( const Vector2f & origin )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

origin New origin

See also

[getOrigin](#)

```
void sf::Shape::setOutlineColor ( const Color & color )
```

Set the outline color of the shape.

By default, the shape's outline color is opaque white.

Parameters

color New outline color of the shape

See also

[getOutlineColor](#), [setFillColor](#)

```
void sf::Shape::setOutlineThickness ( float thickness )
```

Set the thickness of the shape's outline.

Note that negative values are allowed (so that the outline expands toward the center). Using zero disables the outline. By default, the outline thickness is 0.

Parameters

thickness New outline thickness

See also

[getOutlineThickness](#)

```
void sf::Transformable::setPosition ( float x,  
                                     float y  
                                     )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

- x** X coordinate of the new position
- y** Y coordinate of the new position

See also

`move`, `getPosition`

```
void sf::Transformable::setPosition ( const Vector2f & position )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

- position** New position

See also

`move`, `getPosition`

```
void sf::Transformable::setRotation ( float angle )
```

set the orientation of the object

This function completely overwrites the previous rotation. See the `rotate` on the previous rotation instead. The default rotation of a transformable c

Parameters

angle New rotation, in degrees

See also

[rotate](#), [getRotation](#)

```
void sf::Transformable::setScale ( float factorX,  
                                   float factorY  
                                   )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the [scale](#) function for more information. The default scale of a transformable object is 1.0 for both axes.

Parameters

factorX New horizontal scale factor

factorY New vertical scale factor

See also

[scale](#), [getScale](#)

```
void sf::Transformable::setScale ( const Vector2f & factors )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the [scale](#) function for more information. The default scale of a transformable object is 1.0 for both axes.

Parameters

factors New scale factors

See also

[scale](#), [getScale](#)

```
void sf::RectangleShape::setSize ( const Vector2f & size )
```

Set the size of the rectangle.

Parameters

size New size of the rectangle

See also

[getSize](#)

```
void sf::Shape::setTexture ( const Texture * texture,  
                             bool resetRect = false  
                             )
```

Change the source texture of the shape.

The *texture* argument refers to a texture that must exist as long as the shape does. The shape doesn't store its own copy of the texture, but rather keeps a pointer to the texture. If the source texture is destroyed and the shape tries to use the texture, a runtime error will occur. *texture* can be NULL to disable texturing. If *resetRect* is true, the texture rect is automatically adjusted to the size of the new texture. If it is false, the texture rect is not changed.

Parameters

texture New texture

resetRect Should the texture rect be reset to the size of the new texture

See also

[getTexture](#), [setTextureRect](#)

void sf::Shape::setTextureRect (const [IntRect](#) & **rect)**

Set the sub-rectangle of the texture that the shape will display.

The texture rect is useful when you don't want to display the whole texture. By default, the texture rect covers the entire texture.

Parameters

rect Rectangle defining the region of the texture to display

See also

[getTextureRect](#), [setTexture](#)

void sf::Shape::update ()

Recompute the internal geometry of the shape.

This function must be called by the derived class everytime the shape's geometry changes (either `getPointCount` or `getPoint` is different).

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

- [RectangleShape.hpp](#)

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[Public Member Functions](#) | [Public Attributes](#) | [Static Public Attributes](#) | [List of all members](#)

sf::RenderStates Class Reference

Graphics module

Define the states used for drawing to a [RenderTarget](#). [More...](#)

```
#include <RenderStates.hpp>
```

Public Member Functions

`RenderStates ()`

Default constructor. [More...](#)

`RenderStates (const BlendMode &theBlendMode)`

Construct a default set of render states with a custom blend mode. [Mo](#)

`RenderStates (const Transform &theTransform)`

Construct a default set of render states with a custom transform. [More](#)

`RenderStates (const Texture *theTexture)`

Construct a default set of render states with a custom texture. [More...](#)

`RenderStates (const Shader *theShader)`

Construct a default set of render states with a custom shader. [More...](#)

`RenderStates (const BlendMode &theBlendMode, const Transform &t
*theTexture, const Shader *theShader)`

Construct a set of render states with all its attributes. [More...](#)

Public Attributes

BlendMode `blendMode`
Blending mode. [More...](#)

Transform `transform`
Transform. [More...](#)

const Texture * `texture`
Texture. [More...](#)

const Shader * `shader`
Shader. [More...](#)

Static Public Attributes

static const RenderStates Default

Special instance holding the default render st

Detailed Description

Define the states used for drawing to a `RenderTarget`.

There are four global states that can be applied to the drawn objects:

- the blend mode: how pixels of the object are blended with the background
- the transform: how the object is positioned/rotated/scaled
- the texture: what image is mapped to the object
- the shader: what custom effect is applied to the object

High-level objects such as sprites or text force some of these states when drawn. For example, a `Sprite` will set its own texture, so that you don't have to care about it when drawing it.

The transform is a special case: sprites, texts and shapes (and it's also the case for some drawable classes too) combine their transform with the one that is passed to the `draw` function. So that you can use a "global" transform on top of each object's transform.

Most objects, especially high-level drawables, can be drawn directly without any special states – the default set of states is ok in most cases.

```
window.draw(sprite);
```

If you want to use a single specific render state, for example a shader, you can pass it to the `draw` function: `sf::RenderTarget` has an implicit one-argument constructor for each render state.

```
window.draw(sprite, shader);
```

When you're inside the `Draw` function of a drawable object (inherited from `Drawable`), you can pass the render states unmodified, or change some of them. For example:

combine the current transform with its own transform. A sprite will set its te

See also

[sf::RenderTarget](#), [sf::Drawable](#)

Definition at line 45 of file [RenderStates.hpp](#).

Constructor & Destructor Documentation

`sf::RenderStates::RenderStates ()`

Default constructor.

Constructing a default set of render states is equivalent to using `sf::RenderStates::Default` set defines:

- the BlendAlpha blend mode
- the identity transform
- a null texture
- a null shader

`sf::RenderStates::RenderStates (const BlendMode & theBlendMode)`

Construct a default set of render states with a custom blend mode.

Parameters

theBlendMode Blend mode to use

`sf::RenderStates::RenderStates (const Transform & theTransform)`

Construct a default set of render states with a custom transform.

Parameters

theTransform Transform to use

```
sf::RenderStates::RenderStates ( const Texture * theTexture )
```

Construct a default set of render states with a custom texture.

Parameters

theTexture Texture to use

```
sf::RenderStates::RenderStates ( const Shader * theShader )
```

Construct a default set of render states with a custom shader.

Parameters

theShader Shader to use

```
sf::RenderStates::RenderStates ( const BlendMode & theBlendMod  
                                const Transform & theTransform  
                                const Texture * theTexture,  
                                const Shader * theShader  
                                )
```

Construct a set of render states with all its attributes.

Parameters

theBlendMode Blend mode to use

theTransform Transform to use

theTexture Texture to use

theShader Shader to use

Member Data Documentation

BlendMode sf::RenderStates::blendMode

Blending mode.

Definition at line 115 of file [RenderStates.hpp](#).

const RenderStates sf::RenderStates::Default

Special instance holding the default render states.

Definition at line 110 of file [RenderStates.hpp](#).

const Shader* sf::RenderStates::shader

Shader.

Definition at line 118 of file [RenderStates.hpp](#).

const Texture* sf::RenderStates::texture

Texture.

Definition at line 117 of file [RenderStates.hpp](#).

Transform sf::RenderStates::transform

Transform.

Definition at line 116 of file [RenderStates.hpp](#).

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

- [RenderStates.hpp](#)

SFML 2.4.2

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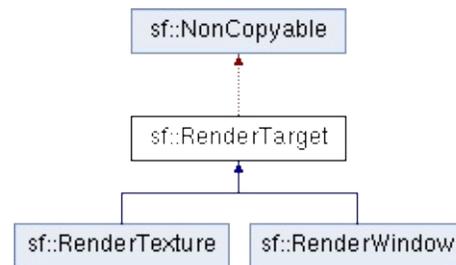
sf::RenderTarget Class Reference abstract

Graphics module

Base class for all render targets (window, texture, ...) [More...](#)

```
#include <RenderTarget.hpp>
```

Inheritance diagram for sf::RenderTarget:



Public Member Functions

virtual `~RenderTarget ()`
Destructor. [More...](#)

void `clear (const Color &color=Color(0, 0, 0, 255))`
Clear the entire target with a single color. [More...](#)

void `setView (const View &view)`
Change the current active view. [More...](#)

const `View &getView () const`
Get the view currently in use in the render target. [More...](#)

const `View &getDefaultView () const`
Get the default view of the render target. [More...](#)

`IntRect getViewport (const View &view) const`
Get the viewport of a view, applied to this render target.

`Vector2f mapPixelToCoords (const Vector2i &point) const`
Convert a point from target coordinates to world coordinates.
[More...](#)

`Vector2f mapPixelToCoords (const Vector2i &point, const View &view) const`
Convert a point from target coordinates to world coordinates.

`Vector2i mapCoordsToPixel (const Vector2f &point) const`
Convert a point from world coordinates to target coordinates.
[More...](#)

`Vector2i mapCoordsToPixel (const Vector2f &point, const View &view) const`
Convert a point from world coordinates to target coordinates.

void `draw` (const `Drawable` &drawable, const `RenderStates`
Draw a drawable object to the render target. [More...](#)

void `draw` (const `Vertex` *vertices, std::size_t vertexCount, `F`
`RenderStates` &states=`RenderStates::Default`)
Draw primitives defined by an array of vertices. [More...](#)

virtual `Vector2u` `getSize` () const =0
Return the size of the rendering region of the target. [More...](#)

void `pushGLStates` ()
Save the current OpenGL render states and matrices. [More...](#)

void `popGLStates` ()
Restore the previously saved OpenGL render states and matrices.

void `resetGLStates` ()
Reset the internal OpenGL states so that the target is ready for rendering.

Protected Member Functions

`RenderTarget ()`

Default constructor. [More...](#)

`void initialize ()`

Performs the common initialization step after creation. [More...](#)

Detailed Description

Base class for all render targets (window, texture, ...)

`sf::RenderTarget` defines the common behavior of all the 2D render target

It makes it possible to draw 2D entities like sprites, shapes, text withc directly.

A `sf::RenderTarget` is also able to use views (`sf::View`), which are a kind can globally scroll, rotate or zoom everything that is drawn, without havin See the documentation of `sf::View` for more details and sample pieces of c

On top of that, render targets are still able to render direct OpenGL stuff. OpenGL calls and regular SFML drawing commands. When doing so, m not messed up by calling the `pushGLStates/popGLStates` functions.

See also

`sf::RenderWindow`, `sf::RenderTexture`, `sf::View`

Definition at line 51 of file `RenderTarget.hpp`.

Constructor & Destructor Documentation

virtual sf::RenderTarget::~~RenderTarget ()

Destructor.

sf::RenderTarget::RenderTarget ()

Default constructor.

Member Function Documentation

```
void sf::RenderTarget::clear ( const Color & color = color(0, 0, 0, 255)
```

Clear the entire target with a single color.

This function is usually called once every frame, to clear the previous color.

Parameters

color Fill color to use to clear the render target

```
void sf::RenderTarget::draw ( const Drawable & drawable,  
                             const RenderStates & states = RenderStates::Default  
                             )
```

Draw a drawable object to the render target.

Parameters

drawable Object to draw

states Render states to use for drawing

```
void sf::RenderTarget::draw ( const Vertex * vertices,  
                             std::size_t vertexCount,  
                             PrimitiveType type,  
                             const RenderStates & states = RenderStates::Default  
                             )
```

Draw primitives defined by an array of vertices.

Parameters

vertices	Pointer to the vertices
vertexCount	Number of vertices in the array
type	Type of primitives to draw
states	Render states to use for drawing

const View& sf::RenderTarget::getDefaultView () const

Get the default view of the render target.

The default view has the initial size of the render target, and never ch created.

Returns

The default view of the render target

See also

[setView](#), [getView](#)

virtual Vector2u sf::RenderTarget::getSize () const

Return the size of the rendering region of the target.

Returns

Size in pixels

Implemented in [sf::RenderTexture](#), and [sf::RenderWindow](#).

const View& sf::RenderTarget::getView () const

Get the view currently in use in the render target.

Returns

The view object that is currently used

See also

[setView](#), [getDefaultView](#)

IntRect sf::RenderTarget::getViewport (const View & view) const

Get the viewport of a view, applied to this render target.

The viewport is defined in the view as a ratio, this function simply scales the dimensions of the render target to calculate the pixels rectangle that the view covers in the target.

Parameters

view The view for which we want to compute the viewport

Returns

Viewport rectangle, expressed in pixels

void sf::RenderTarget::initialize ()

Performs the common initialization step after creation.

The derived classes must call this function after the target is created and

Vector2i sf::RenderTarget::mapCoordsToPixel (const Vector2f & point, const View & view)

Convert a point from world coordinates to target coordinates, using the current view.

This function is an overload of the `mapCoordsToPixel` function that implements the same logic as the `mapCoordsToPixel` function that is equivalent to:

```
target.mapCoordsToPixel(point, target.getView());
```

Parameters

point Point to convert

Returns

The converted point, in target coordinates (pixels)

See also

`mapPixelToCoords`

Vector2i sf::RenderTarget::mapCoordsToPixel (const Vector2f & point, const View & view)

Convert a point from world coordinates to target coordinates.

This function finds the pixel of the render target that matches the given point through the same process as the graphics card, to compute the final position.

Initially, both coordinate systems (world units and target pixels) match. However, when you create a custom view or resize your render target, this assertion is not true anymore. For example, the point (75, 75) in your 2D world may map to the pixel (10, 50) of your render target (140, 25).

This version uses a custom view for calculations, see the other overload to use the current view of the render target.

Parameters

point Point to convert

view The view to use for converting the point

Returns

The converted point, in target coordinates (pixels)

See also

[mapPixelToCoords](#)

Vector2f `sf::RenderTarget::mapPixelToCoords (const Vector2i & point)`

Convert a point from target coordinates to world coordinates, using the current view.

This function is an overload of the `mapPixelToCoords` function that is equivalent to:

```
target.mapPixelToCoords(point, target.getView());
```

Parameters

point Pixel to convert

Returns

The converted point, in "world" coordinates

See also

[mapCoordsToPixel](#)

```
Vector2f sf::RenderTarget::mapPixelToCoords ( const Vector2i & p  
                                                const View & vi  
                                                )                cc
```

Convert a point from target coordinates to world coordinates.

This function finds the 2D position that matches the given pixel of the does the inverse of what the graphics card does, to find the initial position

Initially, both coordinate systems (world units and target pixels) match custom view or resize your render target, this assertion is not true any (50) in your render target may map to the point (150, 75) in your 2D world (140, 25).

For render-windows, this function is typically used to find which point mouse cursor.

This version uses a custom view for calculations, see the other overload use the current view of the render target.

Parameters

point Pixel to convert

view The view to use for converting the point

Returns

The converted point, in "world" units

See also

[mapCoordsToPixel](#)

```
void sf::RenderTarget::popGLStates ( )
```

Restore the previously saved OpenGL render states and matrices.

See the description of `pushGLStates` to get a detailed description of thes

See also

[pushGLStates](#)

`void sf::RenderTarget::pushGLStates ()`

Save the current OpenGL render states and matrices.

This function can be used when you mix SFML drawing and direct Op
`popGLStates`, it ensures that:

- SFML's internal states are not messed up by your OpenGL code
- your OpenGL states are not modified by a call to a SFML function

More specifically, it must be used around code that calls Draw functions.

```
// OpenGL code here...  
window.pushGLStates();  
window.draw(...);  
window.draw(...);  
window.popGLStates();  
// OpenGL code here...
```

Note that this function is quite expensive: it saves all the possible OpenC
ones you don't care about. Therefore it should be used wisely. It is pr
best results will be achieved if you handle OpenGL states yourself (beca
really changed, and need to be saved and restored). Take a look at the
so.

See also

popGLStates

void sf::RenderTarget::resetGLStates ()

Reset the internal OpenGL states so that the target is ready for drawing.

This function can be used when you mix SFML drawing and direct OpenGL to use pushGLStates/popGLStates. It makes sure that all OpenGL states that subsequent `draw()` calls will work as expected.

Example:

```
// OpenGL code here...
glPushAttrib(...);
window.resetGLStates();
window.draw(...);
window.draw(...);
glPopAttrib(...);
// OpenGL code here...
```

void sf::RenderTarget::setView (const View & view)

Change the current active view.

The view is like a 2D camera, it controls which part of the 2D scene is visible to the render target. The new view will affect everything that is drawn, until the render target keeps its own copy of the view object, so it is not necessary to call this function. To restore the original view of the target, you can pass the original view to this function.

Parameters

view New view to use

See also

`getView, getDefaultView`

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

- `RenderTarget.hpp`

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SFML 2.4.2

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[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#)

[Public Member Functions](#) | [Protected Member Functions](#) | [List of all members](#)

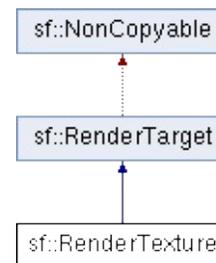
sf::RenderTarget Class Reference

Graphics module

Target for off-screen 2D rendering into a texture. [More...](#)

```
#include <RenderTarget.hpp>
```

Inheritance diagram for sf::RenderTarget:



Public Member Functions

`RenderTexture ()`
Default constructor. [More...](#)

`virtual ~RenderTexture ()`
Destructor. [More...](#)

`bool create (unsigned int width, unsigned int height, bool de)`
Create the render-texture. [More...](#)

`void setSmooth (bool smooth)`
Enable or disable texture smoothing. [More...](#)

`bool isSmooth () const`
Tell whether the smooth filtering is enabled or not. [More...](#)

`void setRepeated (bool repeated)`
Enable or disable texture repeating. [More...](#)

`bool isRepeated () const`
Tell whether the texture is repeated or not. [More...](#)

`bool generateMipmap ()`
Generate a mipmap using the current texture data. [Mor...](#)

`bool setActive (bool active=true)`
Activate or deactivate the render-texture for rendering. [Mor...](#)

`void display ()`
Update the contents of the target texture. [More...](#)

`virtual Vector2u getSize () const`

Return the size of the rendering region of the texture. [More...](#)

`const Texture & getTexture () const`
Get a read-only reference to the target texture. [More...](#)

`void clear (const Color &color=Color(0, 0, 0, 255))`
Clear the entire target with a single color. [More...](#)

`void setView (const View &view)`
Change the current active view. [More...](#)

`const View & getView () const`
Get the view currently in use in the render target. [More...](#)

`const View & getDefaultView () const`
Get the default view of the render target. [More...](#)

`IntRect getViewport (const View &view) const`
Get the viewport of a view, applied to this render target.

`Vector2f mapPixelToCoords (const Vector2i &point) const`
Convert a point from target coordinates to world coordinates.
[More...](#)

`Vector2f mapPixelToCoords (const Vector2i &point, const View &view) const`
Convert a point from target coordinates to world coordinates.

`Vector2i mapCoordsToPixel (const Vector2f &point) const`
Convert a point from world coordinates to target coordinates.
[More...](#)

`Vector2i mapCoordsToPixel (const Vector2f &point, const View &view) const`
Convert a point from world coordinates to target coordinates.

`void draw (const Drawable &drawable, const RenderStates &states) const`

Draw a drawable object to the render target. [More...](#)

void `draw` (const `Vertex` *vertices, std::size_t vertexCount, `RenderStates` &states=`RenderStates::Default`)
Draw primitives defined by an array of vertices. [More...](#)

void `pushGLStates` ()
Save the current OpenGL render states and matrices. [More...](#)

void `popGLStates` ()
Restore the previously saved OpenGL render states and matrices. [More...](#)

void `resetGLStates` ()
Reset the internal OpenGL states so that the target is rendered with the default states. [More...](#)

Protected Member Functions

void `initialize` ()

Performs the common initialization step after creation. [More...](#)

Detailed Description

Target for off-screen 2D rendering into a texture.

`sf::RenderTexture` is the little brother of `sf::RenderWindow`.

It implements the same 2D drawing and OpenGL-related functions (see [sf::RenderWindow](#) for more details), the difference is that the result is stored in an off-screen texture instead of a window.

Rendering to a texture can be useful in a variety of situations:

- precomputing a complex static texture (like a level's background from a 3D scene)
- applying post-effects to the whole scene with shaders
- creating a sprite from a 3D object rendered with OpenGL
- etc.

Usage example:

```
// Create a new render-window
sf::RenderWindow window(sf::VideoMode(800, 600), "SFML window");

// Create a new render-texture
sf::RenderTexture texture;
if (!texture.create(500, 500))
    return -1;

// The main loop
while (window.isOpen())
{
    // Event processing
    // ...

    // Clear the whole texture with red color
    texture.clear(sf::Color::Red);

    // Draw stuff to the texture
    texture.draw(sprite); // sprite is a sf::Sprite
```

```
texture.draw(shape); // shape is a sf::Shape
texture.draw(text); // text is a sf::Text

// We're done drawing to the texture
texture.display();

// Now we start rendering to the window, clear it first
window.clear();

// Draw the texture
sf::Sprite sprite(texture.getTexture());
window.draw(sprite);

// End the current frame and display its contents on screen
window.display();
}
```

Like `sf::RenderWindow`, `sf::RenderTarget` is still able to render direct OpenGL calls and regular SFML drawing commands. If rendering, don't forget to request it when calling `RenderTarget::create`.

See also

`sf::RenderTarget`, `sf::RenderWindow`, `sf::View`, `sf::Texture`

Definition at line 47 of file `RenderTarget.hpp`.

Constructor & Destructor Documentation

sf::RenderTexture::RenderTexture ()

Default constructor.

Constructs an empty, invalid render-texture. You must call `create` to have

See also

[create](#)

virtual sf::RenderTexture::~~RenderTexture ()

Destructor.

Member Function Documentation

```
void sf::RenderTarget::clear ( const Color & color = color(0, 0, 0, 255) )
```

Clear the entire target with a single color.

This function is usually called once every frame, to clear the previous color.

Parameters

color Fill color to use to clear the render target

```
bool sf::RenderTexture::create ( unsigned int width,  
                                unsigned int height,  
                                bool depthBuffer = false  
                                )
```

Create the render-texture.

Before calling this function, the render-texture is in an invalid state, thus you should not do anything with the render-texture. The last parameter, *depthBuffer*, is only used for 3D OpenGL rendering that requires a depth buffer. (You should leave this parameter to false (which is its default value)).

Parameters

width Width of the render-texture

height Height of the render-texture

depthBuffer Do you want this render-texture to have a depth buffer

Returns

True if creation has been successful

void sf::RenderTarget::display ()

Update the contents of the target texture.

This function updates the target texture with what has been drawn so far. This function is mandatory at the end of rendering. Not calling it may leave the

void sf::RenderTarget::draw (const Drawable & drawable, const RenderStates & states = RenderStates::Default)

Draw a drawable object to the render target.

Parameters

drawable Object to draw

states Render states to use for drawing

void sf::RenderTarget::draw (const Vertex * vertices, std::size_t vertexCount, PrimitiveType type, const RenderStates & states = RenderStates::Default)

Draw primitives defined by an array of vertices.

Parameters

vertices	Pointer to the vertices
vertexCount	Number of vertices in the array
type	Type of primitives to draw
states	Render states to use for drawing

bool sf::RenderTarget::generateMipmap ()

Generate a mipmap using the current texture data.

This function is similar to [Texture::generateMipmap](#) and operates on the drawing. Be aware that any draw operation may modify the base level; calling this function only makes sense after all drawing is completed and calling [display](#) after subsequent drawing will lead to undefined behavior.

Returns

True if mipmap generation was successful, false if unsuccessful

const [View](#)& sf::RenderTarget::getDefaultView () const

Get the default view of the render target.

The default view has the initial size of the render target, and never changes.

Returns

The default view of the render target

See also

[setView](#), [getView](#)

virtual `Vector2u` `sf::RenderTarget::getSize () const`

Return the size of the rendering region of the texture.

The returned value is the size that you passed to the create function.

Returns

Size in pixels

Implements `sf::RenderTarget`.

const `Texture&` `sf::RenderTarget::getTexture () const`

Get a read-only reference to the target texture.

After drawing to the render-texture and calling `Display`, you can retrieve function, and draw it using a sprite (for example). The internal `sf::Texture` the same instance, so that it is possible to call this function once and even after it is modified.

Returns

Const reference to the texture

const `View&` `sf::RenderTarget::getView () const`

Get the view currently in use in the render target.

Returns

The view object that is currently used

See also

[setView](#), [getDefaultView](#)

IntRect sf::RenderTarget::getViewport (const View & view) const

Get the viewport of a view, applied to this render target.

The viewport is defined in the view as a ratio, this function simply multiplies the dimensions of the render target to calculate the pixels rectangle that the view covers on the target.

Parameters

view The view for which we want to compute the viewport

Returns

Viewport rectangle, expressed in pixels

void sf::RenderTarget::initialize ()

Performs the common initialization step after creation.

The derived classes must call this function after the target is created and before the first draw call.

bool sf::RenderTexture::isRepeated () const

Tell whether the texture is repeated or not.

Returns

True if texture is repeated

See also

[setRepeated](#)

bool sf::RenderTarget::isSmooth () const

Tell whether the smooth filtering is enabled or not.

Returns

True if texture smoothing is enabled

See also

[setSmooth](#)

Vector2i sf::RenderTarget::mapCoordsToPixel (const Vector2f & p

Convert a point from world coordinates to target coordinates, using the c

This function is an overload of the mapCoordsToPixel function that imp
equivalent to:

```
target.mapCoordsToPixel(point, target.getView());
```

Parameters

point Point to convert

Returns

The converted point, in target coordinates (pixels)

See also

[mapPixelToCoords](#)

```
Vector2i sf::RenderTarget::mapCoordsToPixel ( const Vector2f & point, const View & view )
```

Convert a point from world coordinates to target coordinates.

This function finds the pixel of the render target that matches the given point through the same process as the graphics card, to compute the final position.

Initially, both coordinate systems (world units and target pixels) match. If you use a custom view or resize your render target, this assertion is not true anymore. For example, the point (75, 75) in your 2D world may map to the pixel (10, 50) of your render target (140, 25).

This version uses a custom view for calculations, see the other overload if you want to use the current view of the render target.

Parameters

point Point to convert

view The view to use for converting the point

Returns

The converted point, in target coordinates (pixels)

See also

[mapPixelToCoords](#)

```
Vector2f sf::RenderTarget::mapPixelToCoords ( const Vector2i & point )
```

Convert a point from target coordinates to world coordinates, using the current view.

This function is an overload of the `mapPixelToCoords` function that is equivalent to:

```
target.mapPixelToCoords(point, target.getView());
```

Parameters

point Pixel to convert

Returns

The converted point, in "world" coordinates

See also

`mapCoordsToPixel`

```
Vector2f sf::RenderTarget::mapPixelToCoords ( const Vector2i & point, const View & view ) const
```

Convert a point from target coordinates to world coordinates.

This function finds the 2D position that matches the given pixel of the target. It does the inverse of what the graphics card does, to find the initial position of a pixel on the screen.

Initially, both coordinate systems (world units and target pixels) match. However, if you use a custom view or resize your render target, this assertion is not true any more. For example, a pixel at (50, 50) in your render target may map to the point (150, 75) in your 2D world. A pixel at (140, 25) in your render target may map to the point (140, 25) in your 2D world.

For render-windows, this function is typically used to find which point on the window the mouse cursor is over.

This version uses a custom view for calculations, see the other overload for more information.

use the current view of the render target.

Parameters

point Pixel to convert

view The view to use for converting the point

Returns

The converted point, in "world" units

See also

[mapCoordsToPixel](#)

void sf::RenderTarget::popGLStates ()

Restore the previously saved OpenGL render states and matrices.

See the description of [pushGLStates](#) to get a detailed description of this

See also

[pushGLStates](#)

void sf::RenderTarget::pushGLStates ()

Save the current OpenGL render states and matrices.

This function can be used when you mix SFML drawing and direct OpenGL drawing. When you call [pushGLStates](#), it ensures that:

- SFML's internal states are not messed up by your OpenGL code
- your OpenGL states are not modified by a call to a SFML function

More specifically, it must be used around code that calls Draw functions.

```
// OpenGL code here...
window.pushGLStates();
window.draw(...);
window.draw(...);
window.popGLStates();
// OpenGL code here...
```

Note that this function is quite expensive: it saves all the possible OpenGL states you don't care about. Therefore it should be used wisely. It is possible that the best results will be achieved if you handle OpenGL states yourself (because they are really changed, and need to be saved and restored). Take a look at the [SO](#).

See also

[popGLStates](#)

void sf::RenderTarget::resetGLStates ()

Reset the internal OpenGL states so that the target is ready for drawing.

This function can be used when you mix SFML drawing and direct OpenGL calls. It makes sure that all OpenGL states that have been changed since the last call to `resetGLStates()` are restored so that subsequent `draw()` calls will work as expected.

Example:

```
// OpenGL code here...
glPushAttrib(...);
window.resetGLStates();
window.draw(...);
window.draw(...);
glPopAttrib(...);
// OpenGL code here...
```

bool sf::RenderTexture::setActive (bool **active = true)**

Activate or deactivate the render-texture for rendering.

This function makes the render-texture's context current for future OpenGL calls (you shouldn't care about it if you're not doing direct OpenGL stuff). Only one thread can be the current context, so if you want to draw OpenGL geometry to another render target, you must first forget to activate it again.

Parameters

active True to activate, false to deactivate

Returns

True if operation was successful, false otherwise

void sf::RenderTexture::setRepeated (bool **repeated)**

Enable or disable texture repeating.

This function is similar to [Texture::setRepeated](#). This parameter is disabled by default.

Parameters

repeated True to enable repeating, false to disable it

See also

[isRepeated](#)

void sf::RenderTexture::setSmooth (bool **smooth)**

Enable or disable texture smoothing.

This function is similar to [Texture::setSmooth](#). This parameter is disabled

Parameters

smooth True to enable smoothing, false to disable it

See also

[isSmooth](#)

void sf::RenderTarget::setView (const [View](#) & view)

Change the current active view.

The view is like a 2D camera, it controls which part of the 2D scene is visible in the render target. The new view will affect everything that is drawn, until the render target keeps its own copy of the view object, so it is not necessary to call this function. To restore the original view of the target, you can pass the original view to this function.

Parameters

view New view to use

See also

[getView](#), [getDefaultView](#)

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

- [RenderTarget.hpp](#)

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[Public Member Functions](#) | [Protected Member Functions](#) | [List of all members](#)

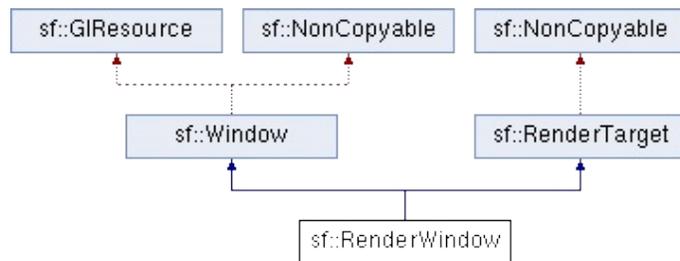
sf::RenderWindow Class Reference

Graphics module

Window that can serve as a target for 2D drawing. [More...](#)

```
#include <RenderWindow.hpp>
```

Inheritance diagram for sf::RenderWindow:



Public Member Functions

`RenderWindow ()`
Default constructor. [More...](#)

`RenderWindow (VideoMode mode, const String &title, const Style::Default, const ContextSettings &settings)`
Construct a new window. [More...](#)

`RenderWindow (WindowHandle handle, const ContextSettings &settings=ContextSettings())`
Construct the window from an existing control.

`virtual ~RenderWindow ()`
Destructor. [More...](#)

`virtual Vector2u getSize () const`
Get the size of the rendering region of the window.

`Image capture () const`
Copy the current contents of the window to an image.

`void create (VideoMode mode, const String &title, const ContextSettings &settings=ContextSettings())`
Create (or recreate) the window. [More...](#)

`void create (WindowHandle handle, const ContextSettings &settings=ContextSettings())`
Create (or recreate) the window from an existing control.

`void close ()`
Close the window and destroy all the attached objects.

bool `isOpen () const`
Tell whether or not the window is open. [More...](#)

const `ContextSettings & getSettings () const`
Get the settings of the OpenGL context of the v

bool `pollEvent (Event &event)`
Pop the event on top of the event queue, if any

bool `waitEvent (Event &event)`
Wait for an event and return it. [More...](#)

`Vector2i getPosition () const`
Get the position of the window. [More...](#)

void `setPosition (const Vector2i &position)`
Change the position of the window on screen. l

void `setSize (const Vector2u &size)`
Change the size of the rendering region of the '

void `setTitle (const String &title)`
Change the title of the window. [More...](#)

void `setIcon (unsigned int width, unsigned int height)`
Change the window's icon. [More...](#)

void `setVisible (bool visible)`
Show or hide the window. [More...](#)

void `setVerticalSyncEnabled (bool enabled)`
Enable or disable vertical synchronization. Mor

void `setMouseCursorVisible (bool visible)`
Show or hide the mouse cursor. [More...](#)

void `setMouseCursorGrabbed` (bool grabbed)
Grab or release the mouse cursor. [More...](#)

void `setKeyRepeatEnabled` (bool enabled)
Enable or disable automatic key-repeat. [More..](#)

void `setFramerateLimit` (unsigned int limit)
Limit the framerate to a maximum fixed frequer

void `setJoystickThreshold` (float threshold)
Change the joystick threshold. [More...](#)

bool `setActive` (bool active=true) const
Activate or deactivate the window as the curren
[More...](#)

void `requestFocus` ()
Request the current window to be made the ac

bool `hasFocus` () const
Check whether the window has the input focus

void `display` ()
Display on screen what has been rendered to t

`WindowHandle` `getSystemHandle` () const
Get the OS-specific handle of the window. [Mor](#)

void `clear` (const `Color` &color=`Color`(0, 0, 0, 255))
Clear the entire target with a single color. [More](#)

void `setView` (const `View` &view)
Change the current active view. [More...](#)

`const View & getView () const`
Get the view currently in use in the render target.

`const View & getDefaultView () const`
Get the default view of the render target. [More.](#)

`IntRect getViewport (const View &view) const`
Get the viewport of a view, applied to this render target.

`Vector2f mapPixelToCoords (const Vector2i &point) const`
Convert a point from target coordinates to world coordinates. [More...](#)

`Vector2f mapPixelToCoords (const Vector2i &point, const View &view) const`
Convert a point from target coordinates to world coordinates. [More...](#)

`Vector2i mapCoordsToPixel (const Vector2f &point) const`
Convert a point from world coordinates to target coordinates. [More...](#)

`Vector2i mapCoordsToPixel (const Vector2f &point, const View &view) const`
Convert a point from world coordinates to target coordinates. [More...](#)

`void draw (const Drawable &drawable, const RenderStates &states=RenderStates::Default)`
Draw a drawable object to the render target. [More...](#)

`void draw (const Vertex *vertices, std::size_t vertexCount, const RenderStates &states=RenderStates::Default)`
Draw primitives defined by an array of vertices. [More...](#)

`void pushGLStates ()`
Save the current OpenGL render states and matrices. [More...](#)

`void popGLStates ()`
Restore the previously saved OpenGL render states and matrices. [More...](#)

```
void resetGLStates ()
```

```
Reset the internal OpenGL states so that the ta
```

```
More...
```

Protected Member Functions

virtual void [onCreate \(\)](#)

Function called after the window has been created. [More...](#)

virtual void [onResize \(\)](#)

Function called after the window has been resized. [More...](#)

void [initialize \(\)](#)

Performs the common initialization step after creation. [More.](#)

Detailed Description

`Window` that can serve as a target for 2D drawing.

`sf::RenderWindow` is the main class of the Graphics module.

It defines an OS window that can be painted using the other classes of the

`sf::RenderWindow` is derived from `sf::Window`, thus it inherits all its features (OpenGL rendering, etc. See the documentation of `sf::Window` for a more features, as well as code examples.

On top of that, `sf::RenderWindow` adds more features related to 2D drawing (see its base class `sf::RenderTarget` for more details). Here is a typical rendering loop for `sf::RenderWindow`:

```
// Declare and create a new render-window
sf::RenderWindow window(sf::VideoMode(800, 600), "SFML window");

// Limit the framerate to 60 frames per second (this step is optional)
window.setFramerateLimit(60);

// The main loop - ends as soon as the window is closed
while (window.isOpen())
{
    // Event processing
    sf::Event event;
    while (window.pollEvent(event))
    {
        // Request for closing the window
        if (event.type == sf::Event::Closed)
            window.close();
    }

    // Clear the whole window before rendering a new frame
    window.clear();

    // Draw some graphical entities
    window.draw(sprite);
    window.draw(circle);
}
```

```

    window.draw(text);

    // End the current frame and display its contents on screen
    window.display();
}

```

Like `sf::Window`, `sf::RenderWindow` is still able to render direct OpenGL together OpenGL calls and regular SFML drawing commands.

```

// Create the render window
sf::RenderWindow window(sf::VideoMode(800, 600), "SFML OpenGL");

// Create a sprite and a text to display
sf::Sprite sprite;
sf::Text text;
...

// Perform OpenGL initializations
glMatrixMode(GL_PROJECTION);
...

// Start the rendering loop
while (window.isOpen())
{
    // Process events
    ...

    // Draw a background sprite
    window.pushGLStates();
    window.draw(sprite);
    window.popGLStates();

    // Draw a 3D object using OpenGL
    glBegin(GL_QUADS);
        glVertex3f(...);
        ...
    glEnd();

    // Draw text on top of the 3D object
    window.pushGLStates();
    window.draw(text);
    window.popGLStates();

    // Finally, display the rendered frame on screen
    window.display();
}

```

See also

`sf::Window`, `sf::RenderTarget`, `sf::RenderTexture`, `sf::View`

Definition at line 44 of file `RenderWindow.hpp`.

Constructor & Destructor Documentation

`sf::RenderWindow::RenderWindow ()`

Default constructor.

This constructor doesn't actually create the window, use the other constr

```
sf::RenderWindow::RenderWindow ( VideoMode mode, mode  
                                const String & title, mode  
                                Uint32 style, style  
                                const ContextSettings & settings, settin  
                                )
```

Construct a new window.

This constructor creates the window with the size and pixel depth define be passed to customize the look and behavior of the window (borders, tit

The fourth parameter is an optional structure specifying advanced Op antialiasing, depth-buffer bits, etc. You shouldn't care about these paran graphics module.

Parameters

- mode** Video mode to use (defines the width, height and depth of window)
- title** Title of the window
- style** Window style, a bitwise OR combination of `sf::Style` enum

settings Additional settings for the underlying OpenGL context

```
sf::RenderWindow::RenderWindow ( WindowHandle handle, const ContextSettings & settings )
```

Construct the window from an existing control.

Use this constructor if you want to create an SFML rendering area into an existing control.

The second parameter is an optional structure specifying advanced OpenGL settings such as antialiasing, depth-buffer bits, etc. You shouldn't care about these parameters if you are using the SFML graphics module.

Parameters

handle Platform-specific handle of the control (*HWND* on Windows, *NSWindow* on OS X)

settings Additional settings for the underlying OpenGL context

```
virtual sf::RenderWindow::~RenderWindow ( )
```

Destructor.

Closes the window and frees all the resources attached to it.

Member Function Documentation

Image sf::RenderWindow::capture () const

Copy the current contents of the window to an image.

Deprecated:

Use a `sf::Texture` and its `sf::Texture::update(const Window&)` function and `sf::Image` instead.

```
sf::Vector2u windowSize = window.getSize();
sf::Texture texture;
texture.create(windowSize.x, windowSize.y);
texture.update(window);
sf::Image screenshot = texture.copyToImage();
```

This is a slow operation, whose main purpose is to make screenshots. To update an image with the contents of the window and then use it for drawing, use `sf::Texture` and its `update(Window&)` function. You can also draw this image using the `sf::RenderTexture` class.

Returns

`Image` containing the captured contents

void sf::RenderTarget::clear (const Color & color = color(0, 0, 0, 255))

Clear the entire target with a single color.

This function is usually called once every frame, to clear the previous contents.

Parameters

color Fill color to use to clear the render target

`void sf::Window::close ()`

Close the window and destroy all the attached resources.

After calling this function, the `sf::Window` instance remains valid and you can still use it to poll events (e.g. `pollEvent()` or `display()` will still work even if `isOpen()` returns `false` every time), and will have no effect on closed windows.

```
void sf::Window::create ( VideoMode mode,
                        const String & title,
                        Uint32 style = Style::Default,
                        const ContextSettings & settings = ContextSettings() )
```

Create (or recreate) the window.

If the window was already created, it closes it first. If `style` contains `Style::Default`, it uses a valid video mode.

The fourth parameter is an optional structure specifying advanced OpenGL settings such as antialiasing, depth-buffer bits, etc.

Parameters

mode Video mode to use (defines the width, height and depth of window)

title Title of the window

style Window style, a bitwise OR combination of `sf::Style` enum values

settings Additional settings for the underlying OpenGL context

```
void sf::Window::create ( WindowHandle handle,
                        const ContextSettings & settings = ContextSettings()
                      )
```

Create (or recreate) the window from an existing control.

Use this function if you want to create an OpenGL rendering area into a window that was already created, it closes it first.

The second parameter is an optional structure specifying advanced OpenGL settings such as antialiasing, depth-buffer bits, etc.

Parameters

handle Platform-specific handle of the control

settings Additional settings for the underlying OpenGL context

```
void sf::Window::display ( )
```

Display on screen what has been rendered to the window so far.

This function is typically called after all OpenGL rendering has been done to show it on screen.

```
void sf::RenderTarget::draw ( const Drawable & drawable,
                             const RenderStates & states = RenderStates()
                           )
```

Draw a drawable object to the render target.

Parameters

drawable Object to draw
states Render states to use for drawing

```
void sf::RenderTarget::draw ( const Vertex *      vertices,  
                             std::size_t      vertexCount,  
                             PrimitiveType     type,  
                             const RenderStates & states = RenderStates::Default  
                             )
```

Draw primitives defined by an array of vertices.

Parameters

vertices Pointer to the vertices
vertexCount Number of vertices in the array
type Type of primitives to draw
states Render states to use for drawing

```
const View& sf::RenderTarget::getDefaultView ( ) const
```

Get the default view of the render target.

The default view has the initial size of the render target, and never changes.

Returns

The default view of the render target

See also

[setView](#), [getView](#)

Vector2i sf::Window::getPosition () const

Get the position of the window.

Returns

Position of the window, in pixels

See also

[setPosition](#)

const ContextSettings& sf::Window::getSettings () const

Get the settings of the OpenGL context of the window.

Note that these settings may be different from what was passed to function, if one or more settings were not supported. In this case, SFML (

Returns

Structure containing the OpenGL context settings

virtual Vector2u sf::RenderWindow::getSize () const

Get the size of the rendering region of the window.

The size doesn't include the titlebar and borders of the window.

Returns

Size in pixels

Implements [sf::RenderTarget](#).

WindowHandle sf::Window::getSystemHandle () const

Get the OS-specific handle of the window.

The type of the returned handle is sf::WindowHandle, which is a type defined by the OS. You shouldn't need to use this function, unless you have very old OSes that SFML doesn't support, or implement a temporary workaround until a bug is fixed.

Returns

System handle of the window

const View& sf::RenderTarget::getView () const

Get the view currently in use in the render target.

Returns

The view object that is currently used

See also

[setView](#), [getDefaultView](#)

IntRect sf::RenderTarget::getViewport (const **View** & **view**) const

Get the viewport of a view, applied to this render target.

The viewport is defined in the view as a ratio, this function simply multiplies the dimensions of the render target to calculate the pixels rectangle that the view covers on the target.

Parameters

view The view for which we want to compute the viewport

Returns

Viewport rectangle, expressed in pixels

bool sf::Window::hasFocus () const

Check whether the window has the input focus.

At any given time, only one window may have the input focus to receive or most mouse events.

Returns

True if window has focus, false otherwise

See also

[requestFocus](#)

void sf::RenderTarget::initialize ()

Performs the common initialization step after creation.

The derived classes must call this function after the target is created and

bool sf::Window::isOpen () const

Tell whether or not the window is open.

This function returns whether or not the window exists. Note that a hidden window is not open (therefore this function would return false).

Returns

True if the window is open, false if it has been closed

Vector2i sf::RenderTarget::mapCoordsToPixel (const **Vector2f** & point)

Convert a point from world coordinates to target coordinates, using the current view.

This function is an overload of the mapCoordsToPixel function that implements the same logic as the following code snippet:

```
target.mapCoordsToPixel(point, target.getView());
```

Parameters

point Point to convert

Returns

The converted point, in target coordinates (pixels)

See also

[mapPixelToCoords](#)

Vector2i sf::RenderTarget::mapCoordsToPixel (const **Vector2f** & point, const **View** & view)

Convert a point from world coordinates to target coordinates.

This function finds the pixel of the render target that matches the given

through the same process as the graphics card, to compute the final position.

Initially, both coordinate systems (world units and target pixels) match. If you change the view or resize your render target, this assertion is not true anymore. For example, the point (140, 75) in your 2D world may map to the pixel (10, 50) of your render target.

This version uses a custom view for calculations, see the other overload. If you don't specify a view, it will use the current view of the render target.

Parameters

point Point to convert

view The view to use for converting the point

Returns

The converted point, in target coordinates (pixels)

See also

[mapPixelToCoords](#)

Vector2f sf::RenderTarget::mapPixelToCoords (const **Vector2i** & point)

Convert a point from target coordinates to world coordinates, using the current view.

This function is an overload of the mapPixelToCoords function that is equivalent to:

```
target.mapPixelToCoords(point, target.getView());
```

Parameters

point Pixel to convert

Returns

The converted point, in "world" coordinates

See also

[mapCoordsToPixel](#)

```
Vector2f sf::RenderTarget::mapPixelToCoords ( const Vector2i & p  
                                             const View & v  
                                             )
```

Convert a point from target coordinates to world coordinates.

This function finds the 2D position that matches the given pixel of the does the inverse of what the graphics card does, to find the initial position.

Initially, both coordinate systems (world units and target pixels) match. However, if you use a custom view or resize your render target, this assertion is not true any more. For example, a point (50, 50) in your render target may map to the point (150, 75) in your 2D world coordinates (140, 25).

For render-windows, this function is typically used to find which point on the window the mouse cursor is pointing to.

This version uses a custom view for calculations, see the other overload if you want to use the current view of the render target.

Parameters

point Pixel to convert

view The view to use for converting the point

Returns

The converted point, in "world" units

See also

mapCoordsToPixel

virtual void sf::RenderWindow::onCreate ()

Function called after the window has been created.

This function is called so that derived classes can perform their own special actions when the window is created.

Reimplemented from [sf::Window](#).

virtual void sf::RenderWindow::onResize ()

Function called after the window has been resized.

This function is called so that derived classes can perform custom actions when the window is resized.

Reimplemented from [sf::Window](#).

bool sf::Window::pollEvent ([Event](#) & event)

Pop the event on top of the event queue, if any, and return it.

This function is not blocking: if there's no pending event then it will return false. Note that more than one event may be present in the event queue, so you should call this function in a loop to make sure that you process every pending event.

```
sf::Event event;  
while (window.pollEvent(event))
```

```
{  
  // process event...  
}
```

Parameters

event `Event` to be returned

Returns

True if an event was returned, or false if the event queue was empty

See also

`waitEvent`

`void sf::RenderTarget::popGLStates ()`

Restore the previously saved OpenGL render states and matrices.

See the description of `pushGLStates` to get a detailed description of these

See also

`pushGLStates`

`void sf::RenderTarget::pushGLStates ()`

Save the current OpenGL render states and matrices.

This function can be used when you mix SFML drawing and direct OpenGL. When you call `popGLStates`, it ensures that:

- SFML's internal states are not messed up by your OpenGL code
- your OpenGL states are not modified by a call to a SFML function

More specifically, it must be used around code that calls Draw functions.

```
// OpenGL code here...
window.pushGLStates();
window.draw(...);
window.draw(...);
window.popGLStates();
// OpenGL code here...
```

Note that this function is quite expensive: it saves all the possible OpenGL states you don't care about. Therefore it should be used wisely. It is possible that the best results will be achieved if you handle OpenGL states yourself (because they are really changed, and need to be saved and restored). Take a look at the [SO](#).

See also

[popGLStates](#)

void sf::Window::requestFocus ()

Request the current window to be made the active foreground window.

At any given time, only one window may have the input focus to receive keyboard or mouse events. If a window requests focus, it only hints to the operating system that it is focused. The operating system is free to deny the request. This is not to

See also

[hasFocus](#)

void sf::RenderTarget::resetGLStates ()

Reset the internal OpenGL states so that the target is ready for drawing.

This function can be used when you mix SFML drawing and direct OpenGL to use `pushGLStates/popGLStates`. It makes sure that all OpenGL states that subsequent `draw()` calls will work as expected.

Example:

```
// OpenGL code here...
glPushAttrib(...);
window.resetGLStates();
window.draw(...);
window.draw(...);
glPopAttrib(...);
// OpenGL code here...
```

bool sf::Window::setActive (bool `active` = true) const

Activate or deactivate the window as the current target for OpenGL rendering.

A window is active only on the current thread, if you want to make it active on another thread, deactivate it on the previous thread first if it was active. Only one window can be active at a time, thus the window previously active (if any) automatically gets deactivated with `requestFocus()`.

Parameters

`active` True to activate, false to deactivate

Returns

True if operation was successful, false otherwise

void sf::Window::setFramerateLimit (unsigned int `limit`)

Limit the framerate to a maximum fixed frequency.

If a limit is set, the window will use a small delay after each call to `dis`

frame lasted long enough to match the framerate limit. SFML will try to r it can, but since it internally uses `sf::sleep`, whose precision depends o may be a little unprecise as well (for example, you can get 65 FPS when

Parameters

limit Framerate limit, in frames per seconds (use 0 to disable limit)

```
void sf::Window::setIcon ( unsigned int width,  
                          unsigned int height,  
                          const Uint8 * pixels  
                          )
```

Change the window's icon.

pixels must be an array of *width* x *height* pixels in 32-bits RGBA format.

The OS default icon is used by default.

Parameters

width Icon's width, in pixels

height Icon's height, in pixels

pixels Pointer to the array of pixels in memory. The pixels are copie source alive after calling this function.

See also

[setTitle](#)

```
void sf::Window::setJoystickThreshold ( float threshold )
```

Change the joystick threshold.

The joystick threshold is the value below which no JoystickMoved event

The threshold value is 0.1 by default.

Parameters

threshold New threshold, in the range [0, 100]

void sf::Window::setKeyRepeatEnabled (bool **enabled)**

Enable or disable automatic key-repeat.

If key repeat is enabled, you will receive repeated KeyPressed events v
is disabled, you will only get a single event when the key is pressed.

Key repeat is enabled by default.

Parameters

enabled True to enable, false to disable

void sf::Window::setMouseCursorGrabbed (bool **grabbed)**

Grab or release the mouse cursor.

If set, grabs the mouse cursor inside this window's client area so it may
bounds. Note that grabbing is only active while the window has focus.

Parameters

grabbed True to enable, false to disable

void sf::Window::setMouseCursorVisible (bool **visible)**

Show or hide the mouse cursor.

The mouse cursor is visible by default.

Parameters

visible True to show the mouse cursor, false to hide it

`void sf::Window::setPosition (const Vector2i & position)`

Change the position of the window on screen.

This function only works for top-level windows (i.e. it will be ignored for v of a child window/control).

Parameters

position New position, in pixels

See also

[getPosition](#)

`void sf::Window::setSize (const Vector2u & size)`

Change the size of the rendering region of the window.

Parameters

size New size, in pixels

See also

[getSize](#)

void sf::Window::setTitle (const [String](#) & title)

Change the title of the window.

Parameters

title New title

See also

[setIcon](#)

void sf::Window::setVerticalSyncEnabled (bool [enabled](#))

Enable or disable vertical synchronization.

Activating vertical synchronization will limit the number of frames displayed on the monitor. This can avoid some visual artifacts, and limit the framerate to a consistent value across different computers).

Vertical synchronization is disabled by default.

Parameters

enabled True to enable v-sync, false to deactivate it

void sf::RenderTarget::setView (const [View](#) & view)

Change the current active view.

The view is like a 2D camera, it controls which part of the 2D scene is visible to the render target. The new view will affect everything that is drawn, until

target keeps its own copy of the view object, so it is not necessary to calling this function. To restore the original view of the target, you can pa to this function.

Parameters

view New view to use

See also

[getView](#), [getDefaultView](#)

void sf::Window::setVisible (bool **visible**)

Show or hide the window.

The window is shown by default.

Parameters

visible True to show the window, false to hide it

bool sf::Window::waitEvent (**Event** & **event**)

Wait for an event and return it.

This function is blocking: if there's no pending event then it will wait unt function returns (and no error occurred), the *event* object is always valid is typically used when you have a thread that is dedicated to events l thread sleep as long as no new event is received.

```
sf::Event event;  
if (window.waitEvent(event))  
{  
    // process event...
```

```
}
```

Parameters

event `Event` to be returned

Returns

False if any error occurred

See also

`pollEvent`

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

- `RenderWindow.hpp`

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[Classes](#) | [Public Types](#) | [Public Member Functions](#) | [Static Public Member Functions](#) | [Static Public Attributes](#) | [Static Private Attributes](#)

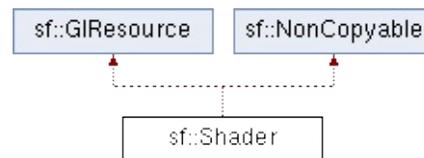
sf::Shader Class Reference

Graphics module

Shader class (vertex, geometry and fragment) [More...](#)

```
#include <Shader.hpp>
```

Inheritance diagram for sf::Shader:



Classes

struct `CurrentTextureType`

Special type that can be passed to `setUniform()`, and that represents being drawn. [More...](#)

Public Types

enum `Type` { `Vertex`, `Geometry`, `Fragment` }
Types of shaders. [More...](#)

Public Member Functions

`Shader ()`

Default constructor. [More...](#)

`~Shader ()`

Destructor. [More...](#)

`bool loadFromFile (const std::string &filename, Type type)`
Load the vertex, geometry or fragment shader from a file. [More...](#)

`bool loadFromFile (const std::string &vertexShaderFilename, const std::string &fragmentShaderFilename)`
Load both the vertex and fragment shaders from files. [More...](#)

`bool loadFromFile (const std::string &vertexShaderFilename, const std::string &geometryShaderFilename, const std::string &fragmentShaderFilename)`
Load the vertex, geometry and fragment shaders from files

`bool loadFromMemory (const std::string &shader, Type type)`
Load the vertex, geometry or fragment shader from a source code string.

`bool loadFromMemory (const std::string &vertexShader, const std::string &fragmentShader)`
Load both the vertex and fragment shaders from source code strings.

`bool loadFromMemory (const std::string &vertexShader, const std::string &geometryShader, const std::string &fragmentShader)`
Load the vertex, geometry and fragment shaders from source code strings.

`bool loadFromStream (InputStream &stream, Type type)`
Load the vertex, geometry or fragment shader from a custom stream.

`bool loadFromStream (InputStream &vertexShaderStream, InputStream &fragmentShaderStream)`

&fragmentShaderStream)

Load both the vertex and fragment shaders from custom st

bool `loadFromStream` (InputStream &vertexShaderStream, Input
&geometryShaderStream, InputStream &fragmentShaderS
Load the vertex, geometry and fragment shaders from cust

void `setUniform` (const std::string &name, float x)
Specify value for `float` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Vec2` &vec
Specify value for `vec2` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Vec3` &vec
Specify value for `vec3` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Vec4` &vec
Specify value for `vec4` uniform. [More...](#)

void `setUniform` (const std::string &name, int x)
Specify value for `int` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Ivec2` &ve
Specify value for `ivec2` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Ivec3` &ve
Specify value for `ivec3` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Ivec4` &ve
Specify value for `ivec4` uniform. [More...](#)

void `setUniform` (const std::string &name, bool x)
Specify value for `bool` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Bvec2` &ve

Specify value for `bvec2` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Bvec3` &v
Specify value for `bvec3` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Bvec4` &v
Specify value for `bvec4` uniform. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Mat3` &ma
Specify value for `mat3` matrix. [More...](#)

void `setUniform` (const std::string &name, const `Gsl::Mat4` &ma
Specify value for `mat4` matrix. [More...](#)

void `setUniform` (const std::string &name, const `Texture` &textur
Specify a texture as `sampler2D` uniform. [More...](#)

void `setUniform` (const std::string &name, `CurrentTextureType`)
Specify current texture as `sampler2D` uniform. [More...](#)

void `setUniformArray` (const std::string &name, const float *scal
Specify values for `float[]` array uniform. [More...](#)

void `setUniformArray` (const std::string &name, const `Gsl::Vec2`
Specify values for `vec2[]` array uniform. [More...](#)

void `setUniformArray` (const std::string &name, const `Gsl::Vec3`
Specify values for `vec3[]` array uniform. [More...](#)

void `setUniformArray` (const std::string &name, const `Gsl::Vec4`
Specify values for `vec4[]` array uniform. [More...](#)

void `setUniformArray` (const std::string &name, const `Gsl::Mat3`
Specify values for `mat3[]` array uniform. [More...](#)

void `setUniformArray` (const std::string &name, const `Gls::Mat4`
Specify values for `mat4[]` array uniform. [More...](#)

void `setParameter` (const std::string &name, float x)
Change a float parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, float x, float y)
Change a 2-components vector parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, float x, float y, float z)
Change a 3-components vector parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, float x, float y, float z, float w)
Change a 4-components vector parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, const `Vector2f` &vec)
Change a 2-components vector parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, const `Vector3f` &vec)
Change a 3-components vector parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, const `Color` &color)
Change a color parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, const `Transform` &transform)
Change a matrix parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, const `Texture` &texture)
Change a texture parameter of the shader. [More...](#)

void `setParameter` (const std::string &name, `CurrentTextureType`)
Change a texture parameter of the shader. [More...](#)

unsigned int `getNativeHandle` () const
Get the underlying OpenGL handle of the shader. [More...](#)

Static Public Member Functions

static void `bind` (const `Shader` *shader)
Bind a shader for rendering. [More...](#)

static bool `isAvailable` ()
Tell whether or not the system supports shaders. [More...](#)

static bool `isGeometryAvailable` ()
Tell whether or not the system supports geometry shaders. [More...](#)

Static Public Attributes

`static CurrentTextureType CurrentTexture`
Represents the texture of the object being dra

Static Private Member Functions

static void `ensureGLContext ()`

Empty function for ABI compatibility, use `acquireTransientCo`

Detailed Description

`Shader` class (vertex, geometry and fragment)

Shaders are programs written using a specific language, executed during rendering, allowing to apply real-time operations to the rendered entities.

There are three kinds of shaders:

- Vertex shaders, that process vertices
- Geometry shaders, that process primitives
- Fragment (pixel) shaders, that process pixels

A `sf::Shader` can be composed of either a vertex shader alone, a geometry shader alone, or any combination of them. (see the variants of the load functions)

Shaders are written in GLSL, which is a C-like language dedicated to graphics. You need to learn its basics before writing your own shaders for SFML.

Like any C/C++ program, a GLSL shader has its own variables called uniforms. `sf::Shader` handles different types of uniforms:

- scalars: `float`, `int`, `bool`
- vectors (2, 3 or 4 components)
- matrices (3x3 or 4x4)
- samplers (textures)

Some SFML-specific types can be converted:

- `sf::Color` as a 4D vector (`vec4`)

- `sf::Transform` as matrices (`mat3` or `mat4`)

Every uniform variable in a shader can be set through one of the `setUniform` overloads. For example, if you have a shader with the following uniforms:

```
uniform float offset;
uniform vec3 point;
uniform vec4 color;
uniform mat4 matrix;
uniform sampler2D overlay;
uniform sampler2D current;
```

You can set their values from C++ code as follows, using the types defined in `sf::Gls1`:

```
shader.setUniform("offset", 2.f);
shader.setUniform("point", sf::Vector3f(0.5f, 0.8f, 0.3f));
shader.setUniform("color", sf::Gls1::Vec4(color)); // color is a Vec4
shader.setUniform("matrix", sf::Gls1::Mat4(transform)); // transform is a Mat4
shader.setUniform("overlay", texture); // texture is a Texture
shader.setUniform("current", sf::Shader::CurrentTexture);
```

The old `setParameter()` overloads are deprecated and will be removed in their `setUniform()` equivalents instead.

The special `Shader::CurrentTexture` argument maps the given `sampler2D` to the object being drawn (which cannot be known in advance).

To apply a shader to a drawable, you must pass it as an additional parameter to `draw`:

```
window.draw(sprite, &shader);
```

... which is in fact just a shortcut for this:

```
sf::RenderStates states;
states.shader = &shader;
window.draw(sprite, states);
```

In the code above we pass a pointer to the shader, because it may be null

Shaders can be used on any drawable, but some combinations are not. A vertex shader on a `sf::Sprite` is limited because there are only 4 vertices subdivided in order to apply wave effects. Another bad example is a font texture of the text is not the actual text that you see on screen, it is characters of the font in an arbitrary order; thus, texture lookups on pixels do not give you the expected result.

Shaders can also be used to apply global post-effects to the current context (`sf::PostFx` class in SFML 1). This can be done in two different ways:

- draw everything to a `sf::RenderTarget`, then draw it to the main target
- draw everything directly to the main target, then use `sf::Texture::update` to a texture and draw it to the main target using the shader

The first technique is more optimized because it doesn't involve retrieving memory, but the second one doesn't impact the rendering process and without impacting all the code.

Like `sf::Texture` that can be used as a raw OpenGL texture, `sf::Shader` can be used as a raw OpenGL shader for custom OpenGL geometry.

```
sf::Shader::bind(&shader);  
... render OpenGL geometry ...  
sf::Shader::bind(NULL);
```

See also

`sf::Gsl`

Definition at line 52 of file `Shader.hpp`.

Member Enumeration Documentation

enum `sf::Shader::Type`

Types of shaders.

Enumerator	
Vertex	Vertex shader
Geometry	Geometry shader.
Fragment	Fragment (pixel) shader.

Definition at line `60` of file `Shader.hpp`.

Constructor & Destructor Documentation

sf::Shader::Shader ()

Default constructor.

This constructor creates an invalid shader.

sf::Shader::~~Shader ()

Destructor.

Member Function Documentation

static void sf::Shader::bind (const Shader * shader)

Bind a shader for rendering.

This function is not part of the graphics API, it mustn't be used when direct mode is used only if you mix sf::Shader with OpenGL code.

```
sf::Shader s1, s2;
...
sf::Shader::bind(&s1);
// draw OpenGL stuff that use s1...
sf::Shader::bind(&s2);
// draw OpenGL stuff that use s2...
sf::Shader::bind(NULL);
// draw OpenGL stuff that use no shader...
```

Parameters

shader Shader to bind, can be null to use no shader

unsigned int sf::Shader::getNativeHandle () const

Get the underlying OpenGL handle of the shader.

You shouldn't need to use this function, unless you have very specific hardware that doesn't support it, or implement a temporary workaround until a bug is fixed.

Returns

OpenGL handle of the shader or 0 if not yet loaded

static bool sf::Shader::isAvailable ()

Tell whether or not the system supports shaders.

This function should always be called before using the shader feature. Any attempt to use `sf::Shader` will fail.

Returns

True if shaders are supported, false otherwise

static bool sf::Shader::isGeometryAvailable ()

Tell whether or not the system supports geometry shaders.

This function should always be called before using the geometry shader. Any attempt to use `sf::Shader` geometry shader features will fail.

This function can only return true if `isAvailable()` would also return true, i.e. basic shaders must be supported in order for geometry shaders to be supported as well.

Note: The first call to this function, whether by your code or SFML will reset the state.

Returns

True if geometry shaders are supported, false otherwise

bool sf::Shader::loadFromFile (const std::string & filename, Type type)

Load the vertex, geometry or fragment shader from a file.

This function loads a single shader, vertex, geometry or fragment, identifier. The source must be a text file containing a valid shader in GLSL language dedicated to OpenGL shaders; you'll probably need to read a good document on your own shaders.

Parameters

filename Path of the vertex, geometry or fragment shader file to load
type Type of shader (vertex, geometry or fragment)

Returns

True if loading succeeded, false if it failed

See also

[loadFromMemory](#), [loadFromStream](#)

```
bool sf::Shader::loadFromFile ( const std::string & vertexShaderFilename,
                               const std::string & fragmentShaderFilename
                             )
```

Load both the vertex and fragment shaders from files.

This function loads both the vertex and the fragment shaders. If one of the filenames is left empty (the valid shader is unloaded). The sources must be text files containing a valid shader in GLSL language. GLSL is a C-like language dedicated to OpenGL shaders; you should read the documentation for it before writing your own shaders.

Parameters

vertexShaderFilename Path of the vertex shader file to load
fragmentShaderFilename Path of the fragment shader file to load

Returns

True if loading succeeded, false if it failed

See also

[loadFromMemory](#), [loadFromStream](#)

```
bool sf::Shader::loadFromFile ( const std::string & vertexShaderFile  
                               const std::string & geometryShaderFile  
                               const std::string & fragmentShaderFile  
                               )
```

Load the vertex, geometry and fragment shaders from files.

This function loads the vertex, geometry and fragment shaders. If one of the files is left empty (the valid shader is unloaded). The sources must be text files (C++ language). GLSL is a C-like language dedicated to OpenGL shaders; you should consult the documentation for it before writing your own shaders.

Parameters

vertexShaderFilename Path of the vertex shader file to load
geometryShaderFilename Path of the geometry shader file to load
fragmentShaderFilename Path of the fragment shader file to load

Returns

True if loading succeeded, false if it failed

See also

[loadFromMemory](#), [loadFromStream](#)

```
bool sf::Shader::loadFromMemory ( const std::string & shader,  
                                  Type  
                                  type
```

)

Load the vertex, geometry or fragment shader from a source code in me

This function loads a single shader, vertex, geometry or fragment, ide
The source code must be a valid shader in GLSL language. GLSL is
OpenGL shaders; you'll probably need to read a good documentation
shaders.

Parameters

shader *String* containing the source code of the shader
type Type of shader (vertex, geometry or fragment)

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromStream](#)

```
bool sf::Shader::loadFromMemory ( const std::string & vertexShad  
                                const std::string & fragmentSh  
                                )
```

Load both the vertex and fragment shaders from source codes in memor

This function loads both the vertex and the fragment shaders. If one of
left empty (the valid shader is unloaded). The sources must be valid sha
a C-like language dedicated to OpenGL shaders; you'll probably need to
it before writing your own shaders.

Parameters

vertexShader *String* containing the source code of the vertex sh

fragmentShader *String* containing the source code of the fragment

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromStream](#)

```
bool sf::Shader::loadFromMemory ( const std::string & vertexShader  
                                const std::string & geometryShader  
                                const std::string & fragmentShader  
                                )
```

Load the vertex, geometry and fragment shaders from source codes in memory.

This function loads the vertex, geometry and fragment shaders. If one of the sources is empty (the valid shader is unloaded). The sources must be valid shader source codes in a C-like language dedicated to OpenGL shaders; you'll probably need to learn about it before writing your own shaders.

Parameters

vertexShader *String* containing the source code of the vertex shader

geometryShader *String* containing the source code of the geometry shader

fragmentShader *String* containing the source code of the fragment shader

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromStream](#)

```
bool sf::Shader::loadFromStream ( InputStream & stream,  
                                Type                type  
                                )
```

Load the vertex, geometry or fragment shader from a custom stream.

This function loads a single shader, vertex, geometry or fragment, identifier. The source code must be a valid shader in GLSL language. GLSL is an OpenGL shader language; you'll probably need to read a good documentation for writing shaders.

Parameters

stream Source stream to read from
type Type of shader (vertex, geometry or fragment)

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromMemory](#)

```
bool sf::Shader::loadFromStream ( InputStream & vertexShaderStream,  
                                InputStream & fragmentShaderStream,  
                                )
```

Load both the vertex and fragment shaders from custom streams.

This function loads both the vertex and the fragment shaders. If one of the streams is left empty (the valid shader is unloaded). The source codes must be valid GLSL. GLSL is a C-like language dedicated to OpenGL shaders; you'll probably need to read a good documentation for it before writing your own shaders.

Parameters

vertexShaderStream Source stream to read the vertex shader file
fragmentShaderStream Source stream to read the fragment shader file

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromMemory](#)

```
bool sf::Shader::loadFromStream ( InputStream & vertexShaderStream,  
                                InputStream & geometryShaderStream,  
                                InputStream & fragmentShaderStream,  
                                const String& name )
```

Load the vertex, geometry and fragment shaders from custom streams.

This function loads the vertex, geometry and fragment shaders. If one of the streams is left empty (the valid shader is unloaded). The source codes must be valid GLSL. GLSL is a C-like language dedicated to OpenGL shaders; you'll find the documentation for it before writing your own shaders.

Parameters

vertexShaderStream Source stream to read the vertex shader file
geometryShaderStream Source stream to read the geometry shader file
fragmentShaderStream Source stream to read the fragment shader file

Returns

True if loading succeeded, false if it failed

See also

[loadFromFile](#), [loadFromMemory](#)

```
void sf::Shader::setParameter ( const std::string & name,  
                                float                x  
                                )
```

Change a float parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, float)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                float                x,  
                                float                y  
                                )
```

Change a 2-components vector parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Glsl::Vec2&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                float                x,  
                                float                y,  
                                float                z  
                                )
```

Change a 3-components vector parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Glsl::Vec3&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                float                x,  
                                float                y,  
                                float                z,  
                                float                w  
                                )
```

Change a 4-components vector parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Glsl::Vec4&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                const Vector2f & vector  
                                )
```

Change a 2-components vector parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Glsl::Vec2&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                const Vector3f & vector  
                                )
```

Change a 3-components vector parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Glsl::Vec3&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                const Color & color  
                                )
```

Change a color parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Glsl::Vec4&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                const Transform & transform  
                                )
```

Change a matrix parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Glsl::Mat4&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                const Texture & texture  
                                )
```

Change a texture parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, const Texture&)` instead.

```
void sf::Shader::setParameter ( const std::string & name,  
                                CurrentTextureType  
                                )
```

Change a texture parameter of the shader.

Deprecated:

Use `setUniform(const std::string&, CurrentTextureType)` instead.

```
void sf::Shader::setUniform ( const std::string & name,  
                              float x  
                              )
```

Specify value for `float` uniform.

Parameters

name Name of the uniform variable in GLSL

x Value of the float scalar

```
void sf::Shader::setUniform ( const std::string & name,  
                              const Gsl::Vec2 & vector  
                              )
```

Specify value for `vec2` uniform.

Parameters

name Name of the uniform variable in GLSL

vector Value of the `vec2` vector

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Glsl::Vec3 & vector  
                             )
```

Specify value for `vec3` uniform.

Parameters

name Name of the uniform variable in GLSL

vector Value of the `vec3` vector

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Glsl::Vec4 & vector  
                             )
```

Specify value for `vec4` uniform.

This overload can also be called with `sf::Color` objects that are converted

It is important to note that the components of the color are normalized to the range [0 .. 1] in the shader. Therefore, they are converted from range [0 .. 255] to range [0 .. 1]. For example, `sf::Color(255, 127, 0, 255)` will be transformed to a `vec4(1.0, 0.5, 0.0, 1.0)`.

Parameters

name Name of the uniform variable in GLSL

vector Value of the `vec4` vector

```
void sf::Shader::setUniform ( const std::string & name,  
                             int x  
                             )
```



```
)
```

Specify value for `ivec4` uniform.

This overload can also be called with `sf::Color` objects that are converted

If color conversions are used, the `ivec4` uniform in GLSL will hold the `sf::Color` instance. For example, `sf::Color(255, 127, 0, 255)` is mapped to

Parameters

name Name of the uniform variable in GLSL

vector Value of the `ivec4` vector

```
void sf::Shader::setUniform ( const std::string & name,  
                             bool x  
                             )
```

Specify value for `bool` uniform.

Parameters

name Name of the uniform variable in GLSL

x Value of the `bool` scalar

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Glsl::Bvec2 & vector  
                             )
```

Specify value for `bvec2` uniform.

Parameters

name Name of the uniform variable in GLSL
vector Value of the bvec2 vector

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Glsl::Bvec3 & vector  
                             )
```

Specify value for `bvec3` uniform.

Parameters

name Name of the uniform variable in GLSL
vector Value of the bvec3 vector

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Glsl::Bvec4 & vector  
                             )
```

Specify value for `bvec4` uniform.

Parameters

name Name of the uniform variable in GLSL
vector Value of the bvec4 vector

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Glsl::Mat3 & matrix  
                             )
```

Specify value for `mat3` matrix.

Parameters

name Name of the uniform variable in GLSL

matrix Value of the mat3 matrix

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Gsl::Mat4 & matrix  
                             )
```

Specify value for `mat4` matrix.

Parameters

name Name of the uniform variable in GLSL

matrix Value of the mat4 matrix

```
void sf::Shader::setUniform ( const std::string & name,  
                             const Texture & texture  
                             )
```

Specify a texture as `sampler2D` uniform.

name is the name of the variable to change in the shader. The corresponding variable must be a 2D texture (`sampler2D` GLSL type).

Example:

```
uniform sampler2D the_texture; // this is the variable in the shader  
  
sf::Texture texture;  
...  
shader.setUniform("the_texture", texture);
```

It is important to note that *texture* must remain alive as long as the s


```
std::size_t    length
)
```

Specify values for `float[]` array uniform.

Parameters

name Name of the uniform variable in GLSL
scalarArray pointer to array of `float` values
length Number of elements in the array

```
void sf::Shader::setUniformArray ( const std::string & name,  
                                   const Glsl::Vec2 * vectorArray,  
                                   std::size_t length  
                                   )
```

Specify values for `vec2[]` array uniform.

Parameters

name Name of the uniform variable in GLSL
vectorArray pointer to array of `vec2` values
length Number of elements in the array

```
void sf::Shader::setUniformArray ( const std::string & name,  
                                   const Glsl::Vec3 * vectorArray,  
                                   std::size_t length  
                                   )
```

Specify values for `vec3[]` array uniform.

Parameters

name Name of the uniform variable in GLSL
vectorArray pointer to array of `vec3` values
length Number of elements in the array

```
void sf::Shader::setUniformArray ( const std::string & name,  
                                   const Gls::Vec4 * vectorArray,  
                                   std::size_t length  
                                   )
```

Specify values for `vec4[]` array uniform.

Parameters

name Name of the uniform variable in GLSL
vectorArray pointer to array of `vec4` values
length Number of elements in the array

```
void sf::Shader::setUniformArray ( const std::string & name,  
                                   const Gls::Mat3 * matrixArray,  
                                   std::size_t length  
                                   )
```

Specify values for `mat3[]` array uniform.

Parameters

name Name of the uniform variable in GLSL
matrixArray pointer to array of `mat3` values
length Number of elements in the array

```
void sf::Shader::setUniformArray ( const std::string & name,
```

```
const Gls::Mat4 * matrixArray,  
std::size_t length  
)
```

Specify values for `mat4[]` array uniform.

Parameters

name Name of the uniform variable in GLSL
matrixArray pointer to array of `mat4` values
length Number of elements in the array

Member Data Documentation

CurrentTextureType sf::Shader::CurrentTexture

Represents the texture of the object being drawn.

See also

`setUniform(const std::string&, CurrentTextureType)`

Definition at line 82 of file `Shader.hpp`.

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

- `Shader.hpp`

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sf::Shader::CurrentTextureType Struct Reference

Special type that can be passed to `setUniform()`, and that represents the

[More...](#)

```
#include <Shader.hpp>
```

Detailed Description

Special type that can be passed to `setUniform()`, and that represents the t

See also

`setUniform(const std::string&, CurrentTextureType)`

Definition at line 74 of file `Shader.hpp`.

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

- `Shader.hpp`

SFML 2.4.2

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[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#)

[Public Member Functions](#) | [Protected Member Functions](#) | [List of all members](#)

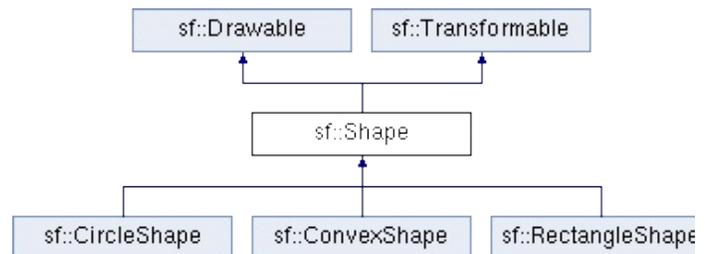
sf::Shape Class Reference abstract

Graphics module

Base class for textured shapes with outline. [More...](#)

```
#include <Shape.hpp>
```

Inheritance diagram for sf::Shape:



Public Member Functions

virtual `~Shape ()`
Virtual destructor. [More...](#)

void `setTexture (const Texture *texture, bool resetRect=false)`
Change the source texture of the shape. [More...](#)

void `setTextureRect (const IntRect &rect)`
Set the sub-rectangle of the texture that the shape w

void `setFillColor (const Color &color)`
Set the fill color of the shape. [More...](#)

void `setOutlineColor (const Color &color)`
Set the outline color of the shape. [More...](#)

void `setOutlineThickness (float thickness)`
Set the thickness of the shape's outline. [More...](#)

const Texture * `getTexture () const`
Get the source texture of the shape. [More...](#)

const IntRect & `getTextureRect () const`
Get the sub-rectangle of the texture displayed by the

const Color & `getFillColor () const`
Get the fill color of the shape. [More...](#)

const Color & `getOutlineColor () const`
Get the outline color of the shape. [More...](#)

float `getOutlineThickness () const`

Get the outline thickness of the shape. [More...](#)

virtual `std::size_t` `getPointCount () const =0`
Get the total number of points of the shape. [More...](#)

virtual `Vector2f` `getPoint (std::size_t index) const =0`
Get a point of the shape. [More...](#)

`FloatRect` `getLocalBounds () const`
Get the local bounding rectangle of the entity. [More..](#)

`FloatRect` `getGlobalBounds () const`
Get the global (non-minimal) bounding rectangle of t

`void` `setPosition (float x, float y)`
set the position of the object [More...](#)

`void` `setPosition (const Vector2f &position)`
set the position of the object [More...](#)

`void` `setRotation (float angle)`
set the orientation of the object [More...](#)

`void` `setScale (float factorX, float factorY)`
set the scale factors of the object [More...](#)

`void` `setScale (const Vector2f &factors)`
set the scale factors of the object [More...](#)

`void` `setOrigin (float x, float y)`
set the local origin of the object [More...](#)

`void` `setOrigin (const Vector2f &origin)`
set the local origin of the object [More...](#)

const `Vector2f` & `getPosition ()` const
get the position of the object [More...](#)

float `getRotation ()` const
get the orientation of the object [More...](#)

const `Vector2f` & `getScale ()` const
get the current scale of the object [More...](#)

const `Vector2f` & `getOrigin ()` const
get the local origin of the object [More...](#)

void `move (float offsetX, float offsetY)`
Move the object by a given offset. [More...](#)

void `move (const Vector2f &offset)`
Move the object by a given offset. [More...](#)

void `rotate (float angle)`
Rotate the object. [More...](#)

void `scale (float factorX, float factorY)`
Scale the object. [More...](#)

void `scale (const Vector2f &factor)`
Scale the object. [More...](#)

const `Transform` & `getTransform ()` const
get the combined transform of the object [More...](#)

const `Transform` & `getInverseTransform ()` const
get the inverse of the combined transform of the object

Protected Member Functions

`Shape ()`

Default constructor. [More...](#)

`void update ()`

Recompute the internal geometry of the shape. [More...](#)

Detailed Description

Base class for textured shapes with outline.

`sf::Shape` is a drawable class that allows to define and display a custom c

It's only an abstract base, it needs to be specialized for concrete types of polygon, star, ...).

In addition to the attributes provided by the specialized shape classes, it has the following attributes:

- a texture
- a texture rectangle
- a fill color
- an outline color
- an outline thickness

Each feature is optional, and can be disabled easily:

- the texture can be null
- the fill/outline colors can be `sf::Color::Transparent`
- the outline thickness can be zero

You can write your own derived shape class, there are only two virtual functions:

- `getPointCount` must return the number of points of the shape
- `getPoint` must return the points of the shape

See also

`sf::RectangleShape, sf::CircleShape, sf::ConvexShape, sf::Transform`

Definition at line 44 of file `Shape.hpp`.

Constructor & Destructor Documentation

virtual sf::Shape::~~Shape ()

Virtual destructor.

sf::Shape::Shape ()

Default constructor.

Member Function Documentation

const Color& sf::Shape::getFillColor () const

Get the fill color of the shape.

Returns

Fill color of the shape

See also

[setFillColor](#)

FloatRect sf::Shape::getGlobalBounds () const

Get the global (non-minimal) bounding rectangle of the entity.

The returned rectangle is in global coordinates, which means that transformations (translation, rotation, scale, ...) that are applied to the entity returns the bounds of the shape in the global 2D world's coordinate system.

This function does not necessarily return the *minimal* bounding rectangle; the returned rectangle covers all the vertices (but possibly more). This allows to use `getGlobalBounds` as a first check; you may want to use more precise checks on top.

Returns

Global bounding rectangle of the entity

const Transform& sf::Transformable::getInverseTransform () const

get the inverse of the combined transform of the object

Returns

Inverse of the combined transformations applied to the object

See also

[getTransform](#)

FloatRect sf::Shape::getLocalBounds () const

Get the local bounding rectangle of the entity.

The returned rectangle is in local coordinates, which means that (translation, rotation, scale, ...) that are applied to the entity. In other bounds of the entity in the entity's coordinate system.

Returns

Local bounding rectangle of the entity

const Vector2f& sf::Transformable::getOrigin () const

get the local origin of the object

Returns

Current origin

See also

[setOrigin](#)

const [Color](#)& sf::Shape::getOutlineColor () const

Get the outline color of the shape.

Returns

Outline color of the shape

See also

[setOutlineColor](#)

float sf::Shape::getOutlineThickness () const

Get the outline thickness of the shape.

Returns

Outline thickness of the shape

See also

[setOutlineThickness](#)

virtual [Vector2f](#) sf::Shape::getPoint (std::size_t [index](#)) const

Get a point of the shape.

The returned point is in local coordinates, that is, the shape's transforms taken into account. The result is undefined if *index* is out of the valid range.

Parameters

[index](#) Index of the point to get, in range [0 .. [getPointCount\(\)](#) - 1]

Returns

index-th point of the shape

See also

[getPointCount](#)

Implemented in [sf::ConvexShape](#), [sf::CircleShape](#), and [sf::RectangleSh](#)

virtual std::size_t sf::Shape::getPointCount () const

Get the total number of points of the shape.

Returns

Number of points of the shape

See also

[getPoint](#)

Implemented in [sf::CircleShape](#), [sf::RectangleShape](#), and [sf::ConvexSh](#)

const [Vector2f](#)& sf::Transformable::getPosition () const

get the position of the object

Returns

Current position

See also

[setPosition](#)

`float sf::Transformable::getRotation () const`

get the orientation of the object

The rotation is always in the range [0, 360].

Returns

Current rotation, in degrees

See also

[setRotation](#)

`const Vector2f& sf::Transformable::getScale () const`

get the current scale of the object

Returns

Current scale factors

See also

[setScale](#)

`const Texture* sf::Shape::getTexture () const`

Get the source texture of the shape.

If the shape has no source texture, a NULL pointer is returned. This means that you can't modify the texture when you retrieve it with this function.

Returns

Pointer to the shape's texture

See also

[setTexture](#)

const IntRect& sf::Shape::getTextureRect () const

Get the sub-rectangle of the texture displayed by the shape.

Returns

[Texture](#) rectangle of the shape

See also

[setTextureRect](#)

const Transform& sf::Transformable::getTransform () const

get the combined transform of the object

Returns

[Transform](#) combining the position/rotation/scale/origin of the object

See also

[getInverseTransform](#)

void sf::Transformable::move (float offsetX, float offsetY)

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
sf::Vector2f pos = object.getPosition();  
object.setPosition(pos.x + offsetX, pos.y + offsetY);
```

Parameters

offsetX X offset

offsetY Y offset

See also

[setPosition](#)

```
void sf::Transformable::move ( const Vector2f & offset )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
object.setPosition(object.getPosition() + offset);
```

Parameters

offset Offset

See also

[setPosition](#)

```
void sf::Transformable::rotate ( float angle )
```

Rotate the object.

This function adds to the current rotation of the object, unlike `setRotation` equivalent to the following code:

```
object.setRotation(object.getRotation() + angle);
```

Parameters

angle Angle of rotation, in degrees

```
void sf::Transformable::scale ( float factorX,  
                               float factorY  
                               )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factorX, scale.y * factorY);
```

Parameters

factorX Horizontal scale factor

factorY Vertical scale factor

See also

`setScale`

```
void sf::Transformable::scale ( const Vector2f & factor )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();
object.setScale(scale.x * factor.x, scale.y * factor.y);
```

Parameters

factor Scale factors

See also

`setScale`

```
void sf::Shape::setFillColor ( const Color & color )
```

Set the fill color of the shape.

This color is modulated (multiplied) with the shape's texture if any. It can also change its global opacity. You can use `sf::Color::Transparent` to be transparent, and have the outline alone. By default, the shape's fill color is black.

Parameters

color New color of the shape

See also

`getFillColor`, `setOutlineColor`

```
void sf::Transformable::setOrigin ( float x,
                                     float y
                                   )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

x X coordinate of the new origin

y Y coordinate of the new origin

See also

[getOrigin](#)

```
void sf::Transformable::setOrigin ( const Vector2f & origin )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

origin New origin

See also

[getOrigin](#)

```
void sf::Shape::setOutlineColor ( const Color & color )
```

Set the outline color of the shape.

By default, the shape's outline color is opaque white.

Parameters

color New outline color of the shape

See also

[getOutlineColor](#), [setFillColor](#)

```
void sf::Shape::setOutlineThickness ( float thickness )
```

Set the thickness of the shape's outline.

Note that negative values are allowed (so that the outline expands toward the center). Using zero disables the outline. By default, the outline thickness is 0.

Parameters

thickness New outline thickness

See also

[getOutlineThickness](#)

```
void sf::Transformable::setPosition ( float x,  
                                     float y  
                                     )
```

set the position of the object

This function completely overwrites the previous position. See the `move` function on the previous position instead. The default position of a transformable is (0, 0).

Parameters

x X coordinate of the new position

y Y coordinate of the new position

See also

[move](#), [getPosition](#)

void sf::Transformable::setPosition (const [Vector2f](#) & [position](#))

set the position of the object

This function completely overwrites the previous position. See the [move](#) on the previous position instead. The default position of a transformable

Parameters

[position](#) New position

See also

[move](#), [getPosition](#)

void sf::Transformable::setRotation (float [angle](#))

set the orientation of the object

This function completely overwrites the previous rotation. See the [rotate](#) on the previous rotation instead. The default rotation of a transformable

Parameters

[angle](#) New rotation, in degrees

See also

[rotate](#), [getRotation](#)

)

Change the source texture of the shape.

The *texture* argument refers to a texture that must exist as long as the shape doesn't store its own copy of the texture, but rather keeps a pointer to the texture. If the source texture is destroyed and the shape tries to use the texture, the texture can be NULL to disable texturing. If *resetRect* is true, the texture rect is automatically adjusted to the size of the new texture. If it is false, the texture rect is not adjusted.

Parameters

texture New texture

resetRect Should the texture rect be reset to the size of the new texture

See also

[getTexture](#), [setTextureRect](#)

void sf::Shape::setTextureRect (const [IntRect](#) & **rect)**

Set the sub-rectangle of the texture that the shape will display.

The texture rect is useful when you don't want to display the whole texture. By default, the texture rect covers the entire texture.

Parameters

rect Rectangle defining the region of the texture to display

See also

[getTextureRect](#), [setTexture](#)

void sf::Shape::update ()

Recompute the internal geometry of the shape.

This function must be called by the derived class everytime the shape's either `getPointCount` or `getPoint` is different).

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

- [Shape.hpp](#)

[Public Member Functions](#) | [List of all members](#)

sf::Sprite Class Reference

Graphics module

Drawable representation of a texture, with its own transformations, color, etc.

```
#include <Sprite.hpp>
```

Inheritance diagram for sf::Sprite:



Public Member Functions

`Sprite ()`
Default constructor. [More...](#)

`Sprite (const Texture &texture)`
Construct the sprite from a source texture. [More...](#)

`Sprite (const Texture &texture, const IntRect &recta)`
Construct the sprite from a sub-rectangle of a source

`void setTexture (const Texture &texture, bool resetRect=f)`
Change the source texture of the sprite. [More...](#)

`void setTextureRect (const IntRect &rectangle)`
Set the sub-rectangle of the texture that the sprite wi

`void setColor (const Color &color)`
Set the global color of the sprite. [More...](#)

`const Texture * getTexture () const`
Get the source texture of the sprite. [More...](#)

`const IntRect & getTextureRect () const`
Get the sub-rectangle of the texture displayed by the

`const Color & getColor () const`
Get the global color of the sprite. [More...](#)

`FloatRect getLocalBounds () const`
Get the local bounding rectangle of the entity. [More..](#)

`FloatRect getGlobalBounds () const`

Get the global bounding rectangle of the entity. [More](#)

void [setPosition](#) (float x, float y)
set the position of the object [More...](#)

void [setPosition](#) (const [Vector2f](#) &position)
set the position of the object [More...](#)

void [setRotation](#) (float angle)
set the orientation of the object [More...](#)

void [setScale](#) (float factorX, float factorY)
set the scale factors of the object [More...](#)

void [setScale](#) (const [Vector2f](#) &factors)
set the scale factors of the object [More...](#)

void [setOrigin](#) (float x, float y)
set the local origin of the object [More...](#)

void [setOrigin](#) (const [Vector2f](#) &origin)
set the local origin of the object [More...](#)

const [Vector2f](#) & [getPosition](#) () const
get the position of the object [More...](#)

float [getRotation](#) () const
get the orientation of the object [More...](#)

const [Vector2f](#) & [getScale](#) () const
get the current scale of the object [More...](#)

const [Vector2f](#) & [getOrigin](#) () const
get the local origin of the object [More...](#)

void `move` (float offsetX, float offsetY)
Move the object by a given offset. [More...](#)

void `move` (const `Vector2f` &offset)
Move the object by a given offset. [More...](#)

void `rotate` (float angle)
Rotate the object. [More...](#)

void `scale` (float factorX, float factorY)
Scale the object. [More...](#)

void `scale` (const `Vector2f` &factor)
Scale the object. [More...](#)

const `Transform` & `getTransform` () const
get the combined transform of the object [More...](#)

const `Transform` & `getInverseTransform` () const
get the inverse of the combined transform of the object

Detailed Description

Drawable representation of a texture, with its own transformations, color, and opacity.

sf::Sprite is a drawable class that allows to easily display a texture (or a part of it).

It inherits all the functions from **sf::Transformable**: position, rotation, scale properties such as the texture to use, the part of it to display, and some the overall color of the sprite, or to get its bounding rectangle.

sf::Sprite works in combination with the **sf::Texture** class, which loads a given texture.

The separation of **sf::Sprite** and **sf::Texture** allows more flexibility and performance. **sf::Texture** is a heavy resource, and any operation on it is slow (often to the point of being unusable). On the other side, a **sf::Sprite** is a lightweight object which can use the pixel data of a texture with its own transformation/color/blending attributes.

It is important to note that the **sf::Sprite** instance doesn't copy the texture reference to it. Thus, a **sf::Texture** must not be destroyed while it is used by a **sf::Sprite** (the `sf::Sprite::setTexture` function that uses a local **sf::Texture** instance for creating a sprite).

See also the note on coordinates and undistorted rendering in **sf::Transformable**.

Usage example:

```
// Declare and load a texture
sf::Texture texture;
texture.loadFromFile("texture.png");

// Create a sprite
sf::Sprite sprite;
sprite.setTexture(texture);
sprite.setTextureRect(sf::IntRect(10, 10, 50, 30));
sprite.setColor(sf::Color(255, 255, 255, 200));
```

```
sprite.setPosition(100, 25);  
  
// Draw it  
window.draw(sprite);
```

See also

[sf::Texture](#), [sf::Transformable](#)

Definition at line 47 of file [Sprite.hpp](#).

Constructor & Destructor Documentation

`sf::Sprite::Sprite ()`

Default constructor.

Creates an empty sprite with no source texture.

`sf::Sprite::Sprite (const Texture & texture)`

Construct the sprite from a source texture.

Parameters

texture Source texture

See also

[setTexture](#)

`sf::Sprite::Sprite (const Texture & texture, const IntRect & rectangle)`

Construct the sprite from a sub-rectangle of a source texture.

Parameters

texture Source texture

rectangle Sub-rectangle of the texture to assign to the sprite

See also

[setTexture](#), [setTextureRect](#)

Member Function Documentation

const Color& sf::Sprite::getColor () const

Get the global color of the sprite.

Returns

Global color of the sprite

See also

[setColor](#)

FloatRect sf::Sprite::getGlobalBounds () const

Get the global bounding rectangle of the entity.

The returned rectangle is in global coordinates, which means that transformations (translation, rotation, scale, ...) that are applied to the entity are not taken into account. The function returns the bounds of the sprite in the global 2D world's coordinate system.

Returns

Global bounding rectangle of the entity

const Transform& sf::Transformable::getInverseTransform () const

get the inverse of the combined transform of the object

Returns

Inverse of the combined transformations applied to the object

See also

[getTransform](#)

FloatRect sf::Sprite::getLocalBounds () const

Get the local bounding rectangle of the entity.

The returned rectangle is in local coordinates, which means that (translation, rotation, scale, ...) that are applied to the entity. In other bounds of the entity in the entity's coordinate system.

Returns

Local bounding rectangle of the entity

const Vector2f& sf::Transformable::getOrigin () const

get the local origin of the object

Returns

Current origin

See also

[setOrigin](#)

const Vector2f& sf::Transformable::getPosition () const

get the position of the object

Returns

Current position

See also

[setPosition](#)

float sf::Transformable::getRotation () const

get the orientation of the object

The rotation is always in the range [0, 360].

Returns

Current rotation, in degrees

See also

[setRotation](#)

const [Vector2f](#)& sf::Transformable::getScale () const

get the current scale of the object

Returns

Current scale factors

See also

[setScale](#)

```
const Texture* sf::Sprite::getTexture ( ) const
```

Get the source texture of the sprite.

If the sprite has no source texture, a NULL pointer is returned. The id means that you can't modify the texture when you retrieve it with this function.

Returns

Pointer to the sprite's texture

See also

[setTexture](#)

```
const IntRect& sf::Sprite::getTextureRect ( ) const
```

Get the sub-rectangle of the texture displayed by the sprite.

Returns

[Texture](#) rectangle of the sprite

See also

[setTextureRect](#)

```
const Transform& sf::Transformable::getTransform ( ) const
```

get the combined transform of the object

Returns

[Transform](#) combining the position/rotation/scale/origin of the object

See also

[getInverseTransform](#)

```
void sf::Transformable::move ( float offsetX,  
                               float offsetY  
                               )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
sf::Vector2f pos = object.getPosition();  
object.setPosition(pos.x + offsetX, pos.y + offsetY);
```

Parameters

offsetX X offset

offsetY Y offset

See also

[setPosition](#)

```
void sf::Transformable::move ( const Vector2f & offset )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
object.setPosition(object.getPosition() + offset);
```

Parameters

offset Offset

See also

[setPosition](#)

void sf::Transformable::rotate (float **angle**)

Rotate the object.

This function adds to the current rotation of the object, unlike `setRotation` equivalent to the following code:

```
object.setRotation(object.getRotation() + angle);
```

Parameters

angle Angle of rotation, in degrees

void sf::Transformable::scale (float **factorX**, float **factorY**)

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factorX, scale.y * factorY);
```

Parameters

factorX Horizontal scale factor
factorY Vertical scale factor

See also

[setScale](#)

```
void sf::Transformable::scale ( const Vector2f & factor )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factor.x, scale.y * factor.y);
```

Parameters

factor Scale factors

See also

[setScale](#)

```
void sf::Sprite::setColor ( const Color & color )
```

Set the global color of the sprite.

This color is modulated (multiplied) with the sprite's texture. It can be change its global opacity. By default, the sprite's color is opaque white.

Parameters

color New color of the sprite

See also

[getColor](#)

```
void sf::Transformable::setOrigin ( float x,  
                                   float y  
                                   )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

x X coordinate of the new origin

y Y coordinate of the new origin

See also

[getOrigin](#)

```
void sf::Transformable::setOrigin ( const Vector2f & origin )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

origin New origin

See also

[getOrigin](#)

```
void sf::Transformable::setPosition ( float x,  
                                     float y  
                                     )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

- x** X coordinate of the new position
- y** Y coordinate of the new position

See also

[move](#), [getPosition](#)

```
void sf::Transformable::setPosition ( const Vector2f & position )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

- position** New position

See also

[move](#), [getPosition](#)

```
void sf::Transformable::setRotation ( float angle )
```

set the orientation of the object

This function completely overwrites the previous rotation. See the `rotate` function for rotating around the previous rotation instead. The default rotation of a transformable object is 0 degrees.

Parameters

angle New rotation, in degrees

See also

`rotate`, `getRotation`

```
void sf::Transformable::setScale ( float factorX,  
                                  float factorY  
                                  )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the `scale` function for scaling around the previous scale instead. The default scale of a transformable object is 1.

Parameters

factorX New horizontal scale factor

factorY New vertical scale factor

See also

`scale`, `getScale`

```
void sf::Transformable::setScale ( const Vector2f & factors )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the `scale` function for how to scale the object by the previous scale instead. The default scale of a transformable object is `(1, 1)`.

Parameters

factors New scale factors

See also

`scale`, `getScale`

```
void sf::Sprite::setTexture ( const Texture & texture,  
                             bool resetRect = false  
                             )
```

Change the source texture of the sprite.

The *texture* argument refers to a texture that must exist as long as the sprite exists. The sprite doesn't store its own copy of the texture, but rather keeps a pointer to the texture. If the source texture is destroyed and the sprite tries to use it, an exception is thrown. If *resetRect* is true, the `TextureRect` property of the sprite is automatically reset to the size of the new texture. If it is false, the texture rect is left unchanged.

Parameters

texture New texture

resetRect Should the texture rect be reset to the size of the new texture?

See also

`getTexture`, `setTextureRect`

```
void sf::Sprite::setTextureRect ( const IntRect & rectangle )
```

Set the sub-rectangle of the texture that the sprite will display.

The texture rect is useful when you don't want to display the whole texture. By default, the texture rect covers the entire texture.

Parameters

rectangle Rectangle defining the region of the texture to display

See also

[getTextureRect](#), [setTexture](#)

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

- [Sprite.hpp](#)

[Public Types](#) | [Public Member Functions](#) | [List of all members](#)

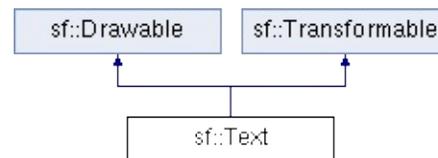
sf::Text Class Reference

Graphics module

Graphical text that can be drawn to a render target. [More...](#)

```
#include <Text.hpp>
```

Inheritance diagram for sf::Text:



Public Types

```
enum Style {  
    Regular = 0, Bold = 1 << 0, Italic = 1 << 1, Underlined = 1 << 2  
    StrikeThrough = 1 << 3  
}
```

Enumeration of the string drawing styles. [More...](#)

Public Member Functions

`Text ()`
Default constructor. [More...](#)

`Text (const String &string, const Font &font, unsigned int size)`
Construct the text from a string, font and size. [More..](#)

`void setString (const String &string)`
Set the text's string. [More...](#)

`void setFont (const Font &font)`
Set the text's font. [More...](#)

`void setCharacterSize (unsigned int size)`
Set the character size. [More...](#)

`void setStyle (Uint32 style)`
Set the text's style. [More...](#)

`void setColor (const Color &color)`
Set the fill color of the text. [More...](#)

`void setFillColor (const Color &color)`
Set the fill color of the text. [More...](#)

`void setOutlineColor (const Color &color)`
Set the outline color of the text. [More...](#)

`void setOutlineThickness (float thickness)`
Set the thickness of the text's outline. [More...](#)

`const String & getString () const`

Get the text's string. [More...](#)

const **Font** * [getFont \(\)](#) const
Get the text's font. [More...](#)

unsigned int [getCharacterSize \(\)](#) const
Get the character size. [More...](#)

UInt32 [getStyle \(\)](#) const
Get the text's style. [More...](#)

const **Color** & [getColor \(\)](#) const
Get the fill color of the text. [More...](#)

const **Color** & [getFillColor \(\)](#) const
Get the fill color of the text. [More...](#)

const **Color** & [getOutlineColor \(\)](#) const
Get the outline color of the text. [More...](#)

float [getOutlineThickness \(\)](#) const
Get the outline thickness of the text. [More...](#)

Vector2f [findCharacterPos \(std::size_t index\)](#) const
Return the position of the *index-th* character. [More...](#)

FloatRect [getLocalBounds \(\)](#) const
Get the local bounding rectangle of the entity. [More..](#)

FloatRect [getGlobalBounds \(\)](#) const
Get the global bounding rectangle of the entity. [More](#)

void [setPosition \(float x, float y\)](#)
set the position of the object [More...](#)

void **setPosition** (const **Vector2f** &position)
set the position of the object [More...](#)

void **setRotation** (float angle)
set the orientation of the object [More...](#)

void **setScale** (float factorX, float factorY)
set the scale factors of the object [More...](#)

void **setScale** (const **Vector2f** &factors)
set the scale factors of the object [More...](#)

void **setOrigin** (float x, float y)
set the local origin of the object [More...](#)

void **setOrigin** (const **Vector2f** &origin)
set the local origin of the object [More...](#)

const **Vector2f** & **getPosition** () const
get the position of the object [More...](#)

float **getRotation** () const
get the orientation of the object [More...](#)

const **Vector2f** & **getScale** () const
get the current scale of the object [More...](#)

const **Vector2f** & **getOrigin** () const
get the local origin of the object [More...](#)

void **move** (float offsetX, float offsetY)
Move the object by a given offset. [More...](#)

void **move** (const **Vector2f** &offset)
Move the object by a given offset. [More...](#)

void `rotate` (float angle)
Rotate the object. [More...](#)

void `scale` (float factorX, float factorY)
Scale the object. [More...](#)

void `scale` (const `Vector2f` &factor)
Scale the object. [More...](#)

const `Transform` & `getTransform` () const
get the combined transform of the object [More...](#)

const `Transform` & `getInverseTransform` () const
get the inverse of the combined transform of the object

Detailed Description

Graphical text that can be drawn to a render target.

`sf::Text` is a drawable class that allows to easily display some text with a render target.

It inherits all the functions from `sf::Transformable`: position, rotation, scaling, and other properties such as the font to use, the character size, the font style (bold, italic, etc.), the global color and the text to display of course. It also provides convenient methods to get the graphical size of the text, or to get the global position of a given character.

`sf::Text` works in combination with the `sf::Font` class, which loads a font (and its characters) of a given font.

The separation of `sf::Font` and `sf::Text` allows more flexibility and better performance. `sf::Font` is a heavy resource, and any operation on it is slow (often too slow for real-time). On the other side, a `sf::Text` is a lightweight object which can combine the glyphs of a font and display any text on a render target.

It is important to note that the `sf::Text` instance doesn't copy the font that it uses. Thus, a `sf::Font` must not be destructed while it is used by a `sf::Text` (or `sf::Text` uses a local `sf::Font` instance for creating a text).

See also the note on coordinates and undistorted rendering in `sf::Transformable`.

Usage example:

```
// Declare and load a font
sf::Font font;
font.loadFromFile("arial.ttf");

// Create a text
```

```
sf::Text text("hello", font);
text.setCharacterSize(30);
text.setStyle(sf::Text::Bold);
text.setColor(sf::Color::Red);

// Draw it
window.draw(text);
```

See also

[sf::Font](#), [sf::Transformable](#)

Definition at line 48 of file [Text.hpp](#).

Member Enumeration Documentation

enum `sf::Text::Style`

Enumeration of the string drawing styles.

Enumerator	
Regular	Regular characters, no style.
Bold	Bold characters.
Italic	Italic characters.
Underlined	Underlined characters.
StrikeThrough	Strike through characters.

Definition at line 56 of file `Text.hpp`.

Constructor & Destructor Documentation

```
sf::Text::Text ( )
```

Default constructor.

Creates an empty text.

```
sf::Text::Text ( const String & string,  
                 const Font & font,  
                 unsigned int  characterSize = 30  
                 )
```

Construct the text from a string, font and size.

Note that if the used font is a bitmap font, it is not scalable, thus not all to use. This needs to be taken into consideration when setting the character size of a certain size, make sure the corresponding bitmap font that supports that size.

Parameters

string	Text assigned to the string
font	Font used to draw the string
characterSize	Base size of characters, in pixels

Member Function Documentation

Vector2f sf::Text::findCharacterPos (std::size_t **index**) const

Return the position of the *index-th* character.

This function computes the visual position of a character from its in position is in global coordinates (translation, rotation, scale and origin range, the position of the end of the string is returned.

Parameters

index Index of the character

Returns

Position of the character

unsigned int sf::Text::getCharacterSize () const

Get the character size.

Returns

Size of the characters, in pixels

See also

[setCharacterSize](#)

const Color& sf::Text::getColor () const

Get the fill color of the text.

Returns

Fill color of the text

See also

[setFillColor](#)

Deprecated:

There is now fill and outline colors instead of a single global color. Use [getOutlineColor\(\)](#) instead.

const [Color](#)& sf::Text::getFillColor () const

Get the fill color of the text.

Returns

Fill color of the text

See also

[setFillColor](#)

const [Font](#)* sf::Text::getFont () const

Get the text's font.

If the text has no font attached, a NULL pointer is returned. The returned pointer is a const pointer that you cannot modify the font when you get it from this function.

Returns

Pointer to the text's font

See also

[setFont](#)

FloatRect sf::Text::getGlobalBounds () const

Get the global bounding rectangle of the entity.

The returned rectangle is in global coordinates, which means that transformations (translation, rotation, scale, ...) that are applied to the entity returns the bounds of the text in the global 2D world's coordinate system

Returns

Global bounding rectangle of the entity

const Transform& sf::Transformable::getInverseTransform () const

get the inverse of the combined transform of the object

Returns

Inverse of the combined transformations applied to the object

See also

[getTransform](#)

FloatRect sf::Text::getLocalBounds () const

Get the local bounding rectangle of the entity.

The returned rectangle is in local coordinates, which means that (translation, rotation, scale, ...) that are applied to the entity. In other bounds of the entity in the entity's coordinate system.

Returns

Local bounding rectangle of the entity

const [Vector2f](#)& sf::Transformable::getOrigin () const

get the local origin of the object

Returns

Current origin

See also

[setOrigin](#)

const [Color](#)& sf::Text::getOutlineColor () const

Get the outline color of the text.

Returns

Outline color of the text

See also

[setOutlineColor](#)

float sf::Text::getOutlineThickness () const

Get the outline thickness of the text.

Returns

Outline thickness of the text, in pixels

See also

[setOutlineThickness](#)

const [Vector2f](#)& sf::Transformable::getPosition () const

get the position of the object

Returns

Current position

See also

[setPosition](#)

float sf::Transformable::getRotation () const

get the orientation of the object

The rotation is always in the range [0, 360].

Returns

Current rotation, in degrees

See also

[setRotation](#)

const **Vector2f**& sf::Transformable::getScale () const

get the current scale of the object

Returns

Current scale factors

See also

[setScale](#)

const **String**& sf::Text::getString () const

Get the text's string.

The returned string is a **sf::String**, which can automatically be converted following lines of code are all valid:

```
sf::String  s1 = text.getString();  
std::string s2 = text.getString();  
std::wstring s3 = text.getString();
```

Returns

Text's string

See also

[setString](#)

Uint32 sf::Text::getStyle () const

Get the text's style.

Returns

`Text`'s style

See also

`setStyle`

```
const Transform& sf::Transformable::getTransform ( ) const
```

get the combined transform of the object

Returns

`Transform` combining the position/rotation/scale/origin of the object

See also

`getInverseTransform`

```
void sf::Transformable::move ( float offsetX,  
                               float offsetY  
                               )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
sf::Vector2f pos = object.getPosition();  
object.setPosition(pos.x + offsetX, pos.y + offsetY);
```

Parameters

offsetX X offset

offsetY Y offset

See also

[setPosition](#)

void sf::Transformable::move (const **Vector2f** & **offset**)

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
object.setPosition(object.getPosition() + offset);
```

Parameters

offset Offset

See also

[setPosition](#)

void sf::Transformable::rotate (float **angle**)

Rotate the object.

This function adds to the current rotation of the object, unlike `setRotation` equivalent to the following code:

```
object.setRotation(object.getRotation() + angle);
```

Parameters

angle Angle of rotation, in degrees

```
void sf::Transformable::scale ( float factorX,  
                               float factorY  
                               )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factorX, scale.y * factorY);
```

Parameters

factorX Horizontal scale factor

factorY Vertical scale factor

See also

`setScale`

```
void sf::Transformable::scale ( const Vector2f & factor )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();  
object.setScale(scale.x * factor.x, scale.y * factor.y);
```

Parameters

factor Scale factors

See also

[setScale](#)

void sf::Text::setCharacterSize (unsigned int **size**)

Set the character size.

The default size is 30.

Note that if the used font is a bitmap font, it is not scalable, thus not all to use. This needs to be taken into consideration when setting the character size of a certain size, make sure the corresponding bitmap font that supports that size.

Parameters

size New character size, in pixels

See also

[getCharacterSize](#)

void sf::Text::setColor (const **Color** & **color**)

Set the fill color of the text.

By default, the text's fill color is opaque white. Setting the fill color to a color with an alpha value less than 255 will cause the outline to be displayed in the fill area of the text.

Parameters

color New fill color of the text

See also

[getFillColor](#)

Deprecated:

There is now fill and outline colors instead of a single global color. Use `setOutlineColor()` instead.

`void sf::Text::setFillColor (const Color & color)`

Set the fill color of the text.

By default, the text's fill color is opaque white. Setting the fill color to a color with an alpha value less than 255 will cause the outline to be displayed in the fill area of the text.

Parameters

color New fill color of the text

See also

`getFillColor`

`void sf::Text::setFont (const Font & font)`

Set the text's font.

The *font* argument refers to a font that must exist as long as the text store its own copy of the font, but rather keeps a pointer to the one that y font is destroyed and the text tries to use it, the behavior is undefined.

Parameters

font New font

See also

`getFont`

```
void sf::Transformable::setOrigin ( float x,  
                                     float y  
                                     )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

x X coordinate of the new origin

y Y coordinate of the new origin

See also

[getOrigin](#)

```
void sf::Transformable::setOrigin ( const Vector2f & origin )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

origin New origin

See also

[getOrigin](#)

```
void sf::Text::setOutlineColor ( const Color & color )
```

Set the outline color of the text.

By default, the text's outline color is opaque black.

Parameters

color New outline color of the text

See also

[getOutlineColor](#)

```
void sf::Text::setOutlineThickness ( float thickness )
```

Set the thickness of the text's outline.

By default, the outline thickness is 0.

Be aware that using a negative value for the outline thickness will cause

Parameters

thickness New outline thickness, in pixels

See also

[getOutlineThickness](#)

```
void sf::Transformable::setPosition ( float x,  
                                     float y  
                                     )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

x X coordinate of the new position

y Y coordinate of the new position

See also

`move`, `getPosition`

`void sf::Transformable::setPosition (const Vector2f & position)`

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

position New position

See also

`move`, `getPosition`

`void sf::Transformable::setRotation (float angle)`

set the orientation of the object

This function completely overwrites the previous rotation. See the `rotate`

on the previous rotation instead. The default rotation of a transformable c

Parameters

angle New rotation, in degrees

See also

[rotate](#), [getRotation](#)

```
void sf::Transformable::setScale ( float factorX,  
                                  float factorY  
                                  )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the scale fu
the previous scale instead. The default scale of a transformable object is

Parameters

factorX New horizontal scale factor

factorY New vertical scale factor

See also

[scale](#), [getScale](#)

```
void sf::Transformable::setScale ( const Vector2f & factors )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the scale fu
the previous scale instead. The default scale of a transformable object is

Parameters

factors New scale factors

See also

[scale](#), [getScale](#)

void sf::Text::setString (const **String** & **string**)

Set the text's string.

The *string* argument is a `sf::String`, which can automatically be constructed from a C++ string. So, the following calls are all valid:

```
text.setString("hello");
text.setString(L"hello");
text.setString(std::string("hello"));
text.setString(std::wstring(L"hello"));
```

A text's string is empty by default.

Parameters

string New string

See also

[getString](#)

void sf::Text::setStyle (Uint32 **style**)

Set the text's style.

You can pass a combination of one or more styles, for example `sf::Text::style` is `sf::Text::Regular`.

Parameters

style New style

See also

[getStyle](#)

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

- [Text.hpp](#)

[Main Page](#) | [Related Pages](#) | [Modules](#) | [Namespaces](#) | **[Classes](#)** | [Files](#)

[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#)

[Public Types](#) | [Public Member Functions](#) | [Static Public Member Functions](#) | [Static Private Member Functions](#) | [Friends](#) | [L](#)

sf::Texture Class Reference

Graphics module

Image living on the graphics card that can be used for drawing. [More...](#)

```
#include <Texture.hpp>
```

Inheritance diagram for sf::Texture:



Public Types

enum `CoordinateType` { `Normalized`, `Pixels` }

Types of texture coordinates that can be used for rendering. [More](#)

Public Member Functions

`Texture ()`
Default constructor. [More...](#)

`Texture (const Texture ©)`
Copy constructor. [More...](#)

`~Texture ()`
Destructor. [More...](#)

`bool create (unsigned int width, unsigned int height)`
Create the texture. [More...](#)

`bool loadFromFile (const std::string &filename, const IntRect &area)`
Load the texture from a file on disk. [More...](#)

`bool loadFromMemory (const void *data, std::size_t size, const IntRect &area)`
Load the texture from a file in memory. [More...](#)

`bool loadFromStream (InputStream &stream, const IntRect &area)`
Load the texture from a custom stream. [More...](#)

`bool loadFromImage (const Image &image, const IntRect &area)`
Load the texture from an image. [More...](#)

`Vector2u getSize () const`
Return the size of the texture. [More...](#)

`Image copyToImage () const`
Copy the texture pixels to an image. [More...](#)

`void update (const Uint8 *pixels)`

Update the whole texture from an array of pixels. [More...](#)

void **update** (const Uint8 *pixels, unsigned int width, unsigned int height, unsigned int x, unsigned int y)
Update a part of the texture from an array of pixels. [More...](#)

void **update** (const Image &image)
Update the texture from an image. [More...](#)

void **update** (const Image &image, unsigned int x, unsigned int y, unsigned int width, unsigned int height)
Update a part of the texture from an image. [More...](#)

void **update** (const Window &window)
Update the texture from the contents of a window. [More...](#)

void **update** (const Window &window, unsigned int x, unsigned int y, unsigned int width, unsigned int height)
Update a part of the texture from the contents of a window.

void **setSmooth** (bool smooth)
Enable or disable the smooth filter. [More...](#)

bool **isSmooth** () const
Tell whether the smooth filter is enabled or not. [More...](#)

void **setSrgb** (bool sRgba)
Enable or disable conversion from sRGB. [More...](#)

bool **isSrgb** () const
Tell whether the texture source is converted from sRGB or not.

void **setRepeated** (bool repeated)
Enable or disable repeating. [More...](#)

bool **isRepeated** () const
Tell whether the texture is repeated or not. [More...](#)

bool `generateMipmap ()`

Generate a mipmap using the current texture data. [More...](#)

Texture & `operator= (const Texture &right)`

Overload of assignment operator. [More...](#)

unsigned int `getNativeHandle () const`

Get the underlying OpenGL handle of the texture. [More...](#)

Static Public Member Functions

static void **bind** (const **Texture** *texture, **CoordinateType** coordir
Bind a texture for rendering. [More...](#)

static unsigned int **getMaximumSize** ()
Get the maximum texture size allowed. [More...](#)

Static Private Member Functions

static void `ensureGLContext ()`

Empty function for ABI compatibility, use `acquireTransientCo`

Friends

class **RenderTarget**

class **RenderTarget**

Detailed Description

`Image` living on the graphics card that can be used for drawing.

`sf::Texture` stores pixels that can be drawn, with a sprite for example.

A texture lives in the graphics card memory, therefore it is very fast to draw. Copying a render target to a texture (the graphics card can access both directly).

Being stored in the graphics card memory has some drawbacks. As a texture is not a `sf::Image`, you need to prepare the pixels first and then upload them to the graphics card (see `Texture::update`).

`sf::Texture` makes it easy to convert from/to `sf::Image`, but keep in mind that there is a latency between the graphics card and the central memory, therefore they are slow.

A texture can be loaded from an image, but also directly from a file. Several shortcuts are defined so that you don't need an image first for the most part. If you want to perform some modifications on the pixels before creating the final texture, use a `sf::Image`, do whatever you need with the pixels, and then call `Texture::update`.

Since they live in the graphics card memory, the pixels of a texture cannot be accessed individually. Therefore, if you need to store collision information (e.g. for pixel-perfect collisions), it is recommended to store the collision information in an array of booleans.

Like `sf::Image`, `sf::Texture` can handle a unique internal representation of colors. This means that a pixel must be composed of 8 bits red, green, blue and alpha. See `sf::Color`.

Usage example:

```

// This example shows the most common use of sf::Texture:
// drawing a sprite

// Load a texture from a file
sf::Texture texture;
if (!texture.loadFromFile("texture.png"))
    return -1;

// Assign it to a sprite
sf::Sprite sprite;
sprite.setTexture(texture);

// Draw the textured sprite
window.draw(sprite);

```

```

// This example shows another common use of sf::Texture:
// streaming real-time data, like video frames

// Create an empty texture
sf::Texture texture;
if (!texture.create(640, 480))
    return -1;

// Create a sprite that will display the texture
sf::Sprite sprite(texture);

while (...) // the main loop
{
    ...

    // update the texture
    sf::Uint8* pixels = ...; // get a fresh chunk of pixels (the next f
    texture.update(pixels);

    // draw it
    window.draw(sprite);

    ...
}

```

Like `sf::Shader` that can be used as a raw OpenGL shader, `sf::Texture` can be used as a raw OpenGL texture for custom OpenGL geometry.

```

sf::Texture::bind(&texture);
... render OpenGL geometry ...
sf::Texture::bind(NULL);

```

See also

`sf::Sprite`, `sf::Image`, `sf::RenderTexture`

Definition at line 47 of file Texture.hpp.

Member Enumeration Documentation

enum `sf::Texture::CoordinateType`

Types of texture coordinates that can be used for rendering.

Enumerator	
Normalized	Texture coordinates in range [0 .. 1].
Pixels	Texture coordinates in range [0 .. size].

Definition at line 55 of file `Texture.hpp`.

Constructor & Destructor Documentation

sf::Texture::Texture ()

Default constructor.

Creates an empty texture.

sf::Texture::Texture (const **Texture & **copy**)**

Copy constructor.

Parameters

copy instance to copy

sf::Texture::~~Texture ()

Destructor.

Member Function Documentation

```
static void sf::Texture::bind ( const Texture * texture,  
                               CoordinateType coordinateType = Normal  
                               )
```

Bind a texture for rendering.

This function is not part of the graphics API, it mustn't be used when drawing. It is used only if you mix `sf::Texture` with OpenGL code.

```
sf::Texture t1, t2;  
...  
sf::Texture::bind(&t1);  
// draw OpenGL stuff that use t1...  
sf::Texture::bind(&t2);  
// draw OpenGL stuff that use t2...  
sf::Texture::bind(NULL);  
// draw OpenGL stuff that use no texture...
```

The *coordinateType* argument controls how texture coordinates will be interpreted (by default, they must be in range [0 .. 1], which is the default way of handling texture coordinates in OpenGL. If `CoordinateType::Pixels`, they must be given in pixels (range [0 .. size])). This makes the definition of texture coordinates in the SFML graphics classes API, users don't need to compute normalized values.

Parameters

texture Pointer to the texture to bind, can be null to use no texture.
coordinateType Type of texture coordinates to use

Image sf::Texture::copyToImage () const

Copy the texture pixels to an image.

This function performs a slow operation that downloads the texture's pixels and copies them to a new image, potentially applying transformations to pixels (padding or flipping).

Returns

Image containing the texture's pixels

See also

loadFromImage

bool sf::Texture::create (unsigned int width, unsigned int height)

Create the texture.

If this function fails, the texture is left unchanged.

Parameters

width Width of the texture

height Height of the texture

Returns

True if creation was successful

bool sf::Texture::generateMipmap ()

Generate a mipmap using the current texture data.

Mipmaps are pre-computed chains of optimized textures. Each level of detail is generated by halving each of the previous level's dimensions. This is done until the texture is small enough to be displayed on the screen. The textures generated in this process may make use of more advanced filtering techniques to maintain the visual quality of textures when they are applied to objects much smaller than the original texture. Because fewer texels (texture elements) have to be sampled, the use of mipmaps can also improve rendering performance in certain scenarios.

Mipmap generation relies on the necessary OpenGL extension being available. If mipmap generation fails due to another reason, this function will return false. Mipmaps are generated until the next time the base level image is modified, so you may have to be called again to regenerate it.

Returns

True if mipmap generation was successful, false if unsuccessful

static unsigned int sf::Texture::getMaximumSize ()

Get the maximum texture size allowed.

This maximum size is defined by the graphics driver. You can expect a maximum of 8192 pixels for older graphics cards, and up to 8192 pixels or more for newer hardware.

Returns

Maximum size allowed for textures, in pixels

unsigned int sf::Texture::getNativeHandle () const

Get the underlying OpenGL handle of the texture.

You shouldn't need to use this function, unless you have very specific requirements that the standard doesn't support, or implement a temporary workaround until a bug is fixed.

Returns

OpenGL handle of the texture or 0 if not yet created

Vector2u sf::Texture::getSize () const

Return the size of the texture.

Returns

Size in pixels

bool sf::Texture::isRepeated () const

Tell whether the texture is repeated or not.

Returns

True if repeat mode is enabled, false if it is disabled

See also

[setRepeated](#)

bool sf::Texture::isSmooth () const

Tell whether the smooth filter is enabled or not.

Returns

True if smoothing is enabled, false if it is disabled

See also

[setSmooth](#)

bool sf::Texture::isSrgb () const

Tell whether the texture source is converted from sRGB or not.

Returns

True if the texture source is converted from sRGB, false if not

See also

[setSrgb](#)

bool sf::Texture::loadFromFile (const std::string & filename, const IntRect & area = IntRect ())

Load the texture from a file on disk.

This function is a shortcut for the following code:

```
sf::Image image;  
image.loadFromFile(filename);  
texture.loadFromImage(image, area);
```

The *area* argument can be used to load only a sub-rectangle of the whole image then leave the default value (which is an empty IntRect). If the *area* is larger than the image, it is adjusted to fit the image size.

The maximum size for a texture depends on the graphics driver. Use the `getMaximumSize` function.

If this function fails, the texture is left unchanged.

Parameters

filename Path of the image file to load

area Area of the image to load

Returns

True if loading was successful

See also

[loadFromMemory](#), [loadFromStream](#), [loadFromImage](#)

```
bool sf::Texture::loadFromImage ( const Image & image,  
                                  const IntRect & area = IntRect ()  
                                  )
```

Load the texture from an image.

The *area* argument can be used to load only a sub-rectangle of the whole image then leave the default value (which is an empty IntRect). If the *area* is larger than the image, it is adjusted to fit the image size.

The maximum size for a texture depends on the graphics driver. Use the `getMaximumSize` function.

If this function fails, the texture is left unchanged.

Parameters

image Image to load into the texture

area Area of the image to load

Returns

True if loading was successful

See also

[loadFromFile](#), [loadFromMemory](#)

```
bool sf::Texture::loadFromMemory ( const void * data,
                                   std::size_t size,
                                   const IntRect & area = IntRect (
                                   ) )
```

Load the texture from a file in memory.

This function is a shortcut for the following code:

```
sf::Image image;
image.loadFromMemory(data, size);
texture.loadFromImage(image, area);
```

The *area* argument can be used to load only a sub-rectangle of the whole image then leave the default value (which is an empty IntRect). If the *area* is larger than the image, it is adjusted to fit the image size.

The maximum size for a texture depends on the graphics driver : getMaximumSize function.

If this function fails, the texture is left unchanged.

Parameters

data Pointer to the file data in memory

size Size of the data to load, in bytes

area Area of the image to load

Returns

True if loading was successful

See also

[loadFromFile](#), [loadFromStream](#), [loadFromImage](#)

```
bool sf::Texture::loadFromStream ( InputStream & stream,  
                                   const IntRect & area = IntRect()  
                                   )
```

Load the texture from a custom stream.

This function is a shortcut for the following code:

```
sf::Image image;  
image.loadFromStream(stream);  
texture.loadFromImage(image, area);
```

The *area* argument can be used to load only a sub-rectangle of the whole image then leave the default value (which is an empty `IntRect`). If the *area* is larger than the image, it is adjusted to fit the image size.

The maximum size for a texture depends on the graphics driver. Use the `getMaximumSize` function.

If this function fails, the texture is left unchanged.

Parameters

stream Source stream to read from

area Area of the image to load

Returns

True if loading was successful

See also

loadFromFile, loadFromMemory, loadFromImage

Texture & sf::Texture::operator= (const Texture & right)

Overload of assignment operator.

Parameters

right Instance to assign

Returns

Reference to self

void sf::Texture::setRepeated (bool repeated)

Enable or disable repeating.

Repeating is involved when using texture coordinates outside the texture. In this case, if repeat mode is enabled, the whole texture will be repeated to reach the coordinate (for example, if the X texture coordinate is 3 * width times). If repeat mode is disabled, the "extra space" will instead be filled with black pixels. On very old graphics cards, white pixels may appear when the texture is repeated. Repeat mode can be used reliably only if the texture has power-of-two dimensions. Repeating is disabled by default.

Parameters

repeated True to repeat the texture, false to disable repeating

See also

isRepeated

`void sf::Texture::setSmooth (bool smooth)`

Enable or disable the smooth filter.

When the filter is activated, the texture appears smoother so that pixels you want the texture to look exactly the same as its source file, you should filter is disabled by default.

Parameters

smooth True to enable smoothing, false to disable it

See also

[isSmooth](#)

`void sf::Texture::setSrgb (bool sRgb)`

Enable or disable conversion from sRGB.

When providing texture data from an image file or memory, it can either be in an sRGB color space. Most digital images account for gamma correction to be "uncorrected" back to linear color space before being processed. The texture can automatically convert it from the sRGB color space to a linear color space. When the rendered image gets output to the final framebuffer, it gets converted back to sRGB.

After enabling or disabling sRGB conversion, make sure to reload the texture to take effect.

This option is only useful in conjunction with an sRGB capable framebuffer. It is not available on window creation.

Parameters

sRgb True to enable sRGB conversion, false to disable it

See also

[isSrgb](#)

```
void sf::Texture::update ( const Uint8 * pixels )
```

Update the whole texture from an array of pixels.

The *pixel* array is assumed to have the same size as the *area* rectangle in pixels.

No additional check is performed on the size of the pixel array, passing undefined behavior.

This function does nothing if *pixels* is null or if the texture was not previously loaded.

Parameters

pixels Array of pixels to copy to the texture

```
void sf::Texture::update ( const Uint8 * pixels,  
                           unsigned int width,  
                           unsigned int height,  
                           unsigned int x,  
                           unsigned int y  
                           )
```

Update a part of the texture from an array of pixels.

The size of the *pixel* array must match the *width* and *height* arguments, as well as the *x* and *y* coordinates, in pixels.

No additional check is performed on the size of the pixel array or the

passing invalid arguments will lead to an undefined behavior.

This function does nothing if *pixels* is null or if the texture was not previously

Parameters

- pixels** Array of pixels to copy to the texture
- width** Width of the pixel region contained in *pixels*
- height** Height of the pixel region contained in *pixels*
- x** X offset in the texture where to copy the source pixels
- y** Y offset in the texture where to copy the source pixels

```
void sf::Texture::update ( const Image & image )
```

Update the texture from an image.

Although the source image can be smaller than the texture, this function updates the whole texture. The other overload, which has (x, y) additional arguments, is updating a sub-area of the texture.

No additional check is performed on the size of the image, passing an invalid image will lead to an undefined behavior.

This function does nothing if the texture was not previously created.

Parameters

- image** Image to copy to the texture

```
void sf::Texture::update ( const Image & image,  
                           unsigned int x,  
                           unsigned int y  
                           )
```


)

Update a part of the texture from the contents of a window.

No additional check is performed on the size of the window, passing a size and offset will lead to an undefined behavior.

This function does nothing if either the texture or the window was not pre

Parameters

window [Window](#) to copy to the texture

x X offset in the texture where to copy the source window

y Y offset in the texture where to copy the source window

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

- [Texture.hpp](#)

[Main Page](#) | [Related Pages](#) | [Modules](#) | [Namespaces](#) | **[Classes](#)** | [Files](#) |

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[Public Member Functions](#) | [Static Public Attributes](#) | [Related Functions](#) | [List of all members](#)

sf::Transform Class Reference

Graphics module

Define a 3x3 transform matrix. [More...](#)

```
#include <Transform.hpp>
```

Public Member Functions

`Transform ()`
Default constructor. [More...](#)

`Transform (float a00, float a01, float a02, float a10, float a11, float a20, float a21, float a22)`
Construct a transform from a 3x3 matrix. [More...](#)

`const float * getMatrix () const`
Return the transform as a 4x4 matrix. [More...](#)

`Transform getInverse () const`
Return the inverse of the transform. [More...](#)

`Vector2f transformPoint (float x, float y) const`
Transform a 2D point. [More...](#)

`Vector2f transformPoint (const Vector2f &point) const`
Transform a 2D point. [More...](#)

`FloatRect transformRect (const FloatRect &rectangle) const`
Transform a rectangle. [More...](#)

`Transform & combine (const Transform &transform)`
Combine the current transform with another one. [More...](#)

`Transform & translate (float x, float y)`
Combine the current transform with a translation. [More...](#)

`Transform & translate (const Vector2f &offset)`
Combine the current transform with a translation. [More...](#)

Transform & rotate (float angle)

Combine the current transform with a rotation. [More...](#)

Transform & rotate (float angle, float centerX, float centerY)

Combine the current transform with a rotation. [More...](#)

Transform & rotate (float angle, const Vector2f ¢er)

Combine the current transform with a rotation. [More...](#)

Transform & scale (float scaleX, float scaleY)

Combine the current transform with a scaling. [More...](#)

Transform & scale (float scaleX, float scaleY, float centerX, float centerY)

Combine the current transform with a scaling. [More...](#)

Transform & scale (const Vector2f &factors)

Combine the current transform with a scaling. [More...](#)

Transform & scale (const Vector2f &factors, const Vector2f ¢er)

Combine the current transform with a scaling. [More...](#)

Static Public Attributes

static const [Transform](#) [Identity](#)

The identity transform (does nothing) [More...](#)

Related Functions

(Note that these are not member functions.)

`Transform` `operator*` (`const Transform &left`, `const Transform &right`)
Overload of binary operator `*` to combine two transforms. [↗](#)

`Transform &` `operator*=(Transform &left, const Transform &right)`
Overload of binary operator `*=` to combine two transforms.

`Vector2f` `operator*` (`const Transform &left`, `const Vector2f &right`)
Overload of binary operator `*` to transform a point. [More...](#)

Detailed Description

Define a 3x3 transform matrix.

A `sf::Transform` specifies how to translate, rotate, scale, shear, project, w/

In mathematical terms, it defines how to transform a coordinate system int

For example, if you apply a rotation transform to a sprite, the result will that is transformed by this rotation transform will be rotated the same way,

Transforms are typically used for drawing. But they can also be used for transform points between the local and global coordinate systems of an e

Example:

```
// define a translation transform
sf::Transform translation;
translation.translate(20, 50);

// define a rotation transform
sf::Transform rotation;
rotation.rotate(45);

// combine them
sf::Transform transform = translation * rotation;

// use the result to transform stuff...
sf::Vector2f point = transform.transformPoint(10, 20);
sf::FloatRect rect = transform.transformRect(sf::FloatRect(0, 0, 10, 1
```

See also

`sf::Transformable`, `sf::RenderStates`

Definition at line 42 of file `Transform.hpp`.

Constructor & Destructor Documentation

sf::Transform::Transform ()

Default constructor.

Creates an identity transform (a transform that does nothing).

```
sf::Transform::Transform ( float a00,  
                           float a01,  
                           float a02,  
                           float a10,  
                           float a11,  
                           float a12,  
                           float a20,  
                           float a21,  
                           float a22  
                           )
```

Construct a transform from a 3x3 matrix.

Parameters

a00 Element (0, 0) of the matrix

a01 Element (0, 1) of the matrix

a02 Element (0, 2) of the matrix

a10 Element (1, 0) of the matrix

a11 Element (1, 1) of the matrix

a₁₂ Element (1, 2) of the matrix

a₂₀ Element (2, 0) of the matrix

a₂₁ Element (2, 1) of the matrix

a₂₂ Element (2, 2) of the matrix

Member Function Documentation

Transform& sf::Transform::combine (const **Transform** & transform

Combine the current transform with another one.

The result is a transform that is equivalent to applying *this followed by equivalent to a matrix multiplication.

Parameters

transform **Transform** to combine with this transform

Returns

Reference to *this

Transform sf::Transform::getInverse () const

Return the inverse of the transform.

If the inverse cannot be computed, an identity transform is returned.

Returns

A new transform which is the inverse of self

const float* sf::Transform::getMatrix () const

Return the transform as a 4x4 matrix.

This function returns a pointer to an array of 16 floats containing the transform which is directly compatible with OpenGL functions.

```
sf::Transform transform = ...;
glLoadMatrixf(transform.getMatrix());
```

Returns

Pointer to a 4x4 matrix

Transform& sf::Transform::rotate (float **angle**)

Combine the current transform with a rotation.

This function returns a reference to *this, so that calls can be chained.

```
sf::Transform transform;
transform.rotate(90).translate(50, 20);
```

Parameters

angle Rotation angle, in degrees

Returns

Reference to *this

See also

[translate](#), [scale](#)

Transform& sf::Transform::rotate (float **angle**, float **centerX**,

```
float centerY  
)
```

Combine the current transform with a rotation.

The center of rotation is provided for convenience as a second argument around arbitrary points more easily (and efficiently) than `center().rotate(angle).translate(center)`.

This function returns a reference to `*this`, so that calls can be chained.

```
sf::Transform transform;  
transform.rotate(90, 8, 3).translate(50, 20);
```

Parameters

angle Rotation angle, in degrees
centerX X coordinate of the center of rotation
centerY Y coordinate of the center of rotation

Returns

Reference to `*this`

See also

[translate](#), [scale](#)

```
Transform& sf::Transform::rotate ( float angle,  
const Vector2f & center  
)
```

Combine the current transform with a rotation.

The center of rotation is provided for convenience as a second argument around arbitrary points more easily (and efficiently) than

center).rotate(angle).translate(center).

This function returns a reference to `*this`, so that calls can be chained.

```
sf::Transform transform;  
transform.rotate(90, sf::Vector2f(8, 3)).translate(sf::Vector2f(50, 2));
```

Parameters

angle Rotation angle, in degrees

center Center of rotation

Returns

Reference to `*this`

See also

[translate](#), [scale](#)

```
Transform& sf::Transform::scale ( float scaleX,  
                                float scaleY  
                                )
```

Combine the current transform with a scaling.

This function returns a reference to `*this`, so that calls can be chained.

```
sf::Transform transform;  
transform.scale(2, 1).rotate(45);
```

Parameters

scaleX Scaling factor on the X axis

scaleY Scaling factor on the Y axis

Returns

Reference to `*this`

See also

`translate`, `rotate`

```
Transform& sf::Transform::scale ( float scaleX,  
                                float scaleY,  
                                float centerX,  
                                float centerY  
                                )
```

Combine the current transform with a scaling.

The center of scaling is provided for convenience as a second argument around arbitrary points more easily (and efficiently) than `center.translate(scale(factors)).translate(center)`.

This function returns a reference to `*this`, so that calls can be chained.

```
sf::Transform transform;  
transform.scale(2, 1, 8, 3).rotate(45);
```

Parameters

scaleX Scaling factor on X axis

scaleY Scaling factor on Y axis

centerX X coordinate of the center of scaling

centerY Y coordinate of the center of scaling

Returns

Reference to `*this`

See also

`translate`, `rotate`

Transform & sf::Transform::scale (const Vector2f & factors)

Combine the current transform with a scaling.

This function returns a reference to *this, so that calls can be chained.

```
sf::Transform transform;  
transform.scale(sf::Vector2f(2, 1)).rotate(45);
```

Parameters

factors Scaling factors

Returns

Reference to *this

See also

[translate](#), [rotate](#)

Transform & sf::Transform::scale (const Vector2f & factors, const Vector2f & center)

Combine the current transform with a scaling.

The center of scaling is provided for convenience as a second argument around arbitrary points more easily (and efficiently) than `center.scale(factors).translate(center)`.

This function returns a reference to *this, so that calls can be chained.

```
sf::Transform transform;
```

```
transform.scale(sf::Vector2f(2, 1), sf::Vector2f(8, 3)).rotate(45);
```

Parameters

factors Scaling factors
center Center of scaling

Returns

Reference to *this

See also

[translate](#), [rotate](#)

```
Vector2f sf::Transform::transformPoint ( float x,  
                                           float y  
                                           ) const
```

Transform a 2D point.

Parameters

x X coordinate of the point to transform
y Y coordinate of the point to transform

Returns

Transformed point

```
Vector2f sf::Transform::transformPoint ( const Vector2f & point ) const
```

Transform a 2D point.

Parameters

point Point to transform

Returns

Transformed point

FloatRect sf::Transform::transformRect (const FloatRect & rectangle)

Transform a rectangle.

Since SFML doesn't provide support for oriented rectangles, the result is an axis-aligned rectangle. Which means that if the transform contains a rotation, the transformed rectangle is returned.

Parameters

rectangle Rectangle to transform

Returns

Transformed rectangle

Transform& sf::Transform::translate (float x, float y)

Combine the current transform with a translation.

This function returns a reference to *this, so that calls can be chained.

```
sf::Transform transform;  
transform.translate(100, 200).rotate(45);
```

Parameters

x Offset to apply on X axis

y Offset to apply on Y axis

Returns

Reference to `*this`

See also

`rotate`, `scale`

Transform & sf::Transform::translate (const **Vector2f** & **offset**)

Combine the current transform with a translation.

This function returns a reference to `*this`, so that calls can be chained.

```
sf::Transform transform;  
transform.translate(sf::Vector2f(100, 200)).rotate(45);
```

Parameters

offset Translation offset to apply

Returns

Reference to `*this`

See also

`rotate`, `scale`

Friends And Related Function Documentatio

```
Transform operator* ( const Transform & left,  
                    const Transform & right  
                    )
```

Overload of binary operator * to combine two transforms.

This call is equivalent to calling Transform(left).combine(right).

Parameters

left Left operand (the first transform)

right Right operand (the second transform)

Returns

New combined transform

```
Vector2f operator* ( const Transform & left,  
                    const Vector2f & right  
                    )
```

Overload of binary operator * to transform a point.

This call is equivalent to calling left.transformPoint(right).

Parameters

left Left operand (the transform)

right Right operand (the point to transform)

Returns

New transformed point

```
Transform & operator*=( Transform & left,  
                        const Transform & right  
                        )
```

Overload of binary operator *= to combine two transforms.

This call is equivalent to calling left.combine(right).

Parameters

left Left operand (the first transform)

right Right operand (the second transform)

Returns

The combined transform

Member Data Documentation

const Transform sf::Transform::Identity

The identity transform (does nothing)

Definition at line 354 of file [Transform.hpp](#).

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

- [Transform.hpp](#)

SFML 2.4.2

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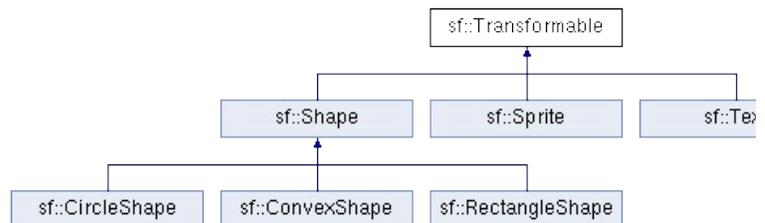
sf::Transformable Class Reference

Graphics module

Decomposed transform defined by a position, a rotation and a scale. [More](#)

```
#include <Transformable.hpp>
```

Inheritance diagram for sf::Transformable:



Public Member Functions

`Transformable ()`
Default constructor. [More...](#)

`virtual ~Transformable ()`
Virtual destructor. [More...](#)

`void setPosition (float x, float y)`
set the position of the object [More...](#)

`void setPosition (const Vector2f &position)`
set the position of the object [More...](#)

`void setRotation (float angle)`
set the orientation of the object [More...](#)

`void setScale (float factorX, float factorY)`
set the scale factors of the object [More...](#)

`void setScale (const Vector2f &factors)`
set the scale factors of the object [More...](#)

`void setOrigin (float x, float y)`
set the local origin of the object [More...](#)

`void setOrigin (const Vector2f &origin)`
set the local origin of the object [More...](#)

`const Vector2f & getPosition () const`
get the position of the object [More...](#)

`float getRotation () const`

get the orientation of the object [More...](#)

const `Vector2f` & `getScale ()` const
get the current scale of the object [More...](#)

const `Vector2f` & `getOrigin ()` const
get the local origin of the object [More...](#)

void `move (float offsetX, float offsetY)`
Move the object by a given offset. [More...](#)

void `move (const Vector2f &offset)`
Move the object by a given offset. [More...](#)

void `rotate (float angle)`
Rotate the object. [More...](#)

void `scale (float factorX, float factorY)`
Scale the object. [More...](#)

void `scale (const Vector2f &factor)`
Scale the object. [More...](#)

const `Transform` & `getTransform ()` const
get the combined transform of the object [More...](#)

const `Transform` & `getInverseTransform ()` const
get the inverse of the combined transform of the object

Detailed Description

Decomposed transform defined by a position, a rotation and a scale.

This class is provided for convenience, on top of `sf::Transform`.

`sf::Transform`, as a low-level class, offers a great level of flexibility but is hard to manage. Indeed, one can easily combine any kind of operation, such as a translation followed by a scaling, but once the result transform is built, there's no way to change only the rotation without modifying the translation and scaling. The transform is recomputed, which means that you need to retrieve the initial translation and scale, combine them the same way you did before updating the rotation. This is tedious and requires to store all the individual components of the final transform.

That's exactly what `sf::Transformable` was written for: it hides these variables behind an easy to use interface. You can set or get any of the individual components without affecting the others. It also provides the composed transform (as a `sf::Transform`).

In addition to the position, rotation and scale, `sf::Transformable` provides a `origin` property that represents the local origin of the three other components. Let's take an example: by default, the sprite is positioned/rotated/scaled relatively to its top-left corner (0, 0). But if we change the origin to be (5, 5), the sprite will be positioned/rotated/scaled around (5, 5) instead. And if we set the origin to (10, 10), it will be transformed around it.

To keep the `sf::Transformable` class simple, there's only one origin for the position: the sprite is positioned relatively to its top-left corner while rotating it around it. For scaling, use `sf::Transform` directly.

`sf::Transformable` can be used as a base class. It is often combined with `sf::Sprite`, `sf::Text` and `sf::Shape`.

```

class MyEntity : public sf::Transformable, public sf::Drawable
{
    virtual void draw(sf::RenderTarget& target, sf::RenderStates states)
    {
        states.transform *= getTransform();
        target.draw(..., states);
    }
};

MyEntity entity;
entity.setPosition(10, 20);
entity.setRotation(45);
window.draw(entity);

```

It can also be used as a member, if you don't want to use its API direct functions, or you have different naming conventions for example).

```

class MyEntity
{
public:
    void SetPosition(const MyVector& v)
    {
        myTransform.setPosition(v.x(), v.y());
    }

    void Draw(sf::RenderTarget& target) const
    {
        target.draw(..., myTransform.getTransform());
    }

private:
    sf::Transformable myTransform;
};

```

A note on coordinates and undistorted rendering:

By default, SFML (or more exactly, OpenGL) may interpolate drawable when rendering. While this allows transitions like slow movements or ro lead to unwanted results in some cases, for example blurred or distort `sf::Drawable` object pixel-perfectly, make sure the involved coordinates al window to texels (pixels in the texture). More specifically, this means:

- The object's position, origin and scale have no fractional part
- The object's and the view's rotation are a multiple of 90 degrees

- The view's center and size have no fractional part

See also

[sf::Transform](#)

Definition at line 41 of file [Transformable.hpp](#).

Constructor & Destructor Documentation

sf::Transformable::Transformable ()

Default constructor.

virtual sf::Transformable::~~Transformable ()

Virtual destructor.

Member Function Documentation

const `Transform`& sf::Transformable::getInverseTransform () const

get the inverse of the combined transform of the object

Returns

Inverse of the combined transformations applied to the object

See also

`getTransform`

const `Vector2f`& sf::Transformable::getOrigin () const

get the local origin of the object

Returns

Current origin

See also

`setOrigin`

const `Vector2f`& sf::Transformable::getPosition () const

get the position of the object

Returns

Current position

See also

[setPosition](#)

float sf::Transformable::getRotation () const

get the orientation of the object

The rotation is always in the range [0, 360].

Returns

Current rotation, in degrees

See also

[setRotation](#)

const [Vector2f](#)& sf::Transformable::getScale () const

get the current scale of the object

Returns

Current scale factors

See also

[setScale](#)

const [Transform](#)& sf::Transformable::getTransform () const

get the combined transform of the object

Returns

`Transform` combining the position/rotation/scale/origin of the object

See also

`getInverseTransform`

```
void sf::Transformable::move ( float offsetX,  
                             float offsetY  
                             )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
sf::Vector2f pos = object.getPosition();  
object.setPosition(pos.x + offsetX, pos.y + offsetY);
```

Parameters

offsetX X offset

offsetY Y offset

See also

`setPosition`

```
void sf::Transformable::move ( const Vector2f & offset )
```

Move the object by a given offset.

This function adds to the current position of the object, unlike `setPosition` equivalent to the following code:

```
object.setPosition(object.getPosition() + offset);
```

Parameters

offset Offset

See also

`setPosition`

`void sf::Transformable::rotate (float angle)`

Rotate the object.

This function adds to the current rotation of the object, unlike `setRotation` equivalent to the following code:

```
object.setRotation(object.getRotation() + angle);
```

Parameters

angle Angle of rotation, in degrees

`void sf::Transformable::scale (float factorX, float factorY)`

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();
object.setScale(scale.x * factorX, scale.y * factorY);
```

Parameters

factorX Horizontal scale factor

factorY Vertical scale factor

See also

[setScale](#)

```
void sf::Transformable::scale ( const Vector2f & factor )
```

Scale the object.

This function multiplies the current scale of the object, unlike `setScale` equivalent to the following code:

```
sf::Vector2f scale = object.getScale();
object.setScale(scale.x * factor.x, scale.y * factor.y);
```

Parameters

factor Scale factors

See also

[setScale](#)

```
void sf::Transformable::setOrigin ( float x,
                                   float y
                                   )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

x X coordinate of the new origin

y Y coordinate of the new origin

See also

[getOrigin](#)

```
void sf::Transformable::setOrigin ( const Vector2f & origin )
```

set the local origin of the object

The origin of an object defines the center point for all transformations: coordinates of this point must be relative to the top-left corner transformations (position, scale, rotation). The default origin of a transform

Parameters

origin New origin

See also

[getOrigin](#)

```
void sf::Transformable::setPosition ( float x,  
                                     float y  
                                     )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

x X coordinate of the new position

y Y coordinate of the new position

See also

`move`, `getPosition`

```
void sf::Transformable::setPosition ( const Vector2f & position )
```

set the position of the object

This function completely overwrites the previous position. See the `move` on the previous position instead. The default position of a transformable

Parameters

`position` New position

See also

`move`, `getPosition`

```
void sf::Transformable::setRotation ( float angle )
```

set the orientation of the object

This function completely overwrites the previous rotation. See the `rotate`

on the previous rotation instead. The default rotation of a transformable c

Parameters

angle New rotation, in degrees

See also

[rotate](#), [getRotation](#)

```
void sf::Transformable::setScale ( float factorX,  
                                  float factorY  
                                  )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the scale fu
the previous scale instead. The default scale of a transformable object is

Parameters

factorX New horizontal scale factor

factorY New vertical scale factor

See also

[scale](#), [getScale](#)

```
void sf::Transformable::setScale ( const Vector2f & factors )
```

set the scale factors of the object

This function completely overwrites the previous scale. See the scale fu
the previous scale instead. The default scale of a transformable object is

Parameters

factors New scale factors

See also

[scale](#), [getScale](#)

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

- [Transformable.hpp](#)

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[Public Member Functions](#) | [Public Attributes](#) | [List of all members](#)

sf::Vertex Class Reference

Graphics module

Define a point with color and texture coordinates. [More...](#)

```
#include <Vertex.hpp>
```

Public Member Functions

`Vertex ()`

Default constructor. [More...](#)

`Vertex (const Vector2f &thePosition)`

Construct the vertex from its position. [More...](#)

`Vertex (const Vector2f &thePosition, const Color &theColor)`

Construct the vertex from its position and color. [More...](#)

`Vertex (const Vector2f &thePosition, const Vector2f &theTexCoords)`

Construct the vertex from its position and texture coordinates. [More...](#)

`Vertex (const Vector2f &thePosition, const Color &theColor, const Vec`

Construct the vertex from its position, color and texture coordinates. [M](#)

Public Attributes

Vector2f position
2D position of the vertex [More...](#)

Color color
Color of the vertex. [More...](#)

Vector2f texCoords
Coordinates of the texture's pixel to map to the vertex. [More...](#)

Detailed Description

Define a point with color and texture coordinates.

A vertex is an improved point.

It has a position and other extra attributes that will be used for drawing: in and a pair of texture coordinates.

The vertex is the building block of drawing. Everything which is visible on are grouped as 2D primitives (triangles, quads, ...), and these primitives complex 2D entities such as sprites, texts, etc.

If you use the graphical entities of SFML (sprite, text, shape) you won't h But if you want to define your own 2D entities, such as tiled maps or pa allow you to get maximum performances.

Example:

```
// define a 100x100 square, red, with a 10x10 texture mapped on it
sf::Vertex vertices[] =
{
    sf::Vertex(sf::Vector2f( 0,  0), sf::Color::Red, sf::Vector2f( 0, 10),
    sf::Vertex(sf::Vector2f( 0, 100), sf::Color::Red, sf::Vector2f( 0, 10),
    sf::Vertex(sf::Vector2f(100, 100), sf::Color::Red, sf::Vector2f(10, 10),
    sf::Vertex(sf::Vector2f(100,  0), sf::Color::Red, sf::Vector2f(10,
};

// draw it
window.draw(vertices, 4, sf::Quads);
```

Note: although texture coordinates are supposed to be an integer am because of some buggy graphics drivers that are not able to process integ

See also

`sf::VertexArray`

Definition at line 42 of file `Vertex.hpp`.

Constructor & Destructor Documentation

sf::Vertex::Vertex ()

Default constructor.

sf::Vertex::Vertex (const **Vector2f & **thePosition**)**

Construct the vertex from its position.

The vertex color is white and texture coordinates are (0, 0).

Parameters

thePosition *Vertex* position

sf::Vertex::Vertex (const **Vector2f & **thePosition**,
 const **Color** & **theColor**
)**

Construct the vertex from its position and color.

The texture coordinates are (0, 0).

Parameters

thePosition *Vertex* position

theColor *Vertex* color

```
sf::Vertex::Vertex ( const Vector2f & thePosition,  
                    const Vector2f & theTexCoords  
                    )
```

Construct the vertex from its position and texture coordinates.

The vertex color is white.

Parameters

thePosition **Vertex** position

theTexCoords **Vertex** texture coordinates

```
sf::Vertex::Vertex ( const Vector2f & thePosition,  
                    const Color & theColor,  
                    const Vector2f & theTexCoords  
                    )
```

Construct the vertex from its position, color and texture coordinates.

Parameters

thePosition **Vertex** position

theColor **Vertex** color

theTexCoords **Vertex** texture coordinates

Member Data Documentation

Color sf::Vertex::color

Color of the vertex.

Definition at line 98 of file [Vertex.hpp](#).

Vector2f sf::Vertex::position

2D position of the vertex

Definition at line 97 of file [Vertex.hpp](#).

Vector2f sf::Vertex::texCoords

Coordinates of the texture's pixel to map to the vertex.

Definition at line 99 of file [Vertex.hpp](#).

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

- [Vertex.hpp](#)

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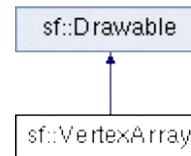
sf::VertexArray Class Reference

Graphics module

Define a set of one or more 2D primitives. [More...](#)

```
#include <VertexArray.hpp>
```

Inheritance diagram for sf::VertexArray:



Public Member Functions

`VertexArray ()`
Default constructor. [More...](#)

`VertexArray (PrimitiveType type, std::size_t vertexCount)`
Construct the vertex array with a type and an initial number of vertices.

`std::size_t getVertexCount () const`
Return the vertex count. [More...](#)

`Vertex & operator[] (std::size_t index)`
Get a read-write access to a vertex by its index. [More...](#)

`const Vertex & operator[] (std::size_t index) const`
Get a read-only access to a vertex by its index. [More...](#)

`void clear ()`
Clear the vertex array. [More...](#)

`void resize (std::size_t vertexCount)`
Resize the vertex array. [More...](#)

`void append (const Vertex &vertex)`
Add a vertex to the array. [More...](#)

`void setPrimitiveType (PrimitiveType type)`
Set the type of primitives to draw. [More...](#)

`PrimitiveType getPrimitiveType () const`
Get the type of primitives drawn by the vertex array. [More...](#)

`FloatRect getBounds () const`

Compute the bounding rectangle of the vertex array. **Mo**

Detailed Description

Define a set of one or more 2D primitives.

`sf::VertexArray` is a very simple wrapper around a dynamic array of vertices.

It inherits `sf::Drawable`, but unlike other drawables it is not transformable.

Example:

```
sf::VertexArray lines(sf::LineStrip, 4);
lines[0].position = sf::Vector2f(10, 0);
lines[1].position = sf::Vector2f(20, 0);
lines[2].position = sf::Vector2f(30, 5);
lines[3].position = sf::Vector2f(40, 2);

window.draw(lines);
```

See also

`sf::Vertex`

Definition at line 45 of file `VertexArray.hpp`.

Constructor & Destructor Documentation

sf::VertexArray::VertexArray ()

Default constructor.

Creates an empty vertex array.

sf::VertexArray::VertexArray (PrimitiveType type, std::size_t vertexCount = 0)

Construct the vertex array with a type and an initial number of vertices.

Parameters

type Type of primitives

vertexCount Initial number of vertices in the array

Member Function Documentation

void sf::VertexArray::append (const `Vertex` & `vertex`)

Add a vertex to the array.

Parameters

`vertex` `Vertex` to add

void sf::VertexArray::clear ()

Clear the vertex array.

This function removes all the vertices from the array. It doesn't deallocate that adding new vertices after clearing doesn't involve reallocating all the

`FloatRect` sf::VertexArray::getBounds () const

Compute the bounding rectangle of the vertex array.

This function returns the minimal axis-aligned rectangle that contains all

Returns

Bounding rectangle of the vertex array

PrimitiveType sf::VertexArray::getPrimitiveType () const

Get the type of primitives drawn by the vertex array.

Returns

Primitive type

std::size_t sf::VertexArray::getVertexCount () const

Return the vertex count.

Returns

Number of vertices in the array

Vertex& sf::VertexArray::operator[] (std::size_t **index**)

Get a read-write access to a vertex by its index.

This function doesn't check *index*, it must be in range [0, `getVertexCount` - 1], otherwise it is undefined.

Parameters

index Index of the vertex to get

Returns

Reference to the index-th vertex

See also

`getVertexCount`

```
const Vertex& sf::VertexArray::operator[] ( std::size_t index ) const
```

Get a read-only access to a vertex by its index.

This function doesn't check *index*, it must be in range [0, `getVertexCount` - 1], otherwise it is undefined otherwise.

Parameters

index Index of the vertex to get

Returns

Const reference to the index-th vertex

See also

`getVertexCount`

```
void sf::VertexArray::resize ( std::size_t vertexCount )
```

Resize the vertex array.

If *vertexCount* is greater than the current size, the previous vertices (if any) are added. If *vertexCount* is less than the current size, the vertices are removed from the array.

Parameters

vertexCount New size of the array (number of vertices)

```
void sf::VertexArray::setPrimitiveType ( PrimitiveType type )
```

Set the type of primitives to draw.

This function defines how the vertices must be interpreted when it's time

- As points
- As lines
- As triangles
- As quads The default primitive type is `sf::Points`.

Parameters

type Type of primitive

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

- [VertexArray.hpp](#)

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[Public Member Functions](#) | [List of all members](#)

sf::View Class Reference

Graphics module

2D camera that defines what region is shown on screen [More...](#)

```
#include <View.hpp>
```

Public Member Functions

`View ()`
Default constructor. [More...](#)

`View (const FloatRect &rectangle)`
Construct the view from a rectangle. [More...](#)

`View (const Vector2f ¢er, const Vector2f &size)`
Construct the view from its center and size. [More...](#)

`void setCenter (float x, float y)`
Set the center of the view. [More...](#)

`void setCenter (const Vector2f ¢er)`
Set the center of the view. [More...](#)

`void setSize (float width, float height)`
Set the size of the view. [More...](#)

`void setSize (const Vector2f &size)`
Set the size of the view. [More...](#)

`void setRotation (float angle)`
Set the orientation of the view. [More...](#)

`void setViewport (const FloatRect &viewport)`
Set the target viewport. [More...](#)

`void reset (const FloatRect &rectangle)`
Reset the view to the given rectangle. [More...](#)

`const Vector2f & getCenter () const`

Get the center of the view. [More...](#)

const `Vector2f` & `getSize ()` const
Get the size of the view. [More...](#)

float `getRotation ()` const
Get the current orientation of the view. [More...](#)

const `FloatRect` & `getViewport ()` const
Get the target viewport rectangle of the view. [More...](#)

void `move (float offsetX, float offsetY)`
Move the view relatively to its current position. [More...](#)

void `move (const Vector2f &offset)`
Move the view relatively to its current position. [More...](#)

void `rotate (float angle)`
Rotate the view relatively to its current orientation. [More...](#)

void `zoom (float factor)`
Resize the view rectangle relatively to its current size.

const `Transform` & `getTransform ()` const
Get the projection transform of the view. [More...](#)

const `Transform` & `getInverseTransform ()` const
Get the inverse projection transform of the view. [More...](#)

Detailed Description

2D camera that defines what region is shown on screen

`sf::View` defines a camera in the 2D scene.

This is a very powerful concept: you can scroll, rotate or zoom the entire scene where your drawable objects are drawn.

A view is composed of a source rectangle, which defines what part of the scene is visible in the viewport, which defines where the contents of the source rectangle will be drawn (window or texture).

The viewport allows to map the scene to a custom part of the render target, such as the screen or for displaying a minimap, for example. If the source rectangle does not fit in the viewport, its contents will be stretched to fit in.

To apply a view, you have to assign it to the render target. Then, objects are rendered affected by the view until you use another view.

Usage example:

```
sf::RenderWindow window;
sf::View view;

// Initialize the view to a rectangle located at (100, 100) and with a width of 300 and a height of 100
view.reset(sf::FloatRect(100, 100, 400, 200));

// Rotate it by 45 degrees
view.rotate(45);

// Set its target viewport to be half of the window
view.setViewport(sf::FloatRect(0.f, 0.f, 0.5f, 1.f));

// Apply it
window.setView(view);

// Render stuff
```

```
window.draw(someSprite);  
  
// Set the default view back  
window.setView(window.getDefaultView());  
  
// Render stuff not affected by the view  
window.draw(someText);
```

See also the note on coordinates and undistorted rendering in [sf::Transform](#)

See also

[sf::RenderWindow](#), [sf::RenderTexture](#)

Definition at line 43 of file [View.hpp](#).

Constructor & Destructor Documentation

sf::View::View ()

Default constructor.

This constructor creates a default view of (0, 0, 1000, 1000)

sf::View::View (const **FloatRect & **rectangle**)**

Construct the view from a rectangle.

Parameters

rectangle Rectangle defining the zone to display

sf::View::View (const **Vector2f & **center**, const **Vector2f** & **size**)**

Construct the view from its center and size.

Parameters

center Center of the zone to display

size Size of zone to display

Member Function Documentation

const `Vector2f`& sf::View::getCenter () const

Get the center of the view.

Returns

Center of the view

See also

`getSize`, `setCenter`

const `Transform`& sf::View::getInverseTransform () const

Get the inverse projection transform of the view.

This function is meant for internal use only.

Returns

Inverse of the projection transform defining the view

See also

`getTransform`

float sf::View::getRotation () const

Get the current orientation of the view.

Returns

Rotation angle of the view, in degrees

See also

[setRotation](#)

const [Vector2f](#)& sf::View::getSize () const

Get the size of the view.

Returns

Size of the view

See also

[getCenter](#), [setSize](#)

const [Transform](#)& sf::View::getTransform () const

Get the projection transform of the view.

This function is meant for internal use only.

Returns

Projection transform defining the view

See also

[getInverseTransform](#)

```
const FloatRect& sf::View::getViewport ( ) const
```

Get the target viewport rectangle of the view.

Returns

Viewport rectangle, expressed as a factor of the target size

See also

[setViewport](#)

```
void sf::View::move ( float offsetX,  
                    float offsetY  
                    )
```

Move the view relatively to its current position.

Parameters

offsetX X coordinate of the move offset

offsetY Y coordinate of the move offset

See also

[setCenter](#), [rotate](#), [zoom](#)

```
void sf::View::move ( const Vector2f & offset )
```

Move the view relatively to its current position.

Parameters

offset Move offset

See also

[setCenter](#), [rotate](#), [zoom](#)

```
void sf::View::reset ( const FloatRect & rectangle )
```

Reset the view to the given rectangle.

Note that this function resets the rotation angle to 0.

Parameters

rectangle Rectangle defining the zone to display

See also

[setCenter](#), [setSize](#), [setRotation](#)

```
void sf::View::rotate ( float angle )
```

Rotate the view relatively to its current orientation.

Parameters

angle Angle to rotate, in degrees

See also

[setRotation](#), [move](#), [zoom](#)

```
void sf::View::setCenter ( float x,  
                           float y  
                           )
```

Set the center of the view.

Parameters

x X coordinate of the new center

y Y coordinate of the new center

See also

[setSize](#), [getCenter](#)

```
void sf::View::setCenter ( const Vector2f & center )
```

Set the center of the view.

Parameters

center New center

See also

[setSize](#), [getCenter](#)

```
void sf::View::setRotation ( float angle )
```

Set the orientation of the view.

The default rotation of a view is 0 degree.

Parameters

angle New angle, in degrees

See also

[getRotation](#)

```
void sf::View::setSize ( float width,  
                        float height  
                        )
```

Set the size of the view.

Parameters

width New width of the view

height New height of the view

See also

[setCenter](#), [getCenter](#)

```
void sf::View::setSize ( const Vector2f & size )
```

Set the size of the view.

Parameters

size New size

See also

[setCenter](#), [getCenter](#)

```
void sf::View::setViewport ( const FloatRect & viewport )
```

Set the target viewport.

The viewport is the rectangle into which the contents of the view are c
(between 0 and 1) of the size of the [RenderTarget](#) to which the view

which takes the left side of the target would be defined with `View.setView`
By default, a view has a viewport which covers the entire target.

Parameters

viewport New viewport rectangle

See also

`getViewport`

`void sf::View::zoom (float factor)`

Resize the view rectangle relatively to its current size.

Resizing the view simulates a zoom, as the zone displayed on screen is multiplied by:

- 1 keeps the size unchanged
- > 1 makes the view bigger (objects appear smaller)
- < 1 makes the view smaller (objects appear bigger)

Parameters

factor Zoom factor to apply

See also

`setSize`, `move`, `rotate`

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

- `View.hpp`

Classes

Network module

Socket-based communication, utilities and higher-level network protocols

Classes

class `sf::Ftp`
A FTP client. [More...](#)

class `sf::Http`
A HTTP client. [More...](#)

class `sf::IpAddress`
Encapsulate an IPv4 network address. [More...](#)

class `sf::Packet`
Utility class to build blocks of data to transfer over the network. [More...](#)

class `sf::Socket`
Base class for all the socket types. [More...](#)

class `sf::SocketSelector`
Multiplexer that allows to read from multiple sockets. [More...](#)

class `sf::TcpListener`
Socket that listens to new TCP connections. [More...](#)

class `sf::TcpSocket`
Specialized socket using the TCP protocol. [More...](#)

class `sf::UdpSocket`
Specialized socket using the UDP protocol. [More...](#)

Detailed Description

Socket-based communication, utilities and higher-level network protocols

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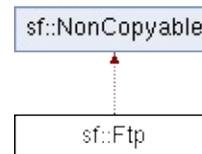
sf::Ftp Class Reference

Network module

A FTP client. [More...](#)

```
#include <Ftp.hpp>
```

Inheritance diagram for sf::Ftp:



Classes

class [DirectoryResponse](#)
Specialization of FTP response returning a directory. [More...](#)

class [ListingResponse](#)
Specialization of FTP response returning a filename listing. [More.](#)

class [Response](#)
Define a FTP response. [More...](#)

Public Types

enum `TransferMode` { `Binary`, `Ascii`, `Ebcdic` }
Enumeration of transfer modes. [More...](#)

Public Member Functions

`~Ftp ()`
Destructor. [More...](#)

Response `connect (const IpAddress &server, unsigned short port, unsigned int timeout=Time::Zero)`
Connect to the specified FTP server. [More...](#)

Response `disconnect ()`
Close the connection with the server. [More...](#)

Response `login ()`
Log in using an anonymous account. [More...](#)

Response `login (const std::string &name, const std::string &password)`
Log in using a username and a password. [More...](#)

Response `keepAlive ()`
Send a null command to keep the connection alive.

DirectoryResponse `getWorkingDirectory ()`
Get the current working directory. [More...](#)

ListingResponse `getDirectoryListing (const std::string &directory="")`
Get the contents of the given directory. [More...](#)

Response `changeDirectory (const std::string &directory)`
Change the current working directory. [More...](#)

Response `parentDirectory ()`
Go to the parent directory of the current one. [More...](#)

Response `createDirectory (const std::string &name)`
Create a new directory. [More...](#)

Response `deleteDirectory (const std::string &name)`
Remove an existing directory. [More...](#)

Response `renameFile (const std::string &file, const std::string &newFile)`
Rename an existing file. [More...](#)

Response `deleteFile (const std::string &name)`
Remove an existing file. [More...](#)

Response `download (const std::string &remoteFile, const std::string &localFile, const std::string &mode=Binary)`
Download a file from the server. [More...](#)

Response `upload (const std::string &localFile, const std::string &remoteFile, const std::string &mode=Binary)`
Upload a file to the server. [More...](#)

Response `sendCommand (const std::string &command, const std::string &args)`
Send a command to the FTP server. [More...](#)

Friends

```
class DataChannel
```

Detailed Description

A FTP client.

`sf::Ftp` is a very simple FTP client that allows you to communicate with a F

The FTP protocol allows you to manipulate a remote file system (list, remove, ...).

Using the FTP client consists of 4 parts:

- Connecting to the FTP server
- Logging in (either as a registered user or anonymously)
- Sending commands to the server
- Disconnecting (this part can be done implicitly by the destructor)

Every command returns a FTP response, which contains the status code and the data returned by the server. Some commands such as `getWorkingDirectory()` and `getDirectoryListing()` return a `sf::Ftp::Response` object and use a class derived from `sf::Ftp::Response` to provide this data. The `sf::Ftp::Response` class is directly provided as member functions, but it is also possible to use the `sendCommand()` function.

Note that response statuses ≥ 1000 are not part of the FTP standard, they indicate that an internal error occurs.

All commands, especially upload and download, may take some time to complete. You should know if you don't want to block your application while the server is completing the operation.

Usage example:

```
// Create a new FTP client
```

```

sf::Ftp ftp;

// Connect to the server
sf::Ftp::Response response = ftp.connect("ftp://ftp.myserver.com");
if (response.isOk())
    std::cout << "Connected" << std::endl;

// Log in
response = ftp.login("laurent", "dF6Zm89D");
if (response.isOk())
    std::cout << "Logged in" << std::endl;

// Print the working directory
sf::Ftp::DirectoryResponse directory = ftp.getWorkingDirectory();
if (directory.isOk())
    std::cout << "Working directory: " << directory.getDirectory() << "
";

// Create a new directory
response = ftp.createDirectory("files");
if (response.isOk())
    std::cout << "Created new directory" << std::endl;

// Upload a file to this new directory
response = ftp.upload("local-path/file.txt", "files", sf::Ftp::Ascii);
if (response.isOk())
    std::cout << "File uploaded" << std::endl;

// Send specific commands (here: FEAT to list supported FTP features)
response = ftp.sendCommand("FEAT");
if (response.isOk())
    std::cout << "Feature list:\n" << response.getMessage() << std::endl;

// Disconnect from the server (optional)
ftp.disconnect();

```

Definition at line 47 of file `Ftp.hpp`.

Member Enumeration Documentation

enum sf::Ftp::TransferMode

Enumeration of transfer modes.

Enumerator

Binary	Binary mode (file is transferred as a sequence of bytes)
Ascii	Text mode using ASCII encoding.
Ebcdic	Text mode using EBCDIC encoding.

Definition at line 55 of file Ftp.hpp.

Constructor & Destructor Documentation

sf::Ftp::~~Ftp ()

Destructor.

Automatically closes the connection with the server if it is still opened.

timeout will be used (which is usually pretty long).

Parameters

server Name or address of the FTP server to connect to

port Port used for the connection

timeout Maximum time to wait

Returns

Server response to the request

See also

[disconnect](#)

Response `sf::Ftp::createDirectory (const std::string & name)`

Create a new directory.

The new directory is created as a child of the current working directory.

Parameters

name Name of the directory to create

Returns

Server response to the request

See also

[deleteDirectory](#)

Response `sf::Ftp::deleteDirectory (const std::string & name)`

Remove an existing directory.

The directory to remove must be relative to the current working directory
the directory will be removed permanently!

Parameters

name Name of the directory to remove

Returns

Server response to the request

See also

[createDirectory](#)

Response `sf::Ftp::deleteFile (const std::string & name)`

Remove an existing file.

The file name must be relative to the current working directory. Use this
be removed permanently!

Parameters

name File to remove

Returns

Server response to the request

See also

[renameFile](#)

Response `sf::Ftp::disconnect ()`

Close the connection with the server.

Returns

Server response to the request

See also

[connect](#)

```
Response sf::Ftp::download ( const std::string & remoteFile,  
                             const std::string & localPath,  
                             TransferMode         mode = Binary  
                             )
```

Download a file from the server.

The filename of the distant file is relative to the current working directory. The destination path is relative to the current directory of your application. If the distant file already exists in the local destination path, it will be overwritten.

Parameters

remoteFile Filename of the distant file to download

localPath The directory in which to put the file on the local computer

mode Transfer mode

Returns

Server response to the request

See also

[upload](#)

```
ListingResponse sf::Ftp::getDirectoryListing ( const std::string & d
```

Get the contents of the given directory.

This function retrieves the sub-directories and files contained in the given directory. The *directory* parameter is relative to the current working directory.

Parameters

directory Directory to list

Returns

Server response to the request

See also

[getWorkingDirectory](#), [changeDirectory](#), [parentDirectory](#)

DirectoryResponse sf::Ftp::getWorkingDirectory ()

Get the current working directory.

The working directory is the root path for subsequent operations involving the connection.

Returns

Server response to the request

See also

[getDirectoryListing](#), [changeDirectory](#), [parentDirectory](#)

Response sf::Ftp::keepAlive ()

Send a null command to keep the connection alive.

This command is useful because the server may close the connection sent.

Returns

Server response to the request

Response `sf::Ftp::login ()`

Log in using an anonymous account.

Logging in is mandatory after connecting to the server. Users that are n operation.

Returns

Server response to the request

Response `sf::Ftp::login (const std::string & name, const std::string & password)`

Log in using a username and a password.

Logging in is mandatory after connecting to the server. Users that are n operation.

Parameters

name User name

password Password

Returns

Server response to the request

Response sf::Ftp::parentDirectory ()

Go to the parent directory of the current one.

Returns

Server response to the request

See also

[getWorkingDirectory](#), [getDirectoryListing](#), [changeDirectory](#)

Response sf::Ftp::renameFile (const std::string & **file**, const std::string & **newName**)

Rename an existing file.

The filenames must be relative to the current working directory.

Parameters

file File to rename
newName New name of the file

Returns

Server response to the request

See also

[deleteFile](#)

Response sf::Ftp::sendCommand (const std::string & **command**,

```
const std::string & parameter =  
)
```

Send a command to the FTP server.

While the most often used commands are provided as member functions can be used to send any FTP command to the server. If the command re they can be specified in *parameter*. If the server returns information, you using `Response::getMessage()`.

Parameters

command Command to send
parameter Command parameter

Returns

Server response to the request

```
Response sf::Ftp::upload ( const std::string & localFile,  
                           const std::string & remotePath,  
                           TransferMode      mode = Binary  
)
```

Upload a file to the server.

The name of the local file is relative to the current working directory of path is relative to the current directory of the FTP server.

Parameters

localFile Path of the local file to upload
remotePath The directory in which to put the file on the server
mode Transfer mode

Returns

Server response to the request

See also

[download](#)

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

- [Ftp.hpp](#)

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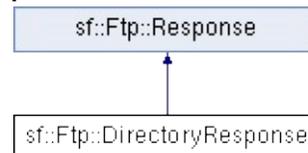
[Public Types](#) | [Public Member Functions](#) | [List of all members](#)

sf::Ftp::DirectoryResponse Class Reference

Specialization of FTP response returning a directory. [More...](#)

```
#include <Ftp.hpp>
```

Inheritance diagram for sf::Ftp::DirectoryResponse:



Public Types

```
enum Status {  
    RestartMarkerReply = 110, ServiceReadySoon = 120, DataCor  
    OpeningDataConnection = 150,  
    Ok = 200, PointlessCommand = 202, SystemStatus = 211, Dire  
    FileStatus = 213, HelpMessage = 214, SystemType = 215, Ser  
    ClosingConnection = 221, DataConnectionOpened = 225, Clos  
    EnteringPassiveMode = 227,  
    LoggedIn = 230, FileActionOk = 250, DirectoryOk = 257, NeedI  
    NeedAccountToLogIn = 332, NeedInformation = 350, ServiceU  
    DataConnectionUnavailable = 425,  
    TransferAborted = 426, FileActionAborted = 450, LocalError = 4  
    452,  
    CommandUnknown = 500, ParametersUnknown = 501, Comm  
    BadCommandSequence = 503,  
    ParameterNotImplemented = 504, NotLoggedIn = 530, NeedAc  
    FileUnavailable = 550,  
    PageTypeUnknown = 551, NotEnoughMemory = 552, Filename  
    InvalidResponse = 1000,  
    ConnectionFailed = 1001, ConnectionClosed = 1002, InvalidFil  
}  
Status codes possibly returned by a FTP response. More...
```

Public Member Functions

`DirectoryResponse` (const `Response` &response)
Default constructor. [More...](#)

const std::string & `getDirectory` () const
Get the directory returned in the response. [More...](#)

bool `isOk` () const
Check if the status code means a success. [More...](#)

Status `getStatus` () const
Get the status code of the response. [More...](#)

const std::string & `getMessage` () const
Get the full message contained in the response. [More...](#)

Detailed Description

Specialization of FTP response returning a directory.

Definition at line [188](#) of file [Ftp.hpp](#).

Member Enumeration Documentation

enum sf::Ftp::Response::Status

Status codes possibly returned by a FTP response.

Enumerator	
RestartMarkerReply	Restart marker reply.
ServiceReadySoon	Service ready in N minutes.
DataConnectionAlreadyOpened	Data connection already opened, tra
OpeningDataConnection	File status ok, about to open data cor
Ok	Command ok.
PointlessCommand	Command not implemented.
SystemStatus	System status, or system help reply.
DirectoryStatus	Directory status.
FileStatus	

	File status.
HelpMessage	Help message.
SystemType	NAME system type, where NAME is the list in the Assigned Numbers doc
ServiceReady	Service ready for new user.
ClosingConnection	Service closing control connection.
DataConnectionOpened	Data connection open, no transfer in
ClosingDataConnection	Closing data connection, requested f
EnteringPassiveMode	Entering passive mode.
LoggedIn	User logged in, proceed. Logged out
FileActionOk	Requested file action ok.
DirectoryOk	PATHNAME created.
NeedPassword	User name ok, need password.
NeedAccountToLogIn	Need account for login.

NeedInformation	Requested file action pending further
ServiceUnavailable	Service not available, closing control
DataConnectionUnavailable	Can't open data connection.
TransferAborted	Connection closed, transfer aborted.
FileActionAborted	Requested file action not taken.
LocalError	Requested action aborted, local error
InsufficientStorageSpace	Requested action not taken; insufficient storage space available.
CommandUnknown	Syntax error, command unrecognized
ParametersUnknown	Syntax error in parameters or arguments
CommandNotImplemented	Command not implemented.
BadCommandSequence	Bad sequence of commands.
ParameterNotImplemented	Command not implemented for that parameter
NotLoggedIn	Not logged in.

NeedAccountToStore	Need account for storing files.
FileUnavailable	Requested action not taken, file unavailable.
PageTypeUnknown	Requested action aborted, page type unknown.
NotEnoughMemory	Requested file action aborted, exceeded memory allocation.
FilenameNotAllowed	Requested action not taken, filename not allowed.
InvalidResponse	Not part of the FTP standard, general error response cannot be parsed.
ConnectionFailed	Not part of the FTP standard, general error level socket connection with the server failed.
ConnectionClosed	Not part of the FTP standard, general error level socket connection is unexpectedly closed.
InvalidFile	Not part of the FTP standard, general error cannot be read or written.

Definition at line 74 of file `Ftp.hpp`.

Constructor & Destructor Documentation

`sf::Ftp::DirectoryResponse::DirectoryResponse (const Response &`

Default constructor.

Parameters

response Source response

Member Function Documentation

const std::string& sf::Ftp::DirectoryResponse::getDirectory () const

Get the directory returned in the response.

Returns

Directory name

const std::string& sf::Ftp::Response::getMessage () const

Get the full message contained in the response.

Returns

The response message

Status sf::Ftp::Response::getStatus () const

Get the status code of the response.

Returns

Status code

bool sf::Ftp::Response::isOk () const

Check if the status code means a success.

This function is defined for convenience, it is equivalent to testing if the s

Returns

True if the status is a success, false if it is a failure

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- [Ftp.hpp](#)

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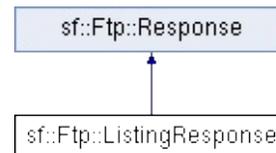
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sf::Ftp::ListingResponse Class Reference

Specialization of FTP response returning a filename listing. [More...](#)

```
#include <Ftp.hpp>
```

Inheritance diagram for sf::Ftp::ListingResponse:



Public Types

```
enum Status {  
    RestartMarkerReply = 110, ServiceReadySoon = 120, DataCor  
    OpeningDataConnection = 150,  
    Ok = 200, PointlessCommand = 202, SystemStatus = 211, Dire  
    FileStatus = 213, HelpMessage = 214, SystemType = 215, Ser  
    ClosingConnection = 221, DataConnectionOpened = 225, Clos  
    EnteringPassiveMode = 227,  
    LoggedIn = 230, FileActionOk = 250, DirectoryOk = 257, NeedI  
    NeedAccountToLogIn = 332, NeedInformation = 350, ServiceU  
    DataConnectionUnavailable = 425,  
    TransferAborted = 426, FileActionAborted = 450, LocalError = 4  
    452,  
    CommandUnknown = 500, ParametersUnknown = 501, Comm  
    BadCommandSequence = 503,  
    ParameterNotImplemented = 504, NotLoggedIn = 530, NeedAc  
    FileUnavailable = 550,  
    PageTypeUnknown = 551, NotEnoughMemory = 552, Filename  
    InvalidResponse = 1000,  
    ConnectionFailed = 1001, ConnectionClosed = 1002, InvalidFil  
}  
Status codes possibly returned by a FTP response. More...
```

Public Member Functions

`ListingResponse` (const `Response` &re
Default constructor. [More...](#)

const std::vector< std::string > & `getListing ()` const
Return the array of directory/file names

bool `isOk ()` const
Check if the status code means a succ

Status `getStatus ()` const
Get the status code of the response. [M](#)

const std::string & `getMessage ()` const
Get the full message contained in the r

Detailed Description

Specialization of FTP response returning a filename listing.

Definition at line [221](#) of file [Ftp.hpp](#).

Member Enumeration Documentation

enum `sf::Ftp::Response::Status`

Status codes possibly returned by a FTP response.

Enumerator	
<code>RestartMarkerReply</code>	Restart marker reply.
<code>ServiceReadySoon</code>	Service ready in N minutes.
<code>DataConnectionAlreadyOpened</code>	Data connection already opened, tra
<code>OpeningDataConnection</code>	File status ok, about to open data cor
<code>Ok</code>	Command ok.
<code>PointlessCommand</code>	Command not implemented.
<code>SystemStatus</code>	System status, or system help reply.
<code>DirectoryStatus</code>	Directory status.
<code>FileStatus</code>	

	File status.
HelpMessage	Help message.
SystemType	NAME system type, where NAME is the list in the Assigned Numbers doc
ServiceReady	Service ready for new user.
ClosingConnection	Service closing control connection.
DataConnectionOpened	Data connection open, no transfer in
ClosingDataConnection	Closing data connection, requested f
EnteringPassiveMode	Entering passive mode.
LoggedIn	User logged in, proceed. Logged out
FileActionOk	Requested file action ok.
DirectoryOk	PATHNAME created.
NeedPassword	User name ok, need password.
NeedAccountToLogIn	Need account for login.

NeedInformation	Requested file action pending further
ServiceUnavailable	Service not available, closing control
DataConnectionUnavailable	Can't open data connection.
TransferAborted	Connection closed, transfer aborted.
FileActionAborted	Requested file action not taken.
LocalError	Requested action aborted, local error
InsufficientStorageSpace	Requested action not taken; insufficient storage space available.
CommandUnknown	Syntax error, command unrecognized
ParametersUnknown	Syntax error in parameters or arguments
CommandNotImplemented	Command not implemented.
BadCommandSequence	Bad sequence of commands.
ParameterNotImplemented	Command not implemented for that parameter
NotLoggedIn	Not logged in.

NeedAccountToStore	Need account for storing files.
FileUnavailable	Requested action not taken, file unav
PageTypeUnknown	Requested action aborted, page type
NotEnoughMemory	Requested file action aborted, exceed
FilenameNotAllowed	Requested action not taken, file nam
InvalidResponse	Not part of the FTP standard, generi response cannot be parsed.
ConnectionFailed	Not part of the FTP standard, gene level socket connection with the servi
ConnectionClosed	Not part of the FTP standard, gene level socket connection is unexpecte
InvalidFile	Not part of the FTP standard, generi cannot be read or written.

Definition at line 74 of file [Ftp.hpp](#).

Constructor & Destructor Documentation

```
sf::Ftp::ListingResponse::ListingResponse ( const Response & response,
                                             const std::string & data )
```

Default constructor.

Parameters

response Source response

data Data containing the raw listing

Member Function Documentation

const std::vector<std::string>& sf::Ftp::ListingResponse::getListings () const

Return the array of directory/file names.

Returns

Array containing the requested listing

const std::string& sf::Ftp::Response::getMessage () const

Get the full message contained in the response.

Returns

The response message

Status sf::Ftp::Response::getStatus () const

Get the status code of the response.

Returns

Status code

bool sf::Ftp::Response::isOk () const

Check if the status code means a success.

This function is defined for convenience, it is equivalent to testing if the s

Returns

True if the status is a success, false if it is a failure

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sf::Ftp::Response Class Reference

Define a FTP response. [More...](#)

```
#include <Ftp.hpp>
```

Inheritance diagram for sf::Ftp::Response:



Public Types

```
enum Status {  
    RestartMarkerReply = 110, ServiceReadySoon = 120, DataCor  
    OpeningDataConnection = 150,  
    Ok = 200, PointlessCommand = 202, SystemStatus = 211, Dire  
    FileStatus = 213, HelpMessage = 214, SystemType = 215, Ser  
    ClosingConnection = 221, DataConnectionOpened = 225, Clos  
    EnteringPassiveMode = 227,  
    LoggedIn = 230, FileActionOk = 250, DirectoryOk = 257, NeedI  
    NeedAccountToLogIn = 332, NeedInformation = 350, ServiceU  
    DataConnectionUnavailable = 425,  
    TransferAborted = 426, FileActionAborted = 450, LocalError = 4  
    452,  
    CommandUnknown = 500, ParametersUnknown = 501, Comm  
    BadCommandSequence = 503,  
    ParameterNotImplemented = 504, NotLoggedIn = 530, NeedAc  
    FileUnavailable = 550,  
    PageTypeUnknown = 551, NotEnoughMemory = 552, Filename  
    InvalidResponse = 1000,  
    ConnectionFailed = 1001, ConnectionClosed = 1002, InvalidFil  
}  
Status codes possibly returned by a FTP response. More...
```

Public Member Functions

`Response` (`Status` code=`InvalidResponse`, const std:
Default constructor. [More...](#)

`bool` `isOk ()` const
Check if the status code means a success. [More...](#)

`Status` `getStatus ()` const
Get the status code of the response. [More...](#)

`const std::string &` `getMessage ()` const
Get the full message contained in the response. [More...](#)

Detailed Description

Define a FTP response.

Definition at line 66 of file `Ftp.hpp`.

Member Enumeration Documentation

enum sf::Ftp::Response::Status

Status codes possibly returned by a FTP response.

Enumerator	
RestartMarkerReply	Restart marker reply.
ServiceReadySoon	Service ready in N minutes.
DataConnectionAlreadyOpened	Data connection already opened, tra
OpeningDataConnection	File status ok, about to open data cor
Ok	Command ok.
PointlessCommand	Command not implemented.
SystemStatus	System status, or system help reply.
DirectoryStatus	Directory status.
FileStatus	

	File status.
HelpMessage	Help message.
SystemType	NAME system type, where NAME is the list in the Assigned Numbers doc
ServiceReady	Service ready for new user.
ClosingConnection	Service closing control connection.
DataConnectionOpened	Data connection open, no transfer in
ClosingDataConnection	Closing data connection, requested f
EnteringPassiveMode	Entering passive mode.
LoggedIn	User logged in, proceed. Logged out
FileActionOk	Requested file action ok.
DirectoryOk	PATHNAME created.
NeedPassword	User name ok, need password.
NeedAccountToLogIn	Need account for login.

NeedInformation	Requested file action pending further
ServiceUnavailable	Service not available, closing control
DataConnectionUnavailable	Can't open data connection.
TransferAborted	Connection closed, transfer aborted.
FileActionAborted	Requested file action not taken.
LocalError	Requested action aborted, local error
InsufficientStorageSpace	Requested action not taken; insufficient storage space available.
CommandUnknown	Syntax error, command unrecognized
ParametersUnknown	Syntax error in parameters or arguments
CommandNotImplemented	Command not implemented.
BadCommandSequence	Bad sequence of commands.
ParameterNotImplemented	Command not implemented for that parameter
NotLoggedIn	Not logged in.

NeedAccountToStore	Need account for storing files.
FileUnavailable	Requested action not taken, file unav
PageTypeUnknown	Requested action aborted, page type
NotEnoughMemory	Requested file action aborted, exceed
FilenameNotAllowed	Requested action not taken, file nam
InvalidResponse	Not part of the FTP standard, generi response cannot be parsed.
ConnectionFailed	Not part of the FTP standard, gene level socket connection with the servi
ConnectionClosed	Not part of the FTP standard, gene level socket connection is unexpecte
InvalidFile	Not part of the FTP standard, generi cannot be read or written.

Definition at line 74 of file [Ftp.hpp](#).

Constructor & Destructor Documentation

```
sf::Ftp::Response::Response ( Status code = InvalidRes  
                             const std::string & message = ""  
                             )
```

Default constructor.

This constructor is used by the FTP client to build the response.

Parameters

code Response status code

message Response message

Member Function Documentation

const std::string& sf::Ftp::Response::getMessage () const

Get the full message contained in the response.

Returns

The response message

Status sf::Ftp::Response::getStatus () const

Get the status code of the response.

Returns

Status code

bool sf::Ftp::Response::isOk () const

Check if the status code means a success.

This function is defined for convenience, it is equivalent to testing if the s

Returns

True if the status is a success, false if it is a failure

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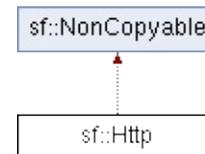
sf::Http Class Reference

Network module

A HTTP client. [More...](#)

```
#include <Http.hpp>
```

Inheritance diagram for sf::Http:



Classes

class **Request**
Define a HTTP request. [More...](#)

class **Response**
Define a HTTP response. [More...](#)

Public Member Functions

`Http ()`
Default constructor. [More...](#)

`Http (const std::string &host, unsigned short port=0)`
Construct the HTTP client with the target host. [More...](#)

`void setHost (const std::string &host, unsigned short port=0)`
Set the target host. [More...](#)

`Response sendRequest (const Request &request, Time timeout=Time::)`
Send a HTTP request and return the server's response. [More...](#)

Detailed Description

A HTTP client.

`sf::Http` is a very simple HTTP client that allows you to communicate with

You can retrieve web pages, send data to an interactive resource, download files. The FTP protocol is not supported.

The HTTP client is split into 3 classes:

- `sf::Http::Request`
- `sf::Http::Response`
- `sf::Http`

`sf::Http::Request` builds the request that will be sent to the server. A request contains:

- a method (what you want to do)
- a target URI (usually the name of the web page or file)
- one or more header fields (options that you can pass to the server)
- an optional body (for POST requests)

`sf::Http::Response` parses the response from the web server and provides a `sf::Http::Response` object. The response contains:

- a status code
- header fields (that may be answers to the ones that you requested)
- a body, which contains the contents of the requested resource

`sf::Http` provides a simple function, `SendRequest`, to send a `sf::Http::Request`

sf::Http::Response from the server.

Usage example:

```
// Create a new HTTP client
sf::Http http;

// We'll work on http://www.sfml-dev.org
http.setHost("http://www.sfml-dev.org");

// Prepare a request to get the 'features.php' page
sf::Http::Request request("features.php");

// Send the request
sf::Http::Response response = http.sendRequest(request);

// Check the status code and display the result
sf::Http::Response::Status status = response.getStatus();
if (status == sf::Http::Response::Ok)
{
    std::cout << response.getBody() << std::endl;
}
else
{
    std::cout << "Error " << status << std::endl;
}
```

Definition at line 46 of file Http.hpp.

Constructor & Destructor Documentation

```
sf::Http::Http ( )
```

Default constructor.

```
sf::Http::Http ( const std::string & host,  
                unsigned short port = 0  
                )
```

Construct the HTTP client with the target host.

This is equivalent to calling `setHost(host, port)`. The port has a default value of 0. The HTTP client will use the right port according to the protocol used (80 for HTTP, 443 for HTTPS) unless you really need a port other than the standard one, or use an explicit protocol.

Parameters

host Web server to connect to

port Port to use for connection

Member Function Documentation

```
Response sf::Http::sendRequest ( const Request & request,  
                                Time timeout = Time::Zero  
                                )
```

Send a HTTP request and return the server's response.

You must have a valid host before sending a request (see `setHost`). Any host in the request will be added with an appropriate value. Warning: this function may not return instantly; use a thread if you don't want to block. `timeout` to limit the time to wait. A value of `Time::Zero` means that the timeout (which is usually pretty long).

Parameters

request Request to send
timeout Maximum time to wait

Returns

Server's response

```
void sf::Http::setHost ( const std::string & host,  
                        unsigned short port = 0  
                        )
```

Set the target host.

This function just stores the host address and port, it doesn't actually

request. The port has a default value of 0, which means that the HT according to the protocol used (80 for HTTP). You should leave it like th other than the standard one, or use an unknown protocol.

Parameters

host Web server to connect to

port Port to use for connection

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sf::Http::Request Class Reference

Define a HTTP request. [More...](#)

```
#include <Http.hpp>
```

Public Types

```
enum Method {  
    Get, Post, Head, Put,  
    Delete  
}  
Enumerate the available HTTP methods for a request. More...
```

Public Member Functions

`Request` (const std::string &uri="/", Method method=Get, const std
Default constructor. [More...](#)

void `setField` (const std::string &field, const std::string &value)
Set the value of a field. [More...](#)

void `setMethod` (Method method)
Set the request method. [More...](#)

void `setUri` (const std::string &uri)
Set the requested URI. [More...](#)

void `setHttpVersion` (unsigned int major, unsigned int minor)
Set the HTTP version for the request. [More...](#)

void `setBody` (const std::string &body)
Set the body of the request. [More...](#)

Friends

class **Http**

Detailed Description

Define a HTTP request.

Definition at line 54 of file `Http.hpp`.

Member Enumeration Documentation

enum sf::Http::Request::Method

Enumerate the available HTTP methods for a request.

Enumerator

Get	<code>Request</code> in get mode, standard method to retrieve a page.
Post	<code>Request</code> in post mode, usually to send data to a page.
Head	<code>Request</code> a page's header only.
Put	<code>Request</code> in put mode, useful for a REST API.
Delete	<code>Request</code> in delete mode, useful for a REST API.

Definition at line 62 of file `Http.hpp`.

Constructor & Destructor Documentation

```
sf::Http::Request::Request ( const std::string & uri = "/",  
                             Method method = get,  
                             const std::string & body = ""  
                             )
```

Default constructor.

This constructor creates a GET request, with the root URI ("/") and an en

Parameters

- uri** Target URI
- method** Method to use for the request
- body** Content of the request's body

Member Function Documentation

```
void sf::Http::Request::setBody ( const std::string & body )
```

Set the body of the request.

The body of a request is optional and only makes sense for POST request methods. The body is empty by default.

Parameters

body Content of the body

```
void sf::Http::Request::setField ( const std::string & field,  
                                   const std::string & value  
                                   )
```

Set the value of a field.

The field is created if it doesn't exist. The name of the field is case-insensitive and doesn't contain any field (but the mandatory fields are added later by the request).

Parameters

field Name of the field to set

value Value of the field

```
void sf::Http::Request::setHttpVersion ( unsigned int major,  
                                         unsigned int minor  
                                         )
```

Set the HTTP version for the request.

The HTTP version is 1.0 by default.

Parameters

major Major HTTP version number

minor Minor HTTP version number

```
void sf::Http::Request::setMethod ( Method method )
```

Set the request method.

See the Method enumeration for a complete list of all the available methods. `Http::Request::Get` by default.

Parameters

method Method to use for the request

```
void sf::Http::Request::setUri ( const std::string & uri )
```

Set the requested URI.

The URI is the resource (usually a web page or a file) that you want to request. `Http::Request::Get` by default.

Parameters

uri URI to request, relative to the host

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sf::Http::Response Class Reference

Define a HTTP response. [More...](#)

```
#include <Http.hpp>
```

Public Types

```
enum Status {  
    Ok = 200, Created = 201, Accepted = 202, NoContent = 204,  
    ResetContent = 205, PartialContent = 206, MultipleChoices = 300,  
    MovedTemporarily = 302, NotModified = 304, BadRequest = 400,  
    Forbidden = 403, NotFound = 404, RangeNotSatisfiable = 407,  
    NotImplemented = 501, BadGateway = 502, ServiceNotAvailable = 503,  
    GatewayTimeout = 504,  
    VersionNotSupported = 505, InvalidResponse = 1000, ConnectTimeout = 1001,  
    InternalServerError = 500  
}
```

Enumerate all the valid status codes for a response. [More...](#)

Public Member Functions

`Response ()`
Default constructor. [More...](#)

`const std::string & getField (const std::string &field) const`
Get the value of a field. [More...](#)

`Status getStatus () const`
Get the response status code. [More...](#)

`unsigned int getMajorHttpVersion () const`
Get the major HTTP version number of the response.

`unsigned int getMinorHttpVersion () const`
Get the minor HTTP version number of the response.

`const std::string & getBody () const`
Get the body of the response. [More...](#)

Friends

class **Http**

Detailed Description

Define a HTTP response.

Definition at line [193](#) of file [Http.hpp](#).

Member Enumeration Documentation

enum `sf::Http::Response::Status`

Enumerate all the valid status codes for a response.

Enumerator	
Ok	Most common code returned when operation w
Created	The resource has successfully been created.
Accepted	The request has been accepted, but will be pro
NoContent	The server didn't send any data in return.
ResetContent	The server informs the client that it should cle the request to be sent.
PartialContent	The server has sent a part of the resource, a request.
MultipleChoices	The requested page can be accessed from sev
MovedPermanently	The requested page has permanently moved to

MovedTemporarily	The requested page has temporarily moved to a
NotModified	For conditional requests, means the request doesn't need to be refreshed.
BadRequest	The server couldn't understand the request (syntax error)
Unauthorized	The requested page needs an authentication to access
Forbidden	The requested page cannot be accessed at all, even if you have the right credentials
NotFound	The requested page doesn't exist.
RangeNotSatisfiable	The server can't satisfy the partial GET request
InternalServerError	The server encountered an unexpected error.
NotImplemented	The server doesn't implement a requested feature
BadGateway	The gateway server has received an error from the upstream server
ServiceNotAvailable	The server is temporarily unavailable (overloaded or down for maintenance)
GatewayTimeout	The gateway server couldn't receive a response from the upstream server
VersionNotSupported	The server doesn't support the requested HTTP version

InvalidResponse	Response is not a valid HTTP one.
ConnectionFailed	Connection with server failed.

Definition at line 201 of file Http.hpp.

Constructor & Destructor Documentation

sf::Http::Response::Response ()

Default constructor.

Constructs an empty response.

Member Function Documentation

const std::string& sf::Http::Response::getBody () const

Get the body of the response.

The body of a response may contain:

- the requested page (for GET requests)
- a response from the server (for POST requests)
- nothing (for HEAD requests)
- an error message (in case of an error)

Returns

The response body

const std::string& sf::Http::Response::getField (const std::string &

Get the value of a field.

If the field *field* is not found in the response header, the empty string is returned. The comparison is case insensitive.

Parameters

field Name of the field to get

Returns

Value of the field, or empty string if not found

unsigned int sf::Http::Response::getMajorHttpVersion () const

Get the major HTTP version number of the response.

Returns

Major HTTP version number

See also

[getMinorHttpVersion](#)

unsigned int sf::Http::Response::getMinorHttpVersion () const

Get the minor HTTP version number of the response.

Returns

Minor HTTP version number

See also

[getMajorHttpVersion](#)

Status sf::Http::Response::getStatus () const

Get the response status code.

The status code should be the first thing to be checked after receiving a success, a failure or anything else (see the Status enumeration).

Returns

Status code of the response

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sf::IpAddress Class Reference

Network module

Encapsulate an IPv4 network address. [More...](#)

```
#include <IpAddress.hpp>
```

Public Member Functions

`IpAddress ()`

Default constructor. [More...](#)

`IpAddress (const std::string &address)`

Construct the address from a string. [More...](#)

`IpAddress (const char *address)`

Construct the address from a string. [More...](#)

`IpAddress (Uint8 byte0, Uint8 byte1, Uint8 byte2, Uint8 byte3)`

Construct the address from 4 bytes. [More...](#)

`IpAddress (Uint32 address)`

Construct the address from a 32-bits integer. [More...](#)

`std::string toString () const`

Get a string representation of the address. [More...](#)

`Uint32 toInteger () const`

Get an integer representation of the address. [More...](#)

Static Public Member Functions

static `IpAddress` `getLocalAddress ()`
Get the computer's local address. [More...](#)

static `IpAddress` `getPublicAddress (Time timeout=Time::Zero)`
Get the computer's public address. [More...](#)

Static Public Attributes

static const `IpAddress` `None`
Value representing an empty/invalid address. [More...](#)

static const `IpAddress` `Any`
Value representing any address (0.0.0.0) [More...](#)

static const `IpAddress` `LocalHost`
The "localhost" address (for connecting a compu

static const `IpAddress` `Broadcast`
The "broadcast" address (for sending UDP mess
network) [More...](#)

Friends

bool `operator<` (const `IpAddress` &left, const `IpAddress` &right)
Overload of < operator to compare two IP addresses. [More...](#)

Detailed Description

Encapsulate an IPv4 network address.

`sf::IpAddress` is a utility class for manipulating network addresses.

It provides a set of implicit constructors and conversion functions to easily convert from/to various representations.

Usage example:

```
sf::IpAddress a0; // an invalid address
sf::IpAddress a1 = sf::IpAddress::None; // an invalid address
sf::IpAddress a2("127.0.0.1"); // the local host
sf::IpAddress a3 = sf::IpAddress::Broadcast; // the broadcast address
sf::IpAddress a4(192, 168, 1, 56); // a local address
sf::IpAddress a5("my_computer"); // a local address
sf::IpAddress a6("89.54.1.169"); // a distant address
sf::IpAddress a7("www.google.com"); // a distant address
    name
sf::IpAddress a8 = sf::IpAddress::getLocalAddress(); // my address on the local network
sf::IpAddress a9 = sf::IpAddress::getPublicAddress(); // my address on the internet
```

Note that `sf::IpAddress` currently doesn't support IPv6 nor other types of network addresses.

Definition at line 44 of file `IpAddress.hpp`.

Constructor & Destructor Documentation

sf::IpAddress::IpAddress ()

Default constructor.

This constructor creates an empty (invalid) address

sf::IpAddress::IpAddress (const std::string & *address*)

Construct the address from a string.

Here *address* can be either a decimal address (ex: "192.168.1.56") or a

Parameters

address IP address or network name

sf::IpAddress::IpAddress (const char * *address*)

Construct the address from a string.

Here *address* can be either a decimal address (ex: "192.168.1.56") or a
This is equivalent to the constructor taking a std::string parameter, it is
the implicit conversions from literal strings to `IpAddress` work.

Parameters

address IP address or network name

```
sf::IpAddress::IpAddress ( Uint8 byte0,  
                           Uint8 byte1,  
                           Uint8 byte2,  
                           Uint8 byte3  
                           )
```

Construct the address from 4 bytes.

Calling `IpAddress(a, b, c, d)` is equivalent to calling `IpAddress("a.b.c.d")` parse a string to get the address components.

Parameters

byte0 First byte of the address

byte1 Second byte of the address

byte2 Third byte of the address

byte3 Fourth byte of the address

```
sf::IpAddress::IpAddress ( Uint32 address )
```

Construct the address from a 32-bits integer.

This constructor uses the internal representation of the address (for optimization purposes, and only if you got that representation from `IpAddress::toInteger`).

Parameters

address 4 bytes of the address packed into a 32-bits integer

See also

[toInteger](#)

Member Function Documentation

static `IpAddress sf::IpAddress::getLocalAddress ()`

Get the computer's local address.

The local address is the address of the computer from the LAN perspective. For example, it could be 192.168.1.56. It is meaningful only for communications over the local network. This function is fast and may be used safely anywhere.

Returns

Local IP address of the computer

See also

[`getPublicAddress`](#)

static `IpAddress sf::IpAddress::getPublicAddress (Time timeout =`

Get the computer's public address.

The public address is the address of the computer from the internet perspective. For example, it could be 89.54.1.169. It is necessary for communications over the world wide web. The public address is to ask it to a distant website; as a consequence, this function involves a network connection and the server, and may be very slow. You should use it with caution. This function depends on the network connection and on a distant server, you want your program to be possibly stuck waiting in case there is a problem. The default timeout is 5 seconds.

Parameters

timeout Maximum time to wait

Returns

Public IP address of the computer

See also

[getLocalAddress](#)

Uint32 sf::IpAddress::toInteger () const

Get an integer representation of the address.

The returned number is the internal representation of the address, and purposes only (like sending the address through a socket). The integer then be converted back to a [sf::IpAddress](#) with the proper constructor.

Returns

32-bits unsigned integer representation of the address

See also

[toString](#)

std::string sf::IpAddress::toString () const

Get a string representation of the address.

The returned string is the decimal representation of the IP address (like constructed from a host name).

Returns

`String` representation of the address

See also

`toInteger`

Friends And Related Function Documentatio

```
bool operator< ( const IpAddress & left,  
                const IpAddress & right  
                )
```

Overload of < operator to compare two IP addresses.

Parameters

left Left operand (a IP address)

right Right operand (a IP address)

Returns

True if *left* is lesser than *right*

Member Data Documentation

const `IpAddress` `sf::IpAddress::Any`

Value representing any address (0.0.0.0)

Definition at line 185 of file `IpAddress.hpp`.

const `IpAddress` `sf::IpAddress::Broadcast`

The "broadcast" address (for sending UDP messages to everyone on a l

Definition at line 187 of file `IpAddress.hpp`.

const `IpAddress` `sf::IpAddress::LocalHost`

The "localhost" address (for connecting a computer to itself locally)

Definition at line 186 of file `IpAddress.hpp`.

const `IpAddress` `sf::IpAddress::None`

Value representing an empty/invalid address.

Definition at line 184 of file `IpAddress.hpp`.

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

- [IpAddress.hpp](#)

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sf::Packet Class Reference

Network module

Utility class to build blocks of data to transfer over the network. [More...](#)

```
#include <Packet.hpp>
```

Public Member Functions

`Packet ()`
Default constructor. [More...](#)

`virtual ~Packet ()`
Virtual destructor. [More...](#)

`void append (const void *data, std::size_t sizeInBytes)`
Append data to the end of the packet. [More...](#)

`void clear ()`
Clear the packet. [More...](#)

`const void * getData () const`
Get a pointer to the data contained in the packet. [More...](#)

`std::size_t getDataSize () const`
Get the size of the data contained in the packet. [More...](#)

`bool endOfPacket () const`
Tell if the reading position has reached the end of the packet.

`operator BoolType () const`
Test the validity of the packet, for reading. [More...](#)

`Packet & operator>> (bool &data)`
Overloads of operator >> to read data from the packet. [More...](#)

`Packet & operator>> (Int8 &data)`

`Packet & operator>> (UInt8 &data)`

`Packet & operator>>` (Int16 &data)

`Packet & operator>>` (UInt16 &data)

`Packet & operator>>` (Int32 &data)

`Packet & operator>>` (UInt32 &data)

`Packet & operator>>` (Int64 &data)

`Packet & operator>>` (UInt64 &data)

`Packet & operator>>` (float &data)

`Packet & operator>>` (double &data)

`Packet & operator>>` (char *data)

`Packet & operator>>` (std::string &data)

`Packet & operator>>` (wchar_t *data)

`Packet & operator>>` (std::wstring &data)

`Packet & operator>>` (String &data)

`Packet & operator<<` (bool data)

Overloads of operator << to write data into the packet. [More](#)

`Packet & operator<<` (Int8 data)

`Packet & operator<<` (UInt8 data)

`Packet & operator<<` (Int16 data)

`Packet & operator<<` (UInt16 data)

Packet & **operator**<< (Int32 data)

Packet & **operator**<< (UInt32 data)

Packet & **operator**<< (Int64 data)

Packet & **operator**<< (UInt64 data)

Packet & **operator**<< (float data)

Packet & **operator**<< (double data)

Packet & **operator**<< (const char *data)

Packet & **operator**<< (const std::string &data)

Packet & **operator**<< (const wchar_t *data)

Packet & **operator**<< (const std::wstring &data)

Packet & **operator**<< (const String &data)

Protected Member Functions

virtual const void * **onSend** (std::size_t &size)

Called before the packet is sent over the network. **Mc**

virtual void **onReceive** (const void *data, std::size_t size)

Called after the packet is received over the network.

Friends

class **TcpSocket**

class **UdpSocket**

Detailed Description

Utility class to build blocks of data to transfer over the network.

Packets provide a safe and easy way to serialize data, in order to send (`sf::TcpSocket`, `sf::UdpSocket`).

Packets solve 2 fundamental problems that arise when transferring data o

- data is interpreted correctly according to the endianness
- the bounds of the packet are preserved (one send == one receive)

The `sf::Packet` class provides both input and output modes. It is designed C++ streams, using operators `>>` and `<<` to extract and insert data.

It is recommended to use only fixed-size types (like `sf::Int32`, etc.), to av the sender and the receiver. Indeed, the native C++ types may have dif your data may be corrupted if that happens.

Usage example:

```
sf::Uint32 x = 24;
std::string s = "hello";
double d = 5.89;

// Group the variables to send into a packet
sf::Packet packet;
packet << x << s << d;

// Send it over the network (socket is a valid sf::TcpSocket)
socket.send(packet);

-----

// Receive the packet at the other end
sf::Packet packet;
socket.receive(packet);
```

```

// Extract the variables contained in the packet
sf::Uint32 x;
std::string s;
double d;
if (packet >> x >> s >> d)
{
    // Data extracted successfully...
}

```

Packets have built-in operator >> and << overloads for standard types:

- bool
- fixed-size integer types (sf::Int8/16/32, sf::Uint8/16/32)
- floating point numbers (float, double)
- string types (char*, wchar_t*, std::string, std::wstring, sf::String)

Like standard streams, it is also possible to define your own overloads to handle your custom types.

```

struct MyStruct
{
    float      number;
    sf::Int8   integer;
    std::string str;
};

sf::Packet& operator <<(sf::Packet& packet, const MyStruct& m)
{
    return packet << m.number << m.integer << m.str;
}

sf::Packet& operator >>(sf::Packet& packet, MyStruct& m)
{
    return packet >> m.number >> m.integer >> m.str;
}

```

Packets also provide an extra feature that allows to apply custom transform functions before it is sent, and after it is received. This is typically used to handle automatic data conversion. This is achieved by inheriting from sf::Packet, and overriding the onSend and onReceive methods.

Here is an example:

```

class ZipPacket : public sf::Packet
{
    virtual const void* onSend(std::size_t& size)
    {
        const void* srcData = getData();
        std::size_t srcSize = getDataSize();

        return MySuperZipFunction(srcData, srcSize, &size);
    }

    virtual void onReceive(const void* data, std::size_t size)
    {
        std::size_t dstSize;
        const void* dstData = MySuperUnzipFunction(data, size, &dstSize);

        append(dstData, dstSize);
    }
};

// Use like regular packets:
ZipPacket packet;
packet << x << s << d;
...

```

See also

[sf::TcpSocket](#), [sf::UdpSocket](#)

Definition at line 47 of file [Packet.hpp](#).

Constructor & Destructor Documentation

sf::Packet::Packet ()

Default constructor.

Creates an empty packet.

virtual sf::Packet::~~Packet ()

Virtual destructor.

Member Function Documentation

```
void sf::Packet::append ( const void * data,  
                          std::size_t  sizeInBytes  
                          )
```

Append data to the end of the packet.

Parameters

data Pointer to the sequence of bytes to append
sizeInBytes Number of bytes to append

See also

[clear](#)

```
void sf::Packet::clear ( )
```

Clear the packet.

After calling Clear, the packet is empty.

See also

[append](#)

```
bool sf::Packet::endOfPacket ( ) const
```

Tell if the reading position has reached the end of the packet.

This function is useful to know if there is some data left to be read, witho

Returns

True if all data was read, false otherwise

See also

operator bool

const void* sf::Packet::getData () const

Get a pointer to the data contained in the packet.

Warning: the returned pointer may become invalid after you append should never be stored. The return pointer is NULL if the packet is empty

Returns

Pointer to the data

See also

[getDataSize](#)

std::size_t sf::Packet::getDataSize () const

Get the size of the data contained in the packet.

This function returns the number of bytes pointed to by what `getData` retu

Returns

Data size, in bytes

See also

[getData](#)

```
virtual void sf::Packet::onReceive ( const void * data,  
                                     std::size_t size  
                                     )
```

Called after the packet is received over the network.

This function can be defined by derived classes to transform the data used for decompression, decryption, etc. The function receives a pointer to the data and the size of the data. The function must fill the packet with the transformed bytes. The default implementation transforms the data.

Parameters

data Pointer to the received bytes

size Number of bytes

See also

[onSend](#)

```
virtual const void* sf::Packet::onSend ( std::size_t & size )
```

Called before the packet is sent over the network.

This function can be defined by derived classes to transform the data before sending it over the network, for compression, encryption, etc. The function must return a pointer to the data and the number of bytes pointed. The default implementation provides the packet as is.

Parameters

size Variable to fill with the size of data to send

Returns

Pointer to the array of bytes to send

See also

[onReceive](#)

sf::Packet::operator BoolType () const

Test the validity of the packet, for reading.

This operator allows to test the packet as a boolean variable, to check if it is successful.

A packet will be in an invalid state if it has no more data to read.

This behavior is the same as standard C++ streams.

Usage example:

```
float x;
packet >> x;
if (packet)
{
    // ok, x was extracted successfully
}

// -- or --

float x;
if (packet >> x)
{
    // ok, x was extracted successfully
}
```

Don't focus on the return type, it's equivalent to bool but it disallows u

integer or pointer types.

Returns

True if last data extraction from packet was successful

See also

[endOfPacket](#)

Packet& sf::Packet::operator<< (bool data)

Overloads of operator << to write data into the packet.

Packet& sf::Packet::operator>> (bool & data)

Overloads of operator >> to read data from the packet.

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

- [Packet.hpp](#)

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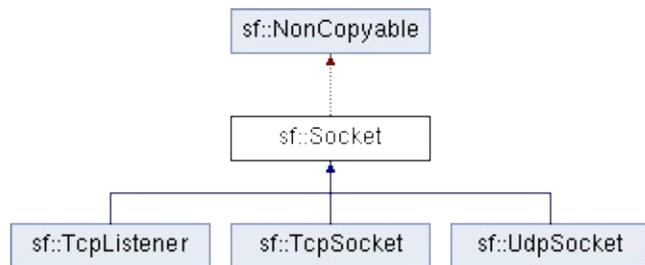
sf::Socket Class Reference

Network module

Base class for all the socket types. [More...](#)

```
#include <Socket.hpp>
```

Inheritance diagram for sf::Socket:



Public Types

enum `Status` {
 `Done`, `NotReady`, `Partial`, `Disconnected`,
 `Error`
}
Status codes that may be returned by socket functions. [More...](#)

enum { `AnyPort = 0` }
Some special values used by sockets. [More...](#)

Public Member Functions

virtual `~Socket ()`
Destructor. [More...](#)

void `setBlocking (bool blocking)`
Set the blocking state of the socket. [More...](#)

bool `isBlocking () const`
Tell whether the socket is in blocking or non-blocking mode. [More...](#)

Protected Types

enum `Type` { `Tcp`, `Udp` }
Types of protocols that the socket can use. [More...](#)

Protected Member Functions

`Socket` (`Type` type)
Default constructor. [More...](#)

`SocketHandle` `getHandle ()` const
Return the internal handle of the socket. [More...](#)

`void` `create ()`
Create the internal representation of the socket. [More...](#)

`void` `create (SocketHandle handle)`
Create the internal representation of the socket from a so

`void` `close ()`
Close the socket gracefully. [More...](#)

Friends

```
class SocketSelector
```

Detailed Description

Base class for all the socket types.

This class mainly defines internal stuff to be used by derived classes.

The only public features that it defines, and which is therefore common to all socket types, is the blocking state. All sockets can be set as blocking or non-blocking.

In blocking mode, socket functions will hang until the operation completes. The current thread (well, in fact the current thread if you use multiple ones) will wait until the operation to complete.

In non-blocking mode, all the socket functions will return immediately. If the requested operation cannot be completed immediately, the function simply returns the proper status code.

The default mode, which is blocking, is the one that is generally used in most applications. The non-blocking mode is rather used in real-time applications where the application must poll the socket often enough, and cannot afford blocking this loop.

See also

[sf::TcpListener](#), [sf::TcpSocket](#), [sf::UdpSocket](#)

Definition at line 45 of file [Socket.hpp](#).

Member Enumeration Documentation

anonymous enum

Some special values used by sockets.

Enumerator

AnyPort	Special value that tells the system to pick any available port.
---------	---

Definition at line 66 of file [Socket.hpp](#).

enum `sf::Socket::Status`

Status codes that may be returned by socket functions.

Enumerator

Done	The socket has sent / received the data.
NotReady	The socket is not ready to send / receive data yet.
Partial	The socket sent a part of the data.
Disconnected	The TCP socket has been disconnected.

Error	An unexpected error happened.
-------	-------------------------------

Definition at line 53 of file `Socket.hpp`.

enum `sf::Socket::Type`

Types of protocols that the socket can use.

Enumerator

Tcp	TCP protocol.
Udp	UDP protocol.

Definition at line 114 of file `Socket.hpp`.

Constructor & Destructor Documentation

virtual sf::Socket::~~Socket ()

Destructor.

sf::Socket::Socket (**Type type)**

Default constructor.

This constructor can only be accessed by derived classes.

Parameters

type Type of the socket (TCP or UDP)

Member Function Documentation

void sf::Socket::close ()

Close the socket gracefully.

This function can only be accessed by derived classes.

void sf::Socket::create ()

Create the internal representation of the socket.

This function can only be accessed by derived classes.

void sf::Socket::create (SocketHandle **handle)**

Create the internal representation of the socket from a socket handle.

This function can only be accessed by derived classes.

Parameters

handle OS-specific handle of the socket to wrap

SocketHandle sf::Socket::getHandle () const

Return the internal handle of the socket.

The returned handle may be invalid if the socket was not created by this function and can only be accessed by derived classes.

Returns

The internal (OS-specific) handle of the socket

bool sf::Socket::isBlocking () const

Tell whether the socket is in blocking or non-blocking mode.

Returns

True if the socket is blocking, false otherwise

See also

[setBlocking](#)

void sf::Socket::setBlocking (bool **blocking)**

Set the blocking state of the socket.

In blocking mode, calls will not return until they have completed their task. In non-blocking mode, calls will always return immediately, using the return code to signal whether the operation was successful. By default, all sockets are blocking.

Parameters

blocking True to set the socket as blocking, false for non-blocking

See also

[isBlocking](#)

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

- [Socket.hpp](#)

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sf::SocketSelector Class Reference

Network module

Multiplexer that allows to read from multiple sockets. [More...](#)

```
#include <SocketSelector.hpp>
```

Public Member Functions

`SocketSelector ()`
Default constructor. [More...](#)

`SocketSelector (const SocketSelector ©)`
Copy constructor. [More...](#)

`~SocketSelector ()`
Destructor. [More...](#)

`void add (Socket &socket)`
Add a new socket to the selector. [More...](#)

`void remove (Socket &socket)`
Remove a socket from the selector. [More...](#)

`void clear ()`
Remove all the sockets stored in the selector. [More...](#)

`bool wait (Time timeout=Time::Zero)`
Wait until one or more sockets are ready to receive. [More...](#)

`bool isReady (Socket &socket) const`
Test a socket to know if it is ready to receive data. [More...](#)

`SocketSelector & operator= (const SocketSelector &right)`
Overload of assignment operator. [More...](#)

Detailed Description

Multiplexer that allows to read from multiple sockets.

Socket selectors provide a way to wait until some data is available on a socket.

This is convenient when you have multiple sockets that may possibly become ready, and you want to know which one will be ready first. In particular, it avoids to use a thread for each socket, as a single thread can handle all the sockets.

All types of sockets can be used in a selector:

- `sf::TcpListener`
- `sf::TcpSocket`
- `sf::UdpSocket`

A selector doesn't store its own copies of the sockets (socket classes are smart pointers). When you add a socket to a selector as a socket container, you must store them outside and make sure they are used in the selector.

Using a selector is simple:

- populate the selector with all the sockets that you want to observe
- make it wait until there is data available on any of the sockets
- test each socket to find out which ones are ready

Usage example:

```
// Create a socket to listen to new connections
sf::TcpListener listener;
listener.listen(55001);
```

```

// Create a list to store the future clients
std::list<sf::TcpSocket*> clients;

// Create a selector
sf::SocketSelector selector;

// Add the listener to the selector
selector.add(listener);

// Endless loop that waits for new connections
while (running)
{
    // Make the selector wait for data on any socket
    if (selector.wait())
    {
        // Test the listener
        if (selector.isReady(listener))
        {
            // The listener is ready: there is a pending connection
            sf::TcpSocket* client = new sf::TcpSocket;
            if (listener.accept(*client) == sf::Socket::Done)
            {
                // Add the new client to the clients list
                clients.push_back(client);

                // Add the new client to the selector so that we will
                // be notified when he sends something
                selector.add(*client);
            }
        }
        else
        {
            // Error, we won't get a new connection, delete the socket
            delete client;
        }
    }
    else
    {
        // The listener socket is not ready, test all other sockets (the client
        for (std::list<sf::TcpSocket*>::iterator it = clients.begin(); it != clients.end(); ++it)
        {
            sf::TcpSocket& client = **it;
            if (selector.isReady(client))
            {
                // The client has sent some data, we can receive it
                sf::Packet packet;
                if (client.receive(packet) == sf::Socket::Done)
                {
                    // ...
                }
            }
        }
    }
}

```

```
}
```

See also

[sf::Socket](#)

Definition at line 43 of file [SocketSelector.hpp](#).

Constructor & Destructor Documentation

sf::SocketSelector::SocketSelector ()

Default constructor.

sf::SocketSelector::SocketSelector (const **SocketSelector & **copy**)**

Copy constructor.

Parameters

copy Instance to copy

sf::SocketSelector::~~SocketSelector ()

Destructor.

Member Function Documentation

void sf::SocketSelector::add ([Socket](#) & [socket](#))

Add a new socket to the selector.

This function keeps a weak reference to the socket, so you have to n destroyed while it is stored in the selector. This function does nothing if tl

Parameters

[socket](#) Reference to the socket to add

See also

[remove](#), [clear](#)

void sf::SocketSelector::clear ()

Remove all the sockets stored in the selector.

This function doesn't destroy any instance, it simply removes all the ref external sockets.

See also

[add](#), [remove](#)

bool sf::SocketSelector::isReady ([Socket](#) & [socket](#)) const

Test a socket to know if it is ready to receive data.

This function must be used after a call to `Wait`, to know which sockets socket is ready, a call to receive will never block because we know the state. Note that if this function returns true for a `TcpListener`, this means that a connection is ready to be accepted.

Parameters

socket `Socket` to test

Returns

True if the socket is ready to read, false otherwise

See also

`isReady`

`SocketSelector& sf::SocketSelector::operator= (const SocketSelector& right)`

Overload of assignment operator.

Parameters

right Instance to assign

Returns

Reference to self

`void sf::SocketSelector::remove (Socket & socket)`

Remove a socket from the selector.

This function doesn't destroy the socket, it simply removes the reference to it from the selector.

Parameters

socket Reference to the socket to remove

See also

[add](#), [clear](#)

```
bool sf::SocketSelector::wait ( Time timeout = Time::Zero )
```

Wait until one or more sockets are ready to receive.

This function returns as soon as at least one socket has some data available. If you use a timeout, when the timeout is over, the function returns false.

Parameters

timeout Maximum time to wait, (use [Time::Zero](#) for infinity)

Returns

True if there are sockets ready, false otherwise

See also

[isReady](#)

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

- [SocketSelector.hpp](#)

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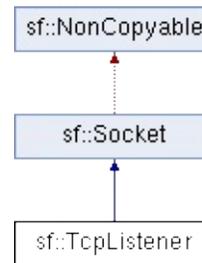
sf::TcpListener Class Reference

Network module

Socket that listens to new TCP connections. [More...](#)

```
#include <TcpListener.hpp>
```

Inheritance diagram for sf::TcpListener:



Public Types

enum `Status` {
 `Done`, `NotReady`, `Partial`, `Disconnected`,
 `Error`
}
Status codes that may be returned by socket functions. [More...](#)

enum { `AnyPort = 0` }
Some special values used by sockets. [More...](#)

Public Member Functions

`TcpListener ()`
Default constructor. [More...](#)

unsigned short `getLocalPort () const`
Get the port to which the socket is bound locally. [More...](#)

Status `listen (unsigned short port, const IpAddress &address=I`
Start listening for connections. [More...](#)

void `close ()`
Stop listening and close the socket. [More...](#)

Status `accept (TcpSocket &socket)`
Accept a new connection. [More...](#)

void `setBlocking (bool blocking)`
Set the blocking state of the socket. [More...](#)

bool `isBlocking () const`
Tell whether the socket is in blocking or non-blocking mo

Protected Types

enum `Type` { `Tcp`, `Udp` }
Types of protocols that the socket can use. [More...](#)

Protected Member Functions

SocketHandle `getHandle ()` const
Return the internal handle of the socket. [More...](#)

void `create ()`
Create the internal representation of the socket. [More...](#)

void `create (SocketHandle handle)`
Create the internal representation of the socket from a so

Detailed Description

`Socket` that listens to new TCP connections.

A listener socket is a special type of socket that listens to a given port and a given IP address. It is used to listen to a given port.

This is all it can do.

When a new connection is received, you must call `accept` and the listener socket is returned. The returned socket is an instance of `sf::TcpSocket` that is properly initialized and can be used to communicate with the client.

Listener sockets are specific to the TCP protocol, UDP sockets are created using `sf::UdpSocket` and can be used to communicate directly. As a consequence, a listener socket will always return an instance of `sf::TcpSocket`.

A listener is automatically closed on destruction, like all other types of sockets. If you need to stop listening before the socket is destroyed, you can call its `close()` function.

Usage example:

```
// Create a listener socket and make it wait for new
// connections on port 55001
sf::TcpListener listener;
listener.listen(55001);

// Endless loop that waits for new connections
while (running)
{
    sf::TcpSocket client;
    if (listener.accept(client) == sf::Socket::Done)
    {
        // A new client just connected!
        std::cout << "New connection received from " << client.getRemoteAddress() << "\n";
        doSomethingWith(client);
    }
}
```

See also

[sf::TcpSocket](#), [sf::Socket](#)

Definition at line 44 of file [TcpListener.hpp](#).

Member Enumeration Documentation

anonymous enum

Some special values used by sockets.

Enumerator

AnyPort	Special value that tells the system to pick any available port.
---------	---

Definition at line 66 of file [Socket.hpp](#).

enum `sf::Socket::Status`

Status codes that may be returned by socket functions.

Enumerator

Done	The socket has sent / received the data.
NotReady	The socket is not ready to send / receive data yet.
Partial	The socket sent a part of the data.
Disconnected	The TCP socket has been disconnected.

Error

An unexpected error happened.

Definition at line 53 of file `Socket.hpp`.

enum `sf::Socket::Type`

Types of protocols that the socket can use.

Enumerator

Tcp

TCP protocol.

Udp

UDP protocol.

Definition at line 114 of file `Socket.hpp`.

Constructor & Destructor Documentation

sf::TcpListener::TcpListener ()

Default constructor.

Member Function Documentation

Status sf::TcpListener::accept (TcpSocket & socket)

Accept a new connection.

If the socket is in blocking mode, this function will not return until a connection is accepted.

Parameters

socket Socket that will hold the new connection

Returns

Status code

See also

[listen](#)

void sf::TcpListener::close ()

Stop listening and close the socket.

This function gracefully stops the listener. If the socket is not listening, this function does nothing.

See also

[listen](#)

void sf::Socket::create ()

Create the internal representation of the socket.

This function can only be accessed by derived classes.

void sf::Socket::create (SocketHandle handle)

Create the internal representation of the socket from a socket handle.

This function can only be accessed by derived classes.

Parameters

handle OS-specific handle of the socket to wrap

SocketHandle sf::Socket::getHandle () const

Return the internal handle of the socket.

The returned handle may be invalid if the socket was not created y
function can only be accessed by derived classes.

Returns

The internal (OS-specific) handle of the socket

unsigned short sf::TcpListener::getLocalPort () const

Get the port to which the socket is bound locally.

If the socket is not listening to a port, this function returns 0.

Returns

Port to which the socket is bound

See also

[listen](#)

bool sf::Socket::isBlocking () const

Tell whether the socket is in blocking or non-blocking mode.

Returns

True if the socket is blocking, false otherwise

See also

[setBlocking](#)

Status sf::TcpListener::listen (unsigned short port, const IpAddress & address = IpAddress::Any)

Start listening for connections.

This functions makes the socket listen to the specified port, waiting for was previously listening to another port, it will be stopped first and bound

Parameters

port Port to listen for new connections
address Address of the interface to listen on

Returns

Status code

See also

[accept](#), [close](#)

void sf::Socket::setBlocking (bool **blocking**)

Set the blocking state of the socket.

In blocking mode, calls will not return until they have completed their task. In non-blocking mode, calls won't return until some data was actually received. `recv` always return immediately, using the return code to signal whether the operation was successful. By default, all sockets are blocking.

Parameters

blocking True to set the socket as blocking, false for non-blocking

See also

[isBlocking](#)

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

- [TcpListener.hpp](#)

SFML 2.4.2

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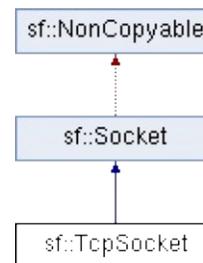
sf::TcpSocket Class Reference

Network module

Specialized socket using the TCP protocol. [More...](#)

```
#include <TcpSocket.hpp>
```

Inheritance diagram for sf::TcpSocket:



Public Types

enum `Status` {
 `Done`, `NotReady`, `Partial`, `Disconnected`,
 `Error`
}
Status codes that may be returned by socket functions. [More...](#)

enum { `AnyPort = 0` }
Some special values used by sockets. [More...](#)

Public Member Functions

`TcpSocket ()`
Default constructor. [More...](#)

unsigned short `getLocalPort () const`
Get the port to which the socket is bound locally. [More...](#)

`IpAddress` `getRemoteAddress () const`
Get the address of the connected peer. [More...](#)

unsigned short `getRemotePort () const`
Get the port of the connected peer to which the socket is

Status `connect (const IpAddress &remoteAddress, unsigned short timeout=Time::Zero)`
Connect the socket to a remote peer. [More...](#)

void `disconnect ()`
Disconnect the socket from its remote peer. [More...](#)

Status `send (const void *data, std::size_t size)`
Send raw data to the remote peer. [More...](#)

Status `send (const void *data, std::size_t size, std::size_t &sent)`
Send raw data to the remote peer. [More...](#)

Status `receive (void *data, std::size_t size, std::size_t &received)`
Receive raw data from the remote peer. [More...](#)

Status `send (Packet &packet)`
Send a formatted packet of data to the remote peer. [More...](#)

Status `receive (Packet &packet)`
Receive a formatted packet of data from the remote peer

void `setBlocking (bool blocking)`
Set the blocking state of the socket. [More...](#)

bool `isBlocking () const`
Tell whether the socket is in blocking or non-blocking mode

Protected Types

enum `Type` { `Tcp`, `Udp` }
Types of protocols that the socket can use. [More...](#)

Protected Member Functions

SocketHandle `getHandle ()` const
Return the internal handle of the socket. [More...](#)

void `create ()`
Create the internal representation of the socket. [More...](#)

void `create (SocketHandle handle)`
Create the internal representation of the socket from a so

void `close ()`
Close the socket gracefully. [More...](#)

Friends

```
class TcpListener
```

Detailed Description

Specialized socket using the TCP protocol.

TCP is a connected protocol, which means that a TCP socket can only be connected to.

It can't send or receive anything if it is not connected.

The TCP protocol is reliable but adds a slight overhead. It ensures that you receive data in order and without errors (no data corrupted, lost or duplicated).

When a socket is connected to a remote host, you can retrieve information using the `getRemoteAddress` and `getRemotePort` functions. You can also get the local address bound (which is automatically chosen when the socket is connected), with `getLocalAddress`.

Sending and receiving data can use either the low-level or the high-level interface. The low-level interface processes a raw sequence of bytes, and cannot ensure that one call to `Send` will be received at the other end of the socket.

The high-level interface uses packets (see [sf::Packet](#)), which are easier to use regarding the data that is exchanged. You can look at the [sf::Packet](#) class to see how they work.

The socket is automatically disconnected when it is destroyed, but if you want to disconnect the connection while the socket instance is still alive, you can call `disconnect`.

Usage example:

```
// ----- The client -----  
  
// Create a socket and connect it to 192.168.1.50 on port 55001  
sf::TcpSocket socket;
```

```

socket.connect("192.168.1.50", 55001);

// Send a message to the connected host
std::string message = "Hi, I am a client";
socket.send(message.c_str(), message.size() + 1);

// Receive an answer from the server
char buffer[1024];
std::size_t received = 0;
socket.receive(buffer, sizeof(buffer), received);
std::cout << "The server said: " << buffer << std::endl;

// ----- The server -----

// Create a listener to wait for incoming connections on port 55001
sf::TcpListener listener;
listener.listen(55001);

// Wait for a connection
sf::TcpSocket socket;
listener.accept(socket);
std::cout << "New client connected: " << socket.getRemoteAddress() << :

// Receive a message from the client
char buffer[1024];
std::size_t received = 0;
socket.receive(buffer, sizeof(buffer), received);
std::cout << "The client said: " << buffer << std::endl;

// Send an answer
std::string message = "welcome, client";
socket.send(message.c_str(), message.size() + 1);

```

See also

[sf::Socket](#), [sf::UdpSocket](#), [sf::Packet](#)

Definition at line 46 of file [TcpSocket.hpp](#).

Member Enumeration Documentation

anonymous enum

Some special values used by sockets.

Enumerator

AnyPort	Special value that tells the system to pick any available port.
---------	---

Definition at line 66 of file [Socket.hpp](#).

enum `sf::Socket::Status`

Status codes that may be returned by socket functions.

Enumerator

Done	The socket has sent / received the data.
NotReady	The socket is not ready to send / receive data yet.
Partial	The socket sent a part of the data.
Disconnected	The TCP socket has been disconnected.

Error	An unexpected error happened.
-------	-------------------------------

Definition at line 53 of file `Socket.hpp`.

enum `sf::Socket::Type`

Types of protocols that the socket can use.

Enumerator

Tcp	TCP protocol.
Udp	UDP protocol.

Definition at line 114 of file `Socket.hpp`.

Constructor & Destructor Documentation

sf::TcpSocket::TcpSocket ()

Default constructor.

Member Function Documentation

void sf::Socket::close ()

Close the socket gracefully.

This function can only be accessed by derived classes.

Status sf::TcpSocket::connect (const **IpAddress & **remoteAddress**,
unsigned short **remotePort**,
Time **timeout** = **Time::**
)**

Connect the socket to a remote peer.

In blocking mode, this function may take a while, especially if the **remoteAddress** parameter allows you to stop trying to connect after a given timeout. If not connected, it is first disconnected.

Parameters

remoteAddress Address of the remote peer
remotePort Port of the remote peer
timeout Optional maximum time to wait

Returns

Status code

See also

`disconnect`

void sf::Socket::create ()

Create the internal representation of the socket.

This function can only be accessed by derived classes.

void sf::Socket::create (SocketHandle `handle`)

Create the internal representation of the socket from a socket handle.

This function can only be accessed by derived classes.

Parameters

`handle` OS-specific handle of the socket to wrap

void sf::TcpSocket::disconnect ()

Disconnect the socket from its remote peer.

This function gracefully closes the connection. If the socket is not connected

See also

`connect`

SocketHandle sf::Socket::getHandle () const

Return the internal handle of the socket.

The returned handle may be invalid if the socket was not created y
function can only be accessed by derived classes.

Returns

The internal (OS-specific) handle of the socket

unsigned short sf::TcpSocket::getLocalPort () const

Get the port to which the socket is bound locally.

If the socket is not connected, this function returns 0.

Returns

Port to which the socket is bound

See also

[connect](#), [getRemotePort](#)

IpAddress sf::TcpSocket::getRemoteAddress () const

Get the address of the connected peer.

If the socket is not connected, this function returns [sf::IpAddress::None](#).

Returns

Address of the remote peer

See also

`getRemotePort`

unsigned short sf::TcpSocket::getRemotePort () const

Get the port of the connected peer to which the socket is connected.

If the socket is not connected, this function returns 0.

Returns

Remote port to which the socket is connected

See also

`getRemoteAddress`

bool sf::Socket::isBlocking () const

Tell whether the socket is in blocking or non-blocking mode.

Returns

True if the socket is blocking, false otherwise

See also

`setBlocking`

**Status sf::TcpSocket::receive (void * data,
std::size_t size,
std::size_t & received
)**

Receive raw data from the remote peer.

In blocking mode, this function will wait until some bytes are actually received if the socket is not connected.

Parameters

- data** Pointer to the array to fill with the received bytes
- size** Maximum number of bytes that can be received
- received** This variable is filled with the actual number of bytes received

Returns

Status code

See also

[send](#)

Status `sf::TcpSocket::receive (Packet & packet)`

Receive a formatted packet of data from the remote peer.

In blocking mode, this function will wait until the whole packet has been received if the socket is not connected.

Parameters

- packet** `Packet` to fill with the received data

Returns

Status code

See also

[send](#)

```
Status sf::TcpSocket::send ( const void * data,  
                             std::size_t size  
                             )
```

Send raw data to the remote peer.

To be able to handle partial sends over non-blocking sockets, use the `std::size_t&` overload instead. This function will fail if the socket is not connected.

Parameters

data Pointer to the sequence of bytes to send

size Number of bytes to send

Returns

Status code

See also

[receive](#)

```
Status sf::TcpSocket::send ( const void * data,  
                             std::size_t size,  
                             std::size_t & sent  
                             )
```

Send raw data to the remote peer.

This function will fail if the socket is not connected.

Parameters

data Pointer to the sequence of bytes to send

size Number of bytes to send

sent The number of bytes sent will be written here

Returns

Status code

See also

[receive](#)

Status `sf::TcpSocket::send (Packet & packet)`

Send a formatted packet of data to the remote peer.

In non-blocking mode, if this function returns `sf::Socket::Partial`, you can send the unmodified packet before sending anything else in order to guarantee the peer receives the data uncorrupted. This function will fail if the socket is not connected.

Parameters

packet Packet to send

Returns

Status code

See also

[receive](#)

void `sf::Socket::setBlocking (bool blocking)`

Set the blocking state of the socket.

In blocking mode, calls will not return until they have completed their task. In non-blocking mode, calls won't return until some data was actually received.

always return immediately, using the return code to signal whether the default, all sockets are blocking.

Parameters

blocking True to set the socket as blocking, false for non-blocking

See also

[isBlocking](#)

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

- [TcpSocket.hpp](#)

[Main Page](#) | [Related Pages](#) | [Modules](#) | [Namespaces](#) | **[Classes](#)** | [Files](#)

[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#)

[Public Types](#) | [Public Member Functions](#) | [Protected Types](#) | [Protected Member Functions](#) | [List of all members](#)

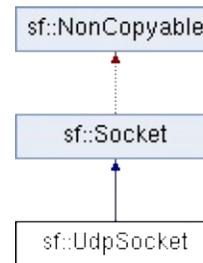
sf::UdpSocket Class Reference

Network module

Specialized socket using the UDP protocol. [More...](#)

```
#include <UdpSocket.hpp>
```

Inheritance diagram for sf::UdpSocket:



Public Types

enum { `MaxDatagramSize` = 65507 }

enum `Status` {
 `Done`, `NotReady`, `Partial`, `Disconnected`,
 `Error`
}

Status codes that may be returned by socket functions. [More...](#)

enum { `AnyPort` = 0 }

Some special values used by sockets. [More...](#)

Public Member Functions

`UdpSocket ()`
Default constructor. [More...](#)

unsigned short `getLocalPort () const`
Get the port to which the socket is bound locally. [More...](#)

Status `bind (unsigned short port, const IpAddress &address=Ip)`
Bind the socket to a specific port. [More...](#)

void `unbind ()`
Unbind the socket from the local port to which it is bound.

Status `send (const void *data, std::size_t size, const IpAddress remotePort)`
Send raw data to a remote peer. [More...](#)

Status `receive (void *data, std::size_t size, std::size_t &received, unsigned short &remotePort)`
Receive raw data from a remote peer. [More...](#)

Status `send (Packet &packet, const IpAddress &remoteAddress)`
Send a formatted packet of data to a remote peer. [More...](#)

Status `receive (Packet &packet, IpAddress &remoteAddress, unsigned short &remotePort)`
Receive a formatted packet of data from a remote peer.

void `setBlocking (bool blocking)`
Set the blocking state of the socket. [More...](#)

bool `isBlocking () const`
Tell whether the socket is in blocking or non-blocking mode.

Protected Types

enum `Type` { `Tcp`, `Udp` }
Types of protocols that the socket can use. [More...](#)

Protected Member Functions

SocketHandle `getHandle ()` const
Return the internal handle of the socket. [More...](#)

void `create ()`
Create the internal representation of the socket. [More...](#)

void `create (SocketHandle handle)`
Create the internal representation of the socket from a so

void `close ()`
Close the socket gracefully. [More...](#)

Detailed Description

Specialized socket using the UDP protocol.

A UDP socket is a connectionless socket.

Instead of connecting once to a remote host, like TCP sockets, it can send data any time.

It is a datagram protocol: bounded blocks of data (datagrams) are transferred instead of a continuous stream of data (TCP). Therefore, one call to send will always succeed (no datagram is not lost), with the same data that was sent.

The UDP protocol is lightweight but unreliable. Unreliable means that data may not arrive or arrive reordered. However, if a datagram arrives, its data is guaranteed to be correct.

UDP is generally used for real-time communication (audio or video streaming) where speed is crucial and lost data doesn't matter much.

Sending and receiving data can use either the low-level or the high-level interface. The low-level interface processes a raw sequence of bytes, whereas the high-level interface uses `Socket` and `Packet` classes. The high-level interface is easier to use and provides more safety regarding the data that is sent. You can use the `Socket::Packet` class to get more details about how they work.

It is important to note that `UdpSocket` is unable to send datagrams bigger than `16384` bytes. In this case, it returns an error and doesn't send anything. This applies to both sending and receiving. Even packets are unable to split and recombine data, due to the unreliability of the protocol. Mixed or duplicated datagrams may lead to a big mess when trying to receive data.

If the socket is bound to a port, it is automatically unbound from it when the process ends. You can unbind the socket explicitly with the `Unbind` function if necessary.

make the port available for other sockets.

Usage example:

```
// ----- The client -----  
  
// Create a socket and bind it to the port 55001  
sf::UdpSocket socket;  
socket.bind(55001);  
  
// Send a message to 192.168.1.50 on port 55002  
std::string message = "Hi, I am " + sf::IpAddress::getLocalAddress().t  
socket.send(message.c_str(), message.size() + 1, "192.168.1.50", 55002  
  
// Receive an answer (most likely from 192.168.1.50, but could be anyone)  
char buffer[1024];  
std::size_t received = 0;  
sf::IpAddress sender;  
unsigned short port;  
socket.receive(buffer, sizeof(buffer), received, sender, port);  
std::cout << sender.ToString() << " said: " << buffer << std::endl;  
  
// ----- The server -----  
  
// Create a socket and bind it to the port 55002  
sf::UdpSocket socket;  
socket.bind(55002);  
  
// Receive a message from anyone  
char buffer[1024];  
std::size_t received = 0;  
sf::IpAddress sender;  
unsigned short port;  
socket.receive(buffer, sizeof(buffer), received, sender, port);  
std::cout << sender.ToString() << " said: " << buffer << std::endl;  
  
// Send an answer  
std::string message = "welcome " + sender.toString();  
socket.send(message.c_str(), message.size() + 1, sender, port);
```

See also

[sf::Socket](#), [sf::TcpSocket](#), [sf::Packet](#)

Definition at line 45 of file [UdpSocket.hpp](#).

Member Enumeration Documentation

anonymous enum

Some special values used by sockets.

Enumerator

AnyPort	Special value that tells the system to pick any available port.
---------	---

Definition at line 66 of file [Socket.hpp](#).

anonymous enum

Enumerator

MaxDatagramSize	The maximum number of bytes that can be sent in
-----------------	---

Definition at line 52 of file [UdpSocket.hpp](#).

enum [sf::Socket::Status](#)

Status codes that may be returned by socket functions.

Enumerator

Done

	The socket has sent / received the data.
NotReady	The socket is not ready to send / receive data yet.
Partial	The socket sent a part of the data.
Disconnected	The TCP socket has been disconnected.
Error	An unexpected error happened.

Definition at line 53 of file [Socket.hpp](#).

enum `sf::Socket::Type`

Types of protocols that the socket can use.

Enumerator	
Tcp	TCP protocol.
Udp	UDP protocol.

Definition at line 114 of file [Socket.hpp](#).

Constructor & Destructor Documentation

sf::UdpSocket::UdpSocket ()

Default constructor.

Member Function Documentation

```
Status sf::UdpSocket::bind ( unsigned short port,  
                             const IpAddress & address = IpAddress  
                             )
```

Bind the socket to a specific port.

Binding the socket to a port is necessary for being able to receive data. The special value `Socket::AnyPort` to tell the system to automatically pick a port. Use `getLocalPort` to retrieve the chosen port.

Parameters

port Port to bind the socket to
address Address of the interface to bind to

Returns

Status code

See also

`unbind`, `getLocalPort`

```
void sf::Socket::close ( )
```

Close the socket gracefully.

This function can only be accessed by derived classes.

void sf::Socket::create ()

Create the internal representation of the socket.

This function can only be accessed by derived classes.

void sf::Socket::create (SocketHandle handle)

Create the internal representation of the socket from a socket handle.

This function can only be accessed by derived classes.

Parameters

handle OS-specific handle of the socket to wrap

SocketHandle sf::Socket::getHandle () const

Return the internal handle of the socket.

The returned handle may be invalid if the socket was not created by this function. This function can only be accessed by derived classes.

Returns

The internal (OS-specific) handle of the socket

unsigned short sf::UdpSocket::getLocalPort () const

Get the port to which the socket is bound locally.

If the socket is not bound to a port, this function returns 0.

Returns

Port to which the socket is bound

See also

[bind](#)

bool sf::Socket::isBlocking () const

Tell whether the socket is in blocking or non-blocking mode.

Returns

True if the socket is blocking, false otherwise

See also

[setBlocking](#)

```
Status sf::UdpSocket::receive ( void *      data,  
                               std::size_t size,  
                               std::size_t & received,  
                               IpAddress & remoteAddress,  
                               unsigned short & remotePort  
                               )
```

Receive raw data from a remote peer.

In blocking mode, this function will wait until some bytes are actually received which is large enough for the data that you intend to receive, if it is returned and *all* the data will be lost.

Parameters

data	Pointer to the array to fill with the received bytes
size	Maximum number of bytes that can be received
received	This variable is filled with the actual number of bytes
remoteAddress	Address of the peer that sent the data
remotePort	Port of the peer that sent the data

Returns

Status code

See also

[send](#)

```
Status sf::UdpSocket::receive ( Packet & packet,  
                               IPAddress & remoteAddress,  
                               unsigned short & remotePort  
                               )
```

Receive a formatted packet of data from a remote peer.

In blocking mode, this function will wait until the whole packet has been received.

Parameters

packet	<code>Packet</code> to fill with the received data
remoteAddress	Address of the peer that sent the data
remotePort	Port of the peer that sent the data

Returns

Status code

See also

[send](#)

```

Status sf::UdpSocket::send ( const void *      data,
                               std::size_t      size,
                               const IpAddress & remoteAddress,
                               unsigned short    remotePort
                               )

```

Send raw data to a remote peer.

Make sure that *size* is not greater than `UdpSocket::MaxDatagramSize` and no data will be sent.

Parameters

data	Pointer to the sequence of bytes to send
size	Number of bytes to send
remoteAddress	Address of the receiver
remotePort	Port of the receiver to send the data to

Returns

Status code

See also

[receive](#)

```

Status sf::UdpSocket::send ( Packet &      packet,
                               const IpAddress & remoteAddress,
                               unsigned short    remotePort
                               )

```

Send a formatted packet of data to a remote peer.

Make sure that the packet size is not greater than `UdpSocket::MaxDatagramSize`

will fail and no data will be sent.

Parameters

packet Packet to send
remoteAddress Address of the receiver
remotePort Port of the receiver to send the data to

Returns

Status code

See also

[receive](#)

`void sf::Socket::setBlocking (bool blocking)`

Set the blocking state of the socket.

In blocking mode, calls will not return until they have completed their task. In non-blocking mode, calls won't return until some data was actually received. Always return immediately, using the return code to signal whether the operation was successful. By default, all sockets are blocking.

Parameters

blocking True to set the socket as blocking, false for non-blocking

See also

[isBlocking](#)

`void sf::UdpSocket::unbind ()`

Unbind the socket from the local port to which it is bound.

The port that the socket was previously bound to is immediately made available after this function is called. This means that a subsequent call to `bind()` by no other process has done so in the mean time. If the socket is not bound, no effect.

See also

`bind`

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

- `UdpSocket.hpp`

[Classes](#) | [Functions](#)

System module

Base module of SFML, defining various utilities. [More...](#)

Classes

class `sf::Clock`
Utility class that measures the elapsed time. [More...](#)

class `sf::FileInputStream`
Implementation of input stream based on a file. [More...](#)

class `sf::InputStream`
Abstract class for custom file input streams. [More...](#)

class `sf::Lock`
Automatic wrapper for locking and unlocking mutexes. [More...](#)

class `sf::MemoryInputStream`
Implementation of input stream based on a memory chunk. [More...](#)

class `sf::Mutex`
Blocks concurrent access to shared resources from multiple threads.

class `sf::NonCopyable`
Utility class that makes any derived class non-copyable. [More...](#)

class `sf::String`
Utility string class that automatically handles conversions between `std::string` and `sf::String`.

class `sf::Thread`
Utility class to manipulate threads. [More...](#)

class `sf::ThreadLocal`
Defines variables with thread-local storage. [More...](#)

class `sf::ThreadLocalPtr< T >`

Pointer to a thread-local variable. [More...](#)

class `sf::Time`
Represents a time value. [More...](#)

class `sf::Utf< N >`
Utility class providing generic functions for UTF conversions. [More...](#)

class `sf::Vector2< T >`
Utility template class for manipulating 2-dimensional vectors. [More...](#)

class `sf::Vector3< T >`
Utility template class for manipulating 3-dimensional vectors. [More...](#)

Functions

`ANativeActivity *` `sf::getNativeActivity ()`
Return a pointer to the Android native activity. [More...](#)

`void` `sf::sleep (Time duration)`
Make the current thread sleep for a given duration. [Mo](#)

`std::ostream &` `sf::err ()`
Standard stream used by SFML to output warnings and

Detailed Description

Base module of SFML, defining various utilities.

It provides vector classes, Unicode strings and conversion functions, threa

Function Documentation

sf::err ()

Standard stream used by SFML to output warnings and errors.

By default, `sf::err()` outputs to the same location as `std::cerr`, (-> the console if there's one available).

It is a standard `std::ostream` instance, so it supports all the insertion (operator <<, manipulators, etc.).

`sf::err()` can be redirected to write to another output, independently of the function provided by the `std::ostream` class.

Example:

```
// Redirect to a file
std::ofstream file("sfml-log.txt");
std::streambuf* previous = sf::err().rdbuf(file.rdbuf());

// Redirect to nothing
sf::err().rdbuf(NULL);

// Restore the original output
sf::err().rdbuf(previous);
```

Returns

Reference to `std::ostream` representing the SFML error stream

ANativeActivity* sf::getNativeActivity ()

Return a pointer to the Android native activity.

You shouldn't have to use this function, unless you want to implement doesn't support, or to use a workaround for a known issue.

Returns

Pointer to Android native activity structure

Platform Limitation

This is only available on Android and to use it, you'll have to spec `SFML/System/NativeActivity.hpp` in your code.

`void sf::sleep (Time duration)`

Make the current thread sleep for a given duration.

`sf::sleep` is the best way to block a program or one of its threads, as it do

Parameters

duration Time to sleep

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[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#) |

[Public Member Functions](#) | [List of all members](#)

sf::Clock Class Reference

System module

Utility class that measures the elapsed time. [More...](#)

```
#include <Clock.hpp>
```

Public Member Functions

`Clock ()`

Default constructor. [More...](#)

Time `getElapsedTime () const`

Get the elapsed time. [More...](#)

Time `restart ()`

Restart the clock. [More...](#)

Detailed Description

Utility class that measures the elapsed time.

`sf::Clock` is a lightweight class for measuring time.

It provides the most precise time that the underlying OS can achieve (nanoseconds). It also ensures monotonicity, which means that the returned time is even if the system time is changed.

Usage example:

```
sf::Clock clock;
...
Time time1 = clock.getElapsedTime();
...
Time time2 = clock.restart();
```

The `sf::Time` value returned by the clock can then be converted to a number of even microseconds.

See also

`sf::Time`

Definition at line 41 of file `Clock.hpp`.

Constructor & Destructor Documentation

sf::Clock::Clock ()

Default constructor.

The clock starts automatically after being constructed.

Member Function Documentation

Time sf::Clock::getElapsedTime () const

Get the elapsed time.

This function returns the time elapsed since the last call to `restart()` (or `restart()` has not been called).

Returns

Time elapsed

Time sf::Clock::restart ()

Restart the clock.

This function puts the time counter back to zero. It also returns the time started.

Returns

Time elapsed

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

- `Clock.hpp`

SFML 2.4.2

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sf::FileInputStream Class Reference

System module

Implementation of input stream based on a file. [More...](#)

```
#include <FileInputStream.hpp>
```

Inheritance diagram for sf::FileInputStream:



Public Member Functions

`FileInputStream ()`
Default constructor. [More...](#)

virtual `~FileInputStream ()`
Default destructor. [More...](#)

bool `open (const std::string &filename)`
Open the stream from a file path. [More...](#)

virtual Int64 `read (void *data, Int64 size)`
Read data from the stream. [More...](#)

virtual Int64 `seek (Int64 position)`
Change the current reading position. [More...](#)

virtual Int64 `tell ()`
Get the current reading position in the stream. [More...](#)

virtual Int64 `getSize ()`
Return the size of the stream. [More...](#)

Detailed Description

Implementation of input stream based on a file.

This class is a specialization of `InputStream` that reads from a file on disk.

It wraps a file in the common `InputStream` interface and therefore a functions that accept such a stream, with a file on disk as the data source.

In addition to the virtual functions inherited from `InputStream`, `FileInputStream` the file to open.

SFML resource classes can usually be loaded directly from a filename, so you unless you create your own algorithms that operate on an `InputStream`

Usage example:

```
void process(InputStream& stream);  
  
FileInputStream stream;  
if (stream.open("some_file.dat"))  
    process(stream);
```

`InputStream`, `MemoryInputStream`

Definition at line 55 of file `FileInputStream.hpp`.

Constructor & Destructor Documentation

sf::FileInputStream::FileInputStream ()

Default constructor.

virtual sf::FileInputStream::~~FileInputStream ()

Default destructor.

Member Function Documentation

virtual Int64 sf::FileInputStream::getSize ()

Return the size of the stream.

Returns

The total number of bytes available in the stream, or -1 on error

Implements [sf::InputStream](#).

bool sf::FileInputStream::open (const std::string & filename)

Open the stream from a file path.

Parameters

filename Name of the file to open

Returns

True on success, false on error

**virtual Int64 sf::FileInputStream::read (void * data,
Int64 size
)**

Read data from the stream.

After reading, the stream's reading position must be advanced by the ar

Parameters

data Buffer where to copy the read data

size Desired number of bytes to read

Returns

The number of bytes actually read, or -1 on error

Implements `sf::InputStream`.

virtual Int64 sf::FileInputStream::seek (Int64 position)

Change the current reading position.

Parameters

position The position to seek to, from the beginning

Returns

The position actually sought to, or -1 on error

Implements `sf::InputStream`.

virtual Int64 sf::FileInputStream::tell ()

Get the current reading position in the stream.

Returns

The current position, or -1 on error.

Implements `sf::InputStream`.

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

- [FileInputStream.hpp](#)

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sf::InputStream Class Reference abstract

System module

Abstract class for custom file input streams. [More...](#)

```
#include <InputStream.hpp>
```

Inheritance diagram for sf::InputStream:



Public Member Functions

virtual `~InputStream ()`
Virtual destructor. [More...](#)

virtual `Int64 read (void *data, Int64 size)=0`
Read data from the stream. [More...](#)

virtual `Int64 seek (Int64 position)=0`
Change the current reading position. [More...](#)

virtual `Int64 tell ()=0`
Get the current reading position in the stream. [More...](#)

virtual `Int64 getSize ()=0`
Return the size of the stream. [More...](#)

Detailed Description

Abstract class for custom file input streams.

This class allows users to define their own file input sources from which SFML resource classes like `sf::Texture` and `sf::SoundBuffer` provide load functions, which read data from conventional sources. However, if you have a custom source (over a network, embedded, encrypted, compressed, etc) you can use `sf::InputStream` and load SFML resources with their `loadFromStream` function.

Usage example:

```
// custom stream class that reads from inside a zip file
class ZipStream : public sf::InputStream
{
public:
    ZipStream(std::string archive);
    bool open(std::string filename);
    Int64 read(void* data, Int64 size);
    Int64 seek(Int64 position);
    Int64 tell();
    Int64 getSize();
private:
    ...
};

// now you can load textures...
sf::Texture texture;
ZipStream stream("resources.zip");
stream.open("images/img.png");
texture.loadFromStream(stream);

// musics...
sf::Music music;
```

```
ZipStream stream("resources.zip");  
stream.open("musics/msc.ogg");  
music.openFromStream(stream);  
  
// etc.
```

Definition at line 41 of file `InputStream.hpp`.

Constructor & Destructor Documentation

virtual sf::InputStream::~~InputStream ()

Virtual destructor.

Definition at line 49 of file [InputStream.hpp](#).

Member Function Documentation

virtual Int64 sf::InputStream::getSize ()

Return the size of the stream.

Returns

The total number of bytes available in the stream, or -1 on error

Implemented in [sf::FileInputStream](#), and [sf::MemoryInputStream](#).

virtual Int64 sf::InputStream::read (void * **data,
 Int64 **size**
)**

Read data from the stream.

After reading, the stream's reading position must be advanced by the amount of data read.

Parameters

data Buffer where to copy the read data

size Desired number of bytes to read

Returns

The number of bytes actually read, or -1 on error

Implemented in [sf::FileInputStream](#), and [sf::MemoryInputStream](#).

virtual Int64 sf::InputStream::seek (Int64 position)

Change the current reading position.

Parameters

position The position to seek to, from the beginning

Returns

The position actually sought to, or -1 on error

Implemented in [sf::FileInputStream](#), and [sf::MemoryInputStream](#).

virtual Int64 sf::InputStream::tell ()

Get the current reading position in the stream.

Returns

The current position, or -1 on error.

Implemented in [sf::FileInputStream](#), and [sf::MemoryInputStream](#).

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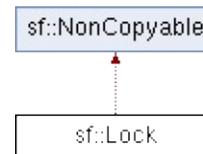
sf::Lock Class Reference

System module

Automatic wrapper for locking and unlocking mutexes. [More...](#)

```
#include <Lock.hpp>
```

Inheritance diagram for sf::Lock:



Public Member Functions

`Lock (Mutex &mutex)`

Construct the lock with a target mutex. [More...](#)

`~Lock ()`

Destructor. [More...](#)

Detailed Description

Automatic wrapper for locking and unlocking mutexes.

`sf::Lock` is a RAII wrapper for `sf::Mutex`.

By unlocking it in its destructor, it ensures that the mutex will always be unlocked when the function (most likely a function) ends. This is even more important when an exception can interrupt the execution flow of the function.

For maximum robustness, `sf::Lock` should always be used to lock/unlock a mutex.

Usage example:

```
sf::Mutex mutex;

void function()
{
    sf::Lock lock(mutex); // mutex is now locked

    functionThatMayThrowAnException(); // mutex is unlocked if this function throws

    if (someCondition)
        return; // mutex is unlocked
} // mutex is unlocked
```

Because the mutex is not explicitly unlocked in the code, it may remain locked for the entire duration of the function. To ensure that the region of the code that needs to be protected by the mutex is not the entire function, you can create a smaller, inner scope so that the lock is limited to this part of the code:

```
sf::Mutex mutex;

void function()
{
    {
        sf::Lock lock(mutex);
        codeThatRequiresProtection();
    }
}
```

```
    } // mutex is unlocked here  
    codeThatDoesntCareAboutTheMutex();  
}
```

Having a mutex locked longer than required is a bad practice which can forget that when a mutex is locked, other threads may be waiting doing no

See also

[sf::Mutex](#)

Definition at line 43 of file [Lock.hpp](#).

Constructor & Destructor Documentation

sf::Lock::Lock ([Mutex](#) & [mutex](#))

Construct the lock with a target mutex.

The mutex passed to [sf::Lock](#) is automatically locked.

Parameters

[mutex](#) [Mutex](#) to lock

sf::Lock::~~Lock ()

Destructor.

The destructor of [sf::Lock](#) automatically unlocks its mutex.

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

- [Lock.hpp](#)

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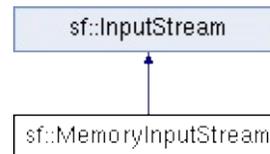
sf::MemoryInputStream Class Reference

System module

Implementation of input stream based on a memory chunk. [More...](#)

```
#include <MemoryInputStream.hpp>
```

Inheritance diagram for sf::MemoryInputStream:



Public Member Functions

`MemoryInputStream ()`

Default constructor. [More...](#)

`void open (const void *data, std::size_t sizeInBytes)`

Open the stream from its data. [More...](#)

`virtual Int64 read (void *data, Int64 size)`

Read data from the stream. [More...](#)

`virtual Int64 seek (Int64 position)`

Change the current reading position. [More...](#)

`virtual Int64 tell ()`

Get the current reading position in the stream. [More...](#)

`virtual Int64 getSize ()`

Return the size of the stream. [More...](#)

Detailed Description

Implementation of input stream based on a memory chunk.

This class is a specialization of `InputStream` that reads from data in memory.

It wraps a memory chunk in the common `InputStream` interface and therefore provides methods and functions that accept such a stream, with content already loaded in memory.

In addition to the virtual functions inherited from `InputStream`, `MemoryInputStream` specifies the pointer and size of the data in memory.

SFML resource classes can usually be loaded directly from memory, so there is no need to use `MemoryInputStream` unless you create your own algorithms that operate on an `InputStream`.

Usage example:

```
void process(InputStream& stream);

MemoryInputStream stream;
stream.open(thePtr, theSize);
process(stream);
```

`InputStream`, `FileInputStream`

Definition at line 43 of file `MemoryInputStream.hpp`.

Constructor & Destructor Documentation

sf::MemoryInputStream::MemoryInputStream ()

Default constructor.

Member Function Documentation

```
virtual Int64 sf::MemoryInputStream::getSize ( )
```

Return the size of the stream.

Returns

The total number of bytes available in the stream, or -1 on error

Implements `sf::InputStream`.

```
void sf::MemoryInputStream::open ( const void * data,  
                                  std::size_t  sizeInBytes  
                                  )
```

Open the stream from its data.

Parameters

data Pointer to the data in memory

sizeInBytes Size of the data, in bytes

```
virtual Int64 sf::MemoryInputStream::read ( void * data,  
                                             Int64  size  
                                             )
```

Read data from the stream.

After reading, the stream's reading position must be advanced by the ar

Parameters

data Buffer where to copy the read data

size Desired number of bytes to read

Returns

The number of bytes actually read, or -1 on error

Implements `sf::InputStream`.

virtual Int64 sf::MemoryInputStream::seek (Int64 position)

Change the current reading position.

Parameters

position The position to seek to, from the beginning

Returns

The position actually sought to, or -1 on error

Implements `sf::InputStream`.

virtual Int64 sf::MemoryInputStream::tell ()

Get the current reading position in the stream.

Returns

The current position, or -1 on error.

Implements `sf::InputStream`.

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

- [MemoryInputStream.hpp](#)

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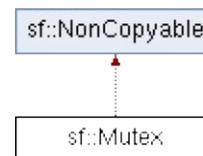
sf::Mutex Class Reference

System module

Blocks concurrent access to shared resources from multiple threads. [More...](#)

```
#include <Mutex.hpp>
```

Inheritance diagram for sf::Mutex:



Public Member Functions

`Mutex ()`

Default constructor. [More...](#)

`~Mutex ()`

Destructor. [More...](#)

`void lock ()`

Lock the mutex. [More...](#)

`void unlock ()`

Unlock the mutex. [More...](#)

Detailed Description

Blocks concurrent access to shared resources from multiple threads.

Mutex stands for "MUTual EXclusion".

A mutex is a synchronization object, used when multiple threads are invol

When you want to protect a part of the code from being accessed simult typically use a mutex. When a thread is locked by a mutex, any other thre until the mutex is released by the thread that locked it. This way, you can access a critical region of your code.

Usage example:

```
Database database; // this is a critical resource that needs some prote
sf::Mutex mutex;

void thread1()
{
    mutex.lock(); // this call will block the thread if the mutex is a
    database.write(...);
    mutex.unlock(); // if thread2 was waiting, it will now be unblocke
}

void thread2()
{
    mutex.lock(); // this call will block the thread if the mutex is a
    database.write(...);
    mutex.unlock(); // if thread1 was waiting, it will now be unblocke
}
```

Be very careful with mutexes. A bad usage can lead to bad problems, waiting for each other and the application is globally stuck).

To make the usage of mutexes more robust, particularly in environments you should use the helper class **sf::Lock** to lock/unlock mutexes.

SFML mutexes are recursive, which means that you can lock a mutex r without creating a deadlock. In this case, the first call to `lock()` behaves have no effect. However, you must call `unlock()` exactly as many times as mutex won't be released.

See also

`sf::Lock`

Definition at line 47 of file `Mutex.hpp`.

Constructor & Destructor Documentation

sf::Mutex::Mutex ()

Default constructor.

sf::Mutex::~~Mutex ()

Destructor.

Member Function Documentation

void sf::Mutex::lock ()

Lock the mutex.

If the mutex is already locked in another thread, this call will block t released.

See also

[unlock](#)

void sf::Mutex::unlock ()

Unlock the mutex.

See also

[lock](#)

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

- [Mutex.hpp](#)

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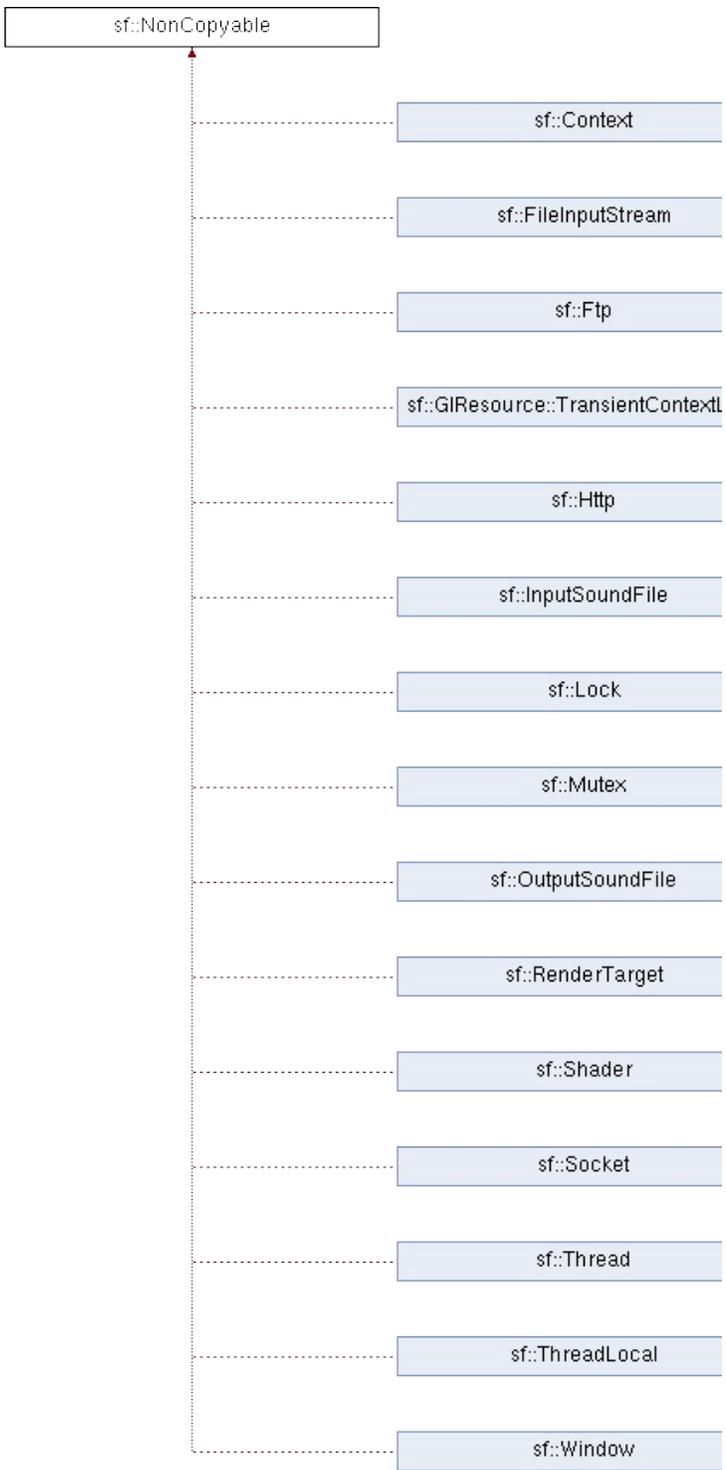
sf::NonCopyable Class Reference

System module

Utility class that makes any derived class non-copyable. [More...](#)

```
#include <NonCopyable.hpp>
```

Inheritance diagram for sf::NonCopyable:



Protected Member Functions

`NonCopyable ()`

Default constructor. [More...](#)

Detailed Description

Utility class that makes any derived class non-copyable.

This class makes its instances non-copyable, by explicitly disabling its copy operator.

To create a non-copyable class, simply inherit from `sf::NonCopyable`.

The type of inheritance (public or private) doesn't matter, the copy constructor declared private in `sf::NonCopyable` so they will end up being inaccessible. A shorter syntax for inheriting from it (see below).

Usage example:

```
class MyNonCopyableClass : sf::NonCopyable
{
    ...
};
```

Deciding whether the instances of a class can be copied or not is a very strongly encouraged to think about it before writing a class, and to use `sf::NonCopyable` to prevent many potential future errors when using it. This is also a very important class.

Definition at line 41 of file `NonCopyable.hpp`.

Constructor & Destructor Documentation

sf::NonCopyable::NonCopyable ()

Default constructor.

Because this class has a copy constructor, the compiler will not aut constructor. That's why we must define it explicitly.

Definition at line 53 of file [NonCopyable.hpp](#).

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sf::String Class Reference

System module

Utility string class that automatically handles conversions between types a

```
#include <String.hpp>
```

Public Types

typedef std::basic_string
< Uint32 >::iterator **Iterator**

Iterator type. [More...](#)

typedef std::basic_string
< Uint32 >::const_iterator **ConstIterator**

Read-only iterator type. [More...](#)

Public Member Functions

`String ()`
Default constructor. [More...](#)

`String (char ansiChar, const std::locale &loc)`
Construct from a single ANSI character and

`String (wchar_t wideChar)`
Construct from single wide character. [More..](#)

`String (Uint32 utf32Char)`
Construct from single UTF-32 character. [Mo](#)

`String (const char *ansiString, const std::loc)`
Construct from a null-terminated C-style ANSI

`String (const std::string &ansiString, const st`
Construct from an ANSI string and a locale.

`String (const wchar_t *wideString)`
Construct from null-terminated C-style wide :

`String (const std::wstring &wideString)`
Construct from a wide string. [More...](#)

`String (const Uint32 *utf32String)`
Construct from a null-terminated C-style UTF

`String (const std::basic_string< Uint32 > &ut`
Construct from an UTF-32 string. [More...](#)

`String (const String ©)`

Copy constructor. [More...](#)

`operator std::string () const`

Implicit conversion operator to `std::string` (ANSI)

`operator std::wstring () const`

Implicit conversion operator to `std::wstring` (wide)

`std::string toAnsiString (const std::locale &locale=std::locale()) const`
Convert the Unicode string to an ANSI string

`std::wstring toWideString () const`
Convert the Unicode string to a wide string. (wide)

`std::basic_string< UInt8 > toUtf8 () const`
Convert the Unicode string to a UTF-8 string

`std::basic_string< UInt16 > toUtf16 () const`
Convert the Unicode string to a UTF-16 string

`std::basic_string< UInt32 > toUtf32 () const`
Convert the Unicode string to a UTF-32 string

`String & operator= (const String &right)`
Overload of assignment operator. [More...](#)

`String & operator+= (const String &right)`
Overload of += operator to append an UTF-8 string

`UInt32 operator[] (std::size_t index) const`
Overload of [] operator to access a character

`UInt32 & operator[] (std::size_t index)`
Overload of [] operator to access a character

void **clear** ()
Clear the string. [More...](#)

std::size_t **getsize** () const
Get the size of the string. [More...](#)

bool **isempty** () const
Check whether the string is empty or not. [More...](#)

void **erase** (std::size_t position, std::size_t count=1)
Erase one or more characters from the string.

void **insert** (std::size_t position, const **String** &str)
Insert one or more characters into the string.

std::size_t **find** (const **String** &str, std::size_t start=0) const
Find a sequence of one or more characters in the string.

void **replace** (std::size_t position, std::size_t length, const **String** &str)
Replace a substring with another string. [More...](#)

void **replace** (const **String** &searchFor, const **String** &replaceWith)
Replace all occurrences of a substring with another string.

String **substring** (std::size_t position, std::size_t length)
Return a part of the string. [More...](#)

const Uint32 * **getData** () const
Get a pointer to the C-style array of characters.

Iterator **begin** ()
Return an iterator to the beginning of the string.

ConstIterator **begin** () const
Return an iterator to the beginning of the string.

Iterator `end ()`

Return an iterator to the end of the string. `MyString::end ()`

ConstIterator `end () const`

Return an iterator to the end of the string. `MyString::end () const`

Static Public Member Functions

`template<typename T >`

`static String fromUtf8 (T begin, T end)`

Create a new `sf::String` from a UTF-8 encoded string. [More](#)

`template<typename T >`

`static String fromUtf16 (T begin, T end)`

Create a new `sf::String` from a UTF-16 encoded string. [Mor](#)

`template<typename T >`

`static String fromUtf32 (T begin, T end)`

Create a new `sf::String` from a UTF-32 encoded string. [Mor](#)

Static Public Attributes

static const std::size_t [InvalidPos](#)

Represents an invalid position in the string. [More](#)

Friends

```
bool operator==(const String &left, const String &right)
```

```
bool operator<(const String &left, const String &right)
```

Related Functions

(Note that these are not member functions.)

bool `operator==` (const `String` &left, const `String` &right)
Overload of `==` operator to compare two UTF-32 strings. [More...](#)

bool `operator!=` (const `String` &left, const `String` &right)
Overload of `!=` operator to compare two UTF-32 strings. [More...](#)

bool `operator<` (const `String` &left, const `String` &right)
Overload of `<` operator to compare two UTF-32 strings. [More...](#)

bool `operator>` (const `String` &left, const `String` &right)
Overload of `>` operator to compare two UTF-32 strings. [More...](#)

bool `operator<=` (const `String` &left, const `String` &right)
Overload of `<=` operator to compare two UTF-32 strings. [More...](#)

bool `operator>=` (const `String` &left, const `String` &right)
Overload of `>=` operator to compare two UTF-32 strings. [More...](#)

`String` `operator+` (const `String` &left, const `String` &right)
Overload of binary `+` operator to concatenate two strings. [More...](#)

Detailed Description

Utility string class that automatically handles conversions between types `std::string` and `std::wstring`. `sf::String` is a utility string class defined mainly for convenience.

It is a Unicode string (implemented using UTF-32), thus it can store any Chinese, Arabic, Hebrew, etc.).

It automatically handles conversions from/to ANSI and wide strings, so `std::string` and `std::wstring` classes and still be compatible with functions taking a `sf::String`.

```
sf::String s;

std::string s1 = s; // automatically converted to ANSI string
std::wstring s2 = s; // automatically converted to wide string
s = "hello"; // automatically converted from ANSI string
s = L"hello"; // automatically converted from wide string
s += 'a'; // automatically converted from ANSI string
s += L'a'; // automatically converted from wide string
```

Conversions involving ANSI strings use the default user locale. However, you can specify a locale if necessary:

```
std::locale locale;
sf::String s;
...
std::string s1 = s.toAnsiString(locale);
s = sf::String("hello", locale);
```

`sf::String` defines the most important functions of the standard `std::string` and `std::wstring`, such as iterating, appending, comparing, etc. However it is a simple class provided for convenience. You may have to consider using a more optimized class if your program requires high performance. If you use `sf::String`, automatic conversion functions will then take care of converting your strings to the required type.

Please note that SFML also defines a low-level, generic interface for `UString` classes.

Definition at line 45 of file `String.hpp`.

Member Typedef Documentation

typedef std::basic_string<Uint32>::const_iterator sf::String::ConstI

Read-only iterator type.

Definition at line 53 of file [String.hpp](#).

typedef std::basic_string<Uint32>::iterator sf::String::Iterator

Iterator type.

Definition at line 52 of file [String.hpp](#).

Constructor & Destructor Documentation

sf::String::String ()

Default constructor.

This constructor creates an empty string.

**sf::String::String (char `ansiChar`,
const std::locale & `locale` = std::locale()
)**

Construct from a single ANSI character and a locale.

The source character is converted to UTF-32 according to the given locale.

Parameters

ansiChar ANSI character to convert

locale Locale to use for conversion

sf::String::String (wchar_t `wideChar`)

Construct from single wide character.

Parameters

wideChar Wide character to convert

```
sf::String::String ( Uint32 utf32Char )
```

Construct from single UTF-32 character.

Parameters

utf32Char UTF-32 character to convert

```
sf::String::String ( const char *      ansiString,  
                    const std::locale & locale = std::locale()  
                    )
```

Construct from a null-terminated C-style ANSI string and a locale.

The source string is converted to UTF-32 according to the given locale.

Parameters

ansiString ANSI string to convert

locale Locale to use for conversion

```
sf::String::String ( const std::string & ansiString,  
                    const std::locale & locale = std::locale()  
                    )
```

Construct from an ANSI string and a locale.

The source string is converted to UTF-32 according to the given locale.

Parameters

ansiString ANSI string to convert

locale Locale to use for conversion

sf::String::String (const wchar_t * **wideString)**

Construct from null-terminated C-style wide string.

Parameters

wideString Wide string to convert

sf::String::String (const std::wstring & **wideString)**

Construct from a wide string.

Parameters

wideString Wide string to convert

sf::String::String (const Uint32 * **utf32String)**

Construct from a null-terminated C-style UTF-32 string.

Parameters

utf32String UTF-32 string to assign

sf::String::String (const std::basic_string< Uint32 > & **utf32String)**

Construct from an UTF-32 string.

Parameters

utf32String UTF-32 string to assign

sf::String::String (const **String & **copy**)**

Copy constructor.

Parameters

copy Instance to copy

Member Function Documentation

Iterator `sf::String::begin ()`

Return an iterator to the beginning of the string.

Returns

Read-write iterator to the beginning of the string characters

See also

`end`

ConstIterator `sf::String::begin () const`

Return an iterator to the beginning of the string.

Returns

Read-only iterator to the beginning of the string characters

See also

`end`

void `sf::String::clear ()`

Clear the string.

This function removes all the characters from the string.

See also

`isEmpty`, `erase`

Iterator `sf::String::end ()`

Return an iterator to the end of the string.

The end iterator refers to 1 position past the last character; thus it represents a position that should never be accessed.

Returns

Read-write iterator to the end of the string characters

See also

`begin`

ConstIterator `sf::String::end () const`

Return an iterator to the end of the string.

The end iterator refers to 1 position past the last character; thus it represents a position that should never be accessed.

Returns

Read-only iterator to the end of the string characters

See also

`begin`

```
void sf::String::erase ( std::size_t position,  
                        std::size_t count = 1  
                        )
```

Erase one or more characters from the string.

This function removes a sequence of *count* characters starting from *posi*

Parameters

position Position of the first character to erase
count Number of characters to erase

```
std::size_t sf::String::find ( const String & str,  
                              std::size_t start = 0  
                              ) const
```

Find a sequence of one or more characters in the string.

This function searches for the characters of *str* in the string, starting from

Parameters

str Characters to find
start Where to begin searching

Returns

Position of *str* in the string, or `String::InvalidPos` if not found

```
template<typename T >
```

```
static String sf::String::fromUtf16 ( T begin,
```

```
T end
)
```

Create a new `sf::String` from a UTF-16 encoded string.

Parameters

begin Forward iterator to the beginning of the UTF-16 sequence

end Forward iterator to the end of the UTF-16 sequence

Returns

A `sf::String` containing the source string

See also

`fromUtf8`, `fromUtf32`

```
template<typename T >
```

```
static String sf::String::fromUtf32 ( T begin,
                                     T end
                                     )
```

Create a new `sf::String` from a UTF-32 encoded string.

This function is provided for consistency, it is equivalent to using the `sf::Uint32*` or a `std::basic_string<sf::Uint32>`.

Parameters

begin Forward iterator to the beginning of the UTF-32 sequence

end Forward iterator to the end of the UTF-32 sequence

Returns

A `sf::String` containing the source string

See also

[fromUtf8](#), [fromUtf16](#)

```
template<typename T >
```

```
static String sf::String::fromUtf8 ( T begin,  
                                     T end  
                                     )
```

Create a new `sf::String` from a UTF-8 encoded string.

Parameters

begin Forward iterator to the beginning of the UTF-8 sequence
end Forward iterator to the end of the UTF-8 sequence

Returns

A `sf::String` containing the source string

See also

[fromUtf16](#), [fromUtf32](#)

```
const Uint32* sf::String::getData ( ) const
```

Get a pointer to the C-style array of characters.

This functions provides a read-only access to a null-terminated C-style returned pointer is temporary and is meant only for immediate use, thus i

Returns

Read-only pointer to the array of characters

`std::size_t sf::String::getSize () const`

Get the size of the string.

Returns

Number of characters in the string

See also

`isEmpty`

`void sf::String::insert (std::size_t position, const String & str)`

Insert one or more characters into the string.

This function inserts the characters of *str* into the string, starting from *pos*

Parameters

position Position of insertion

str Characters to insert

`bool sf::String::isEmpty () const`

Check whether the string is empty or not.

Returns

True if the string is empty (i.e. contains no character)

See also

`clear`, `getSize`

sf::String::operator std::string () const

Implicit conversion operator to std::string (ANSI string)

The current global locale is used for conversion. If you want to use a different locale, call `std::locale::global` before calling `toAnsiString`. Characters that do not fit in the target encoding are discarded. This operator is defined for convenience, and is equivalent to calling `toAnsiString`.

Returns

Converted ANSI string

See also

`toAnsiString`, `operator std::wstring`

sf::String::operator std::wstring () const

Implicit conversion operator to std::wstring (wide string)

Characters that do not fit in the target encoding are discarded from the string. This operator is defined for convenience, and is equivalent to calling `toWideString()`.

Returns

Converted wide string

See also

`toWideString`, `operator std::string`

String& sf::String::operator+= (const String & right)

Overload of += operator to append an UTF-32 string.

Parameters

right *String* to append

Returns

Reference to self

String& sf::String::operator= (const *String* & **right)**

Overload of assignment operator.

Parameters

right Instance to assign

Returns

Reference to self

Uint32 sf::String::operator[] (std::size_t **index) const**

Overload of [] operator to access a character by its position.

This function provides read-only access to characters. Note: the behavior is undefined if *index* is outside the range.

Parameters

index Index of the character to get

Returns

Character at position *index*

```
uint32& sf::String::operator[] ( std::size_t index )
```

Overload of [] operator to access a character by its position.

This function provides read and write access to characters. Note: the behavior is undefined if the index is outside the range of the string.

Parameters

index Index of the character to get

Returns

Reference to the character at position *index*

```
void sf::String::replace ( std::size_t position,  
                          std::size_t length,  
                          const String & replaceWith  
                          )
```

Replace a substring with another string.

This function replaces the substring that starts at index *position* and has a length of *length* characters with the string *replaceWith*.

Parameters

position Index of the first character to be replaced

length Number of characters to replace. You can pass `std::string::npos` to replace until the end of the string.

replaceWith `String` that replaces the given substring.

```
void sf::String::replace ( const String & searchFor,  
                          const String & replaceWith  
                          )
```

Replace all occurrences of a substring with a replacement string.

This function replaces all occurrences of *searchFor* in this string with the

Parameters

searchFor The value being searched for

replaceWith The value that replaces found *searchFor* values

```
String sf::String::substring ( std::size_t position,  
                              std::size_t length = InvalidPos  
                              ) const
```

Return a part of the string.

This function returns the substring that starts at index *position* and spans

Parameters

position Index of the first character

length Number of characters to include in the substring (if the string characters as possible are included). *InvalidPos* can be used as the end of the string.

Returns

String object containing a substring of this object

```
std::string sf::String::toAnsiString ( const std::locale & locale = std::
```

Convert the Unicode string to an ANSI string.

The UTF-32 string is converted to an ANSI string in the encoding defined. Characters that do not fit in the target encoding are discarded from the returned string.

Parameters

locale Locale to use for conversion

Returns

Converted ANSI string

See also

[toWideString](#), `operator std::string`

`std::basic_string<Uint16> sf::String::toUtf16 () const`

Convert the Unicode string to a UTF-16 string.

Returns

Converted UTF-16 string

See also

[toUtf8](#), [toUtf32](#)

`std::basic_string<Uint32> sf::String::toUtf32 () const`

Convert the Unicode string to a UTF-32 string.

This function doesn't perform any conversion, since the string is already

Returns

Converted UTF-32 string

See also

[toUtf8](#), [toUtf16](#)

std::basic_string<Uin8> sf::String::toUtf8 () const

Convert the Unicode string to a UTF-8 string.

Returns

Converted UTF-8 string

See also

[toUtf16](#), [toUtf32](#)

std::wstring sf::String::toWideString () const

Convert the Unicode string to a wide string.

Characters that do not fit in the target encoding are discarded from the re

Returns

Converted wide string

See also

[toAnsiString](#), operator `std::wstring`

Friends And Related Function Documentatio

```
bool operator!= ( const String & left,  
                 const String & right  
                 )
```

Overload of != operator to compare two UTF-32 strings.

Parameters

left Left operand (a string)

right Right operand (a string)

Returns

True if both strings are different

```
String operator+ ( const String & left,  
                  const String & right  
                  )
```

Overload of binary + operator to concatenate two strings.

Parameters

left Left operand (a string)

right Right operand (a string)

Returns

Concatenated string

```
bool operator< ( const String & left,  
                const String & right  
                )
```

Overload of < operator to compare two UTF-32 strings.

Parameters

left Left operand (a string)

right Right operand (a string)

Returns

True if *left* is lexicographically before *right*

```
bool operator<= ( const String & left,  
                 const String & right  
                 )
```

Overload of <= operator to compare two UTF-32 strings.

Parameters

left Left operand (a string)

right Right operand (a string)

Returns

True if *left* is lexicographically before or equivalent to *right*

```
bool operator== ( const String & left,  
                 const String & right  
                 )
```

Overload of == operator to compare two UTF-32 strings.

Parameters

left Left operand (a string)
right Right operand (a string)

Returns

True if both strings are equal

```
bool operator> ( const String & left,  
                const String & right  
                )
```

Overload of > operator to compare two UTF-32 strings.

Parameters

left Left operand (a string)
right Right operand (a string)

Returns

True if *left* is lexicographically after *right*

```
bool operator>= ( const String & left,  
                 const String & right  
                 )
```

Overload of >= operator to compare two UTF-32 strings.

Parameters

left Left operand (a string)

right Right operand (a string)

Returns

True if *left* is lexicographically after or equivalent to *right*

Member Data Documentation

`const std::size_t sf::String::InvalidPos`

Represents an invalid position in the string.

Definition at line 58 of file `String.hpp`.

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

- `String.hpp`

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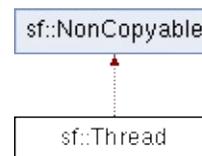
sf::Thread Class Reference

System module

Utility class to manipulate threads. [More...](#)

```
#include <Thread.hpp>
```

Inheritance diagram for sf::Thread:



Public Member Functions

template<typename F >

Thread (F function)

Construct the thread from a functor with no argument. [More...](#)

template<typename F , typename A >

Thread (F function, A argument)

Construct the thread from a functor with an argument. [More...](#)

template<typename C >

Thread (void(C::*function)(), C *object)

Construct the thread from a member function and an object. [More..](#)

~Thread ()

Destructor. [More...](#)

void **launch** ()

Run the thread. [More...](#)

void **wait** ()

Wait until the thread finishes. [More...](#)

void **terminate** ()

Terminate the thread. [More...](#)

Detailed Description

Utility class to manipulate threads.

Threads provide a way to run multiple parts of the code in parallel.

When you launch a new thread, the execution is split and both the new th

To use a `sf::Thread`, you construct it directly with the function to execute
`sf::Thread` has multiple template constructors, which means that you can

- non-member functions with no argument
- non-member functions with one argument of any type
- functors with no argument (this one is particularly useful for compatibility)
- functors with one argument of any type
- member functions from any class with no argument

The function argument, if any, is copied in the `sf::Thread` instance, corresponding constructor is used). Class instances, however, are pass sure that the object won't be destroyed while the thread is still using it.

The thread ends when its function is terminated. If the owner `sf::Thread` thread is finished, the destructor will wait (see `wait()`)

Usage examples:

```
// example 1: non member function with one argument
void threadFunc(int argument)
{
    ...
}
sf::Thread thread(&threadFunc, 5);
```

```
thread.launch(); // start the thread (internally calls threadFunc(5))
```

```
// example 2: member function
```

```
class Task
{
public:
    void run()
    {
        ...
    }
};
```

```
Task task;
sf::Thread thread(&Task::run, &task);
thread.launch(); // start the thread (internally calls task.run())
```

```
// example 3: functor
```

```
struct Task
{
    void operator()()
    {
        ...
    }
};
```

```
sf::Thread thread(Task());
thread.launch(); // start the thread (internally calls operator() on th
```

Creating parallel threads of execution can be dangerous: all threads in the same memory space, which means that you may end up accessing the same memory at the same time. To prevent this kind of situations, you can use mutexes.

See also

[sf::Mutex](#)

Definition at line 48 of file [Thread.hpp](#).

Constructor & Destructor Documentation

```
template<typename F >
```

```
sf::Thread::Thread ( F function )
```

Construct the thread from a functor with no argument.

This constructor works for function objects, as well as free functions.

Use this constructor for this kind of function:

```
void function();  
  
// --- or ----  
  
struct Functor  
{  
    void operator()();  
};
```

Note: this does *not* run the thread, use `launch()`.

Parameters

function Functor or free function to use as the entry point of the thread

```
template<typename F , typename A >
```

```
sf::Thread::Thread ( F function,  
                    A argument  
                    )
```

Construct the thread from a functor with an argument.

This constructor works for function objects, as well as free functions. It the argument can have any type (int, std::string, void*, Toto, ...).

Use this constructor for this kind of function:

```
void function(int arg);  
  
// --- or ----  
  
struct Functor  
{  
    void operator()(std::string arg);  
};
```

Note: this does *not* run the thread, use `launch()`.

Parameters

function Functor or free function to use as the entry point of the th
argument argument to forward to the function

```
template<typename C >
```

```
sf::Thread::Thread ( void(C::*)() function,  
                    C * object  
                    )
```

Construct the thread from a member function and an object.

This constructor is a template, which means that you can use it with ar this kind of function:

```
class MyClass  
{  
public:  
    void function();  
};
```

Note: this does *not* run the thread, use `launch()`.

Parameters

function Entry point of the thread

object Pointer to the object to use

`sf::Thread::~~Thread ()`

Destructor.

This destructor calls `wait()`, so that the internal thread cannot survive destroyed.

Member Function Documentation

void sf::Thread::launch ()

Run the thread.

This function starts the entry point passed to the thread's constructor, and when the function returns, the thread's function is running in parallel to the calling c

void sf::Thread::terminate ()

Terminate the thread.

This function immediately stops the thread, without waiting for its function to finish. Using this function is not safe, and can lead to local variables not being destroyed, memory leaks, and other problems in multi-threaded systems. You should rather try to make the thread function terminate by itself.

void sf::Thread::wait ()

Wait until the thread finishes.

This function will block the execution until the thread's function ends. If the thread's function never ends, the calling thread will block forever. If this function is called on a thread that has not yet started, it will do nothing without doing anything.

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

- Thread.hpp

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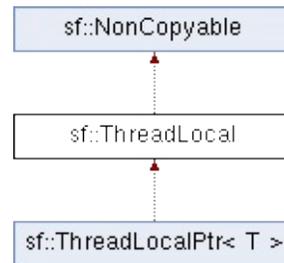
sf::ThreadLocal Class Reference

System module

Defines variables with thread-local storage. [More...](#)

```
#include <ThreadLocal.hpp>
```

Inheritance diagram for sf::ThreadLocal:



Public Member Functions

`ThreadLocal` (void *value=NULL)
Default constructor. [More...](#)

`~ThreadLocal` ()
Destructor. [More...](#)

void `setValue` (void *value)
Set the thread-specific value of the variable. [More...](#)

void * `getValue` () const
Retrieve the thread-specific value of the variable. [More...](#)

Detailed Description

Defines variables with thread-local storage.

This class manipulates `void*` parameters and thus is not appropriate for st

You should rather use the `sf::ThreadLocalPtr` template class.

Definition at line 47 of file `ThreadLocal.hpp`.

Constructor & Destructor Documentation

sf::ThreadLocal::ThreadLocal (void * **value = NULL)**

Default constructor.

Parameters

value Optional value to initialize the variable

sf::ThreadLocal::~~ThreadLocal ()

Destructor.

Member Function Documentation

void* sf::ThreadLocal::getValue () const

Retrieve the thread-specific value of the variable.

Returns

Value of the variable for the current thread

void sf::ThreadLocal::setValue (void * **value)**

Set the thread-specific value of the variable.

Parameters

value Value of the variable for the current thread

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

- [ThreadLocal.hpp](#)

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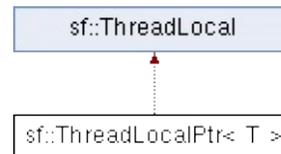
sf::ThreadLocalPtr< T > Class Template Reference

System module

Pointer to a thread-local variable. [More...](#)

```
#include <ThreadLocalPtr.hpp>
```

Inheritance diagram for sf::ThreadLocalPtr< T >:



Public Member Functions

`ThreadLocalPtr` (`T *value=NULL`)
Default constructor. [More...](#)

`T &` `operator*` (`) const`
Overload of unary operator `*`. [More...](#)

`T *` `operator->` (`) const`
Overload of operator `->` [More...](#)

`operator T *` (`) const`
Conversion operator to implicitly convert the pointer
[More...](#)

`ThreadLocalPtr< T > &` `operator=` (`T *value`)
Assignment operator for a raw pointer parameter

`ThreadLocalPtr< T > &` `operator=` (`const ThreadLocalPtr< T > &right`)
Assignment operator for a `ThreadLocalPtr` parameter

Private Member Functions

void `setValue` (void *value)

Set the thread-specific value of the variable. [More...](#)

void * `getValue` () const

Retrieve the thread-specific value of the variable. [More...](#)

Detailed Description

```
template<typename T>
class sf::ThreadLocalPtr< T >
```

Pointer to a thread-local variable.

`sf::ThreadLocalPtr` is a type-safe wrapper for storing pointers to thread-local

A thread-local variable holds a different value for each different thread, shared.

Its usage is completely transparent, so that it is similar to manipulating smart pointer).

Usage example:

```
MyClass object1;
MyClass object2;
sf::ThreadLocalPtr<MyClass> objectPtr;

void thread1()
{
    objectPtr = &object1; // doesn't impact thread2
    ...
}

void thread2()
{
    objectPtr = &object2; // doesn't impact thread1
    ...
}

int main()
{
    // Create and launch the two threads
    sf::Thread t1(&thread1);
    sf::Thread t2(&thread2);
    t1.launch();
}
```

```
t2.launch();  
return 0;  
}
```

`ThreadLocalPtr` is designed for internal use; however you can use its implementation.

Definition at line 41 of file `ThreadLocalPtr.hpp`.

Constructor & Destructor Documentation

```
template<typename T>
```

```
sf::ThreadLocalPtr< T >::ThreadLocalPtr ( T * value = NULL )
```

Default constructor.

Parameters

value Optional value to initialize the variable

Member Function Documentation

template<typename T>

sf::ThreadLocalPtr< T >::operator T * () const

Conversion operator to implicitly convert the pointer to its raw pointer type

Returns

Pointer to the actual object

template<typename T>

T& sf::ThreadLocalPtr< T >::operator* () const

Overload of unary operator *.

Like raw pointers, applying the * operator returns a reference to the pointed-to object.

Returns

Reference to the thread-local variable

template<typename T>

T* sf::ThreadLocalPtr< T >::operator-> () const

Overload of operator ->

Similarly to raw pointers, applying the -> operator returns the pointed-to object.

Returns

Pointer to the thread-local variable

```
template<typename T>
```

```
ThreadLocalPtr<T>& sf::ThreadLocalPtr< T >::operator= ( T * value
```

Assignment operator for a raw pointer parameter.

Parameters

value Pointer to assign

Returns

Reference to self

```
template<typename T>
```

```
ThreadLocalPtr<T>& sf::ThreadLocalPtr< T >::operator= ( const Th
```

Assignment operator for a `ThreadLocalPtr` parameter.

Parameters

right `ThreadLocalPtr` to assign

Returns

Reference to self

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

- `ThreadLocalPtr.hpp`

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sf::Time Class Reference

System module

Represents a time value. [More...](#)

```
#include <Time.hpp>
```

Public Member Functions

`Time ()`

Default constructor. [More...](#)

`float asSeconds () const`

Return the time value as a number of seconds. [More...](#)

`Int32 asMilliseconds () const`

Return the time value as a number of milliseconds. [More...](#)

`Int64 asMicroseconds () const`

Return the time value as a number of microseconds. [More...](#)

Static Public Attributes

static const [Time](#) [Zero](#)

Predefined "zero" time value. [More...](#)

Friends

Time **seconds** (float)

Time **milliseconds** (Int32)

Time **microseconds** (Int64)

Related Functions

(Note that these are not member functions.)

`Time` `seconds` (float amount)
Construct a time value from a number of seconds. [More...](#)

`Time` `milliseconds` (Int32 amount)
Construct a time value from a number of milliseconds. [More...](#)

`Time` `microseconds` (Int64 amount)
Construct a time value from a number of microseconds. [More...](#)

`bool` `operator==` (`Time` left, `Time` right)
Overload of `==` operator to compare two time values. [More...](#)

`bool` `operator!=` (`Time` left, `Time` right)
Overload of `!=` operator to compare two time values. [More...](#)

`bool` `operator<` (`Time` left, `Time` right)
Overload of `<` operator to compare two time values. [More...](#)

`bool` `operator>` (`Time` left, `Time` right)
Overload of `>` operator to compare two time values. [More...](#)

`bool` `operator<=` (`Time` left, `Time` right)
Overload of `<=` operator to compare two time values. [More...](#)

`bool` `operator>=` (`Time` left, `Time` right)
Overload of `>=` operator to compare two time values. [More...](#)

`Time` `operator-` (`Time` right)

Overload of unary - operator to negate a time value. [More...](#)

Time [operator+](#) ([Time left](#), [Time right](#))
Overload of binary + operator to add two time values. [More...](#)

Time & [operator+=](#) ([Time &left](#), [Time right](#))
Overload of binary += operator to add/assign two time values. [More...](#)

Time [operator-](#) ([Time left](#), [Time right](#))
Overload of binary - operator to subtract two time values. [More...](#)

Time & [operator-=](#) ([Time &left](#), [Time right](#))
Overload of binary -= operator to subtract/assign two time values. [More...](#)

Time [operator*](#) ([Time left](#), [float right](#))
Overload of binary * operator to scale a time value. [More...](#)

Time [operator*](#) ([Time left](#), [Int64 right](#))
Overload of binary * operator to scale a time value. [More...](#)

Time [operator*](#) ([float left](#), [Time right](#))
Overload of binary * operator to scale a time value. [More...](#)

Time [operator*](#) ([Int64 left](#), [Time right](#))
Overload of binary * operator to scale a time value. [More...](#)

Time & [operator*+=](#) ([Time &left](#), [float right](#))
Overload of binary *= operator to scale/assign a time value. [More...](#)

Time & [operator*+=](#) ([Time &left](#), [Int64 right](#))
Overload of binary *= operator to scale/assign a time value. [More...](#)

Time [operator/](#) ([Time left](#), [float right](#))
Overload of binary / operator to scale a time value. [More...](#)

Time **operator/** (**Time** left, **Int64** right)
Overload of binary / operator to scale a time value. [More...](#)

Time & **operator/=** (**Time** &left, **float** right)
Overload of binary /= operator to scale/assign a time value. [Mor](#)

Time & **operator/=** (**Time** &left, **Int64** right)
Overload of binary /= operator to scale/assign a time value. [Mor](#)

float **operator/** (**Time** left, **Time** right)
Overload of binary / operator to compute the ratio of two time va

Time **operator%** (**Time** left, **Time** right)
Overload of binary % operator to compute remainder of a time v

Time & **operator%=>** (**Time** &left, **Time** right)
Overload of binary %= operator to compute/assign remainder of

Detailed Description

Represents a time value.

`sf::Time` encapsulates a time value in a flexible way.

It allows to define a time value either as a number of seconds, milliseconds or microseconds. The other way round: you can read a time value as either a number of seconds, milliseconds or microseconds.

By using such a flexible interface, the API doesn't impose any fixed type, let the user choose its own favorite representation.

`Time` values support the usual mathematical operations: you can add or subtract a time by a number, divide a time by a number, compare two times, etc.

Since they represent a time span and not an absolute time value, times can be added or subtracted.

Usage example:

```
sf::Time t1 = sf::seconds(0.1f);
Int32 milli = t1.asMilliseconds(); // 100

sf::Time t2 = sf::milliseconds(30);
Int64 micro = t2.asMicroseconds(); // 30000

sf::Time t3 = sf::microseconds(-800000);
float sec = t3.asSeconds(); // -0.8

void update(sf::Time elapsed)
{
    position += speed * elapsed.asSeconds();
}

update(sf::milliseconds(100));
```

See also

sf::Clock

Definition at line 40 of file Time.hpp.

Constructor & Destructor Documentation

sf::Time::Time ()

Default constructor.

Sets the time value to zero.

Member Function Documentation

Int64 sf::Time::asMicroseconds () const

Return the time value as a number of microseconds.

Returns

`Time` in microseconds

See also

`asSeconds`, `asMilliseconds`

Int32 sf::Time::asMilliseconds () const

Return the time value as a number of milliseconds.

Returns

`Time` in milliseconds

See also

`asSeconds`, `asMicroseconds`

float sf::Time::asSeconds () const

Return the time value as a number of seconds.

Returns

Time in seconds

See also

`asMilliseconds`, `asMicroseconds`

Friends And Related Function Documentatio

Time microseconds (Int64 **amount**)

Construct a time value from a number of microseconds.

Parameters

amount Number of microseconds

Returns

Time value constructed from the amount of microseconds

See also

seconds, **milliseconds**

Time milliseconds (Int32 **amount**)

Construct a time value from a number of milliseconds.

Parameters

amount Number of milliseconds

Returns

Time value constructed from the amount of milliseconds

See also

seconds, **microseconds**

```
bool operator!= ( Time left,  
                Time right  
                )
```

Overload of != operator to compare two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

True if both time values are different

```
Time operator% ( Time left,  
                Time right  
                )
```

Overload of binary % operator to compute remainder of a time value.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

left modulo right

```
Time & operator%= ( Time & left,  
                  Time right  
                  )
```

Overload of binary %= operator to compute/assign remainder of a time v

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

left modulo *right*

```
Time operator* ( Time left,  
                float right  
                )
```

Overload of binary * operator to scale a time value.

Parameters

left Left operand (a time)
right Right operand (a number)

Returns

left multiplied by *right*

```
Time operator* ( Time left,  
                Int64 right  
                )
```

Overload of binary * operator to scale a time value.

Parameters

left Left operand (a time)

right Right operand (a number)

Returns

left multiplied by *right*

```
Time operator* ( float left,  
                Time right  
                )
```

Overload of binary * operator to scale a time value.

Parameters

left Left operand (a number)

right Right operand (a time)

Returns

left multiplied by *right*

```
Time operator* ( Int64 left,  
                Time right  
                )
```

Overload of binary * operator to scale a time value.

Parameters

left Left operand (a number)

right Right operand (a time)

Returns

left multiplied by *right*

```
Time & operator*=( Time & left,  
                  float right  
                  )
```

Overload of binary *= operator to scale/assign a time value.

Parameters

left Left operand (a time)
right Right operand (a number)

Returns

left multiplied by *right*

```
Time & operator*=( Time & left,  
                  Int64 right  
                  )
```

Overload of binary *= operator to scale/assign a time value.

Parameters

left Left operand (a time)
right Right operand (a number)

Returns

left multiplied by *right*

```
Time operator+ ( Time left,  
                Time right  
                )
```

Overload of binary + operator to add two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

Sum of the two times values

```
Time & operator+= ( Time & left,  
                    Time right  
                    )
```

Overload of binary += operator to add/assign two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

Sum of the two times values

```
Time operator- ( Time right )
```

Overload of unary - operator to negate a time value.

Parameters

right Right operand (a time)

Returns

Opposite of the time value

```
Time operator- ( Time left,  
                  Time right  
                )
```

Overload of binary - operator to subtract two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

Difference of the two times values

```
Time & operator-= ( Time & left,  
                    Time right  
                    )
```

Overload of binary -= operator to subtract/assign two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

Difference of the two times values

```
Time operator/ ( Time left,
```

```
float right  
)
```

Overload of binary / operator to scale a time value.

Parameters

left Left operand (a time)

right Right operand (a number)

Returns

left divided by *right*

```
Time operator/ ( Time left,  
                Int64 right  
)
```

Overload of binary / operator to scale a time value.

Parameters

left Left operand (a time)

right Right operand (a number)

Returns

left divided by *right*

```
float operator/ ( Time left,  
                 Time right  
)
```

Overload of binary / operator to compute the ratio of two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

left divided by *right*

```
Time & operator/= ( Time & left,  
                    float right  
                    )
```

Overload of binary /= operator to scale/assign a time value.

Parameters

left Left operand (a time)
right Right operand (a number)

Returns

left divided by *right*

```
Time & operator/= ( Time & left,  
                    Int64 right  
                    )
```

Overload of binary /= operator to scale/assign a time value.

Parameters

left Left operand (a time)
right Right operand (a number)

Returns

left divided by *right*

```
bool operator< ( Time left,  
                Time right  
                )
```

Overload of < operator to compare two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

True if *left* is lesser than *right*

```
bool operator<= ( Time left,  
                  Time right  
                  )
```

Overload of <= operator to compare two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

True if *left* is lesser or equal than *right*

```
bool operator== ( Time left,
```

```
        Time right  
    )
```

Overload of == operator to compare two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

True if both time values are equal

```
bool operator> ( Time left,  
               Time right  
               )
```

Overload of > operator to compare two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

True if *left* is greater than *right*

```
bool operator>= ( Time left,  
                Time right  
                )
```

Overload of >= operator to compare two time values.

Parameters

left Left operand (a time)
right Right operand (a time)

Returns

True if *left* is greater or equal than *right*

Time seconds (float **amount**)

Construct a time value from a number of seconds.

Parameters

amount Number of seconds

Returns

Time value constructed from the amount of seconds

See also

milliseconds, **microseconds**

Member Data Documentation

const `Time` `sf::Time::Zero`

Predefined "zero" time value.

Definition at line 85 of file `Time.hpp`.

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

- `Time.hpp`

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sf::Utf< N > Class Template Reference

System module

Utility class providing generic functions for UTF conversions. [More...](#)

```
#include <Utf.hpp>
```

Detailed Description

```
template<unsigned int N>  
class sf::Utf< N >
```

Utility class providing generic functions for UTF conversions.

`sf::Utf` is a low-level, generic interface for counting, iterating, encoding and decoding characters and strings. It is able to handle ANSI, wide, latin-1, UTF-8, UTF-16 and UTF-32.

`sf::Utf<X>` functions are all static, these classes are not meant to be instantiated. They are a template, so that you can use any character / string type for a given encoding.

It has 3 specializations:

- `sf::Utf<8>` (typedef'd to `sf::Utf8`)
- `sf::Utf<16>` (typedef'd to `sf::Utf16`)
- `sf::Utf<32>` (typedef'd to `sf::Utf32`)

Definition at line 41 of file `Utf.hpp`.

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

- `Utf.hpp`

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sf::Vector2< T > Class Template Reference

System module

Utility template class for manipulating 2-dimensional vectors. [More...](#)

```
#include <Vector2.hpp>
```

Public Member Functions

`Vector2 ()`

Default constructor. [More...](#)

`Vector2 (T X, T Y)`

Construct the vector from its coordinates. [More...](#)

`template<typename U >`

`Vector2 (const Vector2< U > &vector)`

Construct the vector from another type of vector. [More...](#)

Public Attributes

T [x](#)
X coordinate of the vector. [More...](#)

T [y](#)
Y coordinate of the vector. [More...](#)

Related Functions

(Note that these are not member functions.)

template<typename T >

Vector2< T > **operator-** (const **Vector2< T >** &right)

Overload of unary operator -. [More...](#)

template<typename T >

Vector2< T > & **operator+=** (**Vector2< T >** &left, const **Vector2< T >** &right)

Overload of binary operator +=. [More...](#)

template<typename T >

Vector2< T > & **operator-=** (**Vector2< T >** &left, const **Vector2< T >** &right)

Overload of binary operator -=. [More...](#)

template<typename T >

Vector2< T > **operator+** (const **Vector2< T >** &left, const **Vector2< T >** &right)

Overload of binary operator +. [More...](#)

template<typename T >

Vector2< T > **operator-** (const **Vector2< T >** &left, const **Vector2< T >** &right)

Overload of binary operator -. [More...](#)

template<typename T >

Vector2< T > **operator*** (const **Vector2< T >** &left, T right)

Overload of binary operator *. [More...](#)

template<typename T >

Vector2< T > **operator*** (T left, const **Vector2< T >** &right)

Overload of binary operator *. [More...](#)

template<typename T >

Vector2< T > & **operator*= **(****Vector2< T >** &left, T right)**

Overload of binary operator *=. [More...](#)

```
template<typename T >
```

```
    Vector2< T > operator/ (const Vector2< T > &left, T right)
```

```
        Overload of binary operator /. More...
```

```
template<typename T >
```

```
Vector2< T > & operator/= (Vector2< T > &left, T right)
```

```
        Overload of binary operator /=. More...
```

```
template<typename T >
```

```
    bool operator== (const Vector2< T > &left, const Vector2< T
```

```
        Overload of binary operator ==. More...
```

```
template<typename T >
```

```
    bool operator!= (const Vector2< T > &left, const Vector2< T >
```

```
        Overload of binary operator !=. More...
```

Detailed Description

```
template<typename T>
class sf::Vector2< T >
```

Utility template class for manipulating 2-dimensional vectors.

`sf::Vector2` is a simple class that defines a mathematical vector with two c

It can be used to represent anything that has two dimensions: a size, a po

The template parameter `T` is the type of the coordinates. It can be a operations (+, -, /, *) and comparisons (==, !=), for example `int` or `float`.

You generally don't have to care about the templated form (`sf::V` specializations have special typedefs:

- `sf::Vector2<float>` is `sf::Vector2f`
- `sf::Vector2<int>` is `sf::Vector2i`
- `sf::Vector2<unsigned int>` is `sf::Vector2u`

The `sf::Vector2` class has a small and simple interface, its `x` and `y` me (there are no accessors like `setX()`, `getX()`) and it contains no mathematic product, length, etc.

Usage example:

```
sf::Vector2f v1(16.5f, 24.f);
v1.x = 18.2f;
float y = v1.y;

sf::Vector2f v2 = v1 * 5.f;
sf::Vector2f v3;
```

```
v3 = v1 + v2;  
bool different = (v2 != v3);
```

Note: for 3-dimensional vectors, see [sf::Vector3](#).

Definition at line 37 of file [Vector2.hpp](#).

Constructor & Destructor Documentation

```
template<typename T>  
sf::Vector2< T >::Vector2 ( )
```

Default constructor.

Creates a Vector2(0, 0).

```
template<typename T>  
sf::Vector2< T >::Vector2 ( T X,  
                           T Y  
                           )
```

Construct the vector from its coordinates.

Parameters

X X coordinate

Y Y coordinate

```
template<typename T>  
template<typename U >  
sf::Vector2< T >::Vector2 ( const Vector2< U > & vector )
```

Construct the vector from another type of vector.

This constructor doesn't replace the copy constructor, it's called on constructor will fail to compile if U is not convertible to T.

Parameters

vector Vector to convert

Friends And Related Function Documentatio

```
template<typename T >
```

```
bool operator!= ( const Vector2< T > & left,  
                 const Vector2< T > & right  
                 )
```

Overload of binary operator !=.

This operator compares strict difference between two vectors.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

True if *left* is not equal to *right*

```
template<typename T >
```

```
Vector2< T > operator* ( const Vector2< T > & left,  
                        T right  
                        )
```

Overload of binary operator *.

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Memberwise multiplication by *right*

```
template<typename T >
```

```
Vector2< T > operator* ( T           left,  
                        const Vector2< T > & right  
                        )
```

Overload of binary operator *.

Parameters

left Left operand (a scalar value)

right Right operand (a vector)

Returns

Memberwise multiplication by *left*

```
template<typename T >
```

```
Vector2< T > & operator*=( Vector2< T > & left,  
                          T           right  
                          )
```

Overload of binary operator * =.

This operator performs a memberwise multiplication by *right*, and assign:

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Reference to *left*

```
template<typename T >
```

```
Vector2< T > operator+ ( const Vector2< T > & left,  
                        const Vector2< T > & right  
                        )
```

Overload of binary operator +.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Memberwise addition of both vectors

```
template<typename T >
```

```
Vector2< T > & operator+= ( Vector2< T > & left,  
                          const Vector2< T > & right  
                          )
```

Overload of binary operator +=.

This operator performs a memberwise addition of both vectors, and assigns the result to the left operand.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Reference to *left*

```
template<typename T >
```

```
Vector2< T > operator- ( const Vector2< T > & right )
```

Overload of unary operator -.

Parameters

right Vector to negate

Returns

Memberwise opposite of the vector

```
template<typename T >
```

```
Vector2< T > operator- ( const Vector2< T > & left,  
                        const Vector2< T > & right  
                        )
```

Overload of binary operator -.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Memberwise subtraction of both vectors

```
template<typename T >
```

```
Vector2< T > & operator-= ( Vector2< T > & left,
```

```
const Vector2< T > & right  
)
```

Overload of binary operator -=.

This operator performs a memberwise subtraction of both vectors, and a

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Reference to *left*

```
template<typename T >
```

```
Vector2< T > operator/ ( const Vector2< T > & left,  
                        T right  
)
```

Overload of binary operator /.

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Memberwise division by *right*

```
template<typename T >
```

```
Vector2< T > & operator/= ( Vector2< T > & left,  
                           T right)
```

```
)
```

Overload of binary operator /=.

This operator performs a memberwise division by *right*, and assigns the

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Reference to *left*

```
template<typename T >
```

```
bool operator==( const Vector2< T > & left,  
                 const Vector2< T > & right  
                 )
```

Overload of binary operator ==.

This operator compares strict equality between two vectors.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

True if *left* is equal to *right*

Member Data Documentation

template<typename T>

T sf::Vector2< T >::x

X coordinate of the vector.

Definition at line 75 of file [Vector2.hpp](#).

template<typename T>

T sf::Vector2< T >::y

Y coordinate of the vector.

Definition at line 76 of file [Vector2.hpp](#).

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

- [Vector2.hpp](#)

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sf::Vector3< T > Class Template Reference

System module

Utility template class for manipulating 3-dimensional vectors. [More...](#)

```
#include <Vector3.hpp>
```

Public Member Functions

`Vector3 ()`

Default constructor. [More...](#)

`Vector3 (T X, T Y, T Z)`

Construct the vector from its coordinates. [More...](#)

`template<typename U >`

`Vector3 (const Vector3< U > &vector)`

Construct the vector from another type of vector. [More...](#)

Public Attributes

T **x**
X coordinate of the vector. [More...](#)

T **y**
Y coordinate of the vector. [More...](#)

T **z**
Z coordinate of the vector. [More...](#)

Related Functions

(Note that these are not member functions.)

template<typename T >

Vector3< T > **operator-** (const **Vector3< T >** &left)
Overload of unary operator -. [More...](#)

template<typename T >

Vector3< T > & **operator+=** (**Vector3< T >** &left, const **Vector3< T >** &right)
Overload of binary operator +=. [More...](#)

template<typename T >

Vector3< T > & **operator-=** (**Vector3< T >** &left, const **Vector3< T >** &right)
Overload of binary operator -=. [More...](#)

template<typename T >

Vector3< T > **operator+** (const **Vector3< T >** &left, const **Vector3< T >** &right)
Overload of binary operator +. [More...](#)

template<typename T >

Vector3< T > **operator-** (const **Vector3< T >** &left, const **Vector3< T >** &right)
Overload of binary operator -. [More...](#)

template<typename T >

Vector3< T > **operator*** (const **Vector3< T >** &left, T right)
Overload of binary operator *. [More...](#)

template<typename T >

Vector3< T > **operator*** (T left, const **Vector3< T >** &right)
Overload of binary operator *. [More...](#)

template<typename T >

Vector3< T > & **operator*= **(****Vector3< T >** &left, T right)
Overload of binary operator *=. [More...](#)**

```
template<typename T >
```

```
    Vector3< T > operator/ (const Vector3< T > &left, T right)
```

```
        Overload of binary operator /. More...
```

```
template<typename T >
```

```
Vector3< T > & operator/= (Vector3< T > &left, T right)
```

```
        Overload of binary operator /=. More...
```

```
template<typename T >
```

```
    bool operator== (const Vector3< T > &left, const Vector3< T
```

```
        Overload of binary operator ==. More...
```

```
template<typename T >
```

```
    bool operator!= (const Vector3< T > &left, const Vector3< T >
```

```
        Overload of binary operator !=. More...
```

Detailed Description

```
template<typename T>
class sf::Vector3< T >
```

Utility template class for manipulating 3-dimensional vectors.

`sf::Vector3` is a simple class that defines a mathematical vector with three

It can be used to represent anything that has three dimensions: a size, a p

The template parameter `T` is the type of the coordinates. It can be a operations (+, -, /, *) and comparisons (==, !=), for example `int` or `float`.

You generally don't have to care about the templated form (`sf::V` specializations have special typedefs:

- `sf::Vector3<float>` is `sf::Vector3f`
- `sf::Vector3<int>` is `sf::Vector3i`

The `sf::Vector3` class has a small and simple interface, its `x` and `y` me (there are no accessors like `setX()`, `getX()`) and it contains no mathematic product, length, etc.

Usage example:

```
sf::Vector3f v1(16.5f, 24.f, -8.2f);
v1.x = 18.2f;
float y = v1.y;
float z = v1.z;

sf::Vector3f v2 = v1 * 5.f;
sf::Vector3f v3;
v3 = v1 + v2;
```

```
bool different = (v2 != v3);
```

Note: for 2-dimensional vectors, see [sf::Vector2](#).

Definition at line 37 of file [Vector3.hpp](#).

Constructor & Destructor Documentation

```
template<typename T>
```

```
sf::Vector3< T >::Vector3 ( )
```

Default constructor.

Creates a Vector3(0, 0, 0).

```
template<typename T>
```

```
sf::Vector3< T >::Vector3 ( T X,  
                           T Y,  
                           T Z  
                           )
```

Construct the vector from its coordinates.

Parameters

X X coordinate

Y Y coordinate

Z Z coordinate

```
template<typename T>
```

```
template<typename U >
```

```
sf::Vector3< T >::Vector3 ( const Vector3< U > & vector )
```

Construct the vector from another type of vector.

This constructor doesn't replace the copy constructor, it's called on constructor will fail to compile if U is not convertible to T.

Parameters

vector Vector to convert

Friends And Related Function Documentatio

```
template<typename T >
```

```
bool operator!= ( const Vector3< T > & left,  
                 const Vector3< T > & right  
                 )
```

Overload of binary operator !=.

This operator compares strict difference between two vectors.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

True if *left* is not equal to *right*

```
template<typename T >
```

```
Vector3< T > operator* ( const Vector3< T > & left,  
                        T right  
                        )
```

Overload of binary operator *.

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Memberwise multiplication by *right*

```
template<typename T >
```

```
Vector3< T > operator* ( T           left,  
                        const Vector3< T > & right  
                        )
```

Overload of binary operator *.

Parameters

left Left operand (a scalar value)

right Right operand (a vector)

Returns

Memberwise multiplication by *left*

```
template<typename T >
```

```
Vector3< T > & operator*=( Vector3< T > & left,  
                          T           right  
                          )
```

Overload of binary operator * =.

This operator performs a memberwise multiplication by *right*, and assign:

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Reference to *left*

```
template<typename T >
```

```
Vector3< T > operator+ ( const Vector3< T > & left,  
                        const Vector3< T > & right  
                        )
```

Overload of binary operator +.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Memberwise addition of both vectors

```
template<typename T >
```

```
Vector3< T > & operator+= ( Vector3< T > & left,  
                          const Vector3< T > & right  
                          )
```

Overload of binary operator +=.

This operator performs a memberwise addition of both vectors, and assigns the result to the left operand.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Reference to *left*

```
template<typename T >
```

```
Vector3< T > operator- ( const Vector3< T > & left )
```

Overload of unary operator -.

Parameters

left Vector to negate

Returns

Memberwise opposite of the vector

```
template<typename T >
```

```
Vector3< T > operator- ( const Vector3< T > & left,  
                        const Vector3< T > & right  
                        )
```

Overload of binary operator -.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Memberwise subtraction of both vectors

```
template<typename T >
```

```
Vector3< T > & operator-=( Vector3< T > & left,
```

```
const Vector3< T > & right  
)
```

Overload of binary operator -=.

This operator performs a memberwise subtraction of both vectors, and a

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

Reference to *left*

```
template<typename T >
```

```
Vector3< T > operator/ ( const Vector3< T > & left,  
                        T right  
)
```

Overload of binary operator /.

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Memberwise division by *right*

```
template<typename T >
```

```
Vector3< T > & operator/= ( Vector3< T > & left,  
                           T right)
```

)

Overload of binary operator /=.

This operator performs a memberwise division by *right*, and assigns the

Parameters

left Left operand (a vector)

right Right operand (a scalar value)

Returns

Reference to *left*

```
template<typename T >
```

```
bool operator==( const Vector3< T > & left,  
                 const Vector3< T > & right  
                 )
```

Overload of binary operator ==.

This operator compares strict equality between two vectors.

Parameters

left Left operand (a vector)

right Right operand (a vector)

Returns

True if *left* is equal to *right*

Member Data Documentation

template<typename T>

T sf::Vector3< T >::x

X coordinate of the vector.

Definition at line 76 of file [Vector3.hpp](#).

template<typename T>

T sf::Vector3< T >::y

Y coordinate of the vector.

Definition at line 77 of file [Vector3.hpp](#).

template<typename T>

T sf::Vector3< T >::z

Z coordinate of the vector.

Definition at line 78 of file [Vector3.hpp](#).

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

- [Vector3.hpp](#)

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Window module

Provides OpenGL-based windows, and abstractions for events and input I

Classes

class `sf::Context`
Class holding a valid drawing context. [More...](#)

class `sf::ContextSettings`
Structure defining the settings of the OpenGL context attached to

class `sf::Event`
Defines a system event and its parameters. [More...](#)

class `sf::GLResource`
Base class for classes that require an OpenGL context. [More...](#)

class `sf::Joystick`
Give access to the real-time state of the joysticks. [More...](#)

class `sf::Keyboard`
Give access to the real-time state of the keyboard. [More...](#)

class `sf::Mouse`
Give access to the real-time state of the mouse. [More...](#)

class `sf::Sensor`
Give access to the real-time state of the sensors. [More...](#)

class `sf::Touch`
Give access to the real-time state of the touches. [More...](#)

class `sf::VideoMode`
`VideoMode` defines a video mode (width, height, bpp) [More...](#)

class `sf::Window`

Window that serves as a target for OpenGL rendering. [More...](#)

Typedefs

typedef platform-specific `sf::WindowHandle`
Define a low-level window handle type, specifi

Enumerations

```
enum {
    sf::Style::None = 0, sf::Style::Titlebar = 1 << 0, sf::Style::Resize
2,
    sf::Style::Fullscreen = 1 << 3, sf::Style::Default = Titlebar | Resi:
}
```

Enumeration of the window styles. [More...](#)

Detailed Description

Provides OpenGL-based windows, and abstractions for events and input I

Typedef Documentation

sf::WindowHandle

Define a low-level window handle type, specific to each platform.

Platform	Type
Windows	HWND
Linux/FreeBSD	Window
Mac OS X	either <code>NSWindow*</code> or <code>NSView*</code> , disguised as <code>void*</code>
iOS	<code>UIWindow*</code>
Android	<code>ANativeWindow*</code>

Mac OS X Specification

On Mac OS X, a `sf::Window` can be created either from an existing `NSWindow` or from a `NSView`. If a `sf::Window` is created from a `NSWindow`, SFML will use its content. `sf::Window::getSystemHandle()` will return the handle that was used to create the `NSWindow*` by default.

Definition at line 68 of file `WindowHandle.hpp`.

Enumeration Type Documentation

anonymous enum

Enumeration of the window styles.

Enumerator	
None	No border / title bar (this flag and all others are mutually ex
Titlebar	Title bar + fixed border.
Resize	Title bar + resizable border + maximize button.
Close	Title bar + close button.
Fullscreen	Fullscreen mode (this flag and all others are mutually exclu
Default	Default window style.

Definition at line 38 of file [WindowStyle.hpp](#).

SFML 2.4.2

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[Public Member Functions](#) | [Static Public Member Functions](#) | [Static Private Member Functions](#) | [List of all members](#)

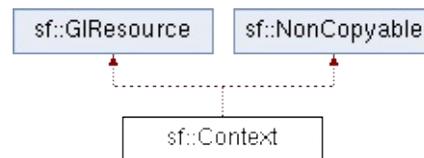
sf::Context Class Reference

Window module

Class holding a valid drawing context. [More...](#)

```
#include <Context.hpp>
```

Inheritance diagram for sf::Context:



Public Member Functions

`Context ()`
Default constructor. [More...](#)

`~Context ()`
Destructor. [More...](#)

`bool setActive (bool active)`
Activate or deactivate explicitly the context. [More...](#)

`const ContextSettings & getSettings () const`
Get the settings of the context. [More...](#)

`Context (const ContextSettings &settings, unsigned height)`
Construct a in-memory context. [More...](#)

Static Public Member Functions

static bool [isExtensionAvailable](#) (const char *name)
Check whether a given OpenGL extension is available.

static GLFunctionPointer [getFunction](#) (const char *name)
Get the address of an OpenGL function. [More..](#)

static const [Context](#) * [getActiveContext](#) ()
Get the currently active context. [More...](#)

Static Private Member Functions

static void `ensureGLContext ()`

Empty function for ABI compatibility, use `acquireTransientCo`

Detailed Description

Class holding a valid drawing context.

If you need to make OpenGL calls without having an active window (li instance of this class to get a valid context.

Having a valid context is necessary for every OpenGL call.

Note that a context is only active in its current thread, if you create a new by default.

To use a `sf::Context` instance, just construct it and let it live as long as yo activation is needed, all it has to do is to exist. Its destructor will take care attached resources.

Usage example:

```
void threadFunction(void*)
{
    sf::Context context;
    // from now on, you have a valid context

    // you can make OpenGL calls
    glClear(GL_DEPTH_BUFFER_BIT);
}
// the context is automatically deactivated and destroyed
// by the sf::Context destructor
```

Definition at line 50 of file `Context.hpp`.

Constructor & Destructor Documentation

sf::Context::Context ()

Default constructor.

The constructor creates and activates the context

sf::Context::~~Context ()

Destructor.

The destructor deactivates and destroys the context

```
sf::Context::Context ( const ContextSettings & settings,  
                      unsigned int width,  
                      unsigned int height  
                      )
```

Construct a in-memory context.

This constructor is for internal use, you don't need to bother with it.

Parameters

settings Creation parameters

width Back buffer width

height Back buffer height

Member Function Documentation

static const `Context*` sf::Context::getActiveContext ()

Get the currently active context.

Returns

The currently active context or NULL if none is active

static `GLFunctionPointer` sf::Context::getFunction (const char * name)

Get the address of an OpenGL function.

Parameters

name Name of the function to get the address of

Returns

Address of the OpenGL function, 0 on failure

const `ContextSettings&` sf::Context::getSettings () const

Get the settings of the context.

Note that these settings may be different than the ones passed to `sf::Context::create` if the original settings are not directly supported by the system.

Returns

Structure containing the settings

static bool sf::Context::isExtensionAvailable (const char * **name**)

Check whether a given OpenGL extension is available.

Parameters

name Name of the extension to check for

Returns

True if available, false if unavailable

bool sf::Context::setActive (bool **active**)

Activate or deactivate explicitly the context.

Parameters

active True to activate, false to deactivate

Returns

True on success, false on failure

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

- [Context.hpp](#)

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[Public Types](#) | [Public Member Functions](#) | [Public Attributes](#) | [List of all members](#)

sf::ContextSettings Class Reference

Window module

Structure defining the settings of the OpenGL context attached to a window.

```
#include <ContextSettings.hpp>
```

Public Types

enum `Attribute` { `Default = 0`, `Core = 1 << 0`, `Debug = 1 << 2` }
Enumeration of the context attribute flags. [More...](#)

Public Member Functions

`ContextSettings` (unsigned int depth=0, unsigned int stencil=0, unsigned int major=1, unsigned int minor=1, unsigned int attributes=`Default`, bool sl) Default constructor. [More...](#)

Public Attributes

unsigned int **depthBits**
Bits of the depth buffer. [More...](#)

unsigned int **stencilBits**
Bits of the stencil buffer. [More...](#)

unsigned int **antialiasingLevel**
Level of antialiasing. [More...](#)

unsigned int **majorVersion**
Major number of the context version to create. [More...](#)

unsigned int **minorVersion**
Minor number of the context version to create. [More...](#)

Uint32 **attributeFlags**
The attribute flags to create the context with. [More...](#)

bool **sRgbCapable**
Whether the context framebuffer is sRGB capable. [More...](#)

Detailed Description

Structure defining the settings of the OpenGL context attached to a window.

`ContextSettings` allows to define several advanced settings of the OpenGL context.

All these settings with the exception of the compatibility flag and anti-aliasing are not supported by regular SFML rendering (graphics module), so you may need to use this structure as a windowing system for custom OpenGL rendering.

The `depthBits` and `stencilBits` members define the number of bits per pixel for the depth and stencil buffers.

`antialiasingLevel` represents the requested number of multisampling levels.

`majorVersion` and `minorVersion` define the version of the OpenGL context. Versions greater or equal to 3.0 are relevant; versions lesser than 3.0 are all handled as version 3.0 (if you don't want an OpenGL 3 context).

When requesting a context with a version greater or equal to 3.2, you have to specify the profile. The context should follow the core or compatibility profile of all newer (>= 3.2) versions. For versions 3.0 and 3.1 there is only the core profile. By default a compatibility profile is requested. You need to specify the core flag if you want a core profile context to use version 3.2 or greater.

Warning: The graphics module will not function if you request a core profile context and the `antialiasingLevel` attribute is set to Default if you want to use the graphics module.

Setting the `debug` attribute flag will request a context with additional debug information. Depending on the system, this might be required for advanced OpenGL features. Debugging is disabled by default.

Special Note for OS X: Apple only supports choosing between either a core or compatibility profile.

core context (OpenGL version depends on the operating system version contexts are not supported. Further information is available on the [OpenC](#) also currently does not support debug contexts.

Please note that these values are only a hint. No failure will be reported if not supported by the system; instead, SFML will try to find the closest valid the settings that the window actually used to create its context, with [Window](#)

Definition at line [36](#) of file [ContextSettings.hpp](#).

Member Enumeration Documentation

enum sf::ContextSettings::Attribute

Enumeration of the context attribute flags.

Enumerator

Default	Non-debug, compatibility context (this and the core attribute a
Core	Core attribute.
Debug	Debug attribute.

Definition at line 42 of file `ContextSettings.hpp`.

Constructor & Destructor Documentation

```
sf::ContextSettings::ContextSettings ( unsigned int depth = 0,  
                                       unsigned int stencil = 0,  
                                       unsigned int antialiasing = 0,  
                                       unsigned int major = 1,  
                                       unsigned int minor = 1,  
                                       unsigned int attributes = Defa  
                                       bool sRgb = false  
                                       )
```

Default constructor.

Parameters

depth	Depth buffer bits
stencil	Stencil buffer bits
antialiasing	Antialiasing level
major	Major number of the context version
minor	Minor number of the context version
attributes	Attribute flags of the context
sRgb	sRGB capable framebuffer

Definition at line 61 of file [ContextSettings.hpp](#).

Member Data Documentation

unsigned int sf::ContextSettings::antialiasingLevel

Level of antialiasing.

Definition at line 77 of file [ContextSettings.hpp](#).

Uint32 sf::ContextSettings::attributeFlags

The attribute flags to create the context with.

Definition at line 80 of file [ContextSettings.hpp](#).

unsigned int sf::ContextSettings::depthBits

Bits of the depth buffer.

Definition at line 75 of file [ContextSettings.hpp](#).

unsigned int sf::ContextSettings::majorVersion

Major number of the context version to create.

Definition at line 78 of file [ContextSettings.hpp](#).

unsigned int sf::ContextSettings::minorVersion

Minor number of the context version to create.

Definition at line 79 of file [ContextSettings.hpp](#).

bool sf::ContextSettings::sRgbCapable

Whether the context framebuffer is sRGB capable.

Definition at line 81 of file [ContextSettings.hpp](#).

unsigned int sf::ContextSettings::stencilBits

Bits of the stencil buffer.

Definition at line 76 of file [ContextSettings.hpp](#).

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

- [ContextSettings.hpp](#)

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sf::Event Class Reference

Window module

Defines a system event and its parameters. [More...](#)

```
#include <Event.hpp>
```

Classes

struct [JoystickButtonEvent](#)
Joystick buttons events parameters (JoystickButtonPressed, Joy:

struct [JoystickConnectEvent](#)
Joystick connection events parameters (JoystickConnected, Joys

struct [JoystickMoveEvent](#)
Joystick axis move event parameters (JoystickMoved) [More...](#)

struct [KeyEvent](#)
Keyboard event parameters (KeyPressed, KeyReleased) [More...](#)

struct [MouseButtonEvent](#)
Mouse buttons events parameters (MouseButtonPressed, Mouse

struct [MouseMoveEvent](#)
Mouse move event parameters (MouseMoved) [More...](#)

struct [MouseWheelEvent](#)
Mouse wheel events parameters (MouseWheelMoved) [More...](#)

struct [MouseWheelScrollEvent](#)
Mouse wheel events parameters (MouseWheelScrolled) [More...](#)

struct [SensorEvent](#)
Sensor event parameters (SensorChanged) [More...](#)

struct [SizeEvent](#)
Size events parameters (Resized) [More...](#)

struct [TextEvent](#)

Text event parameters (TextEntered) [More...](#)

struct **TouchEvent**
Touch events parameters (TouchBegan, TouchMoved, TouchEnd

Public Types

enum EventType {
 Closed, Resized, LostFocus, GainedFocus,
 TextEntered, KeyPressed, KeyReleased, MouseWheelMoved,
 MouseWheelScrolled, MouseButtonPressed, MouseButtonReleased,
 MouseEntered, MouseLeft, JoystickButtonPressed, JoystickButtonReleased,
 JoystickMoved, JoystickConnected, JoystickDisconnected, TouchStarted,
 TouchMoved, TouchEnded, SensorChanged, Count
}
Enumeration of the different types of events. [More...](#)

Public Attributes

	<code>EventType</code>	<code>type</code>	Type of the event. More
<code>union {</code>			
<code> SizeEvent</code>	<code>size</code>		Size event parameters (More)
<code> KeyEvent</code>	<code>key</code>		Key event parameters (More) (Event:: <code>KeyReleased</code>) More
<code> TextEvent</code>	<code>text</code>		Text event parameters (More)
<code> MouseMoveEvent</code>	<code>mouseMove</code>		Mouse move event parameters (More) More...
<code> MouseEvent</code>	<code>mouseButton</code>		Mouse button event parameters (More) (Event:: <code>MouseButtonPressed</code>) (Event:: <code>MouseButtonReleased</code>) More
<code> MouseWheelEvent</code>	<code>mouseWheel</code>		Mouse wheel event parameters (More) (Event:: <code>MouseWheelMoved</code>) More
<code> MouseWheelScrollEvent</code>	<code>mouseWheelScroll</code>		Mouse wheel event parameters (More) (Event:: <code>MouseWheelScrolled</code>) More

JoystickMoveEvent joystickMove

Joystick move event parameter
More...

JoystickButtonEvent joystickButton

Joystick button event parameter
(Event::JoystickButtonPressed, Event::JoystickButtonReleased)

JoystickConnectEvent joystickConnect

Joystick (dis)connect event parameter
(Event::JoystickConnected, Event::JoystickDisconnected)

TouchEvent touch

Touch events parameter
Event::TouchMoved, Event::TouchReleased

SensorEvent sensor

Sensor event parameter
More...

};

Member Enumeration Documentation

enum `sf::Event::EventType`

Enumeration of the different types of events.

Enumerator	
Closed	The window requested to be closed (no data)
Resized	The window was resized (data in event.size)
LostFocus	The window lost the focus (no data)
GainedFocus	The window gained the focus (no data)
TextEntered	A character was entered (data in event.text)
KeyPressed	A key was pressed (data in event.key)
KeyReleased	A key was released (data in event.key)
MouseWheelMoved	The mouse wheel was scrolled (data in event)
MouseWheelScrolled	

	The mouse wheel was scrolled (data in event.mouseWheelScrolled)
MouseButtonPressed	A mouse button was pressed (data in event.mouseButtonPressed)
MouseButtonReleased	A mouse button was released (data in event.mouseButtonReleased)
MouseMove	The mouse cursor moved (data in event.mouseMoved)
MouseEntered	The mouse cursor entered the area of the window (data in event.mouseEntered)
MouseLeft	The mouse cursor left the area of the window (data in event.mouseLeft)
JoystickButtonPressed	A joystick button was pressed (data in event.joystickButtonPressed)
JoystickButtonReleased	A joystick button was released (data in event.joystickButtonReleased)
JoystickMoved	The joystick moved along an axis (data in event.joystickMoved)
JoystickConnected	A joystick was connected (data in event.joystickConnected)
JoystickDisconnected	A joystick was disconnected (data in event.joystickDisconnected)
TouchBegan	A touch event began (data in event.touchBegan)
TouchMoved	A touch moved (data in event.touchMoved)
TouchEnded	A touch event ended (data in event.touchEnded)

	A touch event ended (data in event.touch)
SensorChanged	A sensor value changed (data in event.sensc
Count	Keep last – the total number of event types.

Definition at line 187 of file [Event.hpp](#).

Member Data Documentation

JoystickButtonEvent sf::Event::joystickButton

Joystick button event parameters ([Event::JoystickButtonPressed](#), [Event::JoystickButtonReleased](#))
Definition at line 231 of file [Event.hpp](#).

JoystickConnectEvent sf::Event::joystickConnect

Joystick (dis)connect event parameters ([Event::JoystickConnected](#), [Event::JoystickDisconnected](#))
Definition at line 232 of file [Event.hpp](#).

JoystickMoveEvent sf::Event::joystickMove

Joystick move event parameters ([Event::JoystickMoved](#))
Definition at line 230 of file [Event.hpp](#).

KeyEvent sf::Event::key

Key event parameters ([Event::KeyPressed](#), [Event::KeyReleased](#))
Definition at line 224 of file [Event.hpp](#).

MouseButtonEvent sf::Event::mouseButton

Mouse button event parameters ([Event::MouseButtonPressed](#), [Event::M](#))
Definition at line 227 of file [Event.hpp](#).

MouseMoveEvent sf::Event::mouseMove

Mouse move event parameters ([Event::MouseMoved](#))
Definition at line 226 of file [Event.hpp](#).

MouseWheelEvent sf::Event::mouseWheel

Mouse wheel event parameters ([Event::MouseWheelMoved](#)) (deprecate)
Definition at line 228 of file [Event.hpp](#).

MouseWheelScrollEvent sf::Event::mouseWheelScroll

Mouse wheel event parameters ([Event::MouseWheelScrolled](#))
Definition at line 229 of file [Event.hpp](#).

SensorEvent sf::Event::sensor

Sensor event parameters (`Event::SensorChanged`)

Definition at line 234 of file `Event.hpp`.

SizeEvent `sf::Event::size`

Size event parameters (`Event::Resized`)

Definition at line 223 of file `Event.hpp`.

TextEvent `sf::Event::text`

Text event parameters (`Event::TextEntered`)

Definition at line 225 of file `Event.hpp`.

TouchEvent `sf::Event::touch`

Touch events parameters (`Event::TouchBegan`, `Event::TouchMoved`, `Event::TouchEnded`)

Definition at line 233 of file `Event.hpp`.

EventType `sf::Event::type`

Type of the event.

Definition at line 219 of file `Event.hpp`.

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

- [Event.hpp](#)

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sf::Event::JoystickButtonEvent Struct Reference

Joystick buttons events parameters (JoystickButtonPressed, JoystickButt

```
#include <Event.hpp>
```

Public Attributes

unsigned int `joystickId`
Index of the joystick (in range [0 .. `Joystick::Count - 1`]) `Mo`

unsigned int `button`
Index of the button that has been pressed (in range [0 .. `Jo`

Detailed Description

Joystick buttons events parameters (JoystickButtonPressed, JoystickButt

Definition at line 154 of file Event.hpp.

Member Data Documentation

unsigned int sf::Event::JoystickButtonEvent::button

Index of the button that has been pressed (in range [0 .. [Joystick::Button](#)

Definition at line [157](#) of file [Event.hpp](#).

unsigned int sf::Event::JoystickButtonEvent::joystickId

Index of the joystick (in range [0 .. [Joystick::Count](#) - 1])

Definition at line [156](#) of file [Event.hpp](#).

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sf::Event::JoystickConnectEvent Struct Reference

Joystick connection events parameters (JoystickConnected, JoystickDisc

```
#include <Event.hpp>
```

Public Attributes

unsigned int `joystickId`
Index of the joystick (in range [0 .. `Joystick::Count - 1`]) `Mo`

Detailed Description

`Joystick` connection events parameters (`JoystickConnected`, `JoystickDisc`)

Definition at line `133` of file `Event.hpp`.

Member Data Documentation

unsigned int sf::Event::JoystickConnectEvent::joystickId

Index of the joystick (in range [0 .. [Joystick::Count](#) - 1])

Definition at line [135](#) of file [Event.hpp](#).

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sf::Event::JoystickMoveEvent Struct Referen

Joystick axis move event parameters (JoystickMoved) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

unsigned int `joystickId`
Index of the joystick (in range [0 .. `Joystick::Count - 1`]) [More...](#)

`Joystick::Axis` `axis`
Axis on which the joystick moved. [More...](#)

float `position`
New position on the axis (in range [-100 .. 100]) [More...](#)

Detailed Description

`Joystick` axis move event parameters (`JoystickMoved`)

Definition at line `142` of file `Event.hpp`.

Member Data Documentation

Joystick::Axis sf::Event::JoystickMoveEvent::axis

Axis on which the joystick moved.

Definition at line 145 of file [Event.hpp](#).

unsigned int sf::Event::JoystickMoveEvent::joystickId

Index of the joystick (in range [0 .. [Joystick::Count](#) - 1])

Definition at line 144 of file [Event.hpp](#).

float sf::Event::JoystickMoveEvent::position

New position on the axis (in range [-100 .. 100])

Definition at line 146 of file [Event.hpp](#).

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

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[Public Attributes](#) | [List of all members](#)

sf::Event::KeyEvent Struct Reference

Keyboard event parameters (KeyPressed, KeyReleased) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

`Keyboard::Key` `code`
Code of the key that has been pressed. [More...](#)

`bool` `alt`
Is the Alt key pressed? [More...](#)

`bool` `control`
Is the Control key pressed? [More...](#)

`bool` `shift`
Is the Shift key pressed? [More...](#)

`bool` `system`
Is the System key pressed? [More...](#)

Detailed Description

Keyboard event parameters (KeyPressed, KeyReleased)

Definition at line 62 of file `Event.hpp`.

Member Data Documentation

bool sf::Event::KeyEvent::alt

Is the Alt key pressed?

Definition at line 65 of file [Event.hpp](#).

Keyboard::Key sf::Event::KeyEvent::code

Code of the key that has been pressed.

Definition at line 64 of file [Event.hpp](#).

bool sf::Event::KeyEvent::control

Is the Control key pressed?

Definition at line 66 of file [Event.hpp](#).

bool sf::Event::KeyEvent::shift

Is the Shift key pressed?

Definition at line 67 of file [Event.hpp](#).

bool sf::Event::KeyEvent::system

Is the System key pressed?

Definition at line 68 of file [Event.hpp](#).

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[Class List](#) | [Class Index](#) | [Class Hierarchy](#) | [Class Members](#) |

[Public Attributes](#) | [List of all members](#)

sf::Event::MouseButtonEvent Struct Referen

Mouse buttons events parameters (MouseButtonPressed, MouseButtonR

```
#include <Event.hpp>
```

Public Attributes

`Mouse::Button` `button`
Code of the button that has been pressed. [More...](#)

`int` `x`
X position of the mouse pointer, relative to the left of the

`int` `y`
Y position of the mouse pointer, relative to the top of the

Detailed Description

Mouse buttons events parameters (MouseButtonPressed, MouseButtonR

Definition at line 95 of file `Event.hpp`.

Member Data Documentation

Mouse::Button sf::Event::MouseEvent::button

Code of the button that has been pressed.

Definition at line 97 of file [Event.hpp](#).

int sf::Event::MouseEvent::x

X position of the mouse pointer, relative to the left of the owner window.

Definition at line 98 of file [Event.hpp](#).

int sf::Event::MouseEvent::y

Y position of the mouse pointer, relative to the top of the owner window.

Definition at line 99 of file [Event.hpp](#).

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

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[Public Attributes](#) | [List of all members](#)

sf::Event::MouseMoveEvent Struct Referenc

Mouse move event parameters (MouseMoved) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

`int x`
X position of the mouse pointer, relative to the left of the owner window

`int y`
Y position of the mouse pointer, relative to the top of the owner window

Detailed Description

Mouse move event parameters (MouseMoved)

Definition at line 84 of file `Event.hpp`.

Member Data Documentation

int sf::Event::MouseMoveEvent::x

X position of the mouse pointer, relative to the left of the owner window.

Definition at line 86 of file [Event.hpp](#).

int sf::Event::MouseMoveEvent::y

Y position of the mouse pointer, relative to the top of the owner window.

Definition at line 87 of file [Event.hpp](#).

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sf::Event::MouseWheelEvent Struct Reference

[Mouse wheel events parameters \(MouseWheelMoved\)](#) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

int `delta`

Number of ticks the wheel has moved (positive is up, negative is down)

int `x`

X position of the mouse pointer, relative to the left of the owner window

int `y`

Y position of the mouse pointer, relative to the top of the owner window

Detailed Description

Mouse wheel events parameters (MouseWheelMoved)

Deprecated:

This event is deprecated and potentially inaccurate. Use [MouseWheel](#)

Definition at line [109](#) of file [Event.hpp](#).

Member Data Documentation

int sf::Event::MouseEvent::delta

Number of ticks the wheel has moved (positive is up, negative is down)

Definition at line [111](#) of file [Event.hpp](#).

int sf::Event::MouseEvent::x

X position of the mouse pointer, relative to the left of the owner window.

Definition at line [112](#) of file [Event.hpp](#).

int sf::Event::MouseEvent::y

Y position of the mouse pointer, relative to the top of the owner window.

Definition at line [113](#) of file [Event.hpp](#).

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sf::Event::MouseWheelScrollEvent Struct Re

[Mouse wheel events parameters \(MouseWheelScrolled\)](#) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

Mouse::Wheel **wheel**

Which wheel (for mice with multiple ones) [More...](#)

float **delta**

Wheel offset (positive is up/left, negative is down/right). If non-integral offsets. [More...](#)

int **x**

X position of the mouse pointer, relative to the left of the

int **y**

Y position of the mouse pointer, relative to the top of the

Detailed Description

Mouse wheel events parameters (MouseWheelScrolled)

Definition at line **120** of file **Event.hpp**.

Member Data Documentation

float sf::Event::MouseWheelScrollEvent::delta

Wheel offset (positive is up/left, negative is down/right). High-precis offsets.

Definition at line 123 of file [Event.hpp](#).

Mouse::Wheel sf::Event::MouseWheelScrollEvent::wheel

Which wheel (for mice with multiple ones)

Definition at line 122 of file [Event.hpp](#).

int sf::Event::MouseWheelScrollEvent::x

X position of the mouse pointer, relative to the left of the owner window.

Definition at line 124 of file [Event.hpp](#).

int sf::Event::MouseWheelScrollEvent::y

Y position of the mouse pointer, relative to the top of the owner window.

Definition at line 125 of file [Event.hpp](#).

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sf::Event::SensorEvent Struct Reference

Sensor event parameters (SensorChanged) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

Sensor::Type `type`
Type of the sensor. [More...](#)

float `x`
Current value of the sensor on X axis. [More...](#)

float `y`
Current value of the sensor on Y axis. [More...](#)

float `z`
Current value of the sensor on Z axis. [More...](#)

Detailed Description

Sensor event parameters (SensorChanged)

Definition at line 175 of file Event.hpp.

Member Data Documentation

Sensor::Type sf::Event::SensorEvent::type

Type of the sensor.

Definition at line 177 of file [Event.hpp](#).

float sf::Event::SensorEvent::x

Current value of the sensor on X axis.

Definition at line 178 of file [Event.hpp](#).

float sf::Event::SensorEvent::y

Current value of the sensor on Y axis.

Definition at line 179 of file [Event.hpp](#).

float sf::Event::SensorEvent::z

Current value of the sensor on Z axis.

Definition at line 180 of file [Event.hpp](#).

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sf::Event::SizeEvent Struct Reference

Size events parameters (Resized) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

unsigned int **width**
New width, in pixels. [More...](#)

unsigned int **height**
New height, in pixels. [More...](#)

Detailed Description

Size events parameters (Resized)

Definition at line 52 of file [Event.hpp](#).

Member Data Documentation

unsigned int sf::Event::SizeEvent::height

New height, in pixels.

Definition at line 55 of file [Event.hpp](#).

unsigned int sf::Event::SizeEvent::width

New width, in pixels.

Definition at line 54 of file [Event.hpp](#).

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sf::Event::TextEvent Struct Reference

[Text event parameters \(TextEntered\)](#) [More...](#)

```
#include <Event.hpp>
```

Public Attributes

UInt32 [unicode](#)
UTF-32 Unicode value of the character. [More...](#)

Detailed Description

Text event parameters (TextEntered)

Definition at line 75 of file Event.hpp.

Member Data Documentation

Uint32 sf::Event::TextEvent::unicode

UTF-32 Unicode value of the character.

Definition at line 77 of file [Event.hpp](#).

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sf::Event::TouchEvent Struct Reference

Touch events parameters (TouchBegan, TouchMoved, TouchEnded) [More](#)

```
#include <Event.hpp>
```

Public Attributes

unsigned int **finger**
Index of the finger in case of multi-touch events. [More...](#)

int **x**
X position of the touch, relative to the left of the owner window

int **y**
Y position of the touch, relative to the top of the owner window

Detailed Description

Touch events parameters (TouchBegan, TouchMoved, TouchEnded)

Definition at line **164** of file **Event.hpp**.

Member Data Documentation

unsigned int sf::Event::TouchEvent::finger

Index of the finger in case of multi-touch events.

Definition at line 166 of file [Event.hpp](#).

int sf::Event::TouchEvent::x

X position of the touch, relative to the left of the owner window.

Definition at line 167 of file [Event.hpp](#).

int sf::Event::TouchEvent::y

Y position of the touch, relative to the top of the owner window.

Definition at line 168 of file [Event.hpp](#).

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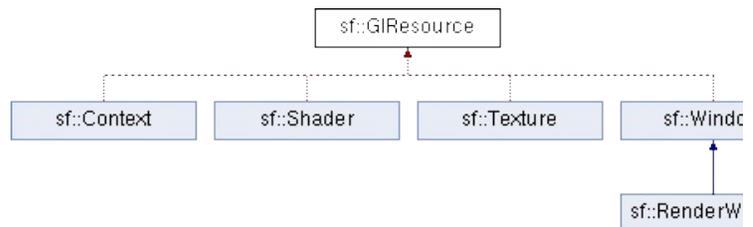
sf::GLResource Class Reference

Window module

Base class for classes that require an OpenGL context. [More...](#)

```
#include <GLResource.hpp>
```

Inheritance diagram for sf::GLResource:



Classes

class `TransientContextLock`

RAII helper class to temporarily lock an available context for use.

Protected Member Functions

`GIResource ()`

Default constructor. [More...](#)

`~GIResource ()`

Destructor. [More...](#)

Static Protected Member Functions

static void `ensureGLContext ()`

Empty function for ABI compatibility, use `acquireTransientCo`

Detailed Description

Base class for classes that require an OpenGL context.

This class is for internal use only, it must be the base of every class that r
order to work.

Definition at line [44](#) of file [GIResource.hpp](#).

Constructor & Destructor Documentation

sf::GResource::GResource ()

Default constructor.

sf::GResource::~~GResource ()

Destructor.

Member Function Documentation

static void sf::GResource::ensureGLContext ()

Empty function for ABI compatibility, use `acquireTransientContext` instead.

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

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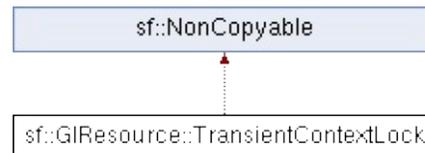
[Public Member Functions](#) | [List of all members](#)

sf::GlResource::TransientContextLock Class

RAII helper class to temporarily lock an available context for use. [More...](#)

```
#include <GlResource.hpp>
```

Inheritance diagram for sf::GlResource::TransientContextLock:



Public Member Functions

`TransientContextLock ()`

Default constructor. [More...](#)

`~TransientContextLock ()`

Destructor. [More...](#)

Detailed Description

RAII helper class to temporarily lock an available context for use.

Definition at line 70 of file [GIResource.hpp](#).

Constructor & Destructor Documentation

sf::GResource::TransientContextLock::TransientContextLock ()

Default constructor.

sf::GResource::TransientContextLock::~~TransientContextLock ()

Destructor.

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

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sf::Joystick Class Reference

Window module

Give access to the real-time state of the joysticks. [More...](#)

```
#include <Joystick.hpp>
```

Classes

struct **Identification**
Structure holding a joystick's identification. [More...](#)

Public Types

enum { Count = 8, ButtonCount = 32, AxisCount = 8 }
Constants related to joysticks capabilities. [More...](#)

enum Axis {
 X, Y, Z, R,
 U, V, PovX, PovY
}
Axes supported by SFML joysticks. [More...](#)

Static Public Member Functions

static bool [isConnected](#) (unsigned int joystick)
Check if a joystick is connected. [More...](#)

static unsigned int [getButtonCount](#) (unsigned int joystick)
Return the number of buttons supported by a joystick. [More...](#)

static bool [hasAxis](#) (unsigned int joystick, [Axis](#) axis)
Check if a joystick supports a given axis. [More...](#)

static bool [isButtonPressed](#) (unsigned int joystick, unsigned int button)
Check if a joystick button is pressed. [More...](#)

static float [getAxisPosition](#) (unsigned int joystick, [Axis](#) axis)
Get the current position of a joystick axis. [More...](#)

static [Identification](#) [getIdentification](#) (unsigned int joystick)
Get the joystick information. [More...](#)

static void [update](#) ()
Update the states of all joysticks. [More...](#)

Detailed Description

Give access to the real-time state of the joysticks.

`sf::Joystick` provides an interface to the state of the joysticks.

It only contains static functions, so it's not meant to be instantiated. Instead, an `sf::Joystick` index that is passed to the functions of this class.

This class allows users to query the state of joysticks at any time and direction of movement. Compared to the `JoystickMoved` and `JoystickButtonReleased` events, `sf::Joystick` can retrieve the state of axes at any time (you don't need to store and update a boolean on your side in order to know if a button is released), and you always get the real state of joysticks, even if they are not connected to your window is out of focus and no event is triggered.

SFML supports:

- 8 joysticks (`sf::Joystick::Count`)
- 32 buttons per joystick (`sf::Joystick::ButtonCount`)
- 8 axes per joystick (`sf::Joystick::AxisCount`)

Unlike the keyboard or mouse, the state of joysticks is sometimes not directly updated by the OS, therefore an `update()` function must be called in order to update the state. If you have a window with event handling, this is done automatically, you don't need to call it. If you have no window, or if you want to check joysticks state before using them, you must call `sf::Joystick::update` explicitly.

Usage example:

```
// Is joystick #0 connected?
```

```
bool connected = sf::Joystick::isConnected(0);

// How many buttons does joystick #0 support?
unsigned int buttons = sf::Joystick::getButtonCount(0);

// Does joystick #0 define a X axis?
bool hasX = sf::Joystick::hasAxis(0, sf::Joystick::X);

// Is button #2 pressed on joystick #0?
bool pressed = sf::Joystick::isButtonPressed(0, 2);

// What's the current position of the Y axis on joystick #0?
float position = sf::Joystick::getAxisPosition(0, sf::Joystick::Y);
```

See also

[sf::Keyboard](#), [sf::Mouse](#)

Definition at line 41 of file Joystick.hpp.

Member Enumeration Documentation

anonymous enum

Constants related to joysticks capabilities.

Enumerator

Count	Maximum number of supported joysticks.
ButtonCount	Maximum number of supported buttons.
AxisCount	Maximum number of supported axes.

Definition at line 49 of file [Joystick.hpp](#).

enum `sf::Joystick::Axis`

Axes supported by SFML joysticks.

Enumerator

X	The X axis.
Y	The Y axis.

Z	The Z axis.
R	The R axis.
U	The U axis.
V	The V axis.
PovX	The X axis of the point-of-view hat.
PovY	The Y axis of the point-of-view hat.

Definition at line 60 of file [Joystick.hpp](#).

Member Function Documentation

```
static float sf::Joystick::getAxisPosition ( unsigned int joystick,
                                             Axis axis
                                             )
```

Get the current position of a joystick axis.

If the joystick is not connected, this function returns 0.

Parameters

joystick Index of the joystick

axis Axis to check

Returns

Current position of the axis, in range [-100 .. 100]

```
static unsigned int sf::Joystick::getButtonCount ( unsigned int joys
```

Return the number of buttons supported by a joystick.

If the joystick is not connected, this function returns 0.

Parameters

joystick Index of the joystick

Returns

Number of buttons supported by the joystick

```
static Identification sf::Joystick::getIdentification ( unsigned int joy
```

Get the joystick information.

Parameters

joystick Index of the joystick

Returns

Structure containing joystick information.

```
static bool sf::Joystick::hasAxis ( unsigned int joystick,  
                                   Axis      axis  
                                   )
```

Check if a joystick supports a given axis.

If the joystick is not connected, this function returns false.

Parameters

joystick Index of the joystick

axis Axis to check

Returns

True if the joystick supports the axis, false otherwise

```
static bool sf::Joystick::isButtonPressed ( unsigned int joystick,  
                                             unsigned int button  
                                             )
```

Check if a joystick button is pressed.

If the joystick is not connected, this function returns false.

Parameters

joystick Index of the joystick

button Button to check

Returns

True if the button is pressed, false otherwise

static bool sf::Joystick::isConnected (unsigned int **joystick)**

Check if a joystick is connected.

Parameters

joystick Index of the joystick to check

Returns

True if the joystick is connected, false otherwise

static void sf::Joystick::update ()

Update the states of all joysticks.

This function is used internally by SFML, so you normally don't have to call it. You may need to call it if you have no window yet (or no window at all): in this case, the joystick states are updated automatically.

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sf::Joystick::Identification Struct Reference

Structure holding a joystick's identification. [More...](#)

```
#include <Joystick.hpp>
```

Public Attributes

String `name`
Name of the joystick. [More...](#)

unsigned int `vendorId`
Manufacturer identifier. [More...](#)

unsigned int `productId`
Product identifier. [More...](#)

Detailed Description

Structure holding a joystick's identification.

Definition at line [76](#) of file [Joystick.hpp](#).

Member Data Documentation

String sf::Joystick::Identification::name

Name of the joystick.

Definition at line 80 of file [Joystick.hpp](#).

unsigned int sf::Joystick::Identification::productId

Product identifier.

Definition at line 82 of file [Joystick.hpp](#).

unsigned int sf::Joystick::Identification::vendorId

Manufacturer identifier.

Definition at line 81 of file [Joystick.hpp](#).

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sf::Keyboard Class Reference

Window module

Give access to the real-time state of the keyboard. [More...](#)

```
#include <Keyboard.hpp>
```

Public Types

```
enum Key {
    Unknown = -1, A = 0, B, C,
    D, E, F, G,
    H, I, J, K,
    L, M, N, O,
    P, Q, R, S,
    T, U, V, W,
    X, Y, Z, Num0,
    Num1, Num2, Num3, Num4,
    Num5, Num6, Num7, Num8,
    Num9, Escape, LControl, LShift,
    LAlt, LSystem, RControl, RShift,
    RAlt, RSystem, Menu, LBracket,
    RBracket, SemiColon, Comma, Period,
    Quote, Slash, BackSlash, Tilde,
    Equal, Dash, Space, Return,
    BackSpace, Tab, PageUp, PageDown,
    End, Home, Insert, Delete,
    Add, Subtract, Multiply, Divide,
    Left, Right, Up, Down,
    Numpad0, Numpad1, Numpad2, Numpad3,
    Numpad4, Numpad5, Numpad6, Numpad7,
    Numpad8, Numpad9, F1, F2,
    F3, F4, F5, F6,
    F7, F8, F9, F10,
    F11, F12, F13, F14,
    F15, Pause, KeyCount
}
Key codes. More...
```

Static Public Member Functions

static bool `isKeyPressed` (Key key)
Check if a key is pressed. [More...](#)

static void `setVirtualKeyboardVisible` (bool visible)
Show or hide the virtual keyboard. [More...](#)

Detailed Description

Give access to the real-time state of the keyboard.

`sf::Keyboard` provides an interface to the state of the keyboard.

It only contains static functions (a single keyboard is assumed), so it's not

This class allows users to query the keyboard state at any time and dire window and its events. Compared to the `KeyPressed` and `KeyReleased` the state of a key at any time (you don't need to store and update a boole a key is pressed or released), and you always get the real state of the ke or released when your window is out of focus and no event is triggered.

Usage example:

```
if (sf::Keyboard::isKeyPressed(sf::Keyboard::Left))
{
    // move left...
}
else if (sf::Keyboard::isKeyPressed(sf::Keyboard::Right))
{
    // move right...
}
else if (sf::Keyboard::isKeyPressed(sf::Keyboard::Escape))
{
    // quit...
}
```

See also

`sf::Joystick`, `sf::Mouse`, `sf::Touch`

Definition at line 40 of file `Keyboard.hpp`.

Member Enumeration Documentation

enum `sf::Keyboard::Key`

Key codes.

Enumerator	
Unknown	Unhandled key.
A	The A key.
B	The B key.
C	The C key.
D	The D key.
E	The E key.
F	The F key.
G	The G key.
H	

	The H key.
I	The I key.
J	The J key.
K	The K key.
L	The L key.
M	The M key.
N	The N key.
O	The O key.
P	The P key.
Q	The Q key.
R	The R key.
S	The S key.
T	The T key.
U	

	The U key.
V	The V key.
W	The W key.
X	The X key.
Y	The Y key.
Z	The Z key.
Num0	The 0 key.
Num1	The 1 key.
Num2	The 2 key.
Num3	The 3 key.
Num4	The 4 key.
Num5	The 5 key.
Num6	The 6 key.
Num7	

	The 7 key.
Num8	The 8 key.
Num9	The 9 key.
Escape	The Escape key.
LControl	The left Control key.
LShift	The left Shift key.
LAlt	The left Alt key.
LSystem	The left OS specific key: window (Windows and Linux), a
RControl	The right Control key.
RShift	The right Shift key.
RAlt	The right Alt key.
RSystem	The right OS specific key: window (Windows and Linux), a
Menu	The Menu key.
LBracket	

	The [key.
RBracket	The] key.
SemiColon	The ; key.
Comma	The , key.
Period	The . key.
Quote	The ' key.
Slash	The / key.
BackSlash	The \ key.
Tilde	The ~ key.
Equal	The = key.
Dash	The - key.
Space	The Space key.
Return	The Return key.
BackSpace	

	The Backspace key.
Tab	The Tabulation key.
PageUp	The Page up key.
PageDown	The Page down key.
End	The End key.
Home	The Home key.
Insert	The Insert key.
Delete	The Delete key.
Add	The + key.
Subtract	The - key.
Multiply	The * key.
Divide	The / key.
Left	Left arrow.
Right	

	Right arrow.
Up	Up arrow.
Down	Down arrow.
Numpad0	The numpad 0 key.
Numpad1	The numpad 1 key.
Numpad2	The numpad 2 key.
Numpad3	The numpad 3 key.
Numpad4	The numpad 4 key.
Numpad5	The numpad 5 key.
Numpad6	The numpad 6 key.
Numpad7	The numpad 7 key.
Numpad8	The numpad 8 key.
Numpad9	The numpad 9 key.
F1	

	The F1 key.
F2	The F2 key.
F3	The F3 key.
F4	The F4 key.
F5	The F5 key.
F6	The F6 key.
F7	The F7 key.
F8	The F8 key.
F9	The F9 key.
F10	The F10 key.
F11	The F11 key.
F12	The F12 key.
F13	The F13 key.
F14	

	The F14 key.
F15	The F15 key.
Pause	The Pause key.
KeyCount	Keep last – the total number of keyboard keys.

Definition at line 48 of file `Keyboard.hpp`.

Member Function Documentation

static bool sf::Keyboard::isKeyPressed ([Key](#) key)

Check if a key is pressed.

Parameters

key Key to check

Returns

True if the key is pressed, false otherwise

static void sf::Keyboard::setVirtualKeyboardVisible (bool [visible](#))

Show or hide the virtual keyboard.

Warning: the virtual keyboard is not supported on all systems. It will typ Oses (Android, iOS) but not on desktop Oses (Windows, Linux, ...).

If the virtual keyboard is not available, this function does nothing.

Parameters

visible True to show, false to hide

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[Public Types](#) | [Static Public Member Functions](#) | [List of all members](#)

sf::Mouse Class Reference

Window module

Give access to the real-time state of the mouse. [More...](#)

```
#include <Mouse.hpp>
```

Public Types

```
enum Button {  
    Left, Right, Middle, XButton1,  
    XButton2, ButtonCount  
}  
Mouse buttons. More...
```

```
enum Wheel { VerticalWheel, HorizontalWheel }  
Mouse wheels. More...
```

Static Public Member Functions

static bool `isButtonPressed` (`Button` button)
Check if a mouse button is pressed. [More...](#)

static `Vector2i` `getPosition` ()
Get the current position of the mouse in desktop coordinates

static `Vector2i` `getPosition` (`const Window` &relativeTo)
Get the current position of the mouse in window coordinates

static void `setPosition` (`const Vector2i` &position)
Set the current position of the mouse in desktop coordinates

static void `setPosition` (`const Vector2i` &position, `const Window` &relativeTo)
Set the current position of the mouse in window coordinates

Detailed Description

Give access to the real-time state of the mouse.

`sf::Mouse` provides an interface to the state of the mouse.

It only contains static functions (a single mouse is assumed), so it's not m

This class allows users to query the mouse state at any time and direc window and its events. Compared to the `MouseMove`, `MouseButtonPre` events, `sf::Mouse` can retrieve the state of the cursor and the buttons at and update a boolean on your side in order to know if a button is pressed the real state of the mouse, even if it is moved, pressed or released whe no event is triggered.

The `setPosition` and `getPosition` functions can be used to change or re mouse pointer. There are two versions: one that operates in global coordin one that operates in window coordinates (relative to a specific window).

Usage example:

```
if (sf::Mouse::isButtonPressed(sf::Mouse::Left))
{
    // left click...
}

// get global mouse position
sf::Vector2i position = sf::Mouse::getPosition();

// set mouse position relative to a window
sf::Mouse::setPosition(sf::Vector2i(100, 200), window);
```

See also

`sf::Joystick`, `sf::Keyboard`, `sf::Touch`

Definition at line 43 of file Mouse.hpp.

Member Enumeration Documentation

enum `sf::Mouse::Button`

Mouse buttons.

Enumerator

Left	The left mouse button.
Right	The right mouse button.
Middle	The middle (wheel) mouse button.
XButton1	The first extra mouse button.
XButton2	The second extra mouse button.
ButtonCount	Keep last – the total number of mouse buttons.

Definition at line 51 of file `Mouse.hpp`.

enum `sf::Mouse::Wheel`

Mouse wheels.

Enumerator	
VerticalWheel	The vertical mouse wheel.
HorizontalWheel	The horizontal mouse wheel.

Definition at line 66 of file `Mouse.hpp`.

Member Function Documentation

static **Vector2i** sf::Mouse::getPosition ()

Get the current position of the mouse in desktop coordinates.

This function returns the global position of the mouse cursor on the desk

Returns

Current position of the mouse

static **Vector2i** sf::Mouse::getPosition (const **Window** & **relativeTo**)

Get the current position of the mouse in window coordinates.

This function returns the current position of the mouse cursor, relative to

Parameters

relativeTo Reference window

Returns

Current position of the mouse

static **bool** sf::Mouse::isButtonPressed (**Button** **button**)

Check if a mouse button is pressed.

Parameters

button Button to check

Returns

True if the button is pressed, false otherwise

```
static void sf::Mouse::setPosition ( const Vector2i & position )
```

Set the current position of the mouse in desktop coordinates.

This function sets the global position of the mouse cursor on the desktop

Parameters

position New position of the mouse

```
static void sf::Mouse::setPosition ( const Vector2i & position,  
                                     const Window & relativeTo  
                                     )
```

Set the current position of the mouse in window coordinates.

This function sets the current position of the mouse cursor, relative to the

Parameters

position New position of the mouse

relativeTo Reference window

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

- [Mouse.hpp](#)

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[Public Types](#) | [Static Public Member Functions](#) | [List of all members](#)

sf::Sensor Class Reference

Window module

Give access to the real-time state of the sensors. [More...](#)

```
#include <Sensor.hpp>
```

Public Types

```
enum Type {  
    Accelerometer, Gyroscope, Magnetometer, Gravity,  
    UserAcceleration, Orientation, Count  
}  
Sensor type. More...
```

Static Public Member Functions

static bool [isAvailable](#) (Type sensor)

Check if a sensor is available on the underlying platform.

static void [setEnabled](#) (Type sensor, bool enabled)

Enable or disable a sensor. [More...](#)

static [Vector3f](#) [getValue](#) (Type sensor)

Get the current sensor value. [More...](#)

Detailed Description

Give access to the real-time state of the sensors.

`sf::Sensor` provides an interface to the state of the various sensors that a

It only contains static functions, so it's not meant to be instantiated.

This class allows users to query the sensors values at any time and dire window and its events. Compared to the `SensorChanged` event, `sf::Se` sensor at any time (you don't need to store and update its current value or

Depending on the OS and hardware of the device (phone, tablet, ...), available. You should always check the availability of a sensor be `sf::Sensor::isAvailable` function.

You may wonder why some sensor types look so similar, for exampl `UserAcceleration`. The first one is the raw measurement of the accelera the earth gravity and the user movement. The others are more precise separately, which is usually more useful. In fact they are not direct sens based on the raw acceleration and other sensors. This is exactly the same

Because sensors consume a non-negligible amount of current, they are call `sf::Sensor::setEnabled` for each sensor in which you are interested.

Usage example:

```
if (sf::Sensor::isAvailable(sf::Sensor::Gravity))
{
    // gravity sensor is available
}

// enable the gravity sensor
sf::Sensor::setEnabled(sf::Sensor::Gravity, true);
```

```
// get the current value of gravity  
sf::Vector3f gravity = sf::Sensor::getValue(sf::Sensor::Gravity);
```

Definition at line 42 of file `Sensor.hpp`.

Member Enumeration Documentation

enum `sf::Sensor::Type`

Sensor type.

Enumerator	
Accelerometer	Measures the raw acceleration (m/s ²)
Gyroscope	Measures the raw rotation rates (degrees/s)
Magnetometer	Measures the ambient magnetic field (micro-teslas)
Gravity	Measures the direction and intensity of gravity, index (m/s ²)
UserAcceleration	Measures the direction and intensity of device acceleration and gravity (m/s ²)
Orientation	Measures the absolute 3D orientation (degrees)
Count	Keep last – the total number of sensor types.

Definition at line 50 of file `Sensor.hpp`.

Member Function Documentation

```
static Vector3f sf::Sensor::getValue ( Type sensor )
```

Get the current sensor value.

Parameters

sensor **Sensor** to read

Returns

The current sensor value

```
static bool sf::Sensor::isAvailable ( Type sensor )
```

Check if a sensor is available on the underlying platform.

Parameters

sensor **Sensor** to check

Returns

True if the sensor is available, false otherwise

```
static void sf::Sensor::setEnabled ( Type sensor,  
                                     bool enabled  
                                     )
```

Enable or disable a sensor.

All sensors are disabled by default, to avoid consuming too much bandwidth. When enabled, it starts sending events of the corresponding type.

This function does nothing if the sensor is unavailable.

Parameters

sensor `Sensor` to enable

enabled True to enable, false to disable

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

- `Sensor.hpp`

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sf::Touch Class Reference

Window module

Give access to the real-time state of the touches. [More...](#)

```
#include <Touch.hpp>
```

Static Public Member Functions

static bool `isDown` (unsigned int finger)

Check if a touch event is currently down. [More...](#)

static `Vector2i` `getPosition` (unsigned int finger)

Get the current position of a touch in desktop coordinates

static `Vector2i` `getPosition` (unsigned int finger, const `Window` &relativeTo)

Get the current position of a touch in window coordinates

Detailed Description

Give access to the real-time state of the touches.

`sf::Touch` provides an interface to the state of the touches.

It only contains static functions, so it's not meant to be instantiated.

This class allows users to query the touches state at any time and directly from a window and its events. Compared to the `TouchBegan`, `TouchMoved` and `TouchEnded` events, `sf::Touch` allows to retrieve the state of the touches at any time (you don't need to store and compare the order to know if a touch is down), and you always get the real state of the touches even when your window is out of focus and no event is triggered.

The `getPosition` function can be used to retrieve the current position of a touch. It can be used in global coordinates (relative to the desktop) and in window coordinates (relative to a specific window).

Touches are identified by an index (the "finger"), so that in multi-touch events they are tracked correctly. As long as a finger touches the screen, it will keep the same index. It can start or stop touching the screen in the meantime. As a consequence, touches can be sequential (i.e. touch number 0 may be released while touch number 1 is still down).

Usage example:

```
if (sf::Touch::isDown(0))
{
    // touch 0 is down
}

// get global position of touch 1
sf::Vector2i globalPos = sf::Touch::getPosition(1);

// get position of touch 1 relative to a window
sf::Vector2i relativePos = sf::Touch::getPosition(1, window);
```

See also

[sf::Joystick](#), [sf::Keyboard](#), [sf::Mouse](#)

Definition at line 43 of file [Touch.hpp](#).

Member Function Documentation

```
static Vector2i sf::Touch::getPosition ( unsigned int finger )
```

Get the current position of a touch in desktop coordinates.

This function returns the current touch position in global (desktop) coordi

Parameters

finger Finger index

Returns

Current position of *finger*, or undefined if it's not down

```
static Vector2i sf::Touch::getPosition ( unsigned int finger,  
                                         const Window & relativeTo  
                                         )
```

Get the current position of a touch in window coordinates.

This function returns the current touch position relative to the given wind

Parameters

finger Finger index

relativeTo Reference window

Returns

Current position of *finger*, or undefined if it's not down

static bool sf::Touch::isDown (unsigned int *finger*)

Check if a touch event is currently down.

Parameters

finger Finger index

Returns

True if *finger* is currently touching the screen, false otherwise

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

- [Touch.hpp](#)

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sf::VideoMode Class Reference

Window module

VideoMode defines a video mode (width, height, bpp) [More...](#)

```
#include <VideoMode.hpp>
```

Public Member Functions

`VideoMode ()`

Default constructor. [More...](#)

`VideoMode (unsigned int modeWidth, unsigned int modeHeight, ur`

Construct the video mode with its attributes. [More...](#)

`bool isValid () const`

Tell whether or not the video mode is valid. [More...](#)

Static Public Member Functions

static `VideoMode` `getDesktopMode ()`

Get the current desktop video mode. [More...](#)

static const `std::vector`
`< VideoMode > &` `getFullscreenModes ()`

Retrieve all the video modes supported in fullscree

Public Attributes

unsigned int **width**
Video mode width, in pixels. [More...](#)

unsigned int **height**
Video mode height, in pixels. [More...](#)

unsigned int **bitsPerPixel**
Video mode pixel depth, in bits per pixels. [More...](#)

Related Functions

(Note that these are not member functions.)

bool `operator==` (const `VideoMode` &left, const `VideoMode` &right)
Overload of == operator to compare two video modes. [More...](#)

bool `operator!=` (const `VideoMode` &left, const `VideoMode` &right)
Overload of != operator to compare two video modes. [More...](#)

bool `operator<` (const `VideoMode` &left, const `VideoMode` &right)
Overload of < operator to compare video modes. [More...](#)

bool `operator>` (const `VideoMode` &left, const `VideoMode` &right)
Overload of > operator to compare video modes. [More...](#)

bool `operator<=` (const `VideoMode` &left, const `VideoMode` &right)
Overload of <= operator to compare video modes. [More...](#)

bool `operator>=` (const `VideoMode` &left, const `VideoMode` &right)
Overload of >= operator to compare video modes. [More...](#)

Detailed Description

`VideoMode` defines a video mode (width, height, bpp)

A video mode is defined by a width and a height (in pixels) and a depth (in

Video modes are used to setup windows (`sf::Window`) at creation time.

The main usage of video modes is for fullscreen mode: indeed you must be allowed by the OS (which are defined by what the monitor and the graphics card support) for window creation will just fail.

`sf::VideoMode` provides a static function for retrieving the list of all the video modes available for fullscreen: `getFullscreenModes()`.

A custom video mode can also be checked directly for fullscreen compatibility: `isFullscreenCompatible()`.

Additionally, `sf::VideoMode` provides a static function to get the mode of the desktop: `getDesktopMode()`. This allows to build windows with the same size or pixel depth as the desktop.

Usage example:

```
// Display the list of all the video modes available for fullscreen
std::vector<sf::VideoMode> modes = sf::VideoMode::getFullscreenModes()
for (std::size_t i = 0; i < modes.size(); ++i)
{
    sf::VideoMode mode = modes[i];
    std::cout << "Mode #" << i << ": "
                << mode.width << "x" << mode.height << " - "
                << mode.bitsPerPixel << " bpp" << std::endl;
}

// Create a window with the same pixel depth as the desktop
sf::VideoMode desktop = sf::VideoMode::getDesktopMode();
window.create(sf::VideoMode(1024, 768, desktop.bitsPerPixel), "SFML wi
```

Definition at line 41 of file VideoMode.hpp.

Constructor & Destructor Documentation

```
sf::VideoMode::VideoMode ( )
```

Default constructor.

This constructors initializes all members to 0.

```
sf::VideoMode::VideoMode ( unsigned int modeWidth,  
                           unsigned int modeHeight,  
                           unsigned int modeBitsPerPixel = 32  
                           )
```

Construct the video mode with its attributes.

Parameters

modeWidth	Width in pixels
modeHeight	Height in pixels
modeBitsPerPixel	Pixel depths in bits per pixel

Member Function Documentation

static `VideoMode` `sf::VideoMode::getDesktopMode ()`

Get the current desktop video mode.

Returns

Current desktop video mode

static const `std::vector<VideoMode>&` `sf::VideoMode::getFullscreen`

Retrieve all the video modes supported in fullscreen mode.

When creating a fullscreen window, the video mode is restricted to be compatible with the video driver and monitor support. This function returns the complete list of all supported fullscreen modes. The returned array is sorted from best to worst, so that the best mode (higher width, height and bits-per-pixel) is first.

Returns

Array containing all the supported fullscreen modes

`bool` `sf::VideoMode::isValid ()` const

Tell whether or not the video mode is valid.

The validity of video modes is only relevant when using fullscreen windows.

can be used with no restriction.

Returns

True if the video mode is valid for fullscreen mode

Friends And Related Function Documentatio

```
bool operator!= ( const VideoMode & left,  
                 const VideoMode & right  
                 )
```

Overload of != operator to compare two video modes.

Parameters

left Left operand (a video mode)
right Right operand (a video mode)

Returns

True if modes are different

```
bool operator< ( const VideoMode & left,  
                const VideoMode & right  
                )
```

Overload of < operator to compare video modes.

Parameters

left Left operand (a video mode)
right Right operand (a video mode)

Returns

True if *left* is lesser than *right*

```
bool operator<= ( const VideoMode & left,  
                 const VideoMode & right  
                 )
```

Overload of <= operator to compare video modes.

Parameters

left Left operand (a video mode)
right Right operand (a video mode)

Returns

True if *left* is lesser or equal than *right*

```
bool operator== ( const VideoMode & left,  
                 const VideoMode & right  
                 )
```

Overload of == operator to compare two video modes.

Parameters

left Left operand (a video mode)
right Right operand (a video mode)

Returns

True if modes are equal

```
bool operator> ( const VideoMode & left,  
                const VideoMode & right  
                )
```

Overload of > operator to compare video modes.

Parameters

left Left operand (a video mode)

right Right operand (a video mode)

Returns

True if *left* is greater than *right*

```
bool operator>= ( const VideoMode & left,  
                 const VideoMode & right  
                 )
```

Overload of >= operator to compare video modes.

Parameters

left Left operand (a video mode)

right Right operand (a video mode)

Returns

True if *left* is greater or equal than *right*

Member Data Documentation

unsigned int sf::VideoMode::bitsPerPixel

Video mode pixel depth, in bits per pixels.

Definition at line 104 of file [VideoMode.hpp](#).

unsigned int sf::VideoMode::height

Video mode height, in pixels.

Definition at line 103 of file [VideoMode.hpp](#).

unsigned int sf::VideoMode::width

Video mode width, in pixels.

Definition at line 102 of file [VideoMode.hpp](#).

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

- [VideoMode.hpp](#)

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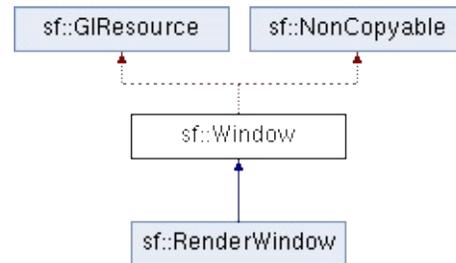
sf::Window Class Reference

Window module

Window that serves as a target for OpenGL rendering. [More...](#)

```
#include <Window.hpp>
```

Inheritance diagram for sf::Window:



Public Member Functions

`Window ()`
Default constructor. [More...](#)

`Window (VideoMode mode, const String &title, unsigned int width, unsigned int height, unsigned int depth, unsigned int flags, const ContextSettings &settings=ContextSettings())`
Construct a new window. [More...](#)

`Window (WindowHandle handle, const ContextSettings &settings=ContextSettings())`
Construct the window from an existing control.

`virtual ~Window ()`
Destructor. [More...](#)

`void create (VideoMode mode, const String &title, unsigned int width, unsigned int height, unsigned int depth, unsigned int flags, const ContextSettings &settings=ContextSettings())`
Create (or recreate) the window. [More...](#)

`void create (WindowHandle handle, const ContextSettings &settings=ContextSettings())`
Create (or recreate) the window from an existing control.

`void close ()`
Close the window and destroy all the attached objects.

`bool isOpen () const`
Tell whether or not the window is open. [More...](#)

`const ContextSettings &getSettings () const`
Get the settings of the OpenGL context of the window.

bool `pollEvent (Event &event)`
Pop the event on top of the event queue, if any

bool `waitEvent (Event &event)`
Wait for an event and return it. [More...](#)

`Vector2i` `getPosition () const`
Get the position of the window. [More...](#)

void `setPosition (const Vector2i &position)`
Change the position of the window on screen. [More...](#)

`Vector2u` `getSize () const`
Get the size of the rendering region of the window. [More...](#)

void `setSize (const Vector2u &size)`
Change the size of the rendering region of the window. [More...](#)

void `setTitle (const String &title)`
Change the title of the window. [More...](#)

void `setIcon (unsigned int width, unsigned int height)`
Change the window's icon. [More...](#)

void `setVisible (bool visible)`
Show or hide the window. [More...](#)

void `setVerticalSyncEnabled (bool enabled)`
Enable or disable vertical synchronization. [More...](#)

void `setMouseCursorVisible (bool visible)`
Show or hide the mouse cursor. [More...](#)

void `setMouseCursorGrabbed (bool grabbed)`
Grab or release the mouse cursor. [More...](#)

void `setKeyRepeatEnabled` (bool enabled)
Enable or disable automatic key-repeat. [More..](#)

void `setFramerateLimit` (unsigned int limit)
Limit the framerate to a maximum fixed frequer

void `setJoystickThreshold` (float threshold)
Change the joystick threshold. [More...](#)

bool `setActive` (bool active=true) const
Activate or deactivate the window as the curren
[More...](#)

void `requestFocus` ()
Request the current window to be made the ac

bool `hasFocus` () const
Check whether the window has the input focus

void `display` ()
Display on screen what has been rendered to t

`WindowHandle` `getSystemHandle` () const
Get the OS-specific handle of the window. [Mor](#)

Protected Member Functions

virtual void `onCreate ()`

Function called after the window has been created. [More...](#)

virtual void `onResize ()`

Function called after the window has been resized. [More...](#)

Static Private Member Functions

static void `ensureGLContext ()`

Empty function for ABI compatibility, use `acquireTransientCo`

Detailed Description

`Window` that serves as a target for OpenGL rendering.

`sf::Window` is the main class of the `Window` module.

It defines an OS window that is able to receive an OpenGL rendering.

A `sf::Window` can create its own new window, or be embedded into an existing window through its `create(handle)` function. This can be useful for embedding an OpenGL rendering area into a bigger GUI with existing windows, controls, etc. It can also be used to embed an OpenGL rendering area into a window created by another (probably richer) GUI library.

The `sf::Window` class provides a simple interface for manipulating the window's position, size, and control mouse cursor, etc. It also provides event handling through its `pollEvent()` function.

Note that OpenGL experts can pass their own parameters (antialiasing level, multisampling, etc.) to the OpenGL context attached to the window, with the `sf::Window::setOpenGLParameters()` function passed as an optional argument when creating the window.

Usage example:

```
// Declare and create a new window
sf::Window window(sf::VideoMode(800, 600), "SFML window");

// Limit the framerate to 60 frames per second (this step is optional)
window.setFramerateLimit(60);

// The main loop - ends as soon as the window is closed
while (window.isOpen())
{
    // Event processing
    sf::Event event;
    while (window.pollEvent(event))
    {
        // Request for closing the window
        if (event.type == sf::Event::Closed)
```

```
        window.close();
    }
    // Activate the window for OpenGL rendering
    window.setActive();

    // OpenGL drawing commands go here...

    // End the current frame and display its contents on screen
    window.display();
}
```

Definition at line 57 of file Window/Window.hpp.

Constructor & Destructor Documentation

`sf::Window::Window ()`

Default constructor.

This constructor doesn't actually create the window, use the other constr

```
sf::Window::Window ( VideoMode mode,
                    const String & title,
                    Uint32 style = Style::Default,
                    const ContextSettings & settings = contextSe
                    )
```

Construct a new window.

This constructor creates the window with the size and pixel depth define be passed to customize the look and behavior of the window (borders, ti *style* contains `Style::Fullscreen`, then *mode* must be a valid video mode.

The fourth parameter is an optional structure specifying advanced Op antialiasing, depth-buffer bits, etc.

Parameters

- mode** Video mode to use (defines the width, height and depth of window)
- title** Title of the window
- style** Window style, a bitwise OR combination of `sf::Style` enum

settings Additional settings for the underlying OpenGL context

```
sf::Window::Window ( WindowHandle handle,  
                    const ContextSettings & settings = contextSe  
                    )
```

Construct the window from an existing control.

Use this constructor if you want to create an OpenGL rendering area into

The second parameter is an optional structure specifying advanced O antialiasing, depth-buffer bits, etc.

Parameters

handle Platform-specific handle of the control

settings Additional settings for the underlying OpenGL context

```
virtual sf::Window::~~Window ( )
```

Destructor.

Closes the window and frees all the resources attached to it.

Member Function Documentation

void sf::Window::close ()

Close the window and destroy all the attached resources.

After calling this function, the `sf::Window` instance remains valid and you can still use the window. All other functions such as `pollEvent()` or `display()` will still work (but `isOpen()` every time), and will have no effect on closed windows.

```
void sf::Window::create ( VideoMode mode, const String & title, Uint32 style = Style::Default, const ContextSettings & settings = contextSettings )
```

Create (or recreate) the window.

If the window was already created, it closes it first. If *style* contains `Style::Default`, it uses a valid video mode.

The fourth parameter is an optional structure specifying advanced OpenGL settings such as antialiasing, depth-buffer bits, etc.

Parameters

- mode** Video mode to use (defines the width, height and depth of window)
- title** Title of the window

style Window style, a bitwise OR combination of sf::Style enum
settings Additional settings for the underlying OpenGL context

```
void sf::Window::create ( WindowHandle handle,  
                        const ContextSettings & settings = context )
```

Create (or recreate) the window from an existing control.

Use this function if you want to create an OpenGL rendering area into a window was already created, it closes it first.

The second parameter is an optional structure specifying advanced O antialiasing, depth-buffer bits, etc.

Parameters

handle Platform-specific handle of the control

settings Additional settings for the underlying OpenGL context

```
void sf::Window::display ( )
```

Display on screen what has been rendered to the window so far.

This function is typically called after all OpenGL rendering has been done to show it on screen.

```
Vector2i sf::Window::getPosition ( ) const
```

Get the position of the window.

Returns

Position of the window, in pixels

See also

[setPosition](#)

const [ContextSettings](#)& sf::Window::getSettings () const

Get the settings of the OpenGL context of the window.

Note that these settings may be different from what was passed to [setSettings](#) function, if one or more settings were not supported. In this case, SFML (

Returns

Structure containing the OpenGL context settings

[Vector2u](#) sf::Window::getSize () const

Get the size of the rendering region of the window.

The size doesn't include the titlebar and borders of the window.

Returns

Size in pixels

See also

[setSize](#)

[WindowHandle](#) sf::Window::getSystemHandle () const

Get the OS-specific handle of the window.

The type of the returned handle is `sf::WindowHandle`, which is a type defined by the OS. You shouldn't need to use this function, unless you have very specific requirements that SFML doesn't support, or implement a temporary workaround until a bug is fixed.

Returns

System handle of the window

bool sf::Window::hasFocus () const

Check whether the window has the input focus.

At any given time, only one window may have the input focus to receive or most mouse events.

Returns

True if window has focus, false otherwise

See also

[requestFocus](#)

bool sf::Window::isOpen () const

Tell whether or not the window is open.

This function returns whether or not the window exists. Note that a hidden window is still open (therefore this function would return true).

Returns

True if the window is open, false if it has been closed

virtual void sf::Window::onCreate ()

Function called after the window has been created.

This function is called so that derived classes can perform their own special actions when the window is created.

Reimplemented in [sf::RenderWindow](#).

virtual void sf::Window::onResize ()

Function called after the window has been resized.

This function is called so that derived classes can perform custom actions when the window is resized.

Reimplemented in [sf::RenderWindow](#).

bool sf::Window::pollEvent (**Event & event)**

Pop the event on top of the event queue, if any, and return it.

This function is not blocking: if there's no pending event then it will return false. Note that more than one event may be present in the event queue, so you should call this function in a loop to make sure that you process every pending event.

```
sf::Event event;
while (window.pollEvent(event))
{
    // process event...
}
```

Parameters

event `Event` to be returned

Returns

True if an event was returned, or false if the event queue was empty

See also

`waitEvent`

`void sf::Window::requestFocus ()`

Request the current window to be made the active foreground window.

At any given time, only one window may have the input focus to receive keyboard or mouse events. If a window requests focus, it only hints to the operating system that it is focused. The operating system is free to deny the request. This is not to

See also

`hasFocus`

`bool sf::Window::setActive (bool active = true) const`

Activate or deactivate the window as the current target for OpenGL rendering.

A window is active only on the current thread, if you want to make it active on another thread, deactivate it on the previous thread first if it was active. Only one window can be active at a time, thus the window previously active (if any) automatically gets deactivated with `requestFocus()`.

Parameters

active True to activate, false to deactivate

Returns

True if operation was successful, false otherwise

```
void sf::Window::setFramerateLimit ( unsigned int limit )
```

Limit the framerate to a maximum fixed frequency.

If a limit is set, the window will use a small delay after each call to `dis` frame lasted long enough to match the framerate limit. SFML will try to r it can, but since it internally uses `sf::sleep`, whose precision depends o may be a little unprecise as well (for example, you can get 65 FPS when

Parameters

limit Framerate limit, in frames per seconds (use 0 to disable limit)

```
void sf::Window::setIcon ( unsigned int width,  
                           unsigned int height,  
                           const Uint8 * pixels  
                           )
```

Change the window's icon.

pixels must be an array of *width* x *height* pixels in 32-bits RGBA format.

The OS default icon is used by default.

Parameters

width Icon's width, in pixels

height Icon's height, in pixels

pixels Pointer to the array of pixels in memory. The pixels are copied source alive after calling this function.

See also

[setTitle](#)

void sf::Window::setJoystickThreshold (float **threshold**)

Change the joystick threshold.

The joystick threshold is the value below which no JoystickMoved event is generated.

The threshold value is 0.1 by default.

Parameters

threshold New threshold, in the range [0, 100]

void sf::Window::setKeyRepeatEnabled (bool **enabled**)

Enable or disable automatic key-repeat.

If key repeat is enabled, you will receive repeated KeyPressed events when a key is held down. If key repeat is disabled, you will only get a single event when the key is pressed.

Key repeat is enabled by default.

Parameters

enabled True to enable, false to disable

void sf::Window::setMouseCursorGrabbed (bool **grabbed**)

Grab or release the mouse cursor.

If set, grabs the mouse cursor inside this window's client area so it may bounds. Note that grabbing is only active while the window has focus.

Parameters

grabbed True to enable, false to disable

void sf::Window::setMouseCursorVisible (bool **visible)**

Show or hide the mouse cursor.

The mouse cursor is visible by default.

Parameters

visible True to show the mouse cursor, false to hide it

void sf::Window::setPosition (const **Vector2i & **position**)**

Change the position of the window on screen.

This function only works for top-level windows (i.e. it will be ignored for v of a child window/control).

Parameters

position New position, in pixels

See also

[getPosition](#)

void sf::Window::setSize (const `Vector2u` & `size`)

Change the size of the rendering region of the window.

Parameters

size New size, in pixels

See also

`getSize`

void sf::Window::setTitle (const `String` & `title`)

Change the title of the window.

Parameters

title New title

See also

`setIcon`

void sf::Window::setVerticalSyncEnabled (bool `enabled`)

Enable or disable vertical synchronization.

Activating vertical synchronization will limit the number of frames displayed per monitor. This can avoid some visual artifacts, and limit the framerate to a value that works across different computers).

Vertical synchronization is disabled by default.

Parameters

enabled True to enable v-sync, false to deactivate it

void sf::Window::setVisible (bool **visible**)

Show or hide the window.

The window is shown by default.

Parameters

visible True to show the window, false to hide it

bool sf::Window::waitEvent (**Event** & **event**)

Wait for an event and return it.

This function is blocking: if there's no pending event then it will wait until the function returns (and no error occurred), the *event* object is always valid. It is typically used when you have a thread that is dedicated to events and that thread sleeps as long as no new event is received.

```
sf::Event event;  
if (window.waitEvent(event))  
{  
    // process event...  
}
```

Parameters

event **Event** to be returned

Returns

False if any error occurred

See also

[pollEvent](#)

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

- [Window/Window.hpp](#)

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[Namespace List](#) | [Namespace Members](#) |

Namespace List

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

▼  **sf**

 **Glsl** Namespace with GLSL types

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[All](#) | [Typedefs](#)

Here is a list of all documented namespace members with links to the namespace:

- [Bvec2](#) : [sf::Gsl](#)
- [Bvec3](#) : [sf::Gsl](#)
- [Bvec4](#) : [sf::Gsl](#)
- [Ivec2](#) : [sf::Gsl](#)
- [Ivec3](#) : [sf::Gsl](#)
- [Ivec4](#) : [sf::Gsl](#)
- [Mat3](#) : [sf::Gsl](#)
- [Mat4](#) : [sf::Gsl](#)
- [Vec2](#) : [sf::Gsl](#)
- [Vec3](#) : [sf::Gsl](#)
- [Vec4](#) : [sf::Gsl](#)

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- [Bvec3 : sf::Gsl](#)
- [Bvec4 : sf::Gsl](#)
- [Ivec2 : sf::Gsl](#)
- [Ivec3 : sf::Gsl](#)
- [Ivec4 : sf::Gsl](#)
- [Mat3 : sf::Gsl](#)
- [Mat4 : sf::Gsl](#)
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Class List

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

▼ sf

 AIResource	Base class for classes that require an C
 BlendMode	Blending modes for drawing
 CircleShape	Specialized shape representing a circle
 Clock	Utility class that measures the elapsed
 Color	Utility class for manipulating RGBA color
 Context	Class holding a valid drawing context
 ContextSettings	Structure defining the settings of the Op window
 ConvexShape	Specialized shape representing a convex
 Drawable	Abstract base class for objects that can
▼  Event	Defines a system event and its paramer
 JoystickButtonEvent	Joystick buttons events parameters (Jo JoystickButtonReleased)
 JoystickConnectEvent	Joystick connection events parameters

	JoystickDisconnected)
JoystickMoveEvent	Joystick axis move event parameters (JoystickMoveEvent)
KeyEvent	Keyboard event parameters (KeyPressEvent)
MouseButtonEvent	Mouse buttons events parameters (MouseButtonPressed, MouseButtonReleased)
MouseMoveEvent	Mouse move event parameters (MouseMoveEvent)
MouseWheelEvent	Mouse wheel events parameters (MouseWheelEvent)
MouseWheelScrollEvent	Mouse wheel events parameters (MouseWheelScrollEvent)
SensorEvent	Sensor event parameters (SensorChangeEvent)
SizeEvent	Size events parameters (Resized)
TextEvent	Text event parameters (TextEntered)
TouchEvent	Touch events parameters (TouchBegan, TouchMoved, TouchEnded)
FileInputStream	Implementation of input stream based class
▼ Font	Class for loading and manipulating character sets
Info	Holds various information about a font
▼ Ftp	A FTP client
DirectoryResponse	Specialization of FTP response returning directory listing
ListingResponse	Specialization of FTP response returning file listing
Response	Define a FTP response
▼ GResource	Base class for classes that require an GResource
TransientContextLock	RAll helper class to temporarily lock an GResource
Glyph	Structure describing a glyph
▼ Http	A HTTP client
Request	Define a HTTP request
Response	Define a HTTP response
Image	Class for loading, manipulating and saving images

InputSoundFile	Provide read access to sound files
InputStream	Abstract class for custom file input stream
IpAddress	Encapsulate an IPv4 network address
▼ Joystick	Give access to the real-time state of the joystick
Identification	Structure holding a joystick's identification
Keyboard	Give access to the real-time state of the keyboard
Listener	The audio listener is the point in the scene where sounds are heard
Lock	Automatic wrapper for locking and unlocking
MemoryInputStream	Implementation of input stream based on memory
Mouse	Give access to the real-time state of the mouse
Music	Streamed music played from an audio file
Mutex	Blocks concurrent access to shared resources
NonCopyable	Utility class that makes any derived class non-copyable
OutputSoundFile	Provide write access to sound files
Packet	Utility class to build blocks of data to transfer
Rect	Utility class for manipulating 2D axis aligned rectangles
RectangleShape	Specialized shape representing a rectangle
RenderStates	Define the states used for drawing to a render target
RenderTarget	Base class for all render targets (window, texture, etc.)
RenderTexture	Target for off-screen 2D rendering into a texture
RenderWindow	Window that can serve as a target for 2D rendering
Sensor	Give access to the real-time state of the sensor
▼ Shader	Shader class (vertex, geometry and fragment)
CurrentTextureType	Special type that can be passed to <code>setTexture</code> of the object being drawn

☑ Shape	Base class for textured shapes with out
☑ Socket	Base class for all the socket types
☑ SocketSelector	Multiplexer that allows to read from mul
☑ Sound	Regular sound that can be played in the
☑ SoundBuffer	Storage for audio samples defining a sc
☑ SoundBufferRecorder	Specialized <code>SoundRecorder</code> which stor
☑ SoundFileFactory	Manages and instantiates sound file rea
▼ ☑ SoundFileReader	Abstract base class for sound file decod
☑ Info	Structure holding the audio properties o
☑ SoundFileWriter	Abstract base class for sound file encoc
☑ SoundRecorder	Abstract base class for capturing sound
☑ SoundSource	Base class defining a sound's propertie
▼ ☑ SoundStream	Abstract base class for streamed audio
☑ Chunk	Structure defining a chunk of audio data
☑ Sprite	<code>Drawable</code> representation of a texture, w
☑ String	Utility string class that automatically ha
☑ TcpListener	<code>Socket</code> that listens to new TCP connect
☑ TcpSocket	Specialized socket using the TCP proto
☑ Text	Graphical text that can be drawn to a re
☑ Texture	<code>Image</code> living on the graphics card that c
☑ Thread	Utility class to manipulate threads
☑ ThreadLocal	Defines variables with thread-local stor
☑ ThreadLocalPtr	Pointer to a thread-local variable
☑ Time	Represents a time value

 Touch	Give access to the real-time state of the
 Transform	Define a 3x3 transform matrix
 Transformable	Decomposed transform defined by a po
 UdpSocket	Specialized socket using the UDP protc
 Utf	Utility class providing generic functions
 Utf< 16 >	Specialization of the Utf template for U
 Utf< 32 >	Specialization of the Utf template for U
 Utf< 8 >	Specialization of the Utf template for U
 Vector2	Utility template class for manipulating 2
 Vector3	Utility template class for manipulating 3
 Vertex	Define a point with color and texture co
 VertexArray	Define a set of one or more 2D primitive
 VideoMode	VideoMode defines a video mode (widt
 View	2D camera that defines what region is s
 Window	Window that serves as a target for Ope

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sf::Utf< 16 > Class Template Reference

Specialization of the [Utf](#) template for UTF-16. [More...](#)

```
#include <Utf.hpp>
```

Static Public Member Functions

template<typename In >

static In **decode** (In begin, In end, Uint32 &output, Uint32 replacement)
Decode a single UTF-16 character. [More...](#)

template<typename Out >

static Out **encode** (Uint32 input, Out output, Uint16 replacement=0)
Encode a single UTF-16 character. [More...](#)

template<typename In >

static In **next** (In begin, In end)
Advance to the next UTF-16 character. [More...](#)

template<typename In >

static std::size_t **count** (In begin, In end)
Count the number of characters of a UTF-16 sequence

template<typename In , typename Out >

static Out **fromAnsi** (In begin, In end, Out output, const std::locale &locale)
Convert an ANSI characters range to UTF-16. [More...](#)

template<typename In , typename Out >

static Out **fromWide** (In begin, In end, Out output)
Convert a wide characters range to UTF-16. [More...](#)

template<typename In , typename Out >

static Out **fromLatin1** (In begin, In end, Out output)
Convert a latin-1 (ISO-5589-1) characters range to UTF-16

template<typename In , typename Out >

static Out **toAnsi** (In begin, In end, Out output, char replacement=0, const std::locale &locale=std::locale())
Convert an UTF-16 characters range to ANSI character

```
template<typename In , typename Out >
```

```
static Out toWide (In begin, In end, Out output, wchar_t replacem  
Convert an UTF-16 characters range to wide character:
```

```
template<typename In , typename Out >
```

```
static Out toLatin1 (In begin, In end, Out output, char replacemen  
Convert an UTF-16 characters range to latin-1 (ISO-55:
```

```
template<typename In , typename Out >
```

```
static Out toUtf8 (In begin, In end, Out output)  
Convert a UTF-16 characters range to UTF-8. More...
```

```
template<typename In , typename Out >
```

```
static Out toUtf16 (In begin, In end, Out output)  
Convert a UTF-16 characters range to UTF-16. More...
```

```
template<typename In , typename Out >
```

```
static Out toUtf32 (In begin, In end, Out output)  
Convert a UTF-16 characters range to UTF-32. More...
```

Detailed Description

```
template<>  
class sf::Utf< 16 >
```

Specialization of the [Utf](#) template for UTF-16.

Definition at line [255](#) of file [Utf.hpp](#).

Member Function Documentation

```
template<typename In >  
static std::size_t sf::Utf< 16 >::count ( In begin,  
                                           In end  
                                           )
```

Count the number of characters of a UTF-16 sequence.

This function is necessary for multi-elements encodings, as a single (storage element, thus the total size can be different from (begin - end).

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence

Returns

Iterator pointing to one past the last read element of the input sequence

```
template<typename In >  
static In sf::Utf< 16 >::decode ( In begin,  
                                  In end,  
                                  Uint32 & output,  
                                  Uint32 replacement = 0  
                                  )
```

Decode a single UTF-16 character.

Decoding a character means finding its unique 32-bits code (called standard).

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Codepoint of the decoded UTF-16 character
replacement Replacement character to use in case the UTF-8 sequence

Returns

Iterator pointing to one past the last read element of the input sequence

```
template<typename Out >
```

```
static Out sf::Utf< 16 >::encode ( Uint32 input,  
                                   Out output,  
                                   Uint16 replacement = 0  
                                   )
```

Encode a single UTF-16 character.

Encoding a character means converting a unique 32-bits code (called encoding, UTF-16).

Parameters

input Codepoint to encode as UTF-16
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to UTF-16

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 16 >::fromAnsi ( In          begin,  
                                     In          end,  
                                     Out        output,  
                                     const std::locale & locale = std::locale() )
```

Convert an ANSI characters range to UTF-16.

The current global locale will be used by default, unless you pass a custom locale.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence
- locale** Locale to use for conversion

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 16 >::fromLatin1 ( In  begin,  
                                       In  end,  
                                       Out output  
                                       )
```

Convert a latin-1 (ISO-5589-1) characters range to UTF-16.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >  
static Out sf::Utf< 16 >::fromWide ( In  begin,  
                                     In  end,  
                                     Out output  
                                     )
```

Convert a wide characters range to UTF-16.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In >  
static In sf::Utf< 16 >::next ( In  begin,  
                              In  end  
                              )
```

Advance to the next UTF-16 character.

This function is necessary for multi-elements encodings, as a single (storage element.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence

Returns

Iterator pointing to one past the last read element of the input sequence

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 16 >::toAnsi ( In          begin,  
                                   In          end,  
                                   Out          output,  
                                   char          replacement = '\u0000',  
                                   const std::locale & locale = std::locale() )
```

Convert an UTF-16 characters range to ANSI characters.

The current global locale will be used by default, unless you pass a custom locale.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to ANSI (UTF-16 to ANSI)
locale Locale to use for conversion

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 16 >::toLatin1 ( In  begin,  
                                     In  end,
```

```
Out output,  
char replacement = 0  
)
```

Convert an UTF-16 characters range to latin-1 (ISO-5589-1) characters.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to wide (u

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 16 >::toUtf16 ( In begin,  
In end,  
Out output  
)
```

Convert a UTF-16 characters range to UTF-16.

This functions does nothing more than a direct copy; it is defined only in other specializations of the sf::Utf<> template, and allow generic code to

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >  
static Out sf::Utf< 16 >::toUtf32 ( In   begin,  
                                   In   end,  
                                   Out  output  
                                   )
```

Convert a UTF-16 characters range to UTF-32.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >  
static Out sf::Utf< 16 >::toUtf8 ( In   begin,  
                                   In   end,  
                                   Out  output  
                                   )
```

Convert a UTF-16 characters range to UTF-8.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 16 >::toWide ( In      begin,  
                                   In      end,  
                                   Out      output,  
                                   wchar_t replacement = 0  
                                   )
```

Convert an UTF-16 characters range to wide characters.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to wide (u

Returns

Iterator to the end of the output sequence which has been written

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

- [Utf.hpp](#)

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sf::Utf< 32 > Class Template Reference

Specialization of the [Utf](#) template for UTF-32. [More...](#)

```
#include <Utf.hpp>
```

Static Public Member Functions

template<typename In >

static In **decode** (In begin, In end, Uint32 &output, Uint32 replacement)
Decode a single UTF-32 character. [More...](#)

template<typename Out >

static Out **encode** (Uint32 input, Out output, Uint32 replacement=0)
Encode a single UTF-32 character. [More...](#)

template<typename In >

static In **next** (In begin, In end)
Advance to the next UTF-32 character. [More...](#)

template<typename In >

static std::size_t **count** (In begin, In end)
Count the number of characters of a UTF-32 sequence

template<typename In , typename Out >

static Out **fromAnsi** (In begin, In end, Out output, const std::locale &locale)
Convert an ANSI characters range to UTF-32. [More...](#)

template<typename In , typename Out >

static Out **fromWide** (In begin, In end, Out output)
Convert a wide characters range to UTF-32. [More...](#)

template<typename In , typename Out >

static Out **fromLatin1** (In begin, In end, Out output)
Convert a latin-1 (ISO-5589-1) characters range to UTF-32

template<typename In , typename Out >

static Out **toAnsi** (In begin, In end, Out output, char replacement=0, const std::locale &locale=std::locale())
Convert an UTF-32 characters range to ANSI character

```
template<typename In , typename Out >
    static Out toWide (In begin, In end, Out output, wchar_t replacem
    Convert an UTF-32 characters range to wide character.
```

```
template<typename In , typename Out >
    static Out toLatin1 (In begin, In end, Out output, char replacemen
    Convert an UTF-16 characters range to latin-1 (ISO-55)
```

```
template<typename In , typename Out >
    static Out toUtf8 (In begin, In end, Out output)
    Convert a UTF-32 characters range to UTF-8. More...
```

```
template<typename In , typename Out >
    static Out toUtf16 (In begin, In end, Out output)
    Convert a UTF-32 characters range to UTF-16. More...
```

```
template<typename In , typename Out >
    static Out toUtf32 (In begin, In end, Out output)
    Convert a UTF-32 characters range to UTF-32. More...
```

```
template<typename In >
    static Uint32 decodeAnsi (In input, const std::locale &locale=std::loc
    Decode a single ANSI character to UTF-32. More...
```

```
template<typename In >
    static Uint32 decodeWide (In input)
    Decode a single wide character to UTF-32. More...
```

```
template<typename Out >
    static Out encodeAnsi (Uint32 codepoint, Out output, char replac
    &locale=std::locale())
    Encode a single UTF-32 character to ANSI. More...
```

```
template<typename Out >
    static Out encodeWide (Uint32 codepoint, Out output, wchar_t re
    Encode a single UTF-32 character to wide. More...
```

Detailed Description

```
template<>  
class sf::Utf< 32 >
```

Specialization of the [Utf](#) template for UTF-32.

Definition at line [462](#) of file [Utf.hpp](#).

Member Function Documentation

```
template<typename In >  
static std::size_t sf::Utf< 32 >::count ( In begin,  
                                           In end  
                                           )
```

Count the number of characters of a UTF-32 sequence.

This function is trivial for UTF-32, which can store every character in a si

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence

Returns

Iterator pointing to one past the last read element of the input seque

```
template<typename In >  
static In sf::Utf< 32 >::decode ( In begin,  
                                 In end,  
                                 Uint32 & output,  
                                 Uint32 replacement = 0  
                                 )
```

Decode a single UTF-32 character.

Decoding a character means finding its unique 32-bits code (called

standard. For UTF-32, the character value is the same as the codepoint.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Codepoint of the decoded UTF-32 character
- replacement** Replacement character to use in case the UTF-8 sequence is invalid

Returns

Iterator pointing to one past the last read element of the input sequence

```
template<typename In >
```

```
static Uint32 sf::Utf< 32 >::decodeAnsi ( In input,  
                                           const std::locale & locale =  
                                           )
```

Decode a single ANSI character to UTF-32.

This function does not exist in other specializations of sf::Utf<>, it is defined by several other conversion functions).

Parameters

- input** Input ANSI character
- locale** Locale to use for conversion

Returns

Converted character

```
template<typename In >
```

```
static Uint32 sf::Utf< 32 >::decodeWide ( In input )
```

Decode a single wide character to UTF-32.

This function does not exist in other specializations of `sf::Utf<>`, it is de by several other conversion functions).

Parameters

input Input wide character

Returns

Converted character

```
template<typename Out >
```

```
static Out sf::Utf< 32 >::encode ( Uint32 input,  
                                   Out    output,  
                                   Uint32 replacement = 0  
                                   )
```

Encode a single UTF-32 character.

Encoding a character means converting a unique 32-bits code (call encoding, UTF-32. For UTF-32, the codepoint is the same as the charac

Parameters

input Codepoint to encode as UTF-32

output Iterator pointing to the beginning of the output sequen

replacement Replacement for characters not convertible to UTF-32

Returns

Iterator to the end of the output sequence which has been written

```
template<typename Out >
```

```
static Out sf::Utf< 32 >::encodeAnsi ( Uint32 codepoint,
                                       Out      output,
                                       char      replacement,
                                       const std::locale & locale = st
                                       )
```

Encode a single UTF-32 character to ANSI.

This function does not exist in other specializations of sf::Utf<>, it is de
by several other conversion functions).

Parameters

codepoint Iterator pointing to the beginning of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement if the input character is not convertible to
locale Locale to use for conversion

Returns

Iterator to the end of the output sequence which has been written

```
template<typename Out >
```

```
static Out sf::Utf< 32 >::encodeWide ( Uint32 codepoint,
                                       Out      output,
                                       wchar_t replacement = 0
                                       )
```

Encode a single UTF-32 character to wide.

This function does not exist in other specializations of sf::Utf<>, it is de
by several other conversion functions).

Parameters

codepoint Iterator pointing to the beginning of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement if the input character is not convertible to UTF-32

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 32 >::fromAnsi ( In          begin,  
                                     In          end,  
                                     Out          output,  
                                     const std::locale & locale = std::locale() )
```

Convert an ANSI characters range to UTF-32.

The current global locale will be used by default, unless you pass a custom locale.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
locale Locale to use for conversion

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 32 >::fromLatin1 ( In  begin,  
                                       In  end,
```

```
        Out output
    )
```

Convert a latin-1 (ISO-5589-1) characters range to UTF-32.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 32 >::fromWide ( In  begin,  
                                     In  end,  
                                     Out output  
                                     )
```

Convert a wide characters range to UTF-32.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In >
```

```
static In sf::Utf< 32 >::next ( In  begin,
```

```
In end  
)
```

Advance to the next UTF-32 character.

This function is trivial for UTF-32, which can store every character in a si

Parameters

begin Iterator pointing to the beginning of the input sequence

end Iterator pointing to the end of the input sequence

Returns

Iterator pointing to one past the last read element of the input seque

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 32 >::toAnsi ( In begin,  
In end,  
Out output,  
char replacement = c  
const std::locale & locale = std::loc  
)
```

Convert an UTF-32 characters range to ANSI characters.

The current global locale will be used by default, unless you pass a custc

Parameters

begin Iterator pointing to the beginning of the input sequence

end Iterator pointing to the end of the input sequence

output Iterator pointing to the beginning of the output sequen

replacement Replacement for characters not convertible to ANSI (u

locale Locale to use for conversion

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 32 >::toLatin1 ( In   begin,  
                                     In   end,  
                                     Out  output,  
                                     char  replacement = 0  
                                     )
```

Convert an UTF-16 characters range to latin-1 (ISO-5589-1) characters.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to wide (u

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 32 >::toUtf16 ( In   begin,  
                                     In   end,  
                                     Out  output  
                                     )
```

Convert a UTF-32 characters range to UTF-16.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >  
static Out sf::Utf< 32 >::toUtf32 ( In  begin,  
                                   In  end,  
                                   Out  output  
                                   )
```

Convert a UTF-32 characters range to UTF-32.

This functions does nothing more than a direct copy; it is defined only in other specializations of the sf::Utf<> template, and allow generic code to

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >  
static Out sf::Utf< 32 >::toUtf8 ( In  begin,  
                                   In  end,  
                                   Out  output  
                                   )
```

Convert a UTF-32 characters range to UTF-8.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 32 >::toWide ( In      begin,  
                                   In      end,  
                                   Out      output,  
                                   wchar_t replacement = 0  
                                   )
```

Convert an UTF-32 characters range to wide characters.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to wide (u

Returns

Iterator to the end of the output sequence which has been written

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

- [Utf.hpp](#)

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sf::Utf< 8 > Class Template Reference

Specialization of the [Utf](#) template for UTF-8. [More...](#)

```
#include <Utf.hpp>
```

Static Public Member Functions

template<typename In >

static In **decode** (In begin, In end, Uint32 &output, Uint32 replacement=0)
Decode a single UTF-8 character. [More...](#)

template<typename Out >

static Out **encode** (Uint32 input, Out output, Uint8 replacement=0)
Encode a single UTF-8 character. [More...](#)

template<typename In >

static In **next** (In begin, In end)
Advance to the next UTF-8 character. [More...](#)

template<typename In >

static std::size_t **count** (In begin, In end)
Count the number of characters of a UTF-8 sequence.

template<typename In , typename Out >

static Out **fromAnsi** (In begin, In end, Out output, const std::locale &locale)
Convert an ANSI characters range to UTF-8. [More...](#)

template<typename In , typename Out >

static Out **fromWide** (In begin, In end, Out output)
Convert a wide characters range to UTF-8. [More...](#)

template<typename In , typename Out >

static Out **fromLatin1** (In begin, In end, Out output)
Convert a latin-1 (ISO-5589-1) characters range to UTF-8.

template<typename In , typename Out >

static Out **toAnsi** (In begin, In end, Out output, char replacement=0, const std::locale &locale=std::locale())
Convert an UTF-8 characters range to ANSI characters

```
template<typename In , typename Out >
```

```
static Out toWide (In begin, In end, Out output, wchar_t replacem  
Convert an UTF-8 characters range to wide characters.
```

```
template<typename In , typename Out >
```

```
static Out toLatin1 (In begin, In end, Out output, char replacemen  
Convert an UTF-8 characters range to latin-1 (ISO-5589-1).
```

```
template<typename In , typename Out >
```

```
static Out toUtf8 (In begin, In end, Out output)  
Convert a UTF-8 characters range to UTF-8. More...
```

```
template<typename In , typename Out >
```

```
static Out toUtf16 (In begin, In end, Out output)  
Convert a UTF-8 characters range to UTF-16. More...
```

```
template<typename In , typename Out >
```

```
static Out toUtf32 (In begin, In end, Out output)  
Convert a UTF-8 characters range to UTF-32. More...
```

Detailed Description

```
template<>  
class sf::Utf< 8 >
```

Specialization of the [Utf](#) template for UTF-8.

Definition at line [48](#) of file [Utf.hpp](#).

Member Function Documentation

```
template<typename In >  
static std::size_t sf::Utf< 8 >::count ( In begin,  
                                         In end  
                                         )
```

Count the number of characters of a UTF-8 sequence.

This function is necessary for multi-elements encodings, as a single (storage element, thus the total size can be different from (begin - end).

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence

Returns

Iterator pointing to one past the last read element of the input sequence

```
template<typename In >  
static In sf::Utf< 8 >::decode ( In begin,  
                                In end,  
                                Uint32 & output,  
                                Uint32 replacement = 0  
                                )
```

Decode a single UTF-8 character.

Decoding a character means finding its unique 32-bits code (called standard).

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Codepoint of the decoded UTF-8 character
replacement Replacement character to use in case the UTF-8 sequence is not valid

Returns

Iterator pointing to one past the last read element of the input sequence

```
template<typename Out >
```

```
static Out sf::Utf< 8 >::encode ( Uint32 input,  
                                Out output,  
                                Uint8 replacement = 0  
                                )
```

Encode a single UTF-8 character.

Encoding a character means converting a unique 32-bits code (called codepoint) to its UTF-8 encoding, UTF-8.

Parameters

input Codepoint to encode as UTF-8
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to UTF-8 (usually a question mark)

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 8 >::fromAnsi ( In          begin,  
                                   In          end,  
                                   Out        output,  
                                   const std::locale & locale = std::locale() )
```

Convert an ANSI characters range to UTF-8.

The current global locale will be used by default, unless you pass a custom locale.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence
- locale** Locale to use for conversion

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 8 >::fromLatin1 ( In  begin,  
                                     In  end,  
                                     Out output  
                                     )
```

Convert a latin-1 (ISO-5589-1) characters range to UTF-8.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >  
static Out sf::Utf< 8 >::fromWide ( In  begin,  
                                   In  end,  
                                   Out  output  
                                   )
```

Convert a wide characters range to UTF-8.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In >  
static In sf::Utf< 8 >::next ( In  begin,  
                             In  end  
                             )
```

Advance to the next UTF-8 character.

This function is necessary for multi-elements encodings, as a single (storage element.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence

Returns

Iterator pointing to one past the last read element of the input sequence

```
template<typename In , typename Out >
static Out sf::Utf< 8 >::toAnsi ( In          begin,
                                In          end,
                                Out         output,
                                char        replacement = 0,
                                const std::locale & locale = std::locale()
                                )
```

Convert an UTF-8 characters range to ANSI characters.

The current global locale will be used by default, unless you pass a custom locale.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to ANSI (UTF-8 to ANSI)
locale Locale to use for conversion

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
static Out sf::Utf< 8 >::toLatin1 ( In  begin,
                                   In  end,
```

```
Out output,  
char replacement = 0  
)
```

Convert an UTF-8 characters range to latin-1 (ISO-5589-1) characters.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to wide (u

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
```

```
static Out sf::Utf< 8 >::toUtf16 ( In begin,  
In end,  
Out output  
)
```

Convert a UTF-8 characters range to UTF-16.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
static Out sf::Utf< 8 >::toUtf32 ( In  begin,
                                   In  end,
                                   Out output
                                   )
```

Convert a UTF-8 characters range to UTF-32.

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
static Out sf::Utf< 8 >::toUtf8 ( In  begin,
                                   In  end,
                                   Out output
                                   )
```

Convert a UTF-8 characters range to UTF-8.

This functions does nothing more than a direct copy; it is defined only in other specializations of the sf::Utf<> template, and allow generic code to

Parameters

- begin** Iterator pointing to the beginning of the input sequence
- end** Iterator pointing to the end of the input sequence
- output** Iterator pointing to the beginning of the output sequence

Returns

Iterator to the end of the output sequence which has been written

```
template<typename In , typename Out >
static Out sf::Utf< 8 >::toWide ( In      begin,
                                In      end,
                                Out      output,
                                wchar_t replacement = 0
                                )
```

Convert an UTF-8 characters range to wide characters.

Parameters

begin Iterator pointing to the beginning of the input sequence
end Iterator pointing to the end of the input sequence
output Iterator pointing to the beginning of the output sequence
replacement Replacement for characters not convertible to wide (u

Returns

Iterator to the end of the output sequence which has been written

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Class Hierarchy

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

▼  <code>sf::AIResource</code>	Base class for classes that
 <code>sf::SoundBuffer</code>	Storage for audio samples c
▶  <code>sf::SoundRecorder</code>	Abstract base class for capt
▶  <code>sf::SoundSource</code>	Base class defining a sound
 <code>sf::BlendMode</code>	Blending modes for drawing
 <code>sf::SoundStream::Chunk</code>	Structure defining a chunk c
 <code>sf::Clock</code>	Utility class that measures t
 <code>sf::Color</code>	Utility class for manipulating
 <code>sf::ContextSettings</code>	Structure defining the settin attached to a window
 <code>sf::Shader::CurrentTextureType</code>	Special type that can be pas represents the texture of the
▼  <code>sf::Drawable</code>	Abstract base class for obje target
▶  <code>sf::Shape</code>	Base class for textured sha

 sf::Sprite	Drawable representation of transformations, color, etc
 sf::Text	Graphical text that can be d
 sf::VertexArray	Define a set of one or more
 sf::Event	Defines a system event and
 sf::Font	Class for loading and manip
▼  sf::GlResource	Base class for classes that i
 sf::Context	Class holding a valid drawir
 sf::Shader	Shader class (vertex, geom
 sf::Texture	Image living on the graphics drawing
▶  sf::Window	Window that serves as a ta
 sf::Glyph	Structure describing a glyph
 sf::Joystick::Identification	Structure holding a joystick'
 sf::Image	Class for loading, manipulat
 sf::SoundFileReader::Info	Structure holding the audio
 sf::Font::Info	Holds various information al
▼  sf::InputStream	Abstract class for custom fil
 sf::FileInputStream	Implementation of input stre
 sf::MemoryInputStream	Implementation of input stre
 sf::IpAddress	Encapsulate an IPv4 netwo
 sf::Joystick	Give access to the real-time
 sf::Event::JoystickButtonEvent	Joystick buttons events par (JoystickButtonReleased)
 sf::Event::JoystickConnectEvent	Joystick connection events (JoystickDisconnected)
 sf::Event::JoystickMoveEvent	Joystick axis move event pa

📄 sf::Keyboard	Give access to the real-time
📄 sf::Event::KeyEvent	Keyboard event parameters
📄 sf::Listener	The audio listener is the point where the sounds are heard
📄 sf::Mouse	Give access to the real-time
📄 sf::Event::MouseButtonEvent	Mouse buttons events parameters (MouseButtonReleased)
📄 sf::Event::MouseMoveEvent	Mouse move event parameters
📄 sf::Event::MouseWheelEvent	Mouse wheel events parameters
📄 sf::Event::MouseWheelScrollEvent	Mouse wheel events parameters
▼ 📄 sf::NonCopyable	Utility class that makes any
📄 sf::Context	Class holding a valid draw
📄 sf::FileInputStream	Implementation of input stream
📄 sf::Ftp	A FTP client
📄 sf::GResource::TransientContextLock	RAII helper class to temporarily use
📄 sf::Http	A HTTP client
📄 sf::InputSoundFile	Provide read access to sound
📄 sf::Lock	Automatic wrapper for locking
📄 sf::Mutex	Blocks concurrent access to threads
📄 sf::OutputSoundFile	Provide write access to sound
▶ 📄 sf::RenderTarget	Base class for all render targets
📄 sf::Shader	Shader class (vertex, geometry)
▶ 📄 sf::Socket	Base class for all the socket
📄 sf::Thread	Utility class to manipulate threads
▶ 📄 sf::ThreadLocal	Defines variables with thread

 sf::Window	Window that serves as a tai
 sf::Packet	Utility class to build blocks c network
 sf::Rect< T >	Utility class for manipulating
 sf::Rect< float >	
 sf::Rect< int >	
 sf::RenderStates	Define the states used for d
 sf::Http::Request	Define a HTTP request
▼  sf::Ftp::Response	Define a FTP response
 sf::Ftp::DirectoryResponse	Specialization of FTP respo
 sf::Ftp::ListingResponse	Specialization of FTP respo
 sf::Http::Response	Define a HTTP response
 sf::Sensor	Give access to the real-time
 sf::Event::SensorEvent	Sensor event parameters (S
 sf::Event::SizeEvent	Size events parameters (Re
 sf::SocketSelector	Multiplexer that allows to re
 sf::SoundFileFactory	Manages and instantiates s
 sf::SoundFileReader	Abstract base class for sour
 sf::SoundFileWriter	Abstract base class for sour
 sf::String	Utility string class that autor between types and encodin
 sf::Event::TextEvent	Text event parameters (Tex
 sf::Time	Represents a time value
 sf::Touch	Give access to the real-time
 sf::Event::TouchEvent	Touch events parameters (T TouchEnded)
 sf::Transform	Define a 3x3 transform mati

▼  sf::Transformable	Decomposed transform definition and a scale
 sf::Shape	Base class for textured shapes
 sf::Sprite	Drawable representation of transformations, color, etc
 sf::Text	Graphical text that can be drawn
 sf::Utf< N >	Utility class providing general utilities
 sf::Utf< 16 >	Specialization of the Utf template
 sf::Utf< 32 >	Specialization of the Utf template
 sf::Utf< 8 >	Specialization of the Utf template
 sf::Vector2< T >	Utility template class for mathematical operations
 sf::Vector2< float >	
 sf::Vector2< unsigned int >	
 sf::Vector3< T >	Utility template class for mathematical operations
 sf::Vertex	Define a point with color and texture coordinates
 sf::VideoMode	VideoMode defines a video mode
 sf::View	2D camera that defines what is visible

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- [antialiasingLevel](#) : [sf::ContextSettings](#)

- Any : sf::IpAddress
- AnyPort : sf::Socket
- append() : sf::Packet , sf::VertexArray
- Ascii : sf::Ftp
- asMicroseconds() : sf::Time
- asMilliseconds() : sf::Time
- asSeconds() : sf::Time
- Attribute : sf::ContextSettings
- attributeFlags : sf::ContextSettings
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- AxisCount : sf::Joystick

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- [BadCommandSequence](#) : [sf::Ftp::Response](#)
- [BadGateway](#) : [sf::Http::Response](#)
- [BadRequest](#) : [sf::Http::Response](#)
- [begin\(\)](#) : [sf::String](#)
- [Binary](#) : [sf::Ftp](#)
- [bind\(\)](#) : [sf::Shader](#) , [sf::Texture](#) , [sf::UdpSocket](#)
- [bitsPerPixel](#) : [sf::VideoMode](#)
- [Black](#) : [sf::Color](#)
- [BlendMode\(\)](#) : [sf::BlendMode](#)
- [blendMode](#) : [sf::RenderStates](#)

- Blue : `sf::Color`
- Bold : `sf::Text`
- bounds : `sf::Glyph`
- Broadcast : `sf::IpAddress`
- button : `sf::Event::JoystickButtonEvent` , `sf::Event::MouseButtonEvent`
- Button : `sf::Mouse`
- ButtonCount : `sf::Joystick` , `sf::Mouse`

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- C -

- [C](#) : [sf::Keyboard](#)
- [capture\(\)](#) : [sf::RenderWindow](#)
- [changeDirectory\(\)](#) : [sf::Ftp](#)
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- colorDstFactor : sf::BlendMode
- colorEquation : sf::BlendMode
- colorSrcFactor : sf::BlendMode
- combine() : sf::Transform
- Comma : sf::Keyboard
- CommandNotImplemented : sf::Ftp::Response
- CommandUnknown : sf::Ftp::Response
- connect() : sf::Ftp , sf::TcpSocket
- ConnectionClosed : sf::Ftp::Response
- ConnectionFailed : sf::Ftp::Response , sf::Http::Response
- ConstIterator : sf::String
- contains() : sf::Rect< T >
- Context() : sf::Context
- ContextSettings() : sf::ContextSettings
- control : sf::Event::KeyEvent
- ConvexShape() : sf::ConvexShape
- CoordinateType : sf::Texture
- copy() : sf::Image
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- Core : sf::ContextSettings
- Count : sf::Event , sf::Joystick , sf::Sensor
- count() : sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- create() : sf::Image , sf::RenderTexture , sf::Socket , sf::Texture , sf::W
- Created : sf::Http::Response
- createDirectory() : sf::Ftp
- createMaskFromColor() : sf::Image

- `createReaderFromFilename()` : `sf::SoundFileFactory`
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- `CurrentTexture` : `sf::Shader`
- `Cyan` : `sf::Color`

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- [D](#) : [sf::Keyboard](#)
- [Dash](#) : [sf::Keyboard](#)
- [DataConnectionAlreadyOpened](#) : [sf::Ftp::Response](#)
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- [Debug](#) : [sf::ContextSettings](#)
- [decode\(\)](#) : [sf::Utf< 16 >](#) , [sf::Utf< 32 >](#) , [sf::Utf< 8 >](#)
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- [Default](#) : [sf::ContextSettings](#) , [sf::RenderStates](#)
- [Delete](#) : [sf::Http::Request](#) , [sf::Keyboard](#)
- [deleteDirectory\(\)](#) : [sf::Ftp](#)
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- [delta](#) : [sf::Event::MouseWheelEvent](#) , [sf::Event::MouseWheelScrollEve](#)

- `depthBits` : `sf::ContextSettings`
- `DirectoryOk` : `sf::Ftp::Response`
- `DirectoryResponse()` : `sf::Ftp::DirectoryResponse`
- `DirectoryStatus` : `sf::Ftp::Response`
- `disconnect()` : `sf::Ftp` , `sf::TcpSocket`
- `Disconnected` : `sf::Socket`
- `display()` : `sf::RenderTexture` , `sf::Window`
- `Divide` : `sf::Keyboard`
- `Done` : `sf::Socket`
- `Down` : `sf::Keyboard`
- `download()` : `sf::Ftp`
- `draw()` : `sf::Drawable` , `sf::RenderTarget`
- `DstAlpha` : `sf::BlendMode`
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- Escape : `sf::Keyboard`
- EventType : `sf::Event`

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- F8 : sf::Keyboard
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- Factor : sf::BlendMode
- family : sf::Font::Info
- FileActionAborted : sf::Ftp::Response
- FileActionOk : sf::Ftp::Response
- FileInputStream() : sf::FileInputStream
- FilenameNotAllowed : sf::Ftp::Response
- FileStatus : sf::Ftp::Response
- FileUnavailable : sf::Ftp::Response
- find() : sf::String
- findCharacterPos() : sf::Text
- finger : sf::Event::TouchEvent
- flipHorizontally() : sf::Image
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- Font() : sf::Font
- Forbidden : sf::Http::Response
- Fragment : sf::Shader
- fromAnsi() : sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
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- fromUtf16() : sf::String
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- [G](#) : [sf::Keyboard](#)
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- `getButtonCount()` : `sf::Joystick`
- `getCenter()` : `sf::View`
- `getChannelCount()` : `sf::InputSoundFile` , `sf::SoundBuffer` , `sf::SoundR`
- `getCharacterSize()` : `sf::Text`
- `getColor()` : `sf::Sprite` , `sf::Text`
- `getData()` : `sf::Packet` , `sf::String`
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- `getDefaultDevice()` : `sf::SoundRecorder`
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- `getDirectory()` : `sf::Ftp::DirectoryResponse`
- `getDirectoryListing()` : `sf::Ftp`
- `getDuration()` : `sf::InputSoundFile` , `sf::Music` , `sf::SoundBuffer`
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- `getFillColor()` : `sf::Shape` , `sf::Text`
- `getFont()` : `sf::Text`
- `getFullscreenModes()` : `sf::VideoMode`
- `getFunction()` : `sf::Context`
- `getGlobalBounds()` : `sf::Shape` , `sf::Sprite` , `sf::Text`
- `getGlobalVolume()` : `sf::Listener`
- `getGlyph()` : `sf::Font`
- `getHandle()` : `sf::Socket`
- `getIdentification()` : `sf::Joystick`

- getInfo() : sf::Font
- getInverse() : sf::Transform
- getInverseTransform() : sf::Transformable , sf::View
- getKerning() : sf::Font
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- getListing() : sf::Ftp::ListingResponse
- getLocalAddress() : sf::IpAddress
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- getLocalPort() : sf::TcpListener , sf::TcpSocket , sf::UdpSocket
- getLoop() : sf::Sound , sf::SoundStream
- getMajorHttpVersion() : sf::Http::Response
- getMatrix() : sf::Transform
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- getNativeHandle() : sf::Shader , sf::Texture
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- getPixelsPtr() : sf::Image
- getPlayingOffset() : sf::Sound , sf::SoundStream
- getPoint() : sf::CircleShape , sf::ConvexShape , sf::RectangleShape ,
- getPointCount() : sf::CircleShape , sf::ConvexShape , sf::RectangleSh

- getPosition() : sf::Listener , sf::Mouse , sf::SoundSource , sf::Touch , s
- getPrimitiveType() : sf::VertexArray
- getPublicAddress() : sf::IpAddress
- getRadius() : sf::CircleShape
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- getRotation() : sf::Transformable , sf::View
- getSampleCount() : sf::InputSoundFile , sf::SoundBuffer
- getSampleRate() : sf::InputSoundFile , sf::SoundBuffer , sf::SoundRec
- getSamples() : sf::SoundBuffer
- getScale() : sf::Transformable
- getSettings() : sf::Context , sf::Window
- getSize() : sf::FileInputStream , sf::Image , sf::InputStream , sf::Memo
sf::RectangleShape , sf::RenderTarget , sf::RenderTexture , sf::Rende
, sf::View , sf::Window
- getStatus() : sf::Ftp::Response , sf::Http::Response , sf::Sound , sf::St
- getString() : sf::Text
- getStyle() : sf::Text
- getSystemHandle() : sf::Window
- getTexture() : sf::Font , sf::RenderTexture , sf::Shape , sf::Sprite
- getTextureRect() : sf::Shape , sf::Sprite
- getTransform() : sf::Transformable , sf::View
- getUnderlinePosition() : sf::Font
- getUnderlineThickness() : sf::Font
- getUpVector() : sf::Listener
- getValue() : sf::Sensor , sf::ThreadLocal
- getVertexCount() : sf::VertexArray

- `getView()` : `sf::RenderTarget`
- `getViewport()` : `sf::RenderTarget` , `sf::View`
- `getVolume()` : `sf::SoundSource`
- `getWorkingDirectory()` : `sf::Ftp`
- `GLResource()` : `sf::GLResource`
- `Glyph()` : `sf::Glyph`
- `Gravity` : `sf::Sensor`
- `Green` : `sf::Color`
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- [I](#) : [sf::Keyboard](#)
- [Identity](#) : [sf::Transform](#)
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- [initialize\(\)](#) : [sf::RenderTarget](#) , [sf::SoundStream](#)
- [InputSoundFile\(\)](#) : [sf::InputSoundFile](#)
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- `isAvailable()` : `sf::Sensor` , `sf::Shader` , `sf::SoundRecorder`
- `isBlocking()` : `sf::Socket`
- `isButtonPressed()` : `sf::Joystick` , `sf::Mouse`
- `isConnected()` : `sf::Joystick`
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- `isEmpty()` : `sf::String`
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- `isKeyPressed()` : `sf::Keyboard`
- `isOk()` : `sf::Ftp::Response`
- `isOpen()` : `sf::Window`
- `isReady()` : `sf::SocketSelector`
- `isRelativeToListener()` : `sf::SoundSource`
- `isRepeated()` : `sf::RenderTexture` , `sf::Texture`
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- `isSrgb()` : `sf::Texture`
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- j -

- [J](#) : `sf::Keyboard`
- `joystickButton` : `sf::Event`
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- `JoystickButtonReleased` : `sf::Event`
- `joystickConnect` : `sf::Event`
- `JoystickConnected` : `sf::Event`
- `JoystickDisconnected` : `sf::Event`
- `joystickId` : `sf::Event::JoystickButtonEvent` , `sf::Event::JoystickConnect`
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- [key](#) : [sf::Event](#)
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- LocalError : sf::Ftp::Response
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- `minorVersion` : `sf::ContextSettings`
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- `mouseMove` : `sf::Event`
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- `move()` : `sf::Transformable` , `sf::View`
- `MovedPermanently` : `sf::Http::Response`
- `MovedTemporarily` : `sf::Http::Response`
- `MultipleChoices` : `sf::Http::Response`
- `Multiply` : `sf::Keyboard`
- `Music()` : `sf::Music`
- `Mutex()` : `sf::Mutex`

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Here is a list of all documented class members with links to the class docu

- n -

- [N](#) : [sf::Keyboard](#)
- [name](#) : [sf::Joystick::Identification](#)
- [NeedAccountToLogIn](#) : [sf::Ftp::Response](#)
- [NeedAccountToStore](#) : [sf::Ftp::Response](#)
- [NeedInformation](#) : [sf::Ftp::Response](#)
- [NeedPassword](#) : [sf::Ftp::Response](#)
- [next\(\)](#) : [sf::Utf< 16 >](#) , [sf::Utf< 32 >](#) , [sf::Utf< 8 >](#)
- [NoContent](#) : [sf::Http::Response](#)
- [NonCopyable\(\)](#) : [sf::NonCopyable](#)
- [None](#) : [sf::IpAddress](#)
- [Normalized](#) : [sf::Texture](#)
- [NotEnoughMemory](#) : [sf::Ftp::Response](#)
- [NotFound](#) : [sf::Http::Response](#)
- [NotImplemented](#) : [sf::Http::Response](#)

- NotLoggedIn : sf::Ftp::Response
- NotModified : sf::Http::Response
- NotReady : sf::Socket
- Num0 : sf::Keyboard
- Num1 : sf::Keyboard
- Num2 : sf::Keyboard
- Num3 : sf::Keyboard
- Num4 : sf::Keyboard
- Num5 : sf::Keyboard
- Num6 : sf::Keyboard
- Num7 : sf::Keyboard
- Num8 : sf::Keyboard
- Num9 : sf::Keyboard
- Numpad0 : sf::Keyboard
- Numpad1 : sf::Keyboard
- Numpad2 : sf::Keyboard
- Numpad3 : sf::Keyboard
- Numpad4 : sf::Keyboard
- Numpad5 : sf::Keyboard
- Numpad6 : sf::Keyboard
- Numpad7 : sf::Keyboard
- Numpad8 : sf::Keyboard
- Numpad9 : sf::Keyboard

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Here is a list of all documented class members with links to the class docu

- O -

- [O](#) : [sf::Keyboard](#)
- [Ok](#) : [sf::Ftp::Response](#) , [sf::Http::Response](#)
- [onCreate\(\)](#) : [sf::RenderWindow](#) , [sf::Window](#)
- [One](#) : [sf::BlendMode](#)
- [OneMinusDstAlpha](#) : [sf::BlendMode](#)
- [OneMinusDstColor](#) : [sf::BlendMode](#)
- [OneMinusSrcAlpha](#) : [sf::BlendMode](#)
- [OneMinusSrcColor](#) : [sf::BlendMode](#)
- [onGetData\(\)](#) : [sf::Music](#) , [sf::SoundStream](#)
- [onProcessSamples\(\)](#) : [sf::SoundBufferRecorder](#) , [sf::SoundRecorder](#)
- [onReceive\(\)](#) : [sf::Packet](#)
- [onResize\(\)](#) : [sf::RenderWindow](#) , [sf::Window](#)
- [onSeek\(\)](#) : [sf::Music](#) , [sf::SoundStream](#)
- [onSend\(\)](#) : [sf::Packet](#)

- onStart() : sf::SoundBufferRecorder , sf::SoundRecorder
- onStop() : sf::SoundBufferRecorder , sf::SoundRecorder
- open() : sf::FileInputStream , sf::MemoryInputStream , sf::SoundFileR
- openForWriting() : sf::InputSoundFile
- openFromFile() : sf::InputSoundFile , sf::Music , sf::OutputSoundFile
- openFromMemory() : sf::InputSoundFile , sf::Music
- openFromStream() : sf::InputSoundFile , sf::Music
- OpeningDataConnection : sf::Ftp::Response
- operator BoolType() : sf::Packet
- operator std::string() : sf::String
- operator std::wstring() : sf::String
- operator T *() : sf::ThreadLocalPtr< T >
- operator!=() : sf::BlendMode , sf::Color , sf::Rect< T > , sf::String , sf::sf::Vector3< T > , sf::VideoMode
- operator%() : sf::Time
- operator%=() : sf::Time
- operator*() : sf::Color , sf::ThreadLocalPtr< T > , sf::Time , sf::Transform sf::Vector3< T >
- operator*=() : sf::Color , sf::Time , sf::Transform , sf::Vector2< T > , sf::
- operator+() : sf::Color , sf::String , sf::Time , sf::Vector2< T > , sf::Vect
- operator+=() : sf::Color , sf::String , sf::Time , sf::Vector2< T > , sf::Ve
- operator-() : sf::Color , sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator-=() : sf::Color , sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator->() : sf::ThreadLocalPtr< T >
- operator/() : sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator/=() : sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator< : sf::IpAddress , sf::String , sf::Time , sf::VideoMode

- `operator<<()` : `sf::Packet`
- `operator<=()` : `sf::String` , `sf::Time` , `sf::VideoMode`
- `operator=()` : `sf::Font` , `sf::SocketSelector` , `sf::Sound` , `sf::SoundBuffer`
`sf::Texture` , `sf::ThreadLocalPtr< T >`
- `operator==()` : `sf::BlendMode` , `sf::Color` , `sf::Rect< T >` , `sf::String` , `sf::Vector3< T >` , `sf::VideoMode`
- `operator>()` : `sf::String` , `sf::Time` , `sf::VideoMode`
- `operator>=()` : `sf::String` , `sf::Time` , `sf::VideoMode`
- `operator>>()` : `sf::Packet`
- `operator[]()` : `sf::String` , `sf::VertexArray`
- `Orientation` : `sf::Sensor`
- `OutputSoundFile()` : `sf::OutputSoundFile`

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- p -

- [P](#) : [sf::Keyboard](#)
- [Packet\(\)](#) : [sf::Packet](#)
- [PageDown](#) : [sf::Keyboard](#)
- [PageTypeUnknown](#) : [sf::Ftp::Response](#)
- [PageUp](#) : [sf::Keyboard](#)
- [ParameterNotImplemented](#) : [sf::Ftp::Response](#)
- [ParametersUnknown](#) : [sf::Ftp::Response](#)
- [parentDirectory\(\)](#) : [sf::Ftp](#)
- [Partial](#) : [sf::Socket](#)
- [PartialContent](#) : [sf::Http::Response](#)
- [Pause](#) : [sf::Keyboard](#)
- [pause\(\)](#) : [sf::Sound](#) , [sf::SoundStream](#)
- [Paused](#) : [sf::SoundSource](#)
- [Period](#) : [sf::Keyboard](#)

- Pixels : sf::Texture
- play() : sf::Sound , sf::SoundStream
- Playing : sf::SoundSource
- PointlessCommand : sf::Ftp::Response
- pollEvent() : sf::Window
- popGLStates() : sf::RenderTarget
- position : sf::Event::JoystickMoveEvent , sf::Vertex
- Post : sf::Http::Request
- PovX : sf::Joystick
- PovY : sf::Joystick
- productId : sf::Joystick::Identification
- pushGLStates() : sf::RenderTarget
- Put : sf::Http::Request

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- q -

- [Q](#) : [sf::Keyboard](#)
- [Quote](#) : [sf::Keyboard](#)

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- r -

- [r](#) : [sf::Color](#)
- [R](#) : [sf::Joystick](#) , [sf::Keyboard](#)
- [RAlt](#) : [sf::Keyboard](#)
- [RangeNotSatisfiable](#) : [sf::Http::Response](#)
- [RBracket](#) : [sf::Keyboard](#)
- [RControl](#) : [sf::Keyboard](#)
- [read\(\)](#) : [sf::FileInputStream](#) , [sf::InputSoundFile](#) , [sf::InputStream](#) , [sf::SoundFileReader](#)
- [receive\(\)](#) : [sf::TcpSocket](#) , [sf::UdpSocket](#)
- [Rect\(\)](#) : [sf::Rect< T >](#)
- [RectangleShape\(\)](#) : [sf::RectangleShape](#)
- [Red](#) : [sf::Color](#)
- [registerReader\(\)](#) : [sf::SoundFileFactory](#)
- [registerWriter\(\)](#) : [sf::SoundFileFactory](#)

- Regular : sf::Text
 - remove() : sf::SocketSelector
 - renameFile() : sf::Ftp
 - RenderStates() : sf::RenderStates
 - RenderTarget() : sf::RenderTarget
 - RenderTexture() : sf::RenderTexture
 - RenderWindow() : sf::RenderWindow
 - replace() : sf::String
 - Request() : sf::Http::Request
 - requestFocus() : sf::Window
 - reset() : sf::View
 - resetBuffer() : sf::Sound
 - ResetContent : sf::Http::Response
 - resetGLStates() : sf::RenderTarget
 - resize() : sf::VertexArray
 - Resized : sf::Event
 - Response() : sf::Ftp::Response , sf::Http::Response
 - restart() : sf::Clock
 - RestartMarkerReply : sf::Ftp::Response
 - Return : sf::Keyboard
 - ReverseSubtract : sf::BlendMode
 - Right : sf::Keyboard , sf::Mouse
 - rotate() : sf::Transform , sf::Transformable , sf::View
 - RShift : sf::Keyboard
 - RSystem : sf::Keyboard
-

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- S -

- [S](#) : [sf::Keyboard](#)
- [sampleCount](#) : [sf::SoundFileReader::Info](#) , [sf::SoundStream::Chunk](#)
- [sampleRate](#) : [sf::SoundFileReader::Info](#)
- [samples](#) : [sf::SoundStream::Chunk](#)
- [saveToFile\(\)](#) : [sf::Image](#) , [sf::SoundBuffer](#)
- [scale\(\)](#) : [sf::Transform](#) , [sf::Transformable](#)
- [seconds\(\)](#) : [sf::Time](#)
- [seek\(\)](#) : [sf::FileInputStream](#) , [sf::InputSoundFile](#) , [sf::InputStream](#) , [sf::SoundFileReader](#)
- [SemiColon](#) : [sf::Keyboard](#)
- [send\(\)](#) : [sf::TcpSocket](#) , [sf::UdpSocket](#)
- [sendCommand\(\)](#) : [sf::Ftp](#)
- [sendRequest\(\)](#) : [sf::Http](#)
- [sensor](#) : [sf::Event](#)

- SensorChanged : sf::Event
- ServiceNotAvailable : sf::Http::Response
- ServiceReady : sf::Ftp::Response
- ServiceReadySoon : sf::Ftp::Response
- ServiceUnavailable : sf::Ftp::Response
- setActive() : sf::Context , sf::RenderTexture , sf::Window
- setAttenuation() : sf::SoundSource
- setBlocking() : sf::Socket
- setBody() : sf::Http::Request
- setBuffer() : sf::Sound
- setCenter() : sf::View
- setChannelCount() : sf::SoundRecorder
- setCharacterSize() : sf::Text
- setColor() : sf::Sprite , sf::Text
- setDevice() : sf::SoundRecorder
- setDirection() : sf::Listener
- setEnabled() : sf::Sensor
- setField() : sf::Http::Request
- setFillColor() : sf::Shape , sf::Text
- setFont() : sf::Text
- setFrameRateLimit() : sf::Window
- setGlobalVolume() : sf::Listener
- setHost() : sf::Http
- setHttpVersion() : sf::Http::Request
- setIcon() : sf::Window
- setJoystickThreshold() : sf::Window

- `setKeyRepeatEnabled()` : `sf::Window`
- `setLoop()` : `sf::Sound` , `sf::SoundStream`
- `setMethod()` : `sf::Http::Request`
- `setMinDistance()` : `sf::SoundSource`
- `setMouseCursorGrabbed()` : `sf::Window`
- `setMouseCursorVisible()` : `sf::Window`
- `setOrigin()` : `sf::Transformable`
- `setOutlineColor()` : `sf::Shape` , `sf::Text`
- `setOutlineThickness()` : `sf::Shape` , `sf::Text`
- `setParameter()` : `sf::Shader`
- `setPitch()` : `sf::SoundSource`
- `setPixel()` : `sf::Image`
- `setPlayingOffset()` : `sf::Sound` , `sf::SoundStream`
- `setPoint()` : `sf::ConvexShape`
- `setPointCount()` : `sf::CircleShape` , `sf::ConvexShape`
- `setPosition()` : `sf::Listener` , `sf::Mouse` , `sf::SoundSource` , `sf::Transformable`
- `setPrimitiveType()` : `sf::VertexArray`
- `setProcessingInterval()` : `sf::SoundRecorder`
- `setRadius()` : `sf::CircleShape`
- `setRelativeToListener()` : `sf::SoundSource`
- `setRepeated()` : `sf::RenderTexture` , `sf::Texture`
- `setRotation()` : `sf::Transformable` , `sf::View`
- `setScale()` : `sf::Transformable`
- `setSize()` : `sf::RectangleShape` , `sf::View` , `sf::Window`
- `setSmooth()` : `sf::RenderTexture` , `sf::Texture`
- `setSrgb()` : `sf::Texture`

- `setString()` : `sf::Text`
- `setStyle()` : `sf::Text`
- `setTexture()` : `sf::Shape` , `sf::Sprite`
- `setTextureRect()` : `sf::Shape` , `sf::Sprite`
- `setTitle()` : `sf::Window`
- `setUniform()` : `sf::Shader`
- `setUniformArray()` : `sf::Shader`
- `setUpVector()` : `sf::Listener`
- `setUri()` : `sf::Http::Request`
- `setValue()` : `sf::ThreadLocal`
- `setVerticalSyncEnabled()` : `sf::Window`
- `setView()` : `sf::RenderTarget`
- `setViewport()` : `sf::View`
- `setVirtualKeyboardVisible()` : `sf::Keyboard`
- `setVisible()` : `sf::Window`
- `setVolume()` : `sf::SoundSource`
- `shader` : `sf::RenderStates`
- `Shader()` : `sf::Shader`
- `Shape()` : `sf::Shape`
- `shift` : `sf::Event::KeyEvent`
- `size` : `sf::Event`
- `Slash` : `sf::Keyboard`
- `Socket()` : `sf::Socket`
- `SocketSelector()` : `sf::SocketSelector`
- `Sound()` : `sf::Sound`
- `SoundBuffer()` : `sf::SoundBuffer`

- `SoundRecorder()` : `sf::SoundRecorder`
- `SoundSource()` : `sf::SoundSource`
- `SoundStream()` : `sf::SoundStream`
- `Space` : `sf::Keyboard`
- `Sprite()` : `sf::Sprite`
- `SrcAlpha` : `sf::BlendMode`
- `SrcColor` : `sf::BlendMode`
- `sRgbCapable` : `sf::ContextSettings`
- `start()` : `sf::SoundRecorder`
- `Status` : `sf::Ftp::Response` , `sf::Http::Response` , `sf::Socket` , `sf::Sound`
- `stencilBits` : `sf::ContextSettings`
- `stop()` : `sf::Sound` , `sf::SoundRecorder` , `sf::SoundStream`
- `Stopped` : `sf::SoundSource`
- `StrikeThrough` : `sf::Text`
- `String()` : `sf::String`
- `Style` : `sf::Text`
- `substring()` : `sf::String`
- `Subtract` : `sf::BlendMode` , `sf::Keyboard`
- `system` : `sf::Event::KeyEvent`
- `SystemStatus` : `sf::Ftp::Response`
- `SystemType` : `sf::Ftp::Response`

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- t -

- [T](#) : [sf::Keyboard](#)
- [Tab](#) : [sf::Keyboard](#)
- [Tcp](#) : [sf::Socket](#)
- [TcpListener\(\)](#) : [sf::TcpListener](#)
- [TcpSocket\(\)](#) : [sf::TcpSocket](#)
- [tell\(\)](#) : [sf::FileInputStream](#) , [sf::InputStream](#) , [sf::MemoryInputStream](#)
- [terminate\(\)](#) : [sf::Thread](#)
- [texCoords](#) : [sf::Vertex](#)
- [text](#) : [sf::Event](#)
- [Text\(\)](#) : [sf::Text](#)
- [TextEntered](#) : [sf::Event](#)
- [texture](#) : [sf::RenderStates](#)
- [Texture\(\)](#) : [sf::Texture](#)
- [textureRect](#) : [sf::Glyph](#)

- Thread() : sf::Thread
- ThreadLocal() : sf::ThreadLocal
- ThreadLocalPtr() : sf::ThreadLocalPtr< T >
- Tilde : sf::Keyboard
- Time() : sf::Time
- toAnsi() : sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toAnsiString() : sf::String
- toInteger() : sf::Color , sf::IpAddress
- toLatin1() : sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- top : sf::Rect< T >
- toString() : sf::IpAddress
- touch : sf::Event
- TouchBegan : sf::Event
- TouchEnded : sf::Event
- TouchMoved : sf::Event
- toUtf16() : sf::String , sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toUtf32() : sf::String , sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toUtf8() : sf::String , sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toWide() : sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toWideString() : sf::String
- TransferAborted : sf::Ftp::Response
- TransferMode : sf::Ftp
- transform : sf::RenderStates
- Transform() : sf::Transform
- Transformable() : sf::Transformable
- transformPoint() : sf::Transform

- `transformRect()` : `sf::Transform`
- `TransientContextLock()` : `sf::GResource::TransientContextLock`
- `translate()` : `sf::Transform`
- `Transparent` : `sf::Color`
- `type` : `sf::Event::SensorEvent` , `sf::Event`
- `Type` : `sf::Sensor` , `sf::Shader` , `sf::Socket`

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- U -

- [U](#) : [sf::Joystick](#) , [sf::Keyboard](#)
- [Udp](#) : [sf::Socket](#)
- [UdpSocket\(\)](#) : [sf::UdpSocket](#)
- [Unauthorized](#) : [sf::Http::Response](#)
- [unbind\(\)](#) : [sf::UdpSocket](#)
- [Underlined](#) : [sf::Text](#)
- [unicode](#) : [sf::Event::TextEvent](#)
- [Unknown](#) : [sf::Keyboard](#)
- [unlock\(\)](#) : [sf::Mutex](#)
- [unregisterReader\(\)](#) : [sf::SoundFileFactory](#)
- [unregisterWriter\(\)](#) : [sf::SoundFileFactory](#)
- [Up](#) : [sf::Keyboard](#)
- [update\(\)](#) : [sf::Joystick](#) , [sf::Shape](#) , [sf::Texture](#)
- [upload\(\)](#) : [sf::Ftp](#)

- UserAcceleration : `sf::Sensor`

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- **V** -

- [V](#) : [sf::Joystick](#) , [sf::Keyboard](#)
- [Vector2\(\)](#) : [sf::Vector2< T >](#)
- [Vector3\(\)](#) : [sf::Vector3< T >](#)
- [vendorId](#) : [sf::Joystick::Identification](#)
- [VersionNotSupported](#) : [sf::Http::Response](#)
- [Vertex](#) : [sf::Shader](#) , [sf::Vertex](#)
- [VertexArray\(\)](#) : [sf::VertexArray](#)
- [VerticalWheel](#) : [sf::Mouse](#)
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- [View\(\)](#) : [sf::View](#)

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Here is a list of all documented class members with links to the class docu

- W -

- [W](#) : [sf::Keyboard](#)
- [wait\(\)](#) : [sf::SocketSelector](#) , [sf::Thread](#)
- [waitEvent\(\)](#) : [sf::Window](#)
- [wheel](#) : [sf::Event::MouseWheelScrollEvent](#)
- [Wheel](#) : [sf::Mouse](#)
- [White](#) : [sf::Color](#)
- [width](#) : [sf::Event::SizeEvent](#) , [sf::Rect< T >](#) , [sf::VideoMode](#)
- [Window\(\)](#) : [sf::Window](#)
- [write\(\)](#) : [sf::OutputSoundFile](#) , [sf::SoundFileWriter](#)

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- X -

- `x` : `sf::Event::MouseButtonEvent` , `sf::Event::MouseMoveEvent` , `sf::Event::MouseWheelScrollEvent` , `sf::Event::SensorEvent` , `sf::Event::TouchEvent`
- `X` : `sf::Joystick` , `sf::Keyboard`
- `x` : `sf::Vector2< T >` , `sf::Vector3< T >`
- `XButton1` : `sf::Mouse`
- `XButton2` : `sf::Mouse`

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Here is a list of all documented class members with links to the class docu

- y -

- `y` : `sf::Event::MouseButtonEvent` , `sf::Event::MouseMoveEvent` , `sf::Event::MouseWheelScrollEvent` , `sf::Event::SensorEvent` , `sf::Event::TouchEvent`
- `Y` : `sf::Joystick` , `sf::Keyboard`
- `y` : `sf::Vector2< T >` , `sf::Vector3< T >`
- `Yellow` : `sf::Color`

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- Z -

- `z : sf::Event::SensorEvent`
- `Z : sf::Joystick , sf::Keyboard`
- `z : sf::Vector3< T >`
- `Zero : sf::BlendMode , sf::Time`
- `zoom() : sf::View`

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- ~ -

- [~AIResource\(\)](#) : [sf::AIResource](#)
- [~Context\(\)](#) : [sf::Context](#)
- [~Drawable\(\)](#) : [sf::Drawable](#)
- [~FileInputStream\(\)](#) : [sf::FileInputStream](#)
- [~Font\(\)](#) : [sf::Font](#)
- [~Ftp\(\)](#) : [sf::Ftp](#)
- [~GResource\(\)](#) : [sf::GResource](#)
- [~Image\(\)](#) : [sf::Image](#)
- [~InputSoundFile\(\)](#) : [sf::InputSoundFile](#)
- [~InputStream\(\)](#) : [sf::InputStream](#)
- [~Lock\(\)](#) : [sf::Lock](#)
- [~Music\(\)](#) : [sf::Music](#)
- [~Mutex\(\)](#) : [sf::Mutex](#)
- [~OutputSoundFile\(\)](#) : [sf::OutputSoundFile](#)

- ~Packet() : sf::Packet
- ~RenderTarget() : sf::RenderTarget
- ~RenderTexture() : sf::RenderTexture
- ~RenderWindow() : sf::RenderWindow
- ~Shader() : sf::Shader
- ~Shape() : sf::Shape
- ~Socket() : sf::Socket
- ~SocketSelector() : sf::SocketSelector
- ~Sound() : sf::Sound
- ~SoundBuffer() : sf::SoundBuffer
- ~SoundBufferRecorder() : sf::SoundBufferRecorder
- ~SoundFileReader() : sf::SoundFileReader
- ~SoundFileWriter() : sf::SoundFileWriter
- ~SoundRecorder() : sf::SoundRecorder
- ~SoundSource() : sf::SoundSource
- ~SoundStream() : sf::SoundStream
- ~Texture() : sf::Texture
- ~Thread() : sf::Thread
- ~ThreadLocal() : sf::ThreadLocal
- ~Transformable() : sf::Transformable
- ~TransientContextLock() : sf::GlResource::TransientContextLock
- ~Window() : sf::Window

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- a -

- `accept()` : `sf::TcpListener`
- `add()` : `sf::SocketSelector`
- `AIResource()` : `sf::AIResource`
- `append()` : `sf::Packet` , `sf::VertexArray`
- `asMicroseconds()` : `sf::Time`
- `asMilliseconds()` : `sf::Time`
- `asSeconds()` : `sf::Time`

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- b -

- `begin()` : `sf::String`
- `bind()` : `sf::Shader` , `sf::Texture` , `sf::UdpSocket`
- `BlendMode()` : `sf::BlendMode`

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- C -

- `capture()` : `sf::RenderWindow`
- `changeDirectory()` : `sf::Ftp`
- `CircleShape()` : `sf::CircleShape`
- `clear()` : `sf::Packet` , `sf::RenderTarget` , `sf::SocketSelector` , `sf::String` ,
- `Clock()` : `sf::Clock`
- `close()` : `sf::Socket` , `sf::TcpListener` , `sf::Window`
- `Color()` : `sf::Color`
- `combine()` : `sf::Transform`
- `connect()` : `sf::Ftp` , `sf::TcpSocket`
- `contains()` : `sf::Rect< T >`
- `Context()` : `sf::Context`
- `ContextSettings()` : `sf::ContextSettings`
- `ConvexShape()` : `sf::ConvexShape`
- `copy()` : `sf::Image`

- `copyToImage()` : `sf::Texture`
- `count()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`
- `create()` : `sf::Image` , `sf::RenderTexture` , `sf::Socket` , `sf::Texture` , `sf::W`
- `createDirectory()` : `sf::Ftp`
- `createMaskFromColor()` : `sf::Image`
- `createReaderFromFilename()` : `sf::SoundFileFactory`
- `createReaderFromMemory()` : `sf::SoundFileFactory`
- `createReaderFromStream()` : `sf::SoundFileFactory`
- `createWriterFromFilename()` : `sf::SoundFileFactory`

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- d -

- `decode()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`
- `decodeAnsi()` : `sf::Utf< 32 >`
- `decodeWide()` : `sf::Utf< 32 >`
- `deleteDirectory()` : `sf::Ftp`
- `deleteFile()` : `sf::Ftp`
- `DirectoryResponse()` : `sf::Ftp::DirectoryResponse`
- `disconnect()` : `sf::Ftp` , `sf::TcpSocket`
- `display()` : `sf::RenderTexture` , `sf::Window`
- `download()` : `sf::Ftp`
- `draw()` : `sf::Drawable` , `sf::RenderTarget`

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- e -

- `encode()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`
- `encodeAnsi()` : `sf::Utf< 32 >`
- `encodeWide()` : `sf::Utf< 32 >`
- `end()` : `sf::String`
- `endOfPacket()` : `sf::Packet`
- `ensureGlContext()` : `sf::GlResource`
- `erase()` : `sf::String`

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- f -

- `FileInputStream()` : `sf::FileInputStream`
- `find()` : `sf::String`
- `findCharacterPos()` : `sf::Text`
- `flipHorizontally()` : `sf::Image`
- `flipVertically()` : `sf::Image`
- `Font()` : `sf::Font`
- `fromAnsi()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`
- `fromLatin1()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`
- `fromUtf16()` : `sf::String`
- `fromUtf32()` : `sf::String`
- `fromUtf8()` : `sf::String`
- `fromWide()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`

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- g -

- `generateMipmap()` : `sf::RenderTexture` , `sf::Texture`
- `getActiveContext()` : `sf::Context`
- `getAttenuation()` : `sf::SoundSource`
- `getAvailableDevices()` : `sf::SoundRecorder`
- `getAxisPosition()` : `sf::Joystick`
- `getBody()` : `sf::Http::Response`
- `getBounds()` : `sf::VertexArray`
- `getBuffer()` : `sf::Sound` , `sf::SoundBufferRecorder`
- `getButtonCount()` : `sf::Joystick`
- `getCenter()` : `sf::View`
- `getChannelCount()` : `sf::InputSoundFile` , `sf::SoundBuffer` , `sf::SoundR`
- `getCharacterSize()` : `sf::Text`
- `getColor()` : `sf::Sprite` , `sf::Text`
- `getData()` : `sf::Packet` , `sf::String`

- `getDataSize() : sf::Packet`
- `getDefaultDevice() : sf::SoundRecorder`
- `getDefaultView() : sf::RenderTarget`
- `getDesktopMode() : sf::VideoMode`
- `getDevice() : sf::SoundRecorder`
- `getDirection() : sf::Listener`
- `getDirectory() : sf::Ftp::DirectoryResponse`
- `getDirectoryListing() : sf::Ftp`
- `getDuration() : sf::InputSoundFile , sf::Music , sf::SoundBuffer`
- `getElapsedTime() : sf::Clock`
- `getField() : sf::Http::Response`
- `getFillColor() : sf::Shape , sf::Text`
- `getFont() : sf::Text`
- `getFullscreenModes() : sf::VideoMode`
- `getFunction() : sf::Context`
- `getGlobalBounds() : sf::Shape , sf::Sprite , sf::Text`
- `getGlobalVolume() : sf::Listener`
- `getGlyph() : sf::Font`
- `getHandle() : sf::Socket`
- `getIdentification() : sf::Joystick`
- `getInfo() : sf::Font`
- `getInverse() : sf::Transform`
- `getInverseTransform() : sf::Transformable , sf::View`
- `getKerning() : sf::Font`
- `getLineSpacing() : sf::Font`
- `getListing() : sf::Ftp::ListingResponse`

- `getLocalAddress()` : `sf::IpAddress`
- `getLocalBounds()` : `sf::Shape` , `sf::Sprite` , `sf::Text`
- `getLocalPort()` : `sf::TcpListener` , `sf::TcpSocket` , `sf::UdpSocket`
- `getLoop()` : `sf::Sound` , `sf::SoundStream`
- `getMajorHttpVersion()` : `sf::Http::Response`
- `getMatrix()` : `sf::Transform`
- `getMaximumSize()` : `sf::Texture`
- `getMessage()` : `sf::Ftp::Response`
- `getMinDistance()` : `sf::SoundSource`
- `getMinorHttpVersion()` : `sf::Http::Response`
- `getNativeHandle()` : `sf::Shader` , `sf::Texture`
- `getOrigin()` : `sf::Transformable`
- `getOutlineColor()` : `sf::Shape` , `sf::Text`
- `getOutlineThickness()` : `sf::Shape` , `sf::Text`
- `getPitch()` : `sf::SoundSource`
- `getPixel()` : `sf::Image`
- `getPixelsPtr()` : `sf::Image`
- `getPlayingOffset()` : `sf::Sound` , `sf::SoundStream`
- `getPoint()` : `sf::CircleShape` , `sf::ConvexShape` , `sf::RectangleShape` ,
- `getPointCount()` : `sf::CircleShape` , `sf::ConvexShape` , `sf::RectangleSh`
- `getPosition()` : `sf::Listener` , `sf::Mouse` , `sf::SoundSource` , `sf::Touch` , `s`
- `getPrimitiveType()` : `sf::VertexArray`
- `getPublicAddress()` : `sf::IpAddress`
- `getRadius()` : `sf::CircleShape`
- `getRemoteAddress()` : `sf::TcpSocket`
- `getRemotePort()` : `sf::TcpSocket`

- `getRotation()` : `sf::Transformable` , `sf::View`
- `getSampleCount()` : `sf::InputSoundFile` , `sf::SoundBuffer`
- `getSampleRate()` : `sf::InputSoundFile` , `sf::SoundBuffer` , `sf::SoundRecorder`
- `getSamples()` : `sf::SoundBuffer`
- `getScale()` : `sf::Transformable`
- `getSettings()` : `sf::Context` , `sf::Window`
- `getSize()` : `sf::FileInputStream` , `sf::Image` , `sf::InputStream` , `sf::MemoryInputStream` , `sf::RectangleShape` , `sf::RenderTarget` , `sf::RenderTexture` , `sf::RenderTarget` , `sf::View` , `sf::Window`
- `getStatus()` : `sf::Ftp::Response` , `sf::Http::Response` , `sf::Sound` , `sf::SoundRecorder`
- `getString()` : `sf::Text`
- `getStyle()` : `sf::Text`
- `getSystemHandle()` : `sf::Window`
- `getTexture()` : `sf::Font` , `sf::RenderTexture` , `sf::Shape` , `sf::Sprite`
- `getTextureRect()` : `sf::Shape` , `sf::Sprite`
- `getTransform()` : `sf::Transformable` , `sf::View`
- `getUnderlinePosition()` : `sf::Font`
- `getUnderlineThickness()` : `sf::Font`
- `getUpVector()` : `sf::Listener`
- `getValue()` : `sf::Sensor` , `sf::ThreadLocal`
- `getVertexCount()` : `sf::VertexArray`
- `getView()` : `sf::RenderTarget`
- `getViewport()` : `sf::RenderTarget` , `sf::View`
- `getVolume()` : `sf::SoundSource`
- `getWorkingDirectory()` : `sf::Ftp`
- `GLResource()` : `sf::GLResource`
- `Glyph()` : `sf::Glyph`

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- h -

- `hasAxis()` : `sf::Joystick`
- `hasFocus()` : `sf::Window`
- `Http()` : `sf::Http`

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- i -

- `Image()` : `sf::Image`
- `initialize()` : `sf::RenderTarget` , `sf::SoundStream`
- `InputSoundFile()` : `sf::InputSoundFile`
- `insert()` : `sf::String`
- `intersects()` : `sf::Rect< T >`
- `IpAddress()` : `sf::IpAddress`
- `isAvailable()` : `sf::Sensor` , `sf::Shader` , `sf::SoundRecorder`
- `isBlocking()` : `sf::Socket`
- `isButtonPressed()` : `sf::Joystick` , `sf::Mouse`
- `isConnected()` : `sf::Joystick`
- `isDown()` : `sf::Touch`
- `isEmpty()` : `sf::String`
- `isExtensionAvailable()` : `sf::Context`
- `isGeometryAvailable()` : `sf::Shader`

- `isKeyPressed()` : `sf::Keyboard`
- `isOk()` : `sf::Ftp::Response`
- `isOpen()` : `sf::Window`
- `isReady()` : `sf::SocketSelector`
- `isRelativeToListener()` : `sf::SoundSource`
- `isRepeated()` : `sf::RenderTexture` , `sf::Texture`
- `isSmooth()` : `sf::RenderTexture` , `sf::Texture`
- `isSrgb()` : `sf::Texture`
- `isValid()` : `sf::VideoMode`

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- k -

- `keepAlive()` : `sf::Ftp`

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- | -

- `launch()` : `sf::Thread`
- `listen()` : `sf::TcpListener`
- `ListingResponse()` : `sf::Ftp::ListingResponse`
- `loadFromFile()` : `sf::Font` , `sf::Image` , `sf::Shader` , `sf::SoundBuffer` , `sf::Texture`
- `loadFromImage()` : `sf::Texture`
- `loadFromMemory()` : `sf::Font` , `sf::Image` , `sf::Shader` , `sf::SoundBuffer`
- `loadFromSamples()` : `sf::SoundBuffer`
- `loadFromStream()` : `sf::Font` , `sf::Image` , `sf::Shader` , `sf::SoundBuffer`
- `Lock()` : `sf::Lock`
- `lock()` : `sf::Mutex`
- `login()` : `sf::Ftp`

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- m -

- `mapCoordsToPixel()` : `sf::RenderTarget`
- `mapPixelToCoords()` : `sf::RenderTarget`
- `MemoryInputStream()` : `sf::MemoryInputStream`
- `microseconds()` : `sf::Time`
- `milliseconds()` : `sf::Time`
- `move()` : `sf::Transformable` , `sf::View`
- `Music()` : `sf::Music`
- `Mutex()` : `sf::Mutex`

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- n -

- `next()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`
- `NonCopyable()` : `sf::NonCopyable`

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- 0 -

- `onCreate()` : `sf::RenderWindow` , `sf::Window`
- `onGetData()` : `sf::Music` , `sf::SoundStream`
- `onProcessSamples()` : `sf::SoundBufferRecorder` , `sf::SoundRecorder`
- `onReceive()` : `sf::Packet`
- `onResize()` : `sf::RenderWindow` , `sf::Window`
- `onSeek()` : `sf::Music` , `sf::SoundStream`
- `onSend()` : `sf::Packet`
- `onStart()` : `sf::SoundBufferRecorder` , `sf::SoundRecorder`
- `onStop()` : `sf::SoundBufferRecorder` , `sf::SoundRecorder`
- `open()` : `sf::FileInputStream` , `sf::MemoryInputStream` , `sf::SoundFileR`
- `openForWriting()` : `sf::InputSoundFile`
- `openFromFile()` : `sf::InputSoundFile` , `sf::Music` , `sf::OutputSoundFile`
- `openFromMemory()` : `sf::InputSoundFile` , `sf::Music`
- `openFromStream()` : `sf::InputSoundFile` , `sf::Music`

- operator BoolType() : sf::Packet
- operator std::string() : sf::String
- operator std::wstring() : sf::String
- operator T *() : sf::ThreadLocalPtr< T >
- operator !=() : sf::BlendMode , sf::Color , sf::Rect< T > , sf::String , sf::sf::Vector3< T > , sf::VideoMode
- operator %() : sf::Time
- operator %=() : sf::Time
- operator *() : sf::Color , sf::ThreadLocalPtr< T > , sf::Time , sf::Transform , sf::Vector3< T >
- operator * =() : sf::Color , sf::Time , sf::Transform , sf::Vector2< T > , sf::Vector3< T >
- operator +() : sf::Color , sf::String , sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator +=() : sf::Color , sf::String , sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator -() : sf::Color , sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator -=() : sf::Color , sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator ->() : sf::ThreadLocalPtr< T >
- operator /() : sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator /=() : sf::Time , sf::Vector2< T > , sf::Vector3< T >
- operator <() : sf::String , sf::Time , sf::VideoMode
- operator <<() : sf::Packet
- operator < =() : sf::String , sf::Time , sf::VideoMode
- operator =() : sf::Font , sf::SocketSelector , sf::Sound , sf::SoundBuffer , sf::Texture , sf::ThreadLocalPtr< T >
- operator ==() : sf::BlendMode , sf::Color , sf::Rect< T > , sf::String , sf::sf::Vector3< T > , sf::VideoMode
- operator >() : sf::String , sf::Time , sf::VideoMode
- operator > =() : sf::String , sf::Time , sf::VideoMode

- `operator>>()` : `sf::Packet`
- `operator[]()` : `sf::String` , `sf::VertexArray`
- `OutputSoundFile()` : `sf::OutputSoundFile`

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- p -

- `Packet()` : `sf::Packet`
- `parentDirectory()` : `sf::Ftp`
- `pause()` : `sf::Sound` , `sf::SoundStream`
- `play()` : `sf::Sound` , `sf::SoundStream`
- `pollEvent()` : `sf::Window`
- `popGLStates()` : `sf::RenderTarget`
- `pushGLStates()` : `sf::RenderTarget`

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- r -

- `read()` : `sf::FileInputStream` , `sf::InputSoundFile` , `sf::InputStream` , `sf::SoundFileReader`
- `receive()` : `sf::TcpSocket` , `sf::UdpSocket`
- `Rect()` : `sf::Rect< T >`
- `RectangleShape()` : `sf::RectangleShape`
- `registerReader()` : `sf::SoundFileFactory`
- `registerWriter()` : `sf::SoundFileFactory`
- `remove()` : `sf::SocketSelector`
- `renameFile()` : `sf::Ftp`
- `RenderStates()` : `sf::RenderStates`
- `RenderTarget()` : `sf::RenderTarget`
- `RenderTexture()` : `sf::RenderTexture`
- `RenderWindow()` : `sf::RenderWindow`
- `replace()` : `sf::String`

- Request() : sf::Http::Request
- requestFocus() : sf::Window
- reset() : sf::View
- resetBuffer() : sf::Sound
- resetGLStates() : sf::RenderTarget
- resize() : sf::VertexArray
- Response() : sf::Ftp::Response , sf::Http::Response
- restart() : sf::Clock
- rotate() : sf::Transform , sf::Transformable , sf::View

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- S -

- `saveToFile()` : `sf::Image` , `sf::SoundBuffer`
- `scale()` : `sf::Transform` , `sf::Transformable`
- `seconds()` : `sf::Time`
- `seek()` : `sf::FileInputStream` , `sf::InputSoundFile` , `sf::InputStream` , `sf::SoundFileReader`
- `send()` : `sf::TcpSocket` , `sf::UdpSocket`
- `sendCommand()` : `sf::Ftp`
- `sendRequest()` : `sf::Http`
- `setActive()` : `sf::Context` , `sf::RenderTexture` , `sf::Window`
- `setAttenuation()` : `sf::SoundSource`
- `setBlocking()` : `sf::Socket`
- `setBody()` : `sf::Http::Request`
- `setBuffer()` : `sf::Sound`
- `setCenter()` : `sf::View`

- `setChannelCount() : sf::SoundRecorder`
- `setCharacterSize() : sf::Text`
- `setColor() : sf::Sprite , sf::Text`
- `setDevice() : sf::SoundRecorder`
- `setDirection() : sf::Listener`
- `setEnabled() : sf::Sensor`
- `setField() : sf::Http::Request`
- `setFillColor() : sf::Shape , sf::Text`
- `setFont() : sf::Text`
- `setFramerateLimit() : sf::Window`
- `setGlobalVolume() : sf::Listener`
- `setHost() : sf::Http`
- `setHttpVersion() : sf::Http::Request`
- `setIcon() : sf::Window`
- `setJoystickThreshold() : sf::Window`
- `setKeyRepeatEnabled() : sf::Window`
- `setLoop() : sf::Sound , sf::SoundStream`
- `setMethod() : sf::Http::Request`
- `setMinDistance() : sf::SoundSource`
- `setMouseCursorGrabbed() : sf::Window`
- `setMouseCursorVisible() : sf::Window`
- `setOrigin() : sf::Transformable`
- `setOutlineColor() : sf::Shape , sf::Text`
- `setOutlineThickness() : sf::Shape , sf::Text`
- `setParameter() : sf::Shader`
- `setPitch() : sf::SoundSource`

- `setPixel()` : `sf::Image`
- `setPlayingOffset()` : `sf::Sound` , `sf::SoundStream`
- `setPoint()` : `sf::ConvexShape`
- `setPointCount()` : `sf::CircleShape` , `sf::ConvexShape`
- `setPosition()` : `sf::Listener` , `sf::Mouse` , `sf::SoundSource` , `sf::Transform`
- `setPrimitiveType()` : `sf::VertexArray`
- `setProcessingInterval()` : `sf::SoundRecorder`
- `setRadius()` : `sf::CircleShape`
- `setRelativeToListener()` : `sf::SoundSource`
- `setRepeated()` : `sf::RenderTexture` , `sf::Texture`
- `setRotation()` : `sf::Transformable` , `sf::View`
- `setScale()` : `sf::Transformable`
- `setSize()` : `sf::RectangleShape` , `sf::View` , `sf::Window`
- `setSmooth()` : `sf::RenderTexture` , `sf::Texture`
- `setSrgb()` : `sf::Texture`
- `setString()` : `sf::Text`
- `setStyle()` : `sf::Text`
- `setTexture()` : `sf::Shape` , `sf::Sprite`
- `setTextureRect()` : `sf::Shape` , `sf::Sprite`
- `setTitle()` : `sf::Window`
- `setUniform()` : `sf::Shader`
- `setUniformArray()` : `sf::Shader`
- `setUpVector()` : `sf::Listener`
- `setUri()` : `sf::Http::Request`
- `setValue()` : `sf::ThreadLocal`
- `setVerticalSyncEnabled()` : `sf::Window`

- `setView()` : `sf::RenderTarget`
- `setViewport()` : `sf::View`
- `setVirtualKeyboardVisible()` : `sf::Keyboard`
- `setVisible()` : `sf::Window`
- `setVolume()` : `sf::SoundSource`
- `Shader()` : `sf::Shader`
- `Shape()` : `sf::Shape`
- `Socket()` : `sf::Socket`
- `SocketSelector()` : `sf::SocketSelector`
- `Sound()` : `sf::Sound`
- `SoundBuffer()` : `sf::SoundBuffer`
- `SoundRecorder()` : `sf::SoundRecorder`
- `SoundSource()` : `sf::SoundSource`
- `SoundStream()` : `sf::SoundStream`
- `Sprite()` : `sf::Sprite`
- `start()` : `sf::SoundRecorder`
- `stop()` : `sf::Sound` , `sf::SoundRecorder` , `sf::SoundStream`
- `String()` : `sf::String`
- `substring()` : `sf::String`

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- t -

- `TcpListener()` : `sf::TcpListener`
- `TcpSocket()` : `sf::TcpSocket`
- `tell()` : `sf::FileInputStream` , `sf::InputStream` , `sf::MemoryInputStream`
- `terminate()` : `sf::Thread`
- `Text()` : `sf::Text`
- `Texture()` : `sf::Texture`
- `Thread()` : `sf::Thread`
- `ThreadLocal()` : `sf::ThreadLocal`
- `ThreadLocalPtr()` : `sf::ThreadLocalPtr< T >`
- `Time()` : `sf::Time`
- `toAnsi()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`
- `toAnsiString()` : `sf::String`
- `toInteger()` : `sf::Color` , `sf::IpAddress`
- `toLatin1()` : `sf::Utf< 16 >` , `sf::Utf< 32 >` , `sf::Utf< 8 >`

- toString() : sf::IpAddress
- toUtf16() : sf::String , sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toUtf32() : sf::String , sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toUtf8() : sf::String , sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toWide() : sf::Utf< 16 > , sf::Utf< 32 > , sf::Utf< 8 >
- toWideString() : sf::String
- Transform() : sf::Transform
- Transformable() : sf::Transformable
- transformPoint() : sf::Transform
- transformRect() : sf::Transform
- TransientContextLock() : sf::GlResource::TransientContextLock
- translate() : sf::Transform

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- u -

- `UdpSocket()` : `sf::UdpSocket`
- `unbind()` : `sf::UdpSocket`
- `unlock()` : `sf::Mutex`
- `unregisterReader()` : `sf::SoundFileFactory`
- `unregisterWriter()` : `sf::SoundFileFactory`
- `update()` : `sf::Joystick` , `sf::Shape` , `sf::Texture`
- `upload()` : `sf::Ftp`

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- V -

- `Vector2()` : `sf::Vector2< T >`
- `Vector3()` : `sf::Vector3< T >`
- `Vertex()` : `sf::Vertex`
- `VertexArray()` : `sf::VertexArray`
- `VideoMode()` : `sf::VideoMode`
- `View()` : `sf::View`

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- W -

- `wait()` : `sf::SocketSelector` , `sf::Thread`
- `waitEvent()` : `sf::Window`
- `Window()` : `sf::Window`
- `write()` : `sf::OutputSoundFile` , `sf::SoundFileWriter`

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- Z -

- `zoom() : sf::View`

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- ~ -

- [~AIResource\(\)](#) : [sf::AIResource](#)
- [~Context\(\)](#) : [sf::Context](#)
- [~Drawable\(\)](#) : [sf::Drawable](#)
- [~FileInputStream\(\)](#) : [sf::FileInputStream](#)
- [~Font\(\)](#) : [sf::Font](#)
- [~Ftp\(\)](#) : [sf::Ftp](#)
- [~GResource\(\)](#) : [sf::GResource](#)
- [~Image\(\)](#) : [sf::Image](#)
- [~InputSoundFile\(\)](#) : [sf::InputSoundFile](#)
- [~InputStream\(\)](#) : [sf::InputStream](#)
- [~Lock\(\)](#) : [sf::Lock](#)
- [~Music\(\)](#) : [sf::Music](#)
- [~Mutex\(\)](#) : [sf::Mutex](#)
- [~OutputSoundFile\(\)](#) : [sf::OutputSoundFile](#)

- ~Packet() : sf::Packet
- ~RenderTarget() : sf::RenderTarget
- ~RenderTexture() : sf::RenderTexture
- ~RenderWindow() : sf::RenderWindow
- ~Shader() : sf::Shader
- ~Shape() : sf::Shape
- ~Socket() : sf::Socket
- ~SocketSelector() : sf::SocketSelector
- ~Sound() : sf::Sound
- ~SoundBuffer() : sf::SoundBuffer
- ~SoundBufferRecorder() : sf::SoundBufferRecorder
- ~SoundFileReader() : sf::SoundFileReader
- ~SoundFileWriter() : sf::SoundFileWriter
- ~SoundRecorder() : sf::SoundRecorder
- ~SoundSource() : sf::SoundSource
- ~SoundStream() : sf::SoundStream
- ~Texture() : sf::Texture
- ~Thread() : sf::Thread
- ~ThreadLocal() : sf::ThreadLocal
- ~Transformable() : sf::Transformable
- ~TransientContextLock() : sf::GlResource::TransientContextLock
- ~Window() : sf::Window

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- a -

- `a` : `sf::Color`
- `advance` : `sf::Glyph`
- `alphaDstFactor` : `sf::BlendMode`
- `alphaEquation` : `sf::BlendMode`
- `alphaSrcFactor` : `sf::BlendMode`
- `alt` : `sf::Event::KeyEvent`
- `antialiasingLevel` : `sf::ContextSettings`
- `Any` : `sf::IpAddress`
- `attributeFlags` : `sf::ContextSettings`
- `axis` : `sf::Event::JoystickMoveEvent`

- b -

- `b` : `sf::Color`

- bitsPerPixel : sf::VideoMode
- Black : sf::Color
- blendMode : sf::RenderStates
- Blue : sf::Color
- bounds : sf::Glyph
- Broadcast : sf::IpAddress
- button : sf::Event::JoystickButtonEvent , sf::Event::MouseButtonEvent

- C -

- channelCount : sf::SoundFileReader::Info
- code : sf::Event::KeyEvent
- color : sf::Vertex
- colorDstFactor : sf::BlendMode
- colorEquation : sf::BlendMode
- colorSrcFactor : sf::BlendMode
- control : sf::Event::KeyEvent
- CurrentTexture : sf::Shader
- Cyan : sf::Color

- d -

- Default : sf::RenderStates
- delta : sf::Event::MouseWheelEvent , sf::Event::MouseWheelScrollEvent
- depthBits : sf::ContextSettings

- f -

- family : sf::Font::Info
- finger : sf::Event::TouchEvent

- g -

- g : sf::Color
- Green : sf::Color

- h -

- height : sf::Event::SizeEvent , sf::Rect< T > , sf::VideoMode

- i -

- Identity : sf::Transform
- InvalidPos : sf::String

- j -

- joystickButton : sf::Event
- joystickConnect : sf::Event
- joystickId : sf::Event::JoystickButtonEvent , sf::Event::JoystickConnect
sf::Event::JoystickMoveEvent
- joystickMove : sf::Event

- k -

- key : sf::Event

- l -

- left : sf::Rect< T >
- LocalHost : sf::IpAddress

- m -

- m_source : sf::SoundSource
- Magenta : sf::Color
- majorVersion : sf::ContextSettings
- minorVersion : sf::ContextSettings
- mouseButton : sf::Event
- mouseMove : sf::Event
- mouseWheel : sf::Event
- mouseWheelScroll : sf::Event

- n -

- name : sf::Joystick::Identification
- None : sf::IpAddress

- p -

- position : sf::Event::JoystickMoveEvent , sf::Vertex
- productId : sf::Joystick::Identification

- r -

- r : sf::Color

- Red : sf::Color

- S -

- sampleCount : sf::SoundFileReader::Info , sf::SoundStream::Chunk
- sampleRate : sf::SoundFileReader::Info
- samples : sf::SoundStream::Chunk
- sensor : sf::Event
- shader : sf::RenderStates
- shift : sf::Event::KeyEvent
- size : sf::Event
- sRgbCapable : sf::ContextSettings
- stencilBits : sf::ContextSettings
- system : sf::Event::KeyEvent

- t -

- texCoords : sf::Vertex
- text : sf::Event
- texture : sf::RenderStates
- textureRect : sf::Glyph
- top : sf::Rect< T >
- touch : sf::Event
- transform : sf::RenderStates
- Transparent : sf::Color
- type : sf::Event::SensorEvent , sf::Event

- Zero : `sf::Time`

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- [ConstIterator](#) : `sf::String`
- [Iterator](#) : `sf::String`

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- [Attribute](#) : [sf::ContextSettings](#)
- [Axis](#) : [sf::Joystick](#)
- [Button](#) : [sf::Mouse](#)
- [CoordinateType](#) : [sf::Texture](#)
- [Equation](#) : [sf::BlendMode](#)
- [EventType](#) : [sf::Event](#)
- [Factor](#) : [sf::BlendMode](#)
- [Key](#) : [sf::Keyboard](#)
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- [Status](#) : [sf::Ftp::Response](#) , [sf::Http::Response](#) , [sf::Socket](#) , [sf::Sound](#)
- [Style](#) : [sf::Text](#)
- [TransferMode](#) : [sf::Ftp](#)
- [Type](#) : [sf::Sensor](#) , [sf::Shader](#) , [sf::Socket](#)
- [Wheel](#) : [sf::Mouse](#)

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- [A](#) : [sf::Keyboard](#)
- [Accelerometer](#) : [sf::Sensor](#)
- [Accepted](#) : [sf::Http::Response](#)
- [Add](#) : [sf::BlendMode](#) , [sf::Keyboard](#)
- [AnyPort](#) : [sf::Socket](#)
- [Ascii](#) : [sf::Ftp](#)
- [AxisCount](#) : [sf::Joystick](#)

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- b -

- [B](#) : `sf::Keyboard`
- [BackSlash](#) : `sf::Keyboard`
- [BackSpace](#) : `sf::Keyboard`
- [BadCommandSequence](#) : `sf::Ftp::Response`
- [BadGateway](#) : `sf::Http::Response`
- [BadRequest](#) : `sf::Http::Response`
- [Binary](#) : `sf::Ftp`
- [Bold](#) : `sf::Text`
- [ButtonCount](#) : `sf::Joystick` , `sf::Mouse`

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- C -

- [C](#) : [sf::Keyboard](#)
- [Closed](#) : [sf::Event](#)
- [ClosingConnection](#) : [sf::Ftp::Response](#)
- [ClosingDataConnection](#) : [sf::Ftp::Response](#)
- [Comma](#) : [sf::Keyboard](#)
- [CommandNotImplemented](#) : [sf::Ftp::Response](#)
- [CommandUnknown](#) : [sf::Ftp::Response](#)
- [ConnectionClosed](#) : [sf::Ftp::Response](#)
- [ConnectionFailed](#) : [sf::Ftp::Response](#) , [sf::Http::Response](#)
- [Core](#) : [sf::ContextSettings](#)
- [Count](#) : [sf::Event](#) , [sf::Joystick](#) , [sf::Sensor](#)
- [Created](#) : [sf::Http::Response](#)

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- d -

- `D` : `sf::Keyboard`
- `Dash` : `sf::Keyboard`
- `DataConnectionAlreadyOpened` : `sf::Ftp::Response`
- `DataConnectionOpened` : `sf::Ftp::Response`
- `DataConnectionUnavailable` : `sf::Ftp::Response`
- `Debug` : `sf::ContextSettings`
- `Default` : `sf::ContextSettings`
- `Delete` : `sf::Http::Request` , `sf::Keyboard`
- `DirectoryOk` : `sf::Ftp::Response`
- `DirectoryStatus` : `sf::Ftp::Response`
- `Disconnected` : `sf::Socket`
- `Divide` : `sf::Keyboard`
- `Done` : `sf::Socket`
- `Down` : `sf::Keyboard`

- DstAlpha : `sf::BlendMode`
- DstColor : `sf::BlendMode`

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- e -

- `E` : `sf::Keyboard`
- `Ebcdic` : `sf::Ftp`
- `End` : `sf::Keyboard`
- `EnteringPassiveMode` : `sf::Ftp::Response`
- `Equal` : `sf::Keyboard`
- `Error` : `sf::Socket`
- `Escape` : `sf::Keyboard`

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- f -

- `F` : `sf::Keyboard`
- `F1` : `sf::Keyboard`
- `F10` : `sf::Keyboard`
- `F11` : `sf::Keyboard`
- `F12` : `sf::Keyboard`
- `F13` : `sf::Keyboard`
- `F14` : `sf::Keyboard`
- `F15` : `sf::Keyboard`
- `F2` : `sf::Keyboard`
- `F3` : `sf::Keyboard`
- `F4` : `sf::Keyboard`
- `F5` : `sf::Keyboard`
- `F6` : `sf::Keyboard`
- `F7` : `sf::Keyboard`

- F8 : `sf::Keyboard`
- F9 : `sf::Keyboard`
- FileActionAborted : `sf::Ftp::Response`
- FileActionOk : `sf::Ftp::Response`
- FilenameNotAllowed : `sf::Ftp::Response`
- FileStatus : `sf::Ftp::Response`
- FileUnavailable : `sf::Ftp::Response`
- Forbidden : `sf::Http::Response`
- Fragment : `sf::Shader`

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- g -

- [G](#) : `sf::Keyboard`
- [GainedFocus](#) : `sf::Event`
- [GatewayTimeout](#) : `sf::Http::Response`
- [Geometry](#) : `sf::Shader`
- [Get](#) : `sf::Http::Request`
- [Gravity](#) : `sf::Sensor`
- [Gyroscope](#) : `sf::Sensor`

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- h -

- [H](#) : `sf::Keyboard`
- [Head](#) : `sf::Http::Request`
- [HelpMessage](#) : `sf::Ftp::Response`
- [Home](#) : `sf::Keyboard`
- [HorizontalWheel](#) : `sf::Mouse`

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- i -

- [I](#) : [sf::Keyboard](#)
- [Insert](#) : [sf::Keyboard](#)
- [InsufficientStorageSpace](#) : [sf::Ftp::Response](#)
- [InternalServerError](#) : [sf::Http::Response](#)
- [InvalidFile](#) : [sf::Ftp::Response](#)
- [InvalidResponse](#) : [sf::Ftp::Response](#) , [sf::Http::Response](#)
- [Italic](#) : [sf::Text](#)

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- j -

- [J : sf::Keyboard](#)
- [JoystickButtonPressed : sf::Event](#)
- [JoystickButtonReleased : sf::Event](#)
- [JoystickConnected : sf::Event](#)
- [JoystickDisconnected : sf::Event](#)
- [JoystickMoved : sf::Event](#)

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- k -

- [K](#) : `sf::Keyboard`
- [KeyCount](#) : `sf::Keyboard`
- [KeyPressed](#) : `sf::Event`
- [KeyReleased](#) : `sf::Event`

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- | -

- `L` : `sf::Keyboard`
- `LAlt` : `sf::Keyboard`
- `LBracket` : `sf::Keyboard`
- `LControl` : `sf::Keyboard`
- `Left` : `sf::Keyboard` , `sf::Mouse`
- `LocalError` : `sf::Ftp::Response`
- `LoggedIn` : `sf::Ftp::Response`
- `LostFocus` : `sf::Event`
- `LShift` : `sf::Keyboard`
- `LSystem` : `sf::Keyboard`

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- m -

- `M` : `sf::Keyboard`
- `Magnetometer` : `sf::Sensor`
- `MaxDatagramSize` : `sf::UdpSocket`
- `Menu` : `sf::Keyboard`
- `Middle` : `sf::Mouse`
- `MouseButtonPressed` : `sf::Event`
- `MouseButtonReleased` : `sf::Event`
- `MouseEntered` : `sf::Event`
- `MouseLeft` : `sf::Event`
- `MouseMoved` : `sf::Event`
- `MouseWheelMoved` : `sf::Event`
- `MouseWheelScrolled` : `sf::Event`
- `MovedPermanently` : `sf::Http::Response`
- `MovedTemporarily` : `sf::Http::Response`

- MultipleChoices : `sf::Http::Response`
- Multiply : `sf::Keyboard`

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- n -

- `N` : `sf::Keyboard`
- `NeedAccountToLogIn` : `sf::Ftp::Response`
- `NeedAccountToStore` : `sf::Ftp::Response`
- `NeedInformation` : `sf::Ftp::Response`
- `NeedPassword` : `sf::Ftp::Response`
- `NoContent` : `sf::Http::Response`
- `Normalized` : `sf::Texture`
- `NotEnoughMemory` : `sf::Ftp::Response`
- `NotFound` : `sf::Http::Response`
- `NotImplemented` : `sf::Http::Response`
- `NotLoggedIn` : `sf::Ftp::Response`
- `NotModified` : `sf::Http::Response`
- `NotReady` : `sf::Socket`
- `Num0` : `sf::Keyboard`

- Num1 : sf::Keyboard
- Num2 : sf::Keyboard
- Num3 : sf::Keyboard
- Num4 : sf::Keyboard
- Num5 : sf::Keyboard
- Num6 : sf::Keyboard
- Num7 : sf::Keyboard
- Num8 : sf::Keyboard
- Num9 : sf::Keyboard
- Numpad0 : sf::Keyboard
- Numpad1 : sf::Keyboard
- Numpad2 : sf::Keyboard
- Numpad3 : sf::Keyboard
- Numpad4 : sf::Keyboard
- Numpad5 : sf::Keyboard
- Numpad6 : sf::Keyboard
- Numpad7 : sf::Keyboard
- Numpad8 : sf::Keyboard
- Numpad9 : sf::Keyboard

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- O -

- `O` : `sf::Keyboard`
- `Ok` : `sf::Ftp::Response` , `sf::Http::Response`
- `One` : `sf::BlendMode`
- `OneMinusDstAlpha` : `sf::BlendMode`
- `OneMinusDstColor` : `sf::BlendMode`
- `OneMinusSrcAlpha` : `sf::BlendMode`
- `OneMinusSrcColor` : `sf::BlendMode`
- `OpeningDataConnection` : `sf::Ftp::Response`
- `Orientation` : `sf::Sensor`

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- p -

- `P` : `sf::Keyboard`
- `PageDown` : `sf::Keyboard`
- `PageTypeUnknown` : `sf::Ftp::Response`
- `PageUp` : `sf::Keyboard`
- `ParameterNotImplemented` : `sf::Ftp::Response`
- `ParametersUnknown` : `sf::Ftp::Response`
- `Partial` : `sf::Socket`
- `PartialContent` : `sf::Http::Response`
- `Pause` : `sf::Keyboard`
- `Paused` : `sf::SoundSource`
- `Period` : `sf::Keyboard`
- `Pixels` : `sf::Texture`
- `Playing` : `sf::SoundSource`
- `PointlessCommand` : `sf::Ftp::Response`

- Post : `sf::Http::Request`
- PovX : `sf::Joystick`
- PovY : `sf::Joystick`
- Put : `sf::Http::Request`

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- q -

- [Q](#) : `sf::Keyboard`
- [Quote](#) : `sf::Keyboard`

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- r -

- [R](#) : [sf::Joystick](#) , [sf::Keyboard](#)
- [RAlt](#) : [sf::Keyboard](#)
- [RangeNotSatisfiable](#) : [sf::Http::Response](#)
- [RBracket](#) : [sf::Keyboard](#)
- [RControl](#) : [sf::Keyboard](#)
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- [Resized](#) : [sf::Event](#)
- [RestartMarkerReply](#) : [sf::Ftp::Response](#)
- [Return](#) : [sf::Keyboard](#)
- [ReverseSubtract](#) : [sf::BlendMode](#)
- [Right](#) : [sf::Keyboard](#) , [sf::Mouse](#)
- [RShift](#) : [sf::Keyboard](#)
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- S -

- [S](#) : [sf::Keyboard](#)
- [SemiColon](#) : [sf::Keyboard](#)
- [SensorChanged](#) : [sf::Event](#)
- [ServiceNotAvailable](#) : [sf::Http::Response](#)
- [ServiceReady](#) : [sf::Ftp::Response](#)
- [ServiceReadySoon](#) : [sf::Ftp::Response](#)
- [ServiceUnavailable](#) : [sf::Ftp::Response](#)
- [Slash](#) : [sf::Keyboard](#)
- [Space](#) : [sf::Keyboard](#)
- [SrcAlpha](#) : [sf::BlendMode](#)
- [SrcColor](#) : [sf::BlendMode](#)
- [Stopped](#) : [sf::SoundSource](#)
- [StrikeThrough](#) : [sf::Text](#)
- [Subtract](#) : [sf::BlendMode](#) , [sf::Keyboard](#)

- SystemStatus : sf::Ftp::Response
- SystemType : sf::Ftp::Response

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- t -

- [T](#) : [sf::Keyboard](#)
- [Tab](#) : [sf::Keyboard](#)
- [Tcp](#) : [sf::Socket](#)
- [TextEntered](#) : [sf::Event](#)
- [Tilde](#) : [sf::Keyboard](#)
- [TouchBegan](#) : [sf::Event](#)
- [TouchEnded](#) : [sf::Event](#)
- [TouchMoved](#) : [sf::Event](#)
- [TransferAborted](#) : [sf::Ftp::Response](#)

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- u -

- [U](#) : [sf::Joystick](#) , [sf::Keyboard](#)
- [Udp](#) : [sf::Socket](#)
- [Unauthorized](#) : [sf::Http::Response](#)
- [Underlined](#) : [sf::Text](#)
- [Unknown](#) : [sf::Keyboard](#)
- [Up](#) : [sf::Keyboard](#)
- [UserAcceleration](#) : [sf::Sensor](#)

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- **V** -

- **V** : [sf::Joystick](#) , [sf::Keyboard](#)
- **VersionNotSupported** : [sf::Http::Response](#)
- **Vertex** : [sf::Shader](#)
- **VerticalWheel** : [sf::Mouse](#)

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- W -

- [W : sf::Keyboard](#)

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- X -

- X : [sf::Joystick](#) , [sf::Keyboard](#)
- XButton1 : [sf::Mouse](#)
- XButton2 : [sf::Mouse](#)

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- y -

- [Y](#) : [sf::Joystick](#) , [sf::Keyboard](#)

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- Z -

- Z : `sf::Joystick` , `sf::Keyboard`
- Zero : `sf::BlendMode`

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■ `operator<` : `sf::IpAddress`

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

-  **AIResource.hpp**
-  **Audio.hpp**
-  **BlendMode.hpp**
-  **CircleShape.hpp**
-  **Clock.hpp**
-  **Color.hpp**
-  **Config.hpp**
-  **Context.hpp**
-  **ContextSettings.hpp**
-  **ConvexShape.hpp**
-  **Drawable.hpp**
-  **Err.hpp**
-  **Event.hpp**
-  **Audio/Export.hpp**
-  **Graphics/Export.hpp**

 **Network/Export.hpp**

 **System/Export.hpp**

 **Window/Export.hpp**

 **FileInputStream.hpp**

 **Font.hpp**

 **Ftp.hpp**

 **GIResource.hpp**

 **Gisl.hpp**

 **Glyph.hpp**

 **Graphics.hpp**

 **Http.hpp**

 **Image.hpp**

 **InputSoundFile.hpp**

 **InputStream.hpp**

 **IpAddress.hpp**

 **Joystick.hpp**

 **Keyboard.hpp**

 **Listener.hpp**

 **Lock.hpp**

 **Main.hpp**

 **mainpage.hpp**

 **MemoryInputStream.hpp**

 **Mouse.hpp**

 **Music.hpp**

 **Mutex.hpp**

 **NativeActivity.hpp**

 **Network.hpp**

 **NonCopyable.hpp**

 **OpenGL.hpp**

 **OutputSoundFile.hpp**

 **Packet.hpp**

 **PrimitiveType.hpp**

 **Rect.hpp**

 **RectangleShape.hpp**

 **RenderStates.hpp**

 **RenderTarget.hpp**

 **RenderTexture.hpp**

 **RenderWindow.hpp**

 **Sensor.hpp**

 **Shader.hpp**

 **Shape.hpp**

 **Sleep.hpp**

 **Socket.hpp**

 **SocketHandle.hpp**

 **SocketSelector.hpp**

 **Sound.hpp**

 **SoundBuffer.hpp**

 **SoundBufferRecorder.hpp**

 **SoundFileFactory.hpp**

 **SoundFileReader.hpp**

 **SoundFileWriter.hpp**

 **SoundRecorder.hpp**

 **SoundSource.hpp**

 **SoundStream.hpp**

 **Sprite.hpp**

 **String.hpp**

 **System.hpp**

 **TcpListener.hpp**

 **TcpSocket.hpp**

 **Text.hpp**

 **Texture.hpp**

 **Thread.hpp**

 **ThreadLocal.hpp**

 **ThreadLocalPtr.hpp**

 **Time.hpp**

 **Touch.hpp**

 **Transform.hpp**

 **Transformable.hpp**

 **UdpSocket.hpp**

 **Utf.hpp**

 **Vector2.hpp**

 **Vector3.hpp**

 **Vertex.hpp**

 **VertexArray.hpp**

 **VideoMode.hpp**

 **View.hpp**

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 **Window.hpp**

 **WindowHandle.hpp**

 **WindowStyle.hpp**

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AlResource.hpp

```
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2 //
3 // SFML - Simple and Fast Multimedia Library
4 // Copyright (C) 2007-2017 Laurent Gomila (laurent@sfml-dev.org)
5 //
6 // This software is provided 'as-is', without any express or imp
7 // In no event will the authors be held liable for any damages a
  software.
8 //
9 // Permission is granted to anyone to use this software for any
10 // including commercial applications, and to alter it and redist
11 // subject to the following restrictions:
12 //
13 // 1. The origin of this software must not be misrepresented;
14 //    you must not claim that you wrote the original software.
15 //    If you use this software in a product, an acknowledgment
16 //    in the product documentation would be appreciated but is n
17 //
18 // 2. Altered source versions must be plainly marked as such,
19 //    and must not be misrepresented as being the original softw
20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_ALRESOURCE_HPP
26 #define SFML_ALRESOURCE_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Audio/Export.hpp>
32 //
33 //
34 namespace sf
35 {
```

```
40 class SFML_AUDIO_API AlResource
41 {
42 protected:
43
44     AlResource();
45
46     ~AlResource();
47 };
48
49 } // namespace sf
50
51 #endif // SFML_ALRESOURCE_HPP
52
```

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Audio.hpp

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8 // from the use of this software.
9 //
10 // Permission is granted to anyone to use this software for any purpose,
11 // including commercial applications, and to alter it and redistribute it
12 // subject to the following restrictions:
13 //
14 // 1. The origin of this software must not be misrepresented; you must not
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18 // 2. Altered source versions must be plainly marked as such, and must not
19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_AUDIO_HPP
26 #define SFML_AUDIO_HPP
27
28 // Headers
29
30
31
32 #include <SFML/System.hpp>
33 #include <SFML/Audio/InputSoundFile.hpp>
34 #include <SFML/Audio/Listener.hpp>
35 #include <SFML/Audio/Music.hpp>
```

```
36 #include <SFML/Audio/OutputSoundFile.hpp>
37 #include <SFML/Audio/Sound.hpp>
38 #include <SFML/Audio/SoundBuffer.hpp>
39 #include <SFML/Audio/SoundBufferRecorder.hpp>
40 #include <SFML/Audio/SoundFileFactory.hpp>
41 #include <SFML/Audio/SoundFileReader.hpp>
42 #include <SFML/Audio/SoundFileWriter.hpp>
43 #include <SFML/Audio/SoundRecorder.hpp>
44 #include <SFML/Audio/SoundSource.hpp>
45 #include <SFML/Audio/SoundStream.hpp>
46
47
48 #endif // SFML_AUDIO_HPP
49
```

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BlendMode.hpp

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18 // 2. Altered source versions must be plainly marked as such, and must not
19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_BLENDMODE_HPP
26 #define SFML_BLENDMODE_HPP
27
28 // Headers
29 #include <SFML/Graphics/Export.hpp>
30
31 namespace sf
32 {
33     namespace graphics
34     {
35         enum BlendMode
```

```

36
41 struct SFML_GRAPHICS_API BlendMode
42 {
43     enum Factor
44     {
45         Zero,
46         One,
47         SrcColor,
48         OneMinusSrcColor,
49         DstColor,
50         OneMinusDstColor,
51         SrcAlpha,
52         OneMinusSrcAlpha,
53         DstAlpha,
54         OneMinusDstAlpha
55     };
56
57     enum Equation
58     {
59         Add,
60         Subtract,
61         ReverseSubtract
62     };
63
64     BlendMode();
65
66     BlendMode(Factor sourceFactor, Factor destinationFactor, Equ
67
68     BlendMode(Factor colorSourceFactor, Factor colorDestinationF
69         Equation colorBlendEquation, Factor alphaSourceFac
70         Factor alphaDestinationFactor, Equation alphaBlend
71
72     // Member Data
73     Factor colorSrcFactor;
74     Factor colorDstFactor;
75     Equation colorEquation;
76     Factor alphaSrcFactor;
77     Factor alphaDstFactor;
78     Equation alphaEquation;
79 };
80
81 SFML_GRAPHICS_API bool operator ==(const BlendMode& left, const
82
83 SFML_GRAPHICS_API bool operator !=(const BlendMode& left, const
84
85 // Commonly used blending modes
86 SFML_GRAPHICS_API extern const BlendMode BlendAlpha;
87 SFML_GRAPHICS_API extern const BlendMode BlendAdd;
88 SFML_GRAPHICS_API extern const BlendMode BlendMultiply;
89 SFML_GRAPHICS_API extern const BlendMode BlendNone;
90
91 } // namespace sf

```

```
156
157
158 #endif // SFML_BLENDMODE_HPP
159
160
```

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CircleShape.hpp

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3 // SFML - Simple and Fast Multimedia Library
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18 // 2. Altered source versions must be plainly marked as such, and must not
19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_CIRCLESHAPE_HPP
26 #define SFML_CIRCLESHAPE_HPP
27
28 // Headers
29 #include <SFML/Graphics/Export.hpp>
30 #include <SFML/Graphics/Shape.hpp>
31
32 namespace sf
```

```

36 {
41 class SFML_GRAPHICS_API CircleShape : public Shape
42 {
43 public:
44
52     explicit CircleShape(float radius = 0, std::size_t pointCour
53
62     void setRadius(float radius);
63
72     float getRadius() const;
73
82     void setPointCount(std::size_t count);
83
92     virtual std::size_t getPointCount() const;
93
107    virtual Vector2f getPoint(std::size_t index) const;
108
109 private:
110
112     // Member data
114     float      m_radius;
115     std::size_t m_pointCount;
116 };
117
118 } // namespace sf
119
120
121 #endif // SFML_CIRCLESHAPE_HPP
122
123

```

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Clock.hpp

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3 // SFML - Simple and Fast Multimedia Library
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11 // including commercial applications, and to alter it and redistribute it
12 // subject to the following restrictions:
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14 // 1. The origin of this software must not be misrepresented; you must not
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16 //    a product, an acknowledgment in the product documentation would be
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18 // 2. Altered source versions must be plainly marked as such, and must not
19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_CLOCK_HPP
26 #define SFML_CLOCK_HPP
27
28 // Headers
29
30 #include <SFML/System/Export.hpp>
31 #include <SFML/System/Time.hpp>
32
33
34
35 namespace sf
```

```
36 {
41 class SFML_SYSTEM_API Clock
42 {
43 public:
44
45     Clock();
46
47     Time getElapsedTime() const;
48
49     Time restart();
50
51 private:
52
53     // Member data
54     Time m_startTime;
55 };
56 } // namespace sf
57 #endif // SFML_CLOCK_HPP
58
59
```



```

40 class SFML_GRAPHICS_API Color
41 {
42 public:
43
44     Color();
45
46     Color(Uint8 red, Uint8 green, Uint8 blue, Uint8 alpha = 255);
47
48     explicit Color(Uint32 color);
49
50     Uint32 toInteger() const;
51
52     // Static member data
53     static const Color Black;
54     static const Color White;
55     static const Color Red;
56     static const Color Green;
57     static const Color Blue;
58     static const Color Yellow;
59     static const Color Magenta;
60     static const Color Cyan;
61     static const Color Transparent;
62
63     // Member data
64     Uint8 r;
65     Uint8 g;
66     Uint8 b;
67     Uint8 a;
68 };
69
70 SFML_GRAPHICS_API bool operator ==(const Color& left, const Color& right);
71
72 SFML_GRAPHICS_API bool operator !=(const Color& left, const Color& right);
73
74 SFML_GRAPHICS_API Color operator +(const Color& left, const Color& right);
75
76 SFML_GRAPHICS_API Color operator -(const Color& left, const Color& right);
77
78 SFML_GRAPHICS_API Color operator *(const Color& left, const Color& right);
79
80 SFML_GRAPHICS_API Color& operator +=(Color& left, const Color& right);
81
82 SFML_GRAPHICS_API Color& operator -=(Color& left, const Color& right);
83
84 SFML_GRAPHICS_API Color& operator *=(Color& left, const Color& right);
85
86 } // namespace sf
87
88 #endif // SFML_COLOR_HPP
89
90
91
92

```

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Config.hpp

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18 // 2. Altered source versions must be plainly marked as such, and must not
19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_CONFIG_HPP
26 #define SFML_CONFIG_HPP
27
28
29 // Define the SFML version
30 #define SFML_VERSION_MAJOR 2
31 #define SFML_VERSION_MINOR 4
32 #define SFML_VERSION_PATCH 2
33
34
35
```

```

36
37
38 // Identify the operating system
39 // see
    http://nadeausoftware.com/articles/2012/01/c\_c\_tip\_how\_use\_compiler\_option\_sfml\_system
40
41 #if defined(_WIN32)
42
43     // Windows
44     #define SFML_SYSTEM_WINDOWS
45     #ifndef NOMINMAX
46         #define NOMINMAX
47     #endif
48
49 #elif defined(__APPLE__) && defined(__MACH__)
50
51     // Apple platform, see which one it is
52     #include "TargetConditionals.h"
53
54     #if TARGET_OS_IPHONE || TARGET_IPHONE_SIMULATOR
55
56         // iOS
57         #define SFML_SYSTEM_IOS
58
59     #elif TARGET_OS_MAC
60
61         // MacOS
62         #define SFML_SYSTEM_MACOS
63
64     #else
65
66         // Unsupported Apple system
67         #error This Apple operating system is not supported by SFML
68
69     #endif
70
71 #elif defined(__unix__)
72
73     // UNIX system, see which one it is
74     #if defined(__ANDROID__)
75
76         // Android
77         #define SFML_SYSTEM_ANDROID
78
79     #elif defined(__linux__)
80
81         // Linux
82         #define SFML_SYSTEM_LINUX
83
84     #elif defined(__FreeBSD__) || defined(__FreeBSD_kernel__)
85
86         // FreeBSD
87         #define SFML_SYSTEM_FREEBSD

```

```

88
89     #else
90
91         // Unsupported UNIX system
92         #error This UNIX operating system is not supported by SF
93
94     #endif
95
96 #else
97
98     // Unsupported system
99     #error This operating system is not supported by SFML librar
100
101 #endif
102
103
105 // Define a portable debug macro
107 #if !defined(NDEBUG)
108
109     #define SFML_DEBUG
110
111 #endif
112
113
115 // Define helpers to create portable import / export macros for
117 #if !defined(SFML_STATIC)
118
119     #if defined(SFML_SYSTEM_WINDOWS)
120
121         // Windows compilers need specific (and different) keywo
122         #define SFML_API_EXPORT __declspec(dllexport)
123         #define SFML_API_IMPORT __declspec(dllimport)
124
125         // For Visual C++ compilers, we also need to turn off th
126         #ifdef _MSC_VER
127
128             #pragma warning(disable: 4251)
129
130         #endif
131
132     #else // Linux, FreeBSD, Mac OS X
133
134         #if __GNUC__ >= 4
135
136             // GCC 4 has special keywords for showing/hidding sy
137             // the same keyword is used for both importing and e
138             #define SFML_API_EXPORT __attribute__((__visibility
139             #define SFML_API_IMPORT __attribute__((__visibility
140
141         #else
142
143             // GCC < 4 has no mechanism to explicitly hide symb

```

```

144         #define SFML_API_EXPORT
145         #define SFML_API_IMPORT
146
147     #endif
148
149 #endif
150
151 #else
152
153     // Static build doesn't need import/export macros
154     #define SFML_API_EXPORT
155     #define SFML_API_IMPORT
156
157 #endif
158
159
161 // Cross-platform warning for deprecated functions and classes
162 //
163 // Usage:
164 // class SFML_DEPRECATED MyClass
165 // {
166 //     SFML_DEPRECATED void memberFunc();
167 // };
168 //
169 // SFML_DEPRECATED void globalFunc();
171 #if defined(SFML_NO_DEPRECATED_WARNINGS)
172
173     // User explicitly requests to disable deprecation warnings
174     #define SFML_DEPRECATED
175
176 #elif defined(_MSC_VER)
177
178     // Microsoft C++ compiler
179     // Note: On newer MSVC versions, using deprecated functions
180     // trigger a warning instead of an error, the compiler flag
181     // specified.
182     #define SFML_DEPRECATED __declspec(deprecated)
183
184 #elif defined(__GNUC__)
185
186     // g++ and Clang
187     #define SFML_DEPRECATED __attribute__((deprecated))
188
189 #else
190
191     // Other compilers are not supported, leave class or function
192     // With a bit of luck, the #pragma directive works, otherwise
193     // error!) for unrecognized #pragma.
194     #pragma message("SFML_DEPRECATED is not supported for your compiler. Please contact the SFML team")
195     #define SFML_DEPRECATED

```

```

194
195 #endif
196
197
199 // Define portable fixed-size types
201 namespace sf
202 {
203     // All "common" platforms use the same size for char, short
204     // (basically there are 3 types for 3 sizes, so no other mat
205     // we can use them without doing any kind of check
206
207     // 8 bits integer types
208     typedef signed char Int8;
209     typedef unsigned char Uint8;
210
211     // 16 bits integer types
212     typedef signed short Int16;
213     typedef unsigned short Uint16;
214
215     // 32 bits integer types
216     typedef signed int Int32;
217     typedef unsigned int Uint32;
218
219     // 64 bits integer types
220     #if defined(_MSC_VER)
221         typedef signed __int64 Int64;
222         typedef unsigned __int64 Uint64;
223     #else
224         typedef signed long long Int64;
225         typedef unsigned long long Uint64;
226     #endif
227
228 } // namespace sf
229
230
231 #endif // SFML_CONFIG_HPP

```

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Context.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_CONTEXT_HPP
26 #define SFML_CONTEXT_HPP
27
28 // Headers
29
30 #include <SFML/Window/Export.hpp>
31 #include <SFML/Window/GlResource.hpp>
32 #include <SFML/Window/ContextSettings.hpp>
33 #include <SFML/System/NonCopyable.hpp>
34
35
```

```

36
37 namespace sf
38 {
39 namespace priv
40 {
41     class GlContext;
42 }
43
44 typedef void (*GlFunctionPointer)();
45
50 class SFML_WINDOW_API Context : GlResource, NonCopyable
51 {
52 public:
53
60     Context();
61
68     ~Context();
69
78     bool setActive(bool active);
79
90     const ContextSettings& getSettings() const;
91
100    static bool isExtensionAvailable(const char* name);
101
110    static GlFunctionPointer getFunction(const char* name);
111
118    static const Context* getActiveContext();
119
131    Context(const ContextSettings& settings, unsigned int width,
132
133 private:
134
136     // Member data
138     priv::GlContext* m_context;
139 };
140
141 } // namespace sf
142
143
144 #endif // SFML_CONTEXT_HPP
145

```



```

43     {
44         Default = 0,
45         Core    = 1 << 0,
46         Debug   = 1 << 2
47     };
48
61     explicit ContextSettings(unsigned int depth = 0, unsigned int
antialiasing = 0, unsigned int major = 1, unsigned int minor = 1,
Default, bool sRgb = false) :
62         depthBits      (depth),
63         stencilBits    (stencil),
64         antialiasingLevel(antialiasing),
65         majorVersion   (major),
66         minorVersion   (minor),
67         attributeFlags (attributes),
68         sRgbCapable    (sRgb)
69     {
70     }
71
73     // Member data
75     unsigned int depthBits;
76     unsigned int stencilBits;
77     unsigned int antialiasingLevel;
78     unsigned int majorVersion;
79     unsigned int minorVersion;
80     Uint32      attributeFlags;
81     bool sRgbCapable;
82 };
83
84 } // namespace sf
85
86
87 #endif // SFML_CONTEXTSETTINGS_HPP
88
89

```

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ConvexShape.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_CONVEXSHAPE_HPP
26 #define SFML_CONVEXSHAPE_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/Shape.hpp>
32 #include <vector>
33
34
35
```

```

36 namespace sf
37 {
42 class SFML_GRAPHICS_API ConvexShape : public Shape
43 {
44 public:
45
52     explicit ConvexShape(std::size_t pointCount = 0);
53
64     void setPointCount(std::size_t count);
65
74     virtual std::size_t getPointCount() const;
75
91     void setPoint(std::size_t index, const Vector2f& point);
92
108    virtual Vector2f getPoint(std::size_t index) const;
109
110 private:
111
113     // Member data
115     std::vector<Vector2f> m_points;
116 };
117
118 } // namespace sf
119
120
121 #endif // SFML_CONVEXSHAPE_HPP
122
123

```

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Drawable.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_DRAWABLE_HPP
26 #define SFML_DRAWABLE_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/RenderStates.hpp>
32
33
34
35 namespace sf
```

```
36 {
37 class RenderTarget;
38
44 class SFML_GRAPHICS_API Drawable
45 {
46 public:
47
52     virtual ~Drawable() {}
53
54 protected:
55
56     friend class RenderTarget;
57
69     virtual void draw(RenderTarget& target, RenderStates states);
70 };
71
72 } // namespace sf
73
74
75 #endif // SFML_DRAWABLE_HPP
76
77
```

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Err.hpp

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21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_ERR_HPP
26 #define SFML_ERR_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/System/Export.hpp>
32 #include <ostream>
33 //
34 //
35 namespace sf
```

```
36 {
41 SFML_SYSTEM_API std::ostream& err();
42
43 } // namespace sf
44
45
46 #endif // SFML_ERR_HPP
47
48
```

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Event.hpp

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19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_EVENT_HPP
26 #define SFML_EVENT_HPP
27
28 // Headers
29
30 #include <SFML/Config.hpp>
31 #include <SFML/Window/Joystick.hpp>
32 #include <SFML/Window/Keyboard.hpp>
33 #include <SFML/Window/Mouse.hpp>
34 #include <SFML/Window/Sensor.hpp>
```

```
36
37
38 namespace sf
39 {
44 class Event
45 {
46 public:
47
52     struct SizeEvent
53     {
54         unsigned int width;
55         unsigned int height;
56     };
57
62     struct KeyEvent
63     {
64         Keyboard::Key code;
65         bool alt;
66         bool control;
67         bool shift;
68         bool system;
69     };
70
75     struct TextEvent
76     {
77         Uint32 unicode;
78     };
79
84     struct MouseMoveEvent
85     {
86         int x;
87         int y;
88     };
89
95     struct MouseButtonEvent
96     {
97         Mouse::Button button;
98         int x;
99         int y;
100    };
101
109    struct MouseWheelEvent
110    {
111        int delta;
112        int x;
113        int y;
114    };
115
120    struct MouseWheelScrollEvent
121    {
122        Mouse::Wheel wheel;
123        float delta;
```

```
124         int x;
125         int y;
126     };
127
133     struct JoystickConnectEvent
134     {
135         unsigned int joystickId;
136     };
137
142     struct JoystickMoveEvent
143     {
144         unsigned int joystickId;
145         Joystick::Axis axis;
146         float position;
147     };
148
154     struct JoystickButtonEvent
155     {
156         unsigned int joystickId;
157         unsigned int button;
158     };
159
164     struct TouchEvent
165     {
166         unsigned int finger;
167         int x;
168         int y;
169     };
170
175     struct SensorEvent
176     {
177         Sensor::Type type;
178         float x;
179         float y;
180         float z;
181     };
182
187     enum EventType
188     {
189         Closed,
190         Resized,
191         LostFocus,
192         GainedFocus,
193         TextEntered,
194         KeyPressed,
195         KeyReleased,
196         MouseWheelMoved,
197         MouseWheelScrolled,
198         MouseButtonPressed,
199         MouseButtonReleased,
200         MouseMoved,
201         MouseEntered,
```

```

202     MouseLeft,
203     JoystickButtonPressed,
204     JoystickButtonReleased,
205     JoystickMoved,
206     JoystickConnected,
207     JoystickDisconnected,
208     TouchBegan,
209     TouchMoved,
210     TouchEnded,
211     SensorChanged,
212
213     Count
214 };
215
216 // Member data
217 EventType type;
218
219 union
220 {
221     SizeEvent size;
222     KeyEvent key;
223     TextEvent text;
224     MouseEvent mouseMove;
225     MouseButtonEvent mouseButton;
226     MouseWheelEvent mouseWheel;
227     MouseWheelScrollEvent mouseWheelScroll;
228     JoystickMoveEvent joystickMove;
229     JoystickButtonEvent joystickButton;
230     JoystickConnectEvent joystickConnect;
231     TouchEvent touch;
232     SensorEvent sensor;
233 };
234 };
235 };
236 };
237
238 } // namespace sf
239
240
241 #endif // SFML_EVENT_HPP
242
243

```

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Audio/Export.hpp

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17 //
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21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_AUDIO_EXPORT_HPP
26 #define SFML_AUDIO_EXPORT_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Config.hpp>
32 //
33 //
34 //
35 // Define portable import / export macros
36 //
37 #if defined(SFML_AUDIO_EXPORTS)
```

```
38
39     #define SFML_AUDIO_API SFML_API_EXPORT
40
41 #else
42
43     #define SFML_AUDIO_API SFML_API_IMPORT
44
45 #endif
46
47
48 #endif // SFML_AUDIO_EXPORT_HPP
```

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Graphics/Export.hpp

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17 //
18 // 2. Altered source versions must be plainly marked as such,
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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_GRAPHICS_EXPORT_HPP
26 #define SFML_GRAPHICS_EXPORT_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Config.hpp>
32 //
33 //
34 //
35 // Define portable import / export macros
36 //
37 #if defined(SFML_GRAPHICS_EXPORTS)
```

```
38
39     #define SFML_GRAPHICS_API SFML_API_EXPORT
40
41 #else
42
43     #define SFML_GRAPHICS_API SFML_API_IMPORT
44
45 #endif
46
47
48 #endif // SFML_GRAPHICS_EXPORT_HPP
```

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Network/Export.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_NETWORK_EXPORT_HPP
26 #define SFML_NETWORK_EXPORT_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Config.hpp>
32 //
33 //
34 //
35 // Define portable import / export macros
36 //
37 #if defined(SFML_NETWORK_EXPORTS)
```

```
38
39     #define SFML_NETWORK_API SFML_API_EXPORT
40
41 #else
42
43     #define SFML_NETWORK_API SFML_API_IMPORT
44
45 #endif
46
47
48 #endif // SFML_NETWORK_EXPORT_HPP
```

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System/Export.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SYSTEM_EXPORT_HPP
26 #define SFML_SYSTEM_EXPORT_HPP
27
28 // Headers
29 #include <SFML/Config.hpp>
30
31 // Define portable import / export macros
32 #if defined(SFML_SYSTEM_EXPORTS)
```

```
38
39     #define SFML_SYSTEM_API SFML_API_EXPORT
40
41 #else
42
43     #define SFML_SYSTEM_API SFML_API_IMPORT
44
45 #endif
46
47
48 #endif // SFML_SYSTEM_EXPORT_HPP
```

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Window/Export.hpp

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23 //
24 //
25 #ifndef SFML_WINDOW_EXPORT_HPP
26 #define SFML_WINDOW_EXPORT_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Config.hpp>
32 //
33 //
34 //
35 // Define portable import / export macros
36 //
37 #if defined(SFML_WINDOW_EXPORTS)
```

```
38
39     #define SFML_WINDOW_API SFML_API_EXPORT
40
41 #else
42
43     #define SFML_WINDOW_API SFML_API_IMPORT
44
45 #endif
46
47
48 #endif // SFML_WINDOW_EXPORT_HPP
```

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FileInputStream.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_FILEINPUTSTREAM_HPP
26 #define SFML_FILEINPUTSTREAM_HPP
27
28 // Headers
29
30 #include <SFML/Config.hpp>
31 #include <SFML/System/Export.hpp>
32 #include <SFML/System/InputStream.hpp>
33 #include <SFML/System/NonCopyable.hpp>
34 #include <cstdint>
```

```

36 #include <string>
37
38 #ifdef ANDROID
39 namespace sf
40 {
41 namespace priv
42 {
43 class SFML_SYSTEM_API ResourceStream;
44 }
45 }
46 #endif
47
48
49 namespace sf
50 {
55 class SFML_SYSTEM_API FileStream : public InputStream, Non
56 {
57 public:
62     FileStream();
63
68     virtual ~FileStream();
69
78     bool open(const std::string& filename);
79
92     virtual Int64 read(void* data, Int64 size);
93
102    virtual Int64 seek(Int64 position);
103
110    virtual Int64 tell();
111
118    virtual Int64 getSize();
119
120 private:
121
123     // Member data
125 #ifdef ANDROID
126     priv::ResourceStream* m_file;
127 #else
128     std::FILE* m_file;
129 #endif
130 };
131
132 } // namespace sf
133
134
135 #endif // SFML_FILEINPUTSTREAM_HPP
136
137

```

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Font.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_FONT_HPP
26 #define SFML_FONT_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Graphics/Export.hpp>
32 #include <SFML/Graphics/Glyph.hpp>
33 #include <SFML/Graphics/Texture.hpp>
34 #include <SFML/Graphics/Rect.hpp>
35 #include <SFML/System/Vector2.hpp>
```

```

36 #include <SFML/System/String.hpp>
37 #include <map>
38 #include <string>
39 #include <vector>
40
41
42 namespace sf
43 {
44 class InputStream;
45
50 class SFML_GRAPHICS_API Font
51 {
52 public:
53
58     struct Info
59     {
60         std::string family;
61     };
62
63 public:
64
71     Font();
72
79     Font(const Font& copy);
80
87     ~Font();
88
109     bool loadFromFile(const std::string& filename);
110
130     bool loadFromMemory(const void* data, std::size_t sizeInByte
131
152     bool loadFromStream(InputStream& stream);
153
160     const Info& getInfo() const;
161
180     const Glyph& getGlyph(Uint32 codePoint, unsigned int charact
outlineThickness = 0) const;
181
198     float getKerning(Uint32 first, Uint32 second, unsigned int c
199
211     float getLineSpacing(unsigned int characterSize) const;
212
226     float getUnderlinePosition(unsigned int characterSize) const
227
240     float getUnderlineThickness(unsigned int characterSize) cons
241
254     const Texture& getTexture(unsigned int characterSize) const;
255
264     Font& operator =(const Font& right);
265
266 private:
267

```

```

272     struct Row
273     {
274         Row(unsigned int rowTop, unsigned int rowHeight) : width
height(rowHeight) {}
275
276         unsigned int width;
277         unsigned int top;
278         unsigned int height;
279     };
280
282     // Types
284     typedef std::map<Uint64, Glyph> GlyphTable;
285
290     struct Page
291     {
292         Page();
293
294         GlyphTable    glyphs;
295         Texture        texture;
296         unsigned int   nextRow;
297         std::vector<Row> rows;
298     };
299
304     void cleanup();
305
317     Glyph loadGlyph(Uint32 codePoint, unsigned int characterSize
outlineThickness) const;
318
329     IntRect findGlyphRect(Page& page, unsigned int width, unsign
330
339     bool setCurrentSize(unsigned int characterSize) const;
340
342     // Types
344     typedef std::map<unsigned int, Page> PageTable;
345
347     // Member data
349     void*                m_library;
350     void*                m_face;
351     void*                m_streamRec;
352     void*                m_stroker;
353     int*                 m_refCount;
354     Info                 m_info;
355     mutable PageTable    m_pages;
356     mutable std::vector<Uint8> m_pixelBuffer;
357     #ifdef SFML_SYSTEM_ANDROID
358     void*                m_stream;
359     #endif
360 };
361
362 } // namespace sf
363
364

```

```
365 #endif // SFML_FONT_HPP
366
367
```

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Ftp.hpp

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22 //
23 //
24 //
25 #ifndef SFML_FTP_HPP
26 #define SFML_FTP_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Network/Export.hpp>
32 #include <SFML/Network/TcpSocket.hpp>
33 #include <SFML/System/NonCopyable.hpp>
34 #include <SFML/System/Time.hpp>
35 #include <string>
```

```

36 #include <vector>
37
38
39 namespace sf
40 {
41 class IPAddress;
42
47 class SFML_NETWORK_API Ftp : NonCopyable
48 {
49 public:
50
55     enum TransferMode
56     {
57         Binary,
58         Ascii,
59         Ebcdic
60     };
61
66     class SFML_NETWORK_API Response
67     {
68     public:
69
74         enum Status
75         {
76             // 1xx: the requested action is being initiated,
77             // expect another reply before proceeding with a new
78             RestartMarkerReply          = 110,
79             ServiceReadySoon            = 120,
80             DataConnectionAlreadyOpened = 125,
81             OpeningDataConnection      = 150,
82
83             // 2xx: the requested action has been successfully c
84             Ok                          = 200,
85             PointlessCommand            = 202,
86             SystemStatus                = 211,
87             DirectoryStatus             = 212,
88             FileStatus                  = 213,
89             HelpMessage                  = 214,
90             SystemType                  = 215,
91             ServiceReady                 = 220,
92             ClosingConnection           = 221,
93             DataConnectionOpened        = 225,
94             ClosingDataConnection       = 226,
95             EnteringPassiveMode         = 227,
96             LoggedIn                    = 230,
97             FileActionOk                = 250,
98             DirectoryOk                 = 257,
99
100            // 3xx: the command has been accepted, but the reque
101            // is dormant, pending receipt of further informatio
102            NeedPassword                  = 331,
103            NeedAccountToLogIn          = 332,

```

```

104         NeedInformation      = 350,
105
106         // 4xx: the command was not accepted and the request
107         // but the error condition is temporary and the acti
108         ServiceUnavailable    = 421,
109         DataConnectionUnavailable = 425,
110         TransferAborted       = 426,
111         FileActionAborted     = 450,
112         LocalError            = 451,
113         InsufficientStorageSpace = 452,
114
115         // 5xx: the command was not accepted and
116         // the requested action did not take place
117         CommandUnknown        = 500,
118         ParametersUnknown     = 501,
119         CommandNotImplemented = 502,
120         BadCommandSequence    = 503,
121         ParameterNotImplemented = 504,
122         NotLoggedIn           = 530,
123         NeedAccountToStore    = 532,
124         FileUnavailable       = 550,
125         PageTypeUnknown       = 551,
126         NotEnoughMemory       = 552,
127         FilenameNotAllowed    = 553,
128
129         // 10xx: SFML custom codes
130         InvalidResponse       = 1000,
131         ConnectionFailed     = 1001,
132         ConnectionClosed     = 1002,
133         InvalidFile          = 1003
134     };
135
136     explicit Response(Status code = InvalidResponse, const s
137
138     bool isOk() const;
139
140     Status getStatus() const;
141
142     const std::string& getMessage() const;
143
144 private:
145
146     // Member data
147     Status      m_status;
148     std::string m_message;
149 };
150
151 class SFML_NETWORK_API DirectoryResponse : public Response
152 {
153 public:
154
155     DirectoryResponse(const Response& response);

```

```

199
206         const std::string& getDirectory() const;
207
208     private:
209
210         // Member data
211         std::string m_directory;
212     };
213
214
215
216
221     class SFML_NETWORK_API ListingResponse : public Response
222     {
223     public:
224
232         ListingResponse(const Response& response, const std::string& directory) : m_directory(directory) {}
233
240         const std::vector<std::string>& getListing() const;
241
242     private:
243
244         // Member data
245         std::vector<std::string> m_listing;
246     };
247
248
249
250
258     ~Ftp();
259
281     Response connect(const IpAddress& server, unsigned short port, const Time::Zero);
282
291     Response disconnect();
292
302     Response login();
303
316     Response login(const std::string& name, const std::string& password);
317
327     Response keepAlive();
328
340     DirectoryResponse getWorkingDirectory();
341
357     ListingResponse getDirectoryListing(const std::string& directory);
358
371     Response changeDirectory(const std::string& directory);
372
381     Response parentDirectory();
382
396     Response createDirectory(const std::string& name);
397
413     Response deleteDirectory(const std::string& name);
414
429     Response renameFile(const std::string& file, const std::string& newFile);
430

```

```

446     Response deleteFile(const std::string& name);
447
468     Response download(const std::string& remoteFile, const std::str
TransferMode mode = Binary);
469
487     Response upload(const std::string& localFile, const std::str
mode = Binary);
488
505     Response sendCommand(const std::string& command, const std::
506
507 private:
508
518     Response getResponse();
519
525     class DataChannel;
526
527     friend class DataChannel;
528
530     // Member data
532     TcpSocket    m_commandSocket;
533     std::string  m_receiveBuffer;
534 };
535
536 } // namespace sf
537
538
539 #endif // SFML_FTP_HPP
540
541

```

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GLResource.hpp

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22 //
23 //
24 //
25 #ifndef SFML_GLRESOURCE_HPP
26 #define SFML_GLRESOURCE_HPP
27
28 // Headers
29 #include <SFML/Window/Export.hpp>
30 #include <SFML/System/NonCopyable.hpp>
31
32 namespace sf
```

```

36 {
37
38 class Context;
39
44 class SFML_WINDOW_API GlResource
45 {
46 protected:
47
52     GlResource();
53
58     ~GlResource();
59
64     static void ensureGlContext();
65
70     class SFML_WINDOW_API TransientContextLock : NonCopyable
71     {
72     public:
77         TransientContextLock();
78
83         ~TransientContextLock();
84
85     private:
86         Context* m_context;
87     };
88 };
89
90 } // namespace sf
91
92
93 #endif // SFML_GLRESOURCE_HPP
94

```

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Gsl.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_GLSL_HPP
26 #define SFML_GLSL_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Transform.hpp>
31 #include <SFML/Graphics/Color.hpp>
32 #include <SFML/System/Vector2.hpp>
33 #include <SFML/System/Vector3.hpp>
34
35
```

```

36
37 namespace sf
38 {
39 namespace priv
40 {
41     // Forward declarations
42     template <std::size_t Columns, std::size_t Rows>
43     struct Matrix;
44
45     template <typename T>
46     struct Vector4;
47
48 #include <SFML/Graphics/Glsl.inl>
49
50 } // namespace priv
51
52
57 namespace Glsl
58 {
59
64     typedef Vector2<float> Vec2;
65
70     typedef Vector2<int> Ivec2;
71
76     typedef Vector2<bool> Bvec2;
77
82     typedef Vector3<float> Vec3;
83
88     typedef Vector3<int> Ivec3;
89
94     typedef Vector3<bool> Bvec3;
95
96 #ifdef SFML_DOXYGEN
97
110     typedef implementation-defined Vec4;
111
124     typedef implementation-defined Ivec4;
125
130     typedef implementation-defined Bvec4;
131
155     typedef implementation-defined Mat3;
156
181     typedef implementation-defined Mat4;
182
183 #else // SFML_DOXYGEN
184
185     typedef priv::Vector4<float> Vec4;
186     typedef priv::Vector4<int> Ivec4;
187     typedef priv::Vector4<bool> Bvec4;
188     typedef priv::Matrix<3, 3> Mat3;
189     typedef priv::Matrix<4, 4> Mat4;
190

```

```
191 #endif // SFML_DOXYGEN
192
193 } // namespace Gls1
194 } // namespace sf
195
196 #endif // SFML_GLSL_HPP
197
198
```

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Glyph.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_GLYPH_HPP
26 #define SFML_GLYPH_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/Rect.hpp>
32
33
34
35 namespace sf
```

```
36 {
41 class SFML_GRAPHICS_API Glyph
42 {
43 public:
44
49     Glyph() : advance(0) {}
50
52     // Member data
54     float advance;
55     FloatRect bounds;
56     IntRect textureRect;
57 };
58
59 } // namespace sf
60
61
62 #endif // SFML_GLYPH_HPP
63
64
```

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Graphics.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_GRAPHICS_HPP
26 #define SFML_GRAPHICS_HPP
27
28 // Headers
29
30
31
32 #include <SFML/Window.hpp>
33 #include <SFML/Graphics/BlendMode.hpp>
34 #include <SFML/Graphics/CircleShape.hpp>
35 #include <SFML/Graphics/Color.hpp>
```

```
36 #include <SFML/Graphics/ConvexShape.hpp>
37 #include <SFML/Graphics/Drawable.hpp>
38 #include <SFML/Graphics/Font.hpp>
39 #include <SFML/Graphics/Glyph.hpp>
40 #include <SFML/Graphics/Image.hpp>
41 #include <SFML/Graphics/PrimitiveType.hpp>
42 #include <SFML/Graphics/Rect.hpp>
43 #include <SFML/Graphics/RectangleShape.hpp>
44 #include <SFML/Graphics/RenderStates.hpp>
45 #include <SFML/Graphics/RenderTarget.hpp>
46 #include <SFML/Graphics/RenderTexture.hpp>
47 #include <SFML/Graphics/RenderWindow.hpp>
48 #include <SFML/Graphics/Shader.hpp>
49 #include <SFML/Graphics/Shape.hpp>
50 #include <SFML/Graphics/Sprite.hpp>
51 #include <SFML/Graphics/Text.hpp>
52 #include <SFML/Graphics/Texture.hpp>
53 #include <SFML/Graphics/Transform.hpp>
54 #include <SFML/Graphics/Transformable.hpp>
55 #include <SFML/Graphics/Vertex.hpp>
56 #include <SFML/Graphics/VertexArray.hpp>
57 #include <SFML/Graphics/View.hpp>
58
59
60 #endif // SFML_GRAPHICS_HPP
61
```

SFML 2.4.2

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Http.hpp

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20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_HTTP_HPP
26 #define SFML_HTTP_HPP
27
28 // Headers
29
30 #include <SFML/Network/Export.hpp>
31 #include <SFML/Network/IpAddress.hpp>
32 #include <SFML/Network/TcpSocket.hpp>
33 #include <SFML/System/NonCopyable.hpp>
34 #include <SFML/System/Time.hpp>
```

```

36 #include <map>
37 #include <string>
38
39
40 namespace sf
41 {
42     class SFML_NETWORK_API Http : NonCopyable
43     {
44     public:
45
46         class SFML_NETWORK_API Request
47         {
48         public:
49
50             enum Method
51             {
52                 Get,
53                 Post,
54                 Head,
55                 Put,
56                 Delete
57             };
58
59             Request(const std::string& uri = "/", Method method = Ge
60 """);
61
62             void setField(const std::string& field, const std::strin
63
64             void setMethod(Method method);
65
66             void setUri(const std::string& uri);
67
68             void setHttpVersion(unsigned int major, unsigned int min
69
70             void setBody(const std::string& body);
71
72         private:
73
74             friend class Http;
75
76             std::string prepare() const;
77
78             bool hasField(const std::string& field) const;
79
80             // Types
81             typedef std::map<std::string, std::string> FieldTable;
82
83             // Member data
84             FieldTable m_fields;
85             Method m_method;
86             std::string m_uri;
87             unsigned int m_majorVersion;

```

```

185     unsigned int m_minorVersion;
186     std::string m_body;
187 };
188
193 class SFML_NETWORK_API Response
194 {
195 public:
196
201     enum Status
202     {
203         // 2xx: success
204         Ok = 200,
205         Created = 201,
206         Accepted = 202,
207         NoContent = 204,
208         ResetContent = 205,
209         PartialContent = 206,
210
211         // 3xx: redirection
212         MultipleChoices = 300,
213         MovedPermanently = 301,
214         MovedTemporarily = 302,
215         NotModified = 304,
216
217         // 4xx: client error
218         BadRequest = 400,
219         Unauthorized = 401,
220         Forbidden = 403,
221         NotFound = 404,
222         RangeNotSatisfiable = 407,
223
224         // 5xx: server error
225         InternalServerError = 500,
226         NotImplemented = 501,
227         BadGateway = 502,
228         ServiceNotAvailable = 503,
229         GatewayTimeout = 504,
230         VersionNotSupported = 505,
231
232         // 10xx: SFML custom codes
233         InvalidResponse = 1000,
234         ConnectionFailed = 1001
235     };
236
243     Response();
244
257     const std::string& getField(const std::string& field) co
258
270     Status getStatus() const;
271
280     unsigned int getMajorHttpVersion() const;
281

```

```

290         unsigned int getMinorHttpVersion() const;
291
304         const std::string& getBody() const;
305
306     private:
307
308         friend class Http;
309
319         void parse(const std::string& data);
320
321
331         void parseFields(std::istream &in);
332
334         // Types
336     typedef std::map<std::string, std::string> FieldTable;
337
339         // Member data
341         FieldTable    m_fields;
342         Status        m_status;
343         unsigned int  m_majorVersion;
344         unsigned int  m_minorVersion;
345         std::string   m_body;
346     };
347
352     Http();
353
368     Http(const std::string& host, unsigned short port = 0);
369
385     void setHost(const std::string& host, unsigned short port =
386
405     Response sendRequest(const Request& request, Time timeout =
406
407 private:
408
410     // Member data
412     TcpSocket    m_connection;
413     IPAddress    m_host;
414     std::string  m_hostName;
415     unsigned short m_port;
416 };
417
418 } // namespace sf
419
420
421 #endif // SFML_HTTP_HPP
422
423

```


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21 //
22 //
23 //
24 //
25 #ifndef SFML_IMAGE_HPP
26 #define SFML_IMAGE_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/Color.hpp>
32 #include <SFML/Graphics/Rect.hpp>
33 #include <string>
34 #include <vector>
```

```

36
37
38 namespace sf
39 {
40 class InputStream;
41
46 class SFML_GRAPHICS_API Image
47 {
48 public:
49
56     Image();
57
62     ~Image();
63
72     void create(unsigned int width, unsigned int height, const C
73
87     void create(unsigned int width, unsigned int height, const U
88
104     bool loadFromFile(const std::string& filename);
105
122     bool loadFromMemory(const void* data, std::size_t size);
123
139     bool loadFromStream(InputStream& stream);
140
156     bool saveToFile(const std::string& filename) const;
157
164     Vector2u getSize() const;
165
177     void createMaskFromColor(const Color& color, Uint8 alpha = 0
178
199     void copy(const Image& source, unsigned int destX, unsigned
sourceRect = IntRect(0, 0, 0, 0), bool applyAlpha = false);
200
215     void setPixel(unsigned int x, unsigned int y, const Color& c
216
232     Color getPixel(unsigned int x, unsigned int y) const;
233
247     const Uint8* getPixelsPtr() const;
248
253     void flipHorizontally();
254
259     void flipVertically();
260
261 private:
262
264     // Member data
266     Vector2u          m_size;
267     std::vector<Uint8> m_pixels;
268     #ifdef SFML_SYSTEM_ANDROID
269     void*             m_stream;
270     #endif
271 };

```

```
272
273 } // namespace sf
274
275
276 #endif // SFML_IMAGE_HPP
277
278
```

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InputSoundFile.hpp

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22 //
23 //
24 //
25 #ifndef SFML_INPUTSOUNDFILE_HPP
26 #define SFML_INPUTSOUNDFILE_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Audio/Export.hpp>
32 #include <SFML/System/NonCopyable.hpp>
33 #include <SFML/System/Time.hpp>
34 #include <string>
35
```

```

36
37 namespace sf
38 {
39 class InputStream;
40 class SoundFileReader;
41
46 class SFML_AUDIO_API InputSoundFile : NonCopyable
47 {
48 public:
49
54     InputSoundFile();
55
60     ~InputSoundFile();
61
73     bool openFromFile(const std::string& filename);
74
87     bool openFromMemory(const void* data, std::size_t sizeInByte
88
100     bool openFromStream(InputStream& stream);
101
112     bool openForWriting(const std::string& filename, unsigned int
sampleRate);
113
120     Uint64 getSampleCount() const;
121
128     unsigned int getChannelCount() const;
129
136     unsigned int getSampleRate() const;
137
147     Time getDuration() const;
148
165     void seek(Uint64 sampleOffset);
166
179     void seek(Time timeOffset);
180
190     Uint64 read(Int16* samples, Uint64 maxCount);
191
192 private:
193
198     void close();
199
201     // Member data
203     SoundFileReader* m_reader;
204     InputStream*     m_stream;
205     bool             m_streamOwned;
206     Uint64           m_sampleCount;
207     unsigned int     m_channelCount;
208     unsigned int     m_sampleRate;
209 };
210
211 } // namespace sf
212

```

```
213
214 #endif // SFML_INPUTSOUNDFILE_HPP
215
216
```

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InputStream.hpp

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21 // distribution.
22 //
23 //
24 //
25 #ifndef SFML_INPUTSTREAM_HPP
26 #define SFML_INPUTSTREAM_HPP
27
28 // Headers
29 #include <SFML/Config.hpp>
30 #include <SFML/System/Export.hpp>
31
32 namespace sf
```

```
36 {
41 class SFML_SYSTEM_API InputStream
42 {
43 public:
44
49     virtual ~InputStream() {}
50
63     virtual Int64 read(void* data, Int64 size) = 0;
64
73     virtual Int64 seek(Int64 position) = 0;
74
81     virtual Int64 tell() = 0;
82
89     virtual Int64 getSize() = 0;
90 };
91
92 } // namespace sf
93
94
95 #endif // SFML_INPUTSTREAM_HPP
96
97
```

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IpAddress.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_IPADDRESS_HPP
26 #define SFML_IPADDRESS_HPP
27
28 // Headers
29
30 #include <SFML/Network/Export.hpp>
31 #include <SFML/System/Time.hpp>
32 #include <istream>
33 #include <ostream>
34 #include <string>
```

```

36
37
38 namespace sf
39 {
44 class SFML_NETWORK_API IPAddress
45 {
46 public:
47
54     IPAddress();
55
65     IPAddress(const std::string& address);
66
79     IPAddress(const char* address);
80
94     IPAddress(UInt8 byte0, UInt8 byte1, UInt8 byte2, UInt8 byte3);
95
109    explicit IPAddress(UInt32 address);
110
123    std::string toString() const;
124
139    UInt32 toInteger() const;
140
155    static IPAddress getLocalAddress();
156
179    static IPAddress getPublicAddress(Time timeout = Time::Zero);
180
182    // Static member data
184    static const IPAddress None;
185    static const IPAddress Any;
186    static const IPAddress LocalHost;
187    static const IPAddress Broadcast;
188
189 private:
190
191     friend SFML_NETWORK_API bool operator <(const IPAddress& left, const IPAddress& right);
192
199     void resolve(const std::string& address);
200
202     // Member data
204     UInt32 m_address;
205     bool m_valid;
206 };
207
217 SFML_NETWORK_API bool operator ==(const IPAddress& left, const IPAddress& right);
218
228 SFML_NETWORK_API bool operator !=(const IPAddress& left, const IPAddress& right);
229
239 SFML_NETWORK_API bool operator <(const IPAddress& left, const IPAddress& right);
240
250 SFML_NETWORK_API bool operator >(const IPAddress& left, const IPAddress& right);
251
261 SFML_NETWORK_API bool operator <=(const IPAddress& left, const IPAddress& right);

```

```
262
272 SFML_NETWORK_API bool operator >=(const IPAddress& left, const I
273
283 SFML_NETWORK_API std::istream& operator >>(std::istream& stream,
284
294 SFML_NETWORK_API std::ostream& operator <<(std::ostream& stream,
295
296 } // namespace sf
297
298
299 #endif // SFML_IPADDRESS_HPP
300
301
```

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Joystick.hpp

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22 //
23 //
24 //
25 #ifndef SFML_JOYSTICK_HPP
26 #define SFML_JOYSTICK_HPP
27
28 // Headers
29 #include <SFML/Window/Export.hpp>
30 #include <SFML/System/String.hpp>
31
32 namespace sf
```

```

36 {
41 class SFML_WINDOW_API Joystick
42 {
43 public:
44
49     enum
50     {
51         Count          = 8,
52         ButtonCount    = 32,
53         AxisCount      = 8
54     };
55
60     enum Axis
61     {
62         X,
63         Y,
64         Z,
65         R,
66         U,
67         V,
68         PovX,
69         PovY
70     };
71
76     struct SFML_WINDOW_API Identification
77     {
78         Identification();
79
80         String name;
81         unsigned int vendorId;
82         unsigned int productId;
83     };
84
93     static bool isConnected(unsigned int joystick);
94
105    static unsigned int getButtonCount(unsigned int joystick);
106
118    static bool hasAxis(unsigned int joystick, Axis axis);
119
131    static bool isButtonPressed(unsigned int joystick, unsigned
132
144    static float getAxisPosition(unsigned int joystick, Axis axis);
145
154    static Identification getIdentification(unsigned int joystick);
155
165    static void update();
166 };
167
168 } // namespace sf
169
170
171 #endif // SFML_JOYSTICK_HPP

```


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Keyboard.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_KEYBOARD_HPP
26 #define SFML_KEYBOARD_HPP
27
28 // Headers
29 #include <SFML/Window/Export.hpp>
30
31 namespace sf
32 {
33     namespace keyboard
34     {
35         enum Key : unsigned short;
```

```
40 class SFML_WINDOW_API Keyboard
41 {
42 public:
43
44     enum Key
45     {
46         Unknown = -1,
47         A = 0,
48         B,
49         C,
50         D,
51         E,
52         F,
53         G,
54         H,
55         I,
56         J,
57         K,
58         L,
59         M,
60         N,
61         O,
62         P,
63         Q,
64         R,
65         S,
66         T,
67         U,
68         V,
69         W,
70         X,
71         Y,
72         Z,
73         Num0,
74         Num1,
75         Num2,
76         Num3,
77         Num4,
78         Num5,
79         Num6,
80         Num7,
81         Num8,
82         Num9,
83         Escape,
84         LControl,
85         LShift,
86         LAlt,
87         LSystem,
88         RControl,
89         RShift,
90         RAlt,
91         RSystem,
```

96	Menu,
97	LBracket,
98	RBracket,
99	SemiColon,
100	Comma,
101	Period,
102	Quote,
103	Slash,
104	BackSlash,
105	Tilde,
106	Equal,
107	Dash,
108	Space,
109	Return,
110	BackSpace,
111	Tab,
112	PageUp,
113	PageDown,
114	End,
115	Home,
116	Insert,
117	Delete,
118	Add,
119	Subtract,
120	Multiply,
121	Divide,
122	Left,
123	Right,
124	Up,
125	Down,
126	Numpad0,
127	Numpad1,
128	Numpad2,
129	Numpad3,
130	Numpad4,
131	Numpad5,
132	Numpad6,
133	Numpad7,
134	Numpad8,
135	Numpad9,
136	F1,
137	F2,
138	F3,
139	F4,
140	F5,
141	F6,
142	F7,
143	F8,
144	F9,
145	F10,
146	F11,
147	F12,

```
148         F13,  
149         F14,  
150         F15,  
151         Pause,  
152  
153         KeyCount  
154     };  
155  
164     static bool isKeyPressed(Key key);  
165  
179     static void setVirtualKeyboardVisible(bool visible);  
180 };  
181  
182 } // namespace sf  
183  
184  
185 #endif // SFML_KEYBOARD_HPP  
186  
187
```

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Listener.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_LISTENER_HPP
26 #define SFML_LISTENER_HPP
27
28 // Headers
29
30 #include <SFML/Audio/Export.hpp>
31 #include <SFML/System/Vector3.hpp>
32
33
34
35 namespace sf
```

```

36 {
42 class SFML_AUDIO_API Listener
43 {
44 public:
45
58     static void setGlobalVolume(float volume);
59
68     static float getGlobalVolume();
69
82     static void setPosition(float x, float y, float z);
83
94     static void setPosition(const Vector3f& position);
95
104    static Vector3f getPosition();
105
123    static void setDirection(float x, float y, float z);
124
140    static void setDirection(const Vector3f& direction);
141
150    static Vector3f getDirection();
151
169    static void setUpVector(float x, float y, float z);
170
186    static void setUpVector(const Vector3f& upVector);
187
196    static Vector3f getUpVector();
197 };
198
199 } // namespace sf
200
201
202 #endif // SFML_LISTENER_HPP
203
204

```

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Lock.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_LOCK_HPP
26 #define SFML_LOCK_HPP
27
28 // Headers
29
30 #include <SFML/System/Export.hpp>
31 #include <SFML/System/NonCopyable.hpp>
32
33
34
35 namespace sf
```

```
36 {
37 class Mutex;
38
43 class SFML_SYSTEM_API Lock : NonCopyable
44 {
45 public:
46
55     explicit Lock(Mutex& mutex);
56
63     ~Lock();
64
65 private:
66
68     // Member data
70     Mutex& m_mutex;
71 };
72
73 } // namespace sf
74
75
76 #endif // SFML_LOCK_HPP
77
78
```

SFML 2.4.2

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Main.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_MAIN_HPP
26 #define SFML_MAIN_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Config.hpp>
32 //
33 //
34 #if defined(SFML_SYSTEM_IOS)
35 //
```

```
36     // On iOS, we have no choice but to have our own main,  
37     // so we need to rename the user one and call it later  
38     #define main sfmlMain  
39  
40 #endif  
41  
42  
43 #endif // SFML_MAIN_HPP
```

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mainpage.hpp

1

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MemoryInputStream.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_MEMORYINPUTSTREAM_HPP
26 #define SFML_MEMORYINPUTSTREAM_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Config.hpp>
32 #include <SFML/System/InputStream.hpp>
33 #include <SFML/System/Export.hpp>
34 #include <cstdlib>
35
```

```

36
37 namespace sf
38 {
43 class SFML_SYSTEM_API MemoryInputStream : public InputStream
44 {
45 public:
46
47     MemoryInputStream();
48
49     void open(const void* data, std::size_t sizeInBytes);
50
51     virtual Int64 read(void* data, Int64 size);
52
53     virtual Int64 seek(Int64 position);
54
55     virtual Int64 tell();
56
57     virtual Int64 getSize();
58
59 private:
60     // Member data
61     const char* m_data;
62     Int64      m_size;
63     Int64      m_offset;
64 };
65 } // namespace sf
66
67 #endif // SFML_MEMORYINPUTSTREAM_HPP
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
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97
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114
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116
117

```

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Mouse.hpp

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22 //
23 //
24 //
25 #ifndef SFML_MOUSE_HPP
26 #define SFML_MOUSE_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Window/Export.hpp>
32 #include <SFML/System/Vector2.hpp>
33 //
34 //
35 namespace sf
```

```

36 {
37 class Window;
38
43 class SFML_WINDOW_API Mouse
44 {
45 public:
46
51     enum Button
52     {
53         Left,
54         Right,
55         Middle,
56         XButton1,
57         XButton2,
58
59         ButtonCount
60     };
61
66     enum Wheel
67     {
68         VerticalWheel,
69         HorizontalWheel
70     };
71
80     static bool isButtonPressed(Button button);
81
91     static Vector2i getPosition();
92
104    static Vector2i getPosition(const Window& relativeTo);
105
115    static void setPosition(const Vector2i& position);
116
127    static void setPosition(const Vector2i& position, const Wind
128 };
129
130 } // namespace sf
131
132
133 #endif // SFML_MOUSE_HPP
134
135

```

SFML 2.4.2

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Music.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_MUSIC_HPP
26 #define SFML_MUSIC_HPP
27
28 // Headers
29
30 #include <SFML/Audio/Export.hpp>
31 #include <SFML/Audio/SoundStream.hpp>
32 #include <SFML/Audio/InputSoundFile.hpp>
33 #include <SFML/System/Mutex.hpp>
34 #include <SFML/System/Time.hpp>
```

```

36 #include <string>
37 #include <vector>
38
39
40 namespace sf
41 {
42 class InputStream;
43
48 class SFML_AUDIO_API Music : public SoundStream
49 {
50 public:
51
56     Music();
57
62     ~Music();
63
83     bool openFromFile(const std::string& filename);
84
106    bool openFromMemory(const void* data, std::size_t sizeInByte
107
127    bool openFromStream(InputStream& stream);
128
135    Time getDuration() const;
136
137 protected:
138
150    virtual bool onGetData(Chunk& data);
151
158    virtual void onSeek(Time timeOffset);
159
160 private:
161
166    void initialize();
167
169    // Member data
171    InputSoundFile    m_file;
172    Time              m_duration;
173    std::vector<Int16> m_samples;
174    Mutex             m_mutex;
175 };
176
177 } // namespace sf
178
179
180 #endif // SFML_MUSIC_HPP
181
182

```


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Mutex.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_MUTEX_HPP
26 #define SFML_MUTEX_HPP
27
28 // Headers
29
30 #include <SFML/System/Export.hpp>
31 #include <SFML/System/NonCopyable.hpp>
32
33
34
35 namespace sf
```

```

36 {
37 namespace priv
38 {
39     class MutexImpl;
40 }
41
47 class SFML_SYSTEM_API Mutex : NonCopyable
48 {
49 public:
50
55     Mutex();
56
61     ~Mutex();
62
73     void lock();
74
81     void unlock();
82
83 private:
84
86     // Member data
88     priv::MutexImpl* m_mutexImpl;
89 };
90
91 } // namespace sf
92
93
94 #endif // SFML_MUTEX_HPP
95
96

```

SFML 2.4.2

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NativeActivity.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_NATIVEACTIVITY_HPP
26 #define SFML_NATIVEACTIVITY_HPP
27
28 // Headers
29
30 // Headers
31
32 #include <SFML/System/Export.hpp>
33
34
35 #if !defined(SFML_SYSTEM_ANDROID)
```

```
36 #error NativeActivity.hpp: This header is Android only.
37 #endif
38
39
40 struct ANativeActivity;
41
42 namespace sf
43 {
44
45     SFML_SYSTEM_API ANativeActivity* getNativeActivity();
46
47 } // namespace sf
48
49 #endif // SFML_NATIVEACTIVITY_HPP
```

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Network.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_NETWORK_HPP
26 #define SFML_NETWORK_HPP
27
28 // Headers
29
30
31
32 #include <SFML/System.hpp>
33 #include <SFML/Network/Ftp.hpp>
34 #include <SFML/Network/Http.hpp>
35 #include <SFML/Network/IpAddress.hpp>
```

```
36 #include <SFML/Network/Packet.hpp>
37 #include <SFML/Network/Socket.hpp>
38 #include <SFML/Network/SocketHandle.hpp>
39 #include <SFML/Network/SocketSelector.hpp>
40 #include <SFML/Network/TcpListener.hpp>
41 #include <SFML/Network/TcpSocket.hpp>
42 #include <SFML/Network/UdpSocket.hpp>
43
44
45 #endif // SFML_NETWORK_HPP
46
```

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NonCopyable.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_NONCOPYABLE_HPP
26 #define SFML_NONCOPYABLE_HPP
27
28 // Headers
29 #include <SFML/System/Export.hpp>
30
31 namespace sf
32 {
33     namespace NonCopyable
34     {
35         class NonCopyable
36         {
37         public:
38             NonCopyable() {}
39             NonCopyable(NonCopyable const &other) {}
40             NonCopyable& operator=(NonCopyable const &other) {}
41             virtual ~NonCopyable() {}
42         };
43     }
44 }
```

```
41 class SFML_SYSTEM_API NonCopyable
42 {
43 protected:
44
45     NonCopyable() {}
46
47 private:
48
49     NonCopyable(const NonCopyable&);
50
51     NonCopyable& operator =(const NonCopyable&);
52 };
53 } // namespace sf
54
55 #endif // SFML_NONCOPYABLE_HPP
56
57
```

SFML 2.4.2

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OpenGL.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_OPENGL_HPP
26 #define SFML_OPENGL_HPP
27
28
29
30
31
32 #include <SFML/Config.hpp>
33
34
35
36
37
38
39 #if defined(SFML_SYSTEM_WINDOWS)
40
```

```

41 // The Visual C++ version of gl.h uses WINGDIAPI and APIENTR
42 #ifdef _MSC_VER
43     #include <windows.h>
44 #endif
45
46     #include <GL/gl.h>
47
48 #elif defined(SFML_SYSTEM_LINUX) || defined(SFML_SYSTEM_FREEBSD)
49
50     #if defined(SFML_OPENGL_ES)
51         #include <GLES/gl.h>
52         #include <GLES/glext.h>
53     #else
54         #include <GL/gl.h>
55     #endif
56
57 #elif defined(SFML_SYSTEM_MACOS)
58
59     #include <OpenGL/gl.h>
60
61 #elif defined (SFML_SYSTEM_IOS)
62
63     #include <OpenGLES/ES1/gl.h>
64     #include <OpenGLES/ES1/glext.h>
65
66 #elif defined (SFML_SYSTEM_ANDROID)
67
68     #include <GLES/gl.h>
69     #include <GLES/glext.h>
70
71     // We're not using OpenGL ES 2+ yet, but we can use the sRGB
72     #include <GLES2/gl2ext.h>
73
74 #endif
75
76
77 #endif // SFML_OPENGL_HPP

```

SFML 2.4.2

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OutputSoundFile.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_OUTPUTSOUNDFILE_HPP
26 #define SFML_OUTPUTSOUNDFILE_HPP
27
28 // Headers
29 #include <SFML/Audio/Export.hpp>
30 #include <SFML/System/NonCopyable.hpp>
31 #include <string>
32
33 #endif
```

```

36 namespace sf
37 {
38 class SoundFileWriter;
39
44 class SFML_AUDIO_API OutputSoundFile : NonCopyable
45 {
46 public:
47
52     OutputSoundFile();
53
60     ~OutputSoundFile();
61
74     bool openFromFile(const std::string& filename, unsigned int
channelCount);
75
83     void write(const Int16* samples, Uint64 count);
84
85 private:
86
91     void close();
92
94     // Member data
96     SoundFileWriter* m_writer;
97 };
98
99 } // namespace sf
100
101
102 #endif // SFML_OUTPUTSOUNDFILE_HPP
103
104

```

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Packet.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_PACKET_HPP
26 #define SFML_PACKET_HPP
27
28 // Headers
29
30 #include <SFML/Network/Export.hpp>
31 #include <string>
32 #include <vector>
33
34
35
```

```

36 namespace sf
37 {
38 class String;
39 class TcpSocket;
40 class UdpSocket;
41
42
43
44
45
46
47 class SFML_NETWORK_API Packet
48 {
49     // A bool-like type that cannot be converted to integer or p
50     typedef bool (Packet::*BoolType)(std::size_t);
51
52 public:
53
54
55
56
57
58
59
60     Packet();
61
62
63
64
65
66     virtual ~Packet();
67
68
69
70
71
72
73
74
75
76
77     void append(const void* data, std::size_t sizeInBytes);
78
79
80
81
82
83
84
85
86
87     void clear();
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102     const void* getData() const;
103
104
105
106
107
108
109
110
111
112
113
114
115     std::size_t getDataSize() const;
116
117
118
119
120
121
122
123
124
125
126
127
128
129     bool endOfPacket() const;
130
131 public:
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171     operator BoolType() const;
172
173
174
175
176
177     Packet& operator >>(bool& data);
178     Packet& operator >>(Int8& data);
179     Packet& operator >>(UInt8& data);
180     Packet& operator >>(Int16& data);
181     Packet& operator >>(UInt16& data);
182     Packet& operator >>(Int32& data);
183     Packet& operator >>(UInt32& data);
184     Packet& operator >>(Int64& data);
185     Packet& operator >>(UInt64& data);
186     Packet& operator >>(float& data);
187     Packet& operator >>(double& data);
188     Packet& operator >>(char* data);
189     Packet& operator >>(std::string& data);
190     Packet& operator >>(wchar_t* data);
191     Packet& operator >>(std::wstring& data);
192     Packet& operator >>(String& data);
193
194
195
196
197
198     Packet& operator <<(bool data);
199     Packet& operator <<(Int8 data);
200     Packet& operator <<(UInt8 data);
201     Packet& operator <<(Int16 data);

```

```

202     Packet& operator <<(Uint16           data);
203     Packet& operator <<(Int32           data);
204     Packet& operator <<(Uint32         data);
205     Packet& operator <<(Int64           data);
206     Packet& operator <<(Uint64         data);
207     Packet& operator <<(float           data);
208     Packet& operator <<(double          data);
209     Packet& operator <<(const char*     data);
210     Packet& operator <<(const std::string& data);
211     Packet& operator <<(const wchar_t*   data);
212     Packet& operator <<(const std::wstring& data);
213     Packet& operator <<(const String&     data);
214
215 protected:
216
217     friend class TcpSocket;
218     friend class UdpSocket;
219
238     virtual const void* onSend(std::size_t& size);
239
257     virtual void onReceive(const void* data, std::size_t size);
258
259 private:
260
265     bool operator ==(const Packet& right) const;
266     bool operator !=(const Packet& right) const;
267
278     bool checkSize(std::size_t size);
279
281     // Member data
283     std::vector<char> m_data;
284     std::size_t      m_readPos;
285     std::size_t      m_sendPos;
286     bool             m_isValid;
287 };
288
289 } // namespace sf
290
291
292 #endif // SFML_PACKET_HPP
293
294

```

PrimitiveType.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_PRIMITIVETYPE_HPP
26 #define SFML_PRIMITIVETYPE_HPP
27
28 namespace sf
29 {
30     enum PrimitiveType
31     {
32         Points,
33         Lines,
34     };
35 }
```

```
43     LineStrip,  
44     Triangles,  
45     TriangleStrip,  
46     TriangleFan,  
47     Quads,  
48  
49     // Deprecated names  
50     LinesStrip    = LineStrip,  
51     TrianglesStrip = TriangleStrip,  
52     TrianglesFan  = TriangleFan  
53 };  
54  
55 } // namespace sf  
56  
57  
58 #endif // SFML_PRIMITIVETYPE_HPP
```

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Rect.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_RECT_HPP
26 #define SFML_RECT_HPP
27
28 // Headers
29 #include <SFML/System/Vector2.hpp>
30 #include <algorithm>
31
32 namespace sf
```

```

36 {
41 template <typename T>
42 class Rect
43 {
44 public:
45
53     Rect();
54
67     Rect(T rectLeft, T rectTop, T rectWidth, T rectHeight);
68
79     Rect(const Vector2<T>& position, const Vector2<T>& size);
80
92     template <typename U>
93     explicit Rect(const Rect<U>& rectangle);
94
109    bool contains(T x, T y) const;
110
124    bool contains(const Vector2<T>& point) const;
125
136    bool intersects(const Rect<T>& rectangle) const;
137
152    bool intersects(const Rect<T>& rectangle, Rect<T>& intersec
153
155    // Member data
157    T left;
158    T top;
159    T width;
160    T height;
161 };
162
175 template <typename T>
176 bool operator ==(const Rect<T>& left, const Rect<T>& right);
177
190 template <typename T>
191 bool operator !=(const Rect<T>& left, const Rect<T>& right);
192
193 #include <SFML/Graphics/Rect.inl>
194
195 // Create typedefs for the most common types
196 typedef Rect<int> IntRect;
197 typedef Rect<float> FloatRect;
198
199 } // namespace sf
200
201
202 #endif // SFML_RECT_HPP
203
204

```

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RectangleShape.hpp

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21 // distribution.
22 //
23 //
24 //
25 #ifndef SFML_RECTANGLESHAPE_HPP
26 #define SFML_RECTANGLESHAPE_HPP
27
28 // Headers
29 #include <SFML/Graphics/Export.hpp>
30 #include <SFML/Graphics/Shape.hpp>
31
32 namespace sf
```

```

36 {
41 class SFML_GRAPHICS_API RectangleShape : public Shape
42 {
43 public:
44
51     explicit RectangleShape(const Vector2f& size = Vector2f(0, 0))
52
61     void setSize(const Vector2f& size);
62
71     const Vector2f& getSize() const;
72
80     virtual std::size_t getPointCount() const;
81
95     virtual Vector2f getPoint(std::size_t index) const;
96
97 private:
98
100     // Member data
102     Vector2f m_size;
103 };
104
105 } // namespace sf
106
107
108 #endif // SFML_RECTANGLESHAPE_HPP
109
110

```

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RenderStates.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_RENDERSTATES_HPP
26 #define SFML_RENDERSTATES_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/BlendMode.hpp>
32 #include <SFML/Graphics/Transform.hpp>
33
34
35
```

```

36 namespace sf
37 {
38 class Shader;
39 class Texture;
40
45 class SFML_GRAPHICS_API RenderStates
46 {
47 public:
48
61     RenderStates();
62
69     RenderStates(const BlendMode& theBlendMode);
70
77     RenderStates(const Transform& theTransform);
78
85     RenderStates(const Texture* theTexture);
86
93     RenderStates(const Shader* theShader);
94
104     RenderStates(const BlendMode& theBlendMode, const Transform
105                 const Texture* theTexture, const Shader* theSha
106
108     // Static member data
110     static const RenderStates Default;
111
113     // Member data
115     BlendMode blendMode;
116     Transform transform;
117     const Texture* texture;
118     const Shader* shader;
119 };
120
121 } // namespace sf
122
123
124 #endif // SFML_RENDERSTATES_HPP
125
126

```

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RenderTarget.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_RENDERTARGET_HPP
26 #define SFML_RENDERTARGET_HPP
27
28 // Headers
29 #include <SFML/Graphics/Export.hpp>
30 #include <SFML/Graphics/Color.hpp>
31 #include <SFML/Graphics/Rect.hpp>
32 #include <SFML/Graphics/View.hpp>
33 #include <SFML/Graphics/Transform.hpp>
```

```

36 #include <SFML/Graphics/BlendMode.hpp>
37 #include <SFML/Graphics/RenderStates.hpp>
38 #include <SFML/Graphics/PrimitiveType.hpp>
39 #include <SFML/Graphics/Vertex.hpp>
40 #include <SFML/System/NonCopyable.hpp>
41
42
43 namespace sf
44 {
45     class Drawable;
46
47     class SFML_GRAPHICS_API RenderTarget : NonCopyable
48     {
49     public:
50
51         virtual ~RenderTarget();
52
53         void clear(const Color& color = Color(0, 0, 0, 255));
54
55         void setView(const View& view);
56
57         const View& getView() const;
58
59         const View& getDefaultView() const;
60
61         IntRect getViewport(const View& view) const;
62
63         Vector2f mapPixelToCoords(const Vector2i& point) const;
64
65         Vector2f mapPixelToCoords(const Vector2i& point, const View& view) const;
66
67         Vector2i mapCoordsToPixel(const Vector2f& point) const;
68
69         Vector2i mapCoordsToPixel(const Vector2f& point, const View& view) const;
70
71         void draw(const Drawable& drawable, const RenderStates& states);
72
73         void draw(const Vertex* vertices, std::size_t vertexCount,
74                 PrimitiveType type, const RenderStates& states = RenderStates());
75
76         virtual Vector2u getSize() const = 0;
77
78         void pushGLStates();
79
80         void popGLStates();
81
82         void resetGLStates();
83
84     protected:
85
86         RenderTarget();
87
88     };
89
90 };

```

```

341     void initialize();
342
343 private:
344
349     void applyCurrentView();
350
357     void applyBlendMode(const BlendMode& mode);
358
365     void applyTransform(const Transform& transform);
366
373     void applyTexture(const Texture* texture);
374
381     void applyShader(const Shader* shader);
382
395     virtual bool activate(bool active) = 0;
396
401     struct StatesCache
402     {
403         enum {VertexCacheSize = 4};
404
405         bool        glStatesSet;
406         bool        viewChanged;
407         BlendMode   lastBlendMode;
408         Uint64      lastTextureId;
409         bool        useVertexCache;
410         Vertex      vertexCache[VertexCacheSize];
411     };
412
414     // Member data
416     View          m_defaultView;
417     View          m_view;
418     StatesCache  m_cache;
419 };
420
421 } // namespace sf
422
423
424 #endif // SFML_RENDERTARGET_HPP
425
426

```

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RenderTargetTexture.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_RENDERTEXTURE_HPP
26 #define SFML_RENDERTEXTURE_HPP
27
28 // Headers
29 #include <SFML/Graphics/Export.hpp>
30 #include <SFML/Graphics/Texture.hpp>
31 #include <SFML/Graphics/RenderTarget.hpp>
32
33
34
35
```

```

36 namespace sf
37 {
38 namespace priv
39 {
40     class RenderTextureImpl;
41 }
42
47 class SFML_GRAPHICS_API RenderTexture : public RenderTarget
48 {
49 public:
50
60     RenderTexture();
61
66     virtual ~RenderTexture();
67
86     bool create(unsigned int width, unsigned int height, bool de
87
99     void setSmooth(bool smooth);
100
109     bool isSmooth() const;
110
122     void setRepeated(bool repeated);
123
132     bool isRepeated() const;
133
148     bool generateMipmap();
149
165     bool setActive(bool active = true);
166
176     void display();
177
187     virtual Vector2u getSize() const;
188
203     const Texture& getTexture() const;
204
205 private:
206
218     virtual bool activate(bool active);
219
221     // Member data
223     priv::RenderTextureImpl* m_impl;
224     Texture                    m_texture;
225 };
226
227 } // namespace sf
228
229
230 #endif // SFML_RENDERTEXTURE_HPP
231
232

```

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RenderWindow.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_RENDERWINDOW_HPP
26 #define SFML_RENDERWINDOW_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/RenderTarget.hpp>
32 #include <SFML/Graphics/Image.hpp>
33 #include <SFML/Window/Window.hpp>
34 #include <string>
```

```

36
37
38 namespace sf
39 {
44 class SFML_GRAPHICS_API RenderWindow : public Window, public Re
45 {
46 public:
47
55     RenderWindow();
56
76     RenderWindow(VideoMode mode, const String& title, Uint32 st
ContextSettings& settings = ContextSettings());
77
94     explicit RenderWindow(WindowHandle handle, const ContextSet
ContextSettings());
95
102     virtual ~RenderWindow();
103
113     virtual Vector2u getSize() const;
114
140     SFML_DEPRECATED Image capture() const;
141
142 protected:
143
152     virtual void onCreate();
153
161     virtual void onResize();
162
163 private:
164
173     virtual bool activate(bool active);
174 };
175
176 } // namespace sf
177
178
179 #endif // SFML_RENDERWINDOW_HPP
180
181

```

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Sensor.hpp

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22 //
23 //
24 //
25 #ifndef SFML_SENSOR_HPP
26 #define SFML_SENSOR_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Window/Export.hpp>
32 #include <SFML/System/Vector3.hpp>
33 #include <SFML/System/Time.hpp>
34 //
35
```

```

36 namespace sf
37 {
42 class SFML_WINDOW_API Sensor
43 {
44 public:
45
50     enum Type
51     {
52         Accelerometer,
53         Gyroscope,
54         Magnetometer,
55         Gravity,
56         UserAcceleration,
57         Orientation,
58
59         Count
60     };
61
70     static bool isAvailable(Type sensor);
71
85     static void setEnabled(Type sensor, bool enabled);
86
95     static Vector3f getValue(Type sensor);
96 };
97
98 } // namespace sf
99
100
101 #endif // SFML_SENSOR_HPP
102
103

```

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Shader.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SHADER_HPP
26 #define SFML_SHADER_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/Glsl.hpp>
32 #include <SFML/Window/GlResource.hpp>
33 #include <SFML/System/NonCopyable.hpp>
34 #include <SFML/System/Vector2.hpp>
```

```

36 #include <SFML/System/Vector3.hpp>
37 #include <map>
38 #include <string>
39
40
41 namespace sf
42 {
43 class Color;
44 class InputStream;
45 class Texture;
46 class Transform;
47
52 class SFML_GRAPHICS_API Shader : GLResource, NonCopyable
53 {
54 public:
55
60     enum Type
61     {
62         Vertex,
63         Geometry,
64         Fragment
65     };
66
74     struct CurrentTextureType {};
75
82     static CurrentTextureType CurrentTexture;
83
84 public:
85
92     Shader();
93
98     ~Shader();
99
119     bool loadFromFile(const std::string& filename, Type type);
120
140     bool loadFromFile(const std::string& vertexShaderFilename, c
fragmentShaderFilename);
141
162     bool loadFromFile(const std::string& vertexShaderFilename, c
geometryShaderFilename, const std::string& fragmentShaderFilename);
163
182     bool loadFromMemory(const std::string& shader, Type type);
183
203     bool loadFromMemory(const std::string& vertexShader, const s
204
225     bool loadFromMemory(const std::string& vertexShader, const s
const std::string& fragmentShader);
226
245     bool loadFromStream(InputStream& stream, Type type);
246
266     bool loadFromStream(InputStream& vertexShaderStream, InputSt
267

```

```

288     bool loadFromStream(InputStream& vertexShaderStream, InputSt
InputStream& fragmentShaderStream);
289
297     void setUniform(const std::string& name, float x);
298
306     void setUniform(const std::string& name, const Gls1::Vec2& v
307
315     void setUniform(const std::string& name, const Gls1::Vec3& v
316
333     void setUniform(const std::string& name, const Gls1::Vec4& v
334
342     void setUniform(const std::string& name, int x);
343
351     void setUniform(const std::string& name, const Gls1::Ivec2&
352
360     void setUniform(const std::string& name, const Gls1::Ivec3&
361
377     void setUniform(const std::string& name, const Gls1::Ivec4&
378
386     void setUniform(const std::string& name, bool x);
387
395     void setUniform(const std::string& name, const Gls1::Bvec2&
396
404     void setUniform(const std::string& name, const Gls1::Bvec3&
405
413     void setUniform(const std::string& name, const Gls1::Bvec4&
414
422     void setUniform(const std::string& name, const Gls1::Mat3& m
423
431     void setUniform(const std::string& name, const Gls1::Mat4& m
432
463     void setUniform(const std::string& name, const Texture& text
464
486     void setUniform(const std::string& name, CurrentTextureType)
487
496     void setUniformArray(const std::string& name, const float* s
length);
497
506     void setUniformArray(const std::string& name, const Gls1::Ve
length);
507
516     void setUniformArray(const std::string& name, const Gls1::Ve
length);
517
526     void setUniformArray(const std::string& name, const Gls1::Ve
length);
527
536     void setUniformArray(const std::string& name, const Gls1::Ma
length);
537
546     void setUniformArray(const std::string& name, const Gls1::Ma
length);

```

```

547
554 SFML_DEPRECATED void setParameter(const std::string& name, f
555
562 SFML_DEPRECATED void setParameter(const std::string& name, f
563
570 SFML_DEPRECATED void setParameter(const std::string& name, f
571
578 SFML_DEPRECATED void setParameter(const std::string& name, f
w);
579
586 SFML_DEPRECATED void setParameter(const std::string& name, c
587
594 SFML_DEPRECATED void setParameter(const std::string& name, c
595
602 SFML_DEPRECATED void setParameter(const std::string& name, c
603
610 SFML_DEPRECATED void setParameter(const std::string& name, c
611
618 SFML_DEPRECATED void setParameter(const std::string& name, c
619
626 SFML_DEPRECATED void setParameter(const std::string& name, C
627
638 unsigned int getNativeHandle() const;
639
661 static void bind(const Shader* shader);
662
673 static bool isAvailable();
674
692 static bool isGeometryAvailable();
693
694 private:
695
709 bool compile(const char* vertexShaderCode, const char* geome
fragmentShaderCode);
710
718 void bindTextures() const;
719
728 int getUniformLocation(const std::string& name);
729
737 struct UniformBinder;
738
740 // Types
742 typedef std::map<int, const Texture*> TextureTable;
743 typedef std::map<std::string, int> UniformTable;
744
746 // Member data
748 unsigned int m_shaderProgram;
749 int m_currentTexture;
750 TextureTable m_textures;
751 UniformTable m_uniforms;
752 };
753

```

```
754 } // namespace sf
755
756
757 #endif // SFML_SHADER_HPP
758
759
```

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Shape.hpp

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21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_SHAPE_HPP
26 #define SFML_SHAPE_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Graphics/Export.hpp>
32 #include <SFML/Graphics/Drawable.hpp>
33 #include <SFML/Graphics/Transformable.hpp>
34 #include <SFML/Graphics/VertexArray.hpp>
35 #include <SFML/System/Vector2.hpp>
```

```

36
37
38 namespace sf
39 {
44 class SFML_GRAPHICS_API Shape : public Drawable, public Transfo
45 {
46 public:
47
52     virtual ~Shape();
53
74     void setTexture(const Texture* texture, bool resetRect = fal
75
88     void setTextureRect(const IntRect& rect);
89
105    void setFillColor(const Color& color);
106
117    void setOutlineColor(const Color& color);
118
132    void setOutlineThickness(float thickness);
133
146    const Texture* getTexture() const;
147
156    const IntRect& getTextureRect() const;
157
166    const Color& getFillColor() const;
167
176    const Color& getOutlineColor() const;
177
186    float getOutlineThickness() const;
187
196    virtual std::size_t getPointCount() const = 0;
197
213    virtual Vector2f getPoint(std::size_t index) const = 0;
214
227    FloatRect getLocalBounds() const;
228
248    FloatRect getGlobalBounds() const;
249
250 protected:
251
256     Shape();
257
266     void update();
267
268 private:
269
277     virtual void draw(RenderTarget& target, RenderStates states
278
283     void updateFillColors();
284
289     void updateTexCoords();
290

```

```
295     void updateOutline();
296
301     void updateOutlineColors();
302
303 private:
304
306     // Member data
308     const Texture* m_texture;
309     IntRect        m_textureRect;
310     Color          m_fillColor;
311     Color          m_outlineColor;
312     float          m_outlineThickness;
313     VertexArray    m_vertices;
314     VertexArray    m_outlineVertices;
315     FloatRect      m_insideBounds;
316     FloatRect      m_bounds;
317 };
318
319 } // namespace sf
320
321
322 #endif // SFML_SHAPE_HPP
323
324
```

SFML 2.4.2

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Sleep.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_SLEEP_HPP
26 #define SFML_SLEEP_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/System/Export.hpp>
32 #include <SFML/System/Time.hpp>
33 //
34 //
35 namespace sf
```

```
36 {
47 void SFML_SYSTEM_API sleep(Time duration);
48
49 } // namespace sf
50
51
52 #endif // SFML_SLEEP_HPP
```

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Socket.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOCKET_HPP
26 #define SFML_SOCKET_HPP
27
28 // Headers
29
30 #include <SFML/Network/Export.hpp>
31 #include <SFML/Network/SocketHandle.hpp>
32 #include <SFML/System/NonCopyable.hpp>
33 #include <vector>
34
35
```

```

36
37 namespace sf
38 {
39 class SocketSelector;
40
45 class SFML_NETWORK_API Socket : NonCopyable
46 {
47 public:
48
53     enum Status
54     {
55         Done,
56         NotReady,
57         Partial,
58         Disconnected,
59         Error
60     };
61
66     enum
67     {
68         AnyPort = 0
69     };
70
71 public:
72
77     virtual ~Socket();
78
96     void setBlocking(bool blocking);
97
106    bool isBlocking() const;
107
108 protected:
109
114     enum Type
115     {
116         Tcp,
117         Udp
118     };
119
128     Socket(Type type);
129
140     SocketHandle getHandle() const;
141
148     void create();
149
159     void create(SocketHandle handle);
160
167     void close();
168
169 private:
170
171     friend class SocketSelector;

```

```
172
173
174     // Member data
175
176     Type      m_type;
177     SocketHandle m_socket;
178     bool      m_isBlocking;
179 };
180
181 } // namespace sf
182
183
184 #endif // SFML_SOCKET_HPP
185
186
```

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SocketHandle.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOCKETHANDLE_HPP
26 #define SFML_SOCKETHANDLE_HPP
27
28 // Headers
29
30 #include <SFML/Config.hpp>
31
32 #if defined(SFML_SYSTEM_WINDOWS)
33     #include <basetsd.h>
34 #endif
35 #endif
```

```
36
37
38 namespace sf
39 {
40 // Define the low-level socket handle type, specific to
41 // each platform
42 #if defined(SFML_SYSTEM_WINDOWS)
43     typedef UINT_PTR SocketHandle;
44 #else
45     typedef int SocketHandle;
46 #endif
47 } // namespace sf
48
49 #endif // SFML_SOCKETHANDLE_HPP
```

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SocketSelector.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOCKETSELECTOR_HPP
26 #define SFML_SOCKETSELECTOR_HPP
27
28 // Headers
29
30 #include <SFML/Network/Export.hpp>
31 #include <SFML/System/Time.hpp>
32
33
34
35 namespace sf
```

```

36 {
37 class Socket;
38
43 class SFML_NETWORK_API SocketSelector
44 {
45 public:
46
51     SocketSelector();
52
59     SocketSelector(const SocketSelector& copy);
60
65     ~SocketSelector();
66
80     void add(Socket& socket);
81
93     void remove(Socket& socket);
94
105    void clear();
106
123    bool wait(Time timeout = Time::Zero);
124
142    bool isReady(Socket& socket) const;
143
152    SocketSelector& operator =(const SocketSelector& right);
153
154 private:
155
156     struct SocketSelectorImpl;
157
159     // Member data
161     SocketSelectorImpl* m_impl;
162 };
163
164 } // namespace sf
165
166
167 #endif // SFML_SOCKETSELECTOR_HPP
168
169

```

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Sound.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOUND_HPP
26 #define SFML_SOUND_HPP
27
28 // Headers
29
30 #include <SFML/Export.hpp>
31 #include <SFML/Audio/Export.hpp>
32 #include <SFML/Audio/SoundSource.hpp>
33 #include <SFML/System/Time.hpp>
34 #include <cstdlib>
35
```

```

36
37 namespace sf
38 {
39 class SoundBuffer;
40
45 class SFML_AUDIO_API Sound : public SoundSource
46 {
47 public:
48
53     Sound();
54
61     explicit Sound(const SoundBuffer& buffer);
62
69     Sound(const Sound& copy);
70
75     ~Sound();
76
89     void play();
90
100    void pause();
101
112    void stop();
113
126    void setBuffer(const SoundBuffer& buffer);
127
141    void setLoop(bool loop);
142
156    void setPlayingOffset(Time timeOffset);
157
164    const SoundBuffer* getBuffer() const;
165
174    bool getLoop() const;
175
184    Time getPlayingOffset() const;
185
192    Status getStatus() const;
193
202    Sound& operator =(const Sound& right);
203
213    void resetBuffer();
214
215 private:
216
218     // Member data
220     const SoundBuffer* m_buffer;
221 };
222
223 } // namespace sf
224
225
226 #endif // SFML_SOUND_HPP
227

```

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SoundBuffer.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOUNDBUFFER_HPP
26 #define SFML_SOUNDBUFFER_HPP
27
28 // Headers
29
30 #include <SFML/Audio/Export.hpp>
31 #include <SFML/Audio/AlResource.hpp>
32 #include <SFML/System/Time.hpp>
33 #include <string>
34 #include <vector>
```

```

36 #include <set>
37
38
39 namespace sf
40 {
41 class Sound;
42 class InputSoundFile;
43 class InputStream;
44
49 class SFML_AUDIO_API SoundBuffer : AlResource
50 {
51 public:
52
57     SoundBuffer();
58
65     SoundBuffer(const SoundBuffer& copy);
66
71     ~SoundBuffer();
72
86     bool loadFromFile(const std::string& filename);
87
102    bool loadFromMemory(const void* data, std::size_t sizeInByte
103
117    bool loadFromStream(InputStream& stream);
118
135    bool loadFromSamples(const Int16* samples, Uint64 sampleCount
unsigned int sampleRate);
136
150    bool saveToFile(const std::string& filename) const;
151
164    const Int16* getSamples() const;
165
177    Uint64 getSampleCount() const;
178
191    unsigned int getSampleRate() const;
192
204    unsigned int getChannelCount() const;
205
214    Time getDuration() const;
215
224    SoundBuffer& operator =(const SoundBuffer& right);
225
226 private:
227
228     friend class Sound;
229
238     bool initialize(InputSoundFile& file);
239
249     bool update(unsigned int channelCount, unsigned int sampleRate);
250
257     void attachSound(Sound* sound) const;
258

```

```
265     void detachSound(Sound* sound) const;
266
267     // Types
270     typedef std::set<Sound*> SoundList;
271
272     // Member data
275     unsigned int      m_buffer;
276     std::vector<Int16> m_samples;
277     Time              m_duration;
278     mutable SoundList m_sounds;
279 };
280
281 } // namespace sf
282
283
284 #endif // SFML_SOUNDBUFFER_HPP
285
286
```

SFML 2.4.2

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SoundBufferRecorder.hpp

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22 //
23 //
24 //
25 #ifndef SFML_SOUNDBUFFERRECORDER_HPP
26 #define SFML_SOUNDBUFFERRECORDER_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Audio/Export.hpp>
32 #include <SFML/Audio/SoundBuffer.hpp>
33 #include <SFML/Audio/SoundRecorder.hpp>
34 #include <vector>
35
```

```

36
37 namespace sf
38 {
44 class SFML_AUDIO_API SoundBufferRecorder : public SoundRecorder
45 {
46 public:
47
52     ~SoundBufferRecorder();
53
65     const SoundBuffer& getBuffer() const;
66
67 protected:
68
75     virtual bool onStart();
76
86     virtual bool onProcessSamples(const Int16* samples, std::siz
87
92     virtual void onStop();
93
94 private:
95
97     // Member data
99     std::vector<Int16> m_samples;
100     SoundBuffer      m_buffer;
101 };
102
103 } // namespace sf
104
105 #endif // SFML_SOUNDBUFFERRECORDER_HPP
106
107

```

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SoundFileFactory.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOUNDFILEFACTORY_HPP
26 #define SFML_SOUNDFILEFACTORY_HPP
27
28 // Headers
29
30 #include <SFML/Audio/Export.hpp>
31 #include <string>
32 #include <vector>
33
34
35
```

```

36 namespace sf
37 {
38 class InputStream;
39 class SoundFileReader;
40 class SoundFileWriter;
41
46 class SFML_AUDIO_API SoundFileFactory
47 {
48 public:
49
56     template <typename T>
57     static void registerReader();
58
65     template <typename T>
66     static void unregisterReader();
67
74     template <typename T>
75     static void registerWriter();
76
83     template <typename T>
84     static void unregisterWriter();
85
98     static SoundFileReader* createReaderFromFilename(const std::
99
113    static SoundFileReader* createReaderFromMemory(const void* c
114
127    static SoundFileReader* createReaderFromStream(InputStream&
128
139    static SoundFileWriter* createWriterFromFilename(const std::
140
141 private:
142
144     // Types
146     struct ReaderFactory
147     {
148         bool (*check)(InputStream&);
149         SoundFileReader* (*create)();
150     };
151     typedef std::vector<ReaderFactory> ReaderFactoryArray;
152
153     struct WriterFactory
154     {
155         bool (*check)(const std::string&);
156         SoundFileWriter* (*create)();
157     };
158     typedef std::vector<WriterFactory> WriterFactoryArray;
159
161     // Static member data
163     static ReaderFactoryArray s_readers;
164     static WriterFactoryArray s_writers;
165 };
166

```

```
167 } // namespace sf
168
169 #include <SFML/Audio/SoundFileFactory.inl>
170
171 #endif // SFML_SOUNDFILEFACTORY_HPP
172
173
```

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SoundFileReader.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOUNDFILEREADER_HPP
26 #define SFML_SOUNDFILEREADER_HPP
27
28 // Headers
29 #include <SFML/Audio/Export.hpp>
30 #include <string>
31
32 namespace sf
```

```

36 {
37 class InputStream;
38
43 class SFML_AUDIO_API SoundFileReader
44 {
45 public:
46
47     struct Info
48     {
49         Uint64      sampleCount;
50         unsigned int channelCount;
51         unsigned int sampleRate;
52     };
53
54     virtual ~SoundFileReader() {}
55
56     virtual bool open(InputStream& stream, Info& info) = 0;
57
58     virtual void seek(Uint64 sampleOffset) = 0;
59
60     virtual Uint64 read(Int16* samples, Uint64 maxCount) = 0;
61 };
62
63 } // namespace sf
64
65 #endif // SFML_SOUNDFILEREADER_HPP
66
67
68
69
70
71
72
73
74
75
76
77
78
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110

```

SFML 2.4.2

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SoundFileWriter.hpp

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18 // 2. Altered source versions must be plainly marked as such, and must not
19 // be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source
21 // distribution.
22 //
23 //
24 //
25 #ifndef SFML_SOUNDFILEWRITER_HPP
26 #define SFML_SOUNDFILEWRITER_HPP
27
28 // Headers
29 #include <SFML/Audio/Export.hpp>
30 #include <string>
31
32 namespace sf
```

```
36 {
41 class SFML_AUDIO_API SoundFileWriter
42 {
43 public:
44
49     virtual ~SoundFileWriter() {}
50
61     virtual bool open(const std::string& filename, unsigned int
channelCount) = 0;
62
70     virtual void write(const Int16* samples, Uint64 count) = 0;
71 };
72
73 } // namespace sf
74
75
76 #endif // SFML_SOUNDFILEWRITER_HPP
77
78
```

SFML 2.4.2

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SoundRecorder.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_SOUNDRECORDER_HPP
26 #define SFML_SOUNDRECORDER_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Audio/Export.hpp>
32 #include <SFML/Audio/AlResource.hpp>
33 #include <SFML/System/Thread.hpp>
34 #include <SFML/System/Time.hpp>
35 #include <vector>
```

```

36 #include <string>
37
38
39 namespace sf
40 {
45 class SFML_AUDIO_API SoundRecorder : AlResource
46 {
47 public:
48
49     virtual ~SoundRecorder();
50
51     bool start(unsigned int sampleRate = 44100);
52
53     void stop();
54
55     unsigned int getSampleRate() const;
56
57     static std::vector<std::string> getAvailableDevices();
58
59     static std::string getDefaultDevice();
60
61     bool setDevice(const std::string& name);
62
63     const std::string& getDevice() const;
64
65     void setChannelCount(unsigned int channelCount);
66
67     unsigned int getChannelCount() const;
68
69     static bool isAvailable();
70
71 protected:
72     SoundRecorder();
73
74     void setProcessingInterval(Time interval);
75
76     virtual bool onStart();
77
78     virtual bool onProcessSamples(const Int16* samples, std::siz
79
80     virtual void onStop();
81
82 private:
83     void record();
84
85     void processCapturedSamples();
86
87     void cleanup();
88
89     // Member data

```

```
288     Thread          m_thread;
289     std::vector<Int16> m_samples;
290     unsigned int      m_sampleRate;
291     Time              m_processingInterval;
292     bool              m_isCapturing;
293     std::string       m_deviceName;
294     unsigned int      m_channelCount;
295 };
296
297 } // namespace sf
298
299
300 #endif // SFML_SOUNDRECORDER_HPP
301
302
```

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SoundSource.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SOUNDSOURCE_HPP
26 #define SFML_SOUNDSOURCE_HPP
27
28 // Headers
29
30 #include <SFML/Audio/Export.hpp>
31 #include <SFML/Audio/AlResource.hpp>
32 #include <SFML/System/Vector3.hpp>
33
34
35
```

```

36 namespace sf
37 {
42 class SFML_AUDIO_API SoundSource : AResource
43 {
44 public:
45
50     enum Status
51     {
52         Stopped,
53         Paused,
54         Playing
55     };
56
63     SoundSource(const SoundSource& copy);
64
69     virtual ~SoundSource();
70
85     void setPitch(float pitch);
86
98     void setVolume(float volume);
99
114    void setPosition(float x, float y, float z);
115
128    void setPosition(const Vector3f& position);
129
144    void setRelativeToListener(bool relative);
145
161    void setMinDistance(float distance);
162
180    void setAttenuation(float attenuation);
181
190    float getPitch() const;
191
200    float getVolume() const;
201
210    Vector3f getPosition() const;
211
221    bool isRelativeToListener() const;
222
231    float getMinDistance() const;
232
241    float getAttenuation() const;
242
251    SoundSource& operator =(const SoundSource& right);
252
253 protected:
254
261     SoundSource();
262
269     Status getStatus() const;
270
272     // Member data

```

```
274 unsigned int m_source;  
275 };  
276  
277 } // namespace sf  
278  
279  
280 #endif // SFML_SOUNDSOURCE_HPP  
281  
282
```

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SoundStream.hpp

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21 // distribution.
22 //
23 //
24 //
25 #ifndef SFML_SOUNDSTREAM_HPP
26 #define SFML_SOUNDSTREAM_HPP
27
28 // Headers
29
30 #include <SFML/Audio/Export.hpp>
31 #include <SFML/Audio/SoundSource.hpp>
32 #include <SFML/System/Thread.hpp>
33 #include <SFML/System/Time.hpp>
34 #include <SFML/System/Mutex.hpp>
```

```

36 #include <cstdlib>
37
38
39 namespace sf
40 {
45 class SFML_AUDIO_API SoundStream : public SoundSource
46 {
47 public:
48
49
53     struct Chunk
54     {
55         const Int16* samples;
56         std::size_t sampleCount;
57     };
58
63     virtual ~SoundStream();
64
77     void play();
78
88     void pause();
89
100    void stop();
101
110    unsigned int getChannelCount() const;
111
121    unsigned int getSampleRate() const;
122
129    Status getStatus() const;
130
144    void setPlayingOffset(Time timeOffset);
145
154    Time getPlayingOffset() const;
155
169    void setLoop(bool loop);
170
179    bool getLoop() const;
180
181 protected:
182
189     SoundStream();
190
205     void initialize(unsigned int channelCount, unsigned int samp
206
224     virtual bool onGetData(Chunk& data) = 0;
225
235     virtual void onSeek(Time timeOffset) = 0;
236
237 private:
238
246     void streamData();
247
261     bool fillAndPushBuffer(unsigned int bufferNum);

```

```

262
272     bool fillQueue();
273
280     void clearQueue();
281
282     enum
283     {
284         BufferCount = 3
285     };
286
287     // Member data
288
289     Thread      m_thread;
290     mutable Mutex m_threadMutex;
291     Status      m_threadStartState;
292     bool        m_isStreaming;
293     unsigned int m_buffers[BufferCount];
294     unsigned int m_channelCount;
295     unsigned int m_sampleRate;
296     Uint32      m_format;
297     bool        m_loop;
298     Uint64      m_samplesProcessed;
299     bool        m_endBuffers[BufferCount];
300 };
301 };
302
303 } // namespace sf
304
305
306 #endif // SFML_SOUNDSTREAM_HPP
307
308

```

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Sprite.hpp

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19 //    be misrepresented as being the original software.
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21 //
22 //
23 //
24 //
25 #ifndef SFML_SPRITE_HPP
26 #define SFML_SPRITE_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/Drawable.hpp>
32 #include <SFML/Graphics/Transformable.hpp>
33 #include <SFML/Graphics/Vertex.hpp>
34 #include <SFML/Graphics/Rect.hpp>
```

```

36
37
38 namespace sf
39 {
40 class Texture;
41
47 class SFML_GRAPHICS_API Sprite : public Drawable, public Transf
48 {
49 public:
50
57     Sprite();
58
67     explicit Sprite(const Texture& texture);
68
78     Sprite(const Texture& texture, const IntRect& rectangle);
79
99     void setTexture(const Texture& texture, bool resetRect = fal
100
113     void setTextureRect(const IntRect& rectangle);
114
128     void setColor(const Color& color);
129
142     const Texture* getTexture() const;
143
152     const IntRect& getTextureRect() const;
153
162     const Color& getColor() const;
163
176     FloatRect getLocalBounds() const;
177
190     FloatRect getGlobalBounds() const;
191
192 private:
193
201     virtual void draw(RenderTarget& target, RenderStates states
202
207     void updatePositions();
208
213     void updateTexCoords();
214
216     // Member data
218     Vertex          m_vertices[4];
219     const Texture*  m_texture;
220     IntRect         m_textureRect;
221 };
222
223 } // namespace sf
224
225
226 #endif // SFML_SPRITE_HPP
227
228

```

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String.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_STRING_HPP
26 #define SFML_STRING_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/System/Export.hpp>
32 #include <SFML/System/Utf.hpp>
33 #include <iterator>
34 #include <locale>
35 #include <string>
```

```

36
37
38 namespace sf
39 {
45 class SFML_SYSTEM_API String
46 {
47 public:
48
49     // Types
50     typedef std::basic_string<Uint32>::iterator      Iterator;
51     typedef std::basic_string<Uint32>::const_iterator ConstIterator;
52
53     // Static member data
54     static const std::size_t InvalidPos;
55
56     String();
57
58     String(char ansiChar, const std::locale& locale = std::local
59
60     String(wchar_t wideChar);
61
62     String(Uint32 utf32Char);
63
64     String(const char* ansiString, const std::locale& locale = s
65
66     String(const std::string& ansiString, const std::locale& loc
67
68     String(const wchar_t* wideString);
69
70     String(const std::wstring& wideString);
71
72     String(const Uint32* utf32String);
73
74     String(const std::basic_string<Uint32>& utf32String);
75
76     String(const String& copy);
77
78     template <typename T>
79     static String fromUtf8(T begin, T end);
80
81     template <typename T>
82     static String fromUtf16(T begin, T end);
83
84     template <typename T>
85     static String fromUtf32(T begin, T end);
86
87     operator std::string() const;
88
89     operator std::wstring() const;
90
91     std::string toAnsiString(const std::locale& locale = std::lo
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
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140
141
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151
152
153
154

```

```

266     std::wstring toWideString() const;
267
276     std::basic_string<Uint8> toUtf8() const;
277
286     std::basic_string<Uint16> toUtf16() const;
287
299     std::basic_string<Uint32> toUtf32() const;
300
309     String& operator =(const String& right);
310
319     String& operator +=(const String& right);
320
332     Uint32 operator [](std::size_t index) const;
333
345     Uint32& operator [](std::size_t index);
346
355     void clear();
356
365     std::size_t getSize() const;
366
375     bool isEmpty() const;
376
387     void erase(std::size_t position, std::size_t count = 1);
388
399     void insert(std::size_t position, const String& str);
400
413     std::size_t find(const String& str, std::size_t start = 0) c
414
427     void replace(std::size_t position, std::size_t length, const
428
439     void replace(const String& searchFor, const String& replace
440
456     String substring(std::size_t position, std::size_t length =
457
469     const Uint32* getData() const;
470
479     Iterator begin();
480
489     ConstIterator begin() const;
490
503     Iterator end();
504
517     ConstIterator end() const;
518
519 private:
520
521     friend SFML_SYSTEM_API bool operator ==(const String& left,
522     friend SFML_SYSTEM_API bool operator <(const String& left, c
523
525     // Member data
527     std::basic_string<Uint32> m_string;
528 };

```

```
529
540 SFML_SYSTEM_API bool operator ==(const String& left, const Strin
541
552 SFML_SYSTEM_API bool operator !=(const String& left, const Strin
553
564 SFML_SYSTEM_API bool operator <(const String& left, const String
565
576 SFML_SYSTEM_API bool operator >(const String& left, const String
577
588 SFML_SYSTEM_API bool operator <=(const String& left, const Strin
589
600 SFML_SYSTEM_API bool operator >=(const String& left, const Strin
601
612 SFML_SYSTEM_API String operator +(const String& left, const Str:
613
614 #include <SFML/System/String.inl>
615
616 } // namespace sf
617
618
619 #endif // SFML_STRING_HPP
620
621
```

SFML 2.4.2

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21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_SYSTEM_HPP
26 #define SFML_SYSTEM_HPP
27 //
28 //
29 // Headers
30 //
31 //
32 #include <SFML/Config.hpp>
33 #include <SFML/System/Clock.hpp>
34 #include <SFML/System/Err.hpp>
35 #include <SFML/System/FileInputStream.hpp>
```

```
36 #include <SFML/System/InputStream.hpp>
37 #include <SFML/System/Lock.hpp>
38 #include <SFML/System/MemoryInputStream.hpp>
39 #include <SFML/System/Mutex.hpp>
40 #include <SFML/System/NonCopyable.hpp>
41 #include <SFML/System/Sleep.hpp>
42 #include <SFML/System/String.hpp>
43 #include <SFML/System/Thread.hpp>
44 #include <SFML/System/ThreadLocal.hpp>
45 #include <SFML/System/ThreadLocalPtr.hpp>
46 #include <SFML/System/Time.hpp>
47 #include <SFML/System/Utf.hpp>
48 #include <SFML/System/Vector2.hpp>
49 #include <SFML/System/Vector3.hpp>
50
51 #endif // SFML_SYSTEM_HPP
52
```

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TcpListener.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_TCPLISTENER_HPP
26 #define SFML_TCPLISTENER_HPP
27
28 // Headers
29
30 #include <SFML/Network/Export.hpp>
31 #include <SFML/Network/Socket.hpp>
32 #include <SFML/Network/IpAddress.hpp>
33
34
35
```

```
36 namespace sf
37 {
38 class TcpSocket;
39
44 class SFML_NETWORK_API TcpListener : public Socket
45 {
46 public:
47
52     TcpListener();
53
65     unsigned short getLocalPort() const;
66
83     Status listen(unsigned short port, const IPAddress& address
84
94     void close();
95
109    Status accept(TcpSocket& socket);
110 };
111
112
113 } // namespace sf
114
115
116 #endif // SFML_TCPLISTENER_HPP
117
118
```

SFML 2.4.2

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21 //
22 //
23 //
24 //
25 #ifndef SFML_TCPSOCKET_HPP
26 #define SFML_TCPSOCKET_HPP
27
28 // Headers
29 #include <SFML/Network/Export.hpp>
30 #include <SFML/Network/Socket.hpp>
31 #include <SFML/System/Time.hpp>
32
33 #endif
```



```
235  
236 #endif // SFML_TCPSOCKET_HPP  
237  
238
```

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Text.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_TEXT_HPP
26 #define SFML_TEXT_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Graphics/Export.hpp>
32 #include <SFML/Graphics/Drawable.hpp>
33 #include <SFML/Graphics/Transformable.hpp>
34 #include <SFML/Graphics/Font.hpp>
35 #include <SFML/Graphics/Rect.hpp>
```

```

36 #include <SFML/Graphics/VertexArray.hpp>
37 #include <SFML/System/String.hpp>
38 #include <string>
39 #include <vector>
40
41
42 namespace sf
43 {
48 class SFML_GRAPHICS_API Text : public Drawable, public Transformable
49 {
50 public:
51
52     enum Style
53     {
54         Regular          = 0,
55         Bold              = 1 << 0,
56         Italic           = 1 << 1,
57         Underlined       = 1 << 2,
58         Strikethrough    = 1 << 3
59     };
60
61     Text();
62
63     Text(const String& string, const Font& font, unsigned int characterSize);
64
65     void setString(const String& string);
66
67     void setFont(const Font& font);
68
69     void setCharacterSize(unsigned int size);
70
71     void setStyle(Style style);
72
73     SFML_DEPRECATED void setColor(const Color& color);
74
75     void setFillColor(const Color& color);
76
77     void setOutlineColor(const Color& color);
78
79     void setOutlineThickness(float thickness);
80
81     const String& getString() const;
82
83     const Font* getFont() const;
84
85     unsigned int getCharacterSize() const;
86
87     Style getStyle() const;
88
89     SFML_DEPRECATED const Color& getColor() const;
90
91     const Color& getFillColor() const;

```

```

296
305     const Color& getOutlineColor() const;
306
315     float getOutlineThickness() const;
316
332     Vector2f findCharacterPos(std::size_t index) const;
333
346     FloatRect getLocalBounds() const;
347
360     FloatRect getGlobalBounds() const;
361
362 private:
363
371     virtual void draw(RenderTarget& target, RenderStates states);
372
380     void ensureGeometryUpdate() const;
381
383     // Member data
385     String          m_string;
386     const Font*     m_font;
387     unsigned int    m_characterSize;
388     Uint32          m_style;
389     Color           m_fillColor;
390     Color           m_outlineColor;
391     float           m_outlineThickness;
392     mutable VertexArray m_vertices;
393     mutable VertexArray m_outlineVertices;
394     mutable FloatRect m_bounds;
395     mutable bool      m_geometryNeedUpdate;
396 };
397
398 } // namespace sf
399
400
401 #endif // SFML_TEXT_HPP
402
403

```

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Texture.hpp

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20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_TEXTURE_HPP
26 #define SFML_TEXTURE_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Graphics/Export.hpp>
32 #include <SFML/Graphics/Image.hpp>
33 #include <SFML/Window/GlResource.hpp>
34 //
35
```

```

36 namespace sf
37 {
38 class Window;
39 class RenderTarget;
40 class RenderTexture;
41 class InputStream;
42
47 class SFML_GRAPHICS_API Texture : GLResource
48 {
49 public:
50
55     enum CoordinateType
56     {
57         Normalized,
58         Pixels
59     };
60
61 public:
62
69     Texture();
70
77     Texture(const Texture& copy);
78
83     ~Texture();
84
96     bool create(unsigned int width, unsigned int height);
97
127     bool loadFromFile(const std::string& filename, const IntRect
128
159     bool loadFromMemory(const void* data, std::size_t size, cons
160
190     bool loadFromStream(InputStream& stream, const IntRect& are:
191
214     bool loadFromImage(const Image& image, const IntRect& area :
215
222     Vector2u getSize() const;
223
237     Image copyToImage() const;
238
255     void update(const Uint8* pixels);
256
277     void update(const Uint8* pixels, unsigned int width, unsigne
unsigned int y);
278
297     void update(const Image& image);
298
314     void update(const Image& image, unsigned int x, unsigned int
315
334     void update(const Window& window);
335
351     void update(const Window& window, unsigned int x, unsigned i
352

```

```
367     void setSmooth(bool smooth);
368
377     bool isSmooth() const;
378
402     void setSrgb(bool sRgb);
403
412     bool isSrgb() const;
413
436     void setRepeated(bool repeated);
437
446     bool isRepeated() const;
447
471     bool generateMipmap();
472
481     Texture& operator =(const Texture& right);
482
493     unsigned int getNativeHandle() const;
494
526     static void bind(const Texture* texture, CoordinateType coordType);
527
538     static unsigned int getMaximumSize();
539
540 private:
541
542     friend class RenderTexture;
543     friend class RenderTarget;
544
558     static unsigned int getValidSize(unsigned int size);
559
567     void invalidateMipmap();
568
570     // Member data
572     Vector2u      m_size;
573     Vector2u      m_actualSize;
574     unsigned int  m_texture;
575     bool          m_isSmooth;
576     bool          m_sRgb;
577     bool          m_isRepeated;
578     mutable bool  m_pixelsFlipped;
579     bool          m_fboAttachment;
580     bool          m_hasMipmap;
581     Uint64        m_cacheId;
582 };
583
584 } // namespace sf
585
586
587 #endif // SFML_TEXTURE_HPP
588
```

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Thread.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_THREAD_HPP
26 #define SFML_THREAD_HPP
27
28 // Headers
29
30 #include <SFML/System/Export.hpp>
31 #include <SFML/System/NonCopyable.hpp>
32 #include <cstdlib>
33
34
35
```

```

36 namespace sf
37 {
38 namespace priv
39 {
40     class ThreadImpl;
41     struct ThreadFunc;
42 }
43
48 class SFML_SYSTEM_API Thread : NonCopyable
49 {
50 public:
51
74     template <typename F>
75     Thread(F function);
76
102    template <typename F, typename A>
103    Thread(F function, A argument);
104
125    template <typename C>
126    Thread(void(C::*function)(), C* object);
127
135    ~Thread();
136
146    void launch();
147
159    void wait();
160
172    void terminate();
173
174 private:
175
176     friend class priv::ThreadImpl;
177
184     void run();
185
187     // Member data
189     priv::ThreadImpl* m_impl;
190     priv::ThreadFunc* m_entryPoint;
191 };
192
193 #include <SFML/System/Thread.inl>
194
195 } // namespace sf
196
197 #endif // SFML_THREAD_HPP
198
199

```


SFML 2.4.2

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ThreadLocal.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_THREADLOCAL_HPP
26 #define SFML_THREADLOCAL_HPP
27
28 // Headers
29
30 #include <SFML/System/Export.hpp>
31 #include <SFML/System/NonCopyable.hpp>
32 #include <cstdlib>
33
34
35
```

```

36 namespace sf
37 {
38 namespace priv
39 {
40     class ThreadLocalImpl;
41 }
42
47 class SFML_SYSTEM_API ThreadLocal : NonCopyable
48 {
49 public:
50
57     ThreadLocal(void* value = NULL);
58
63     ~ThreadLocal();
64
71     void setValue(void* value);
72
79     void* getValue() const;
80
81 private:
82
84     // Member data
86     priv::ThreadLocalImpl* m_impl;
87 };
88
89 } // namespace sf
90
91
92 #endif // SFML_THREADLOCAL_HPP
93
94

```

SFML 2.4.2

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ThreadLocalPtr.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_THREADLOCALPTR_HPP
26 #define SFML_THREADLOCALPTR_HPP
27
28 // Headers
29 #include <SFML/System/ThreadLocal.hpp>
30
31 namespace sf
32 {
33     class ThreadLocalPtr
34     {
35     public:
```

```

40 template <typename T>
41 class ThreadLocalPtr : private ThreadLocal
42 {
43 public:
44
45     ThreadLocalPtr(T* value = NULL);
46
47     T& operator *() const;
48
49     T* operator ->() const;
50
51     operator T*() const;
52
53     ThreadLocalPtr<T>& operator =(T* value);
54
55     ThreadLocalPtr<T>& operator =(const ThreadLocalPtr<T>& righ
102 };
103 };
104
105 } // namespace sf
106
107 #include <SFML/System/ThreadLocalPtr.inl>
108
109
110 #endif // SFML_THREADLOCALPTR_HPP
111
112

```

SFML 2.4.2

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Time.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_TIME_HPP
26 #define SFML_TIME_HPP
27
28 // Headers
29 #include <SFML/System/Export.hpp>
30
31 namespace sf
32 {
33     namespace Time
34     {
35         // ...
36     }
37 }
```

```

40 class SFML_SYSTEM_API Time
41 {
42 public:
43
44     Time();
45
46     float asSeconds() const;
47
48     Int32 asMilliseconds() const;
49
50     Int64 asMicroseconds() const;
51
52     // Static member data
53     static const Time Zero;
54
55 private:
56
57     friend SFML_SYSTEM_API Time seconds(float);
58     friend SFML_SYSTEM_API Time milliseconds(Int32);
59     friend SFML_SYSTEM_API Time microseconds(Int64);
60
61     explicit Time(Int64 microseconds);
62
63 private:
64
65     // Member data
66     Int64 m_microseconds;
67 };
68
69 SFML_SYSTEM_API Time seconds(float amount);
70
71 SFML_SYSTEM_API Time milliseconds(Int32 amount);
72
73 SFML_SYSTEM_API Time microseconds(Int64 amount);
74
75 SFML_SYSTEM_API bool operator ==(Time left, Time right);
76
77 SFML_SYSTEM_API bool operator !=(Time left, Time right);
78
79 SFML_SYSTEM_API bool operator <(Time left, Time right);
80
81 SFML_SYSTEM_API bool operator >(Time left, Time right);
82
83 SFML_SYSTEM_API bool operator <=(Time left, Time right);
84
85 SFML_SYSTEM_API bool operator >=(Time left, Time right);
86
87 SFML_SYSTEM_API Time operator -(Time right);
88
89 SFML_SYSTEM_API Time operator +(Time left, Time right);
90
91 SFML_SYSTEM_API Time& operator +=(Time& left, Time right);

```

```

257
268 SFML_SYSTEM_API Time operator -(Time left, Time right);
269
280 SFML_SYSTEM_API Time& operator ==(Time& left, Time right);
281
292 SFML_SYSTEM_API Time operator *(Time left, float right);
293
304 SFML_SYSTEM_API Time operator *(Time left, Int64 right);
305
316 SFML_SYSTEM_API Time operator *(float left, Time right);
317
328 SFML_SYSTEM_API Time operator *(Int64 left, Time right);
329
340 SFML_SYSTEM_API Time& operator *=(Time& left, float right);
341
352 SFML_SYSTEM_API Time& operator *=(Time& left, Int64 right);
353
364 SFML_SYSTEM_API Time operator /(Time left, float right);
365
376 SFML_SYSTEM_API Time operator /(Time left, Int64 right);
377
388 SFML_SYSTEM_API Time& operator /=(Time& left, float right);
389
400 SFML_SYSTEM_API Time& operator /=(Time& left, Int64 right);
401
412 SFML_SYSTEM_API float operator /(Time left, Time right);
413
424 SFML_SYSTEM_API Time operator %(Time left, Time right);
425
436 SFML_SYSTEM_API Time& operator %=(Time& left, Time right);
437
438 } // namespace sf
439
440
441 #endif // SFML_TIME_HPP
442
443

```

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Touch.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_TOUCH_HPP
26 #define SFML_TOUCH_HPP
27
28 // Headers
29
30 #include <SFML/Window/Export.hpp>
31 #include <SFML/System/Vector2.hpp>
32
33
34
35 namespace sf
```

```
36 {
37 class Window;
38
43 class SFML_WINDOW_API Touch
44 {
45 public:
46
55     static bool isDown(unsigned int finger);
56
68     static Vector2i getPosition(unsigned int finger);
69
82     static Vector2i getPosition(unsigned int finger, const Window* window);
83 };
84
85 } // namespace sf
86
87
88 #endif // SFML_TOUCH_HPP
89
90
```

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Transform.hpp

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21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_TRANSFORM_HPP
26 #define SFML_TRANSFORM_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Graphics/Export.hpp>
32 #include <SFML/Graphics/Rect.hpp>
33 #include <SFML/System/Vector2.hpp>
34 //
35
```

```

36 namespace sf
37 {
42 class SFML_GRAPHICS_API Transform
43 {
44 public:
45
52     Transform();
53
68     Transform(float a00, float a01, float a02,
69               float a10, float a11, float a12,
70               float a20, float a21, float a22);
71
87     const float* getMatrix() const;
88
98     Transform getInverse() const;
99
109    Vector2f transformPoint(float x, float y) const;
110
119    Vector2f transformPoint(const Vector2f& point) const;
120
135    FloatRect transformRect(const FloatRect& rectangle) const;
136
149    Transform& combine(const Transform& transform);
150
169    Transform& translate(float x, float y);
170
188    Transform& translate(const Vector2f& offset);
189
207    Transform& rotate(float angle);
208
233    Transform& rotate(float angle, float centerX, float centerY)
234
258    Transform& rotate(float angle, const Vector2f& center);
259
278    Transform& scale(float scaleX, float scaleY);
279
305    Transform& scale(float scaleX, float scaleY, float centerX,
306
324    Transform& scale(const Vector2f& factors);
325
349    Transform& scale(const Vector2f& factors, const Vector2f& c
350
352    // Static member data
354    static const Transform Identity;
355
356 private:
357
359    // Member data
361    float m_matrix[16];
362 };
363
376 SFML_GRAPHICS_API Transform operator *(const Transform& left, co

```

```
377
390 SFML_GRAPHICS_API Transform& operator *=(Transform& left, const
391
404 SFML_GRAPHICS_API Vector2f operator *(const Transform& left, co
405
406 } // namespace sf
407
408
409 #endif // SFML_TRANSFORM_HPP
410
411
```

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Transformable.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_TRANSFORMABLE_HPP
26 #define SFML_TRANSFORMABLE_HPP
27
28 // Headers
29 #include <SFML/Graphics/Export.hpp>
30 #include <SFML/Graphics/Transformable.hpp>
31
32 namespace sf
```

```

36 {
41 class SFML_GRAPHICS_API Transformable
42 {
43 public:
44
49     Transformable();
50
55     virtual ~Transformable();
56
70     void setPosition(float x, float y);
71
84     void setPosition(const Vector2f& position);
85
98     void setRotation(float angle);
99
113    void setScale(float factorX, float factorY);
114
127    void setScale(const Vector2f& factors);
128
145    void setOrigin(float x, float y);
146
162    void setOrigin(const Vector2f& origin);
163
172    const Vector2f& getPosition() const;
173
184    float getRotation() const;
185
194    const Vector2f& getScale() const;
195
204    const Vector2f& getOrigin() const;
205
223    void move(float offsetX, float offsetY);
224
240    void move(const Vector2f& offset);
241
255    void rotate(float angle);
256
274    void scale(float factorX, float factorY);
275
292    void scale(const Vector2f& factor);
293
302    const Transform& getTransform() const;
303
312    const Transform& getInverseTransform() const;
313
314 private:
315
317     // Member data
319     Vector2f      m_origin;
320     Vector2f      m_position;
321     float         m_rotation;
322     Vector2f      m_scale;

```

```
323     mutable Transform m_transform;
324     mutable bool      m_transformNeedUpdate;
325     mutable Transform m_inverseTransform;
326     mutable bool      m_inverseTransformNeedUpdate;
327 };
328
329 } // namespace sf
330
331
332 #endif // SFML_TRANSFORMABLE_HPP
333
334
```

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UdpSocket.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_UDPSOCKET_HPP
26 #define SFML_UDPSOCKET_HPP
27
28 // Headers
29
30 #include <SFML/Network/Export.hpp>
31 #include <SFML/Network/Socket.hpp>
32 #include <SFML/Network/IpAddress.hpp>
33 #include <vector>
34
35
```

```

36
37 namespace sf
38 {
39 class Packet;
40
45 class SFML_NETWORK_API UdpSocket : public Socket
46 {
47 public:
48
50     // Constants
52     enum
53     {
54         MaxDatagramSize = 65507
55     };
56
61     UdpSocket();
62
74     unsigned short getLocalPort() const;
75
93     Status bind(unsigned short port, const IPAddress& address =
94
107     void unbind();
108
126     Status send(const void* data, std::size_t size, const IpAddr
short remotePort);
127
149     Status receive(void* data, std::size_t size, std::size_t& re
remoteAddress, unsigned short& remotePort);
150
167     Status send(Packet& packet, const IPAddress& remoteAddress,
168
184     Status receive(Packet& packet, IPAddress& remoteAddress, un:
185
186 private:
187
189     // Member data
191     std::vector<char> m_buffer;
192 };
193
194 } // namespace sf
195
196
197 #endif // SFML_UDPSOCKET_HPP
198
199

```

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Utf.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_UTF_HPP
26 #define SFML_UTF_HPP
27
28 // Headers
29
30 #include <SFML/Config.hpp>
31 #include <algorithm>
32 #include <locale>
33 #include <string>
34 #include <string>
35 #include <cstdlib>
```

```

36
37
38 namespace sf
39 {
40 template <unsigned int N>
41 class Utf;
42
47 template <>
48 class Utf<8>
49 {
50 public:
51
56     template <typename In>
57     static In decode(In begin, In end, Uint32& output, Uint32 re
58
62     template <typename Out>
63     static Out encode(Uint32 input, Out output, Uint8 replacem
64
67     template <typename In>
68     static In next(In begin, In end);
69
73     template <typename In>
74     static std::size_t count(In begin, In end);
75
80     template <typename In, typename Out>
81     static Out fromAnsi(In begin, In end, Out output, const std:
131 std::locale());
132
133     template <typename In, typename Out>
134     static Out fromWide(In begin, In end, Out output);
135
136     template <typename In, typename Out>
137     static Out fromLatin1(In begin, In end, Out output);
138
143     template <typename In, typename Out>
144     static Out toAnsi(In begin, In end, Out output, char replace
175 locale = std::locale());
176
177     template <typename In, typename Out>
178     static Out toWide(In begin, In end, Out output, wchar_t repl
179
180
183     template <typename In, typename Out>
184     static Out toLatin1(In begin, In end, Out output, char repla
185
186
191     template <typename In, typename Out>
192     static Out toUtf8(In begin, In end, Out output);
193
194
197     template <typename In, typename Out>
198     static Out toUtf16(In begin, In end, Out output);
199
200
203     template <typename In, typename Out>
204     static Out toUtf32(In begin, In end, Out output);
205
206
211     template <typename In, typename Out>
212     static Out toUtf8(In begin, In end, Out output);
213
214
217     template <typename In, typename Out>
218     static Out toUtf16(In begin, In end, Out output);
219
220
223     template <typename In, typename Out>
224     static Out toUtf32(In begin, In end, Out output);
225
226
229     template <typename In, typename Out>
230     static Out toUtf8(In begin, In end, Out output);
231
232
235     template <typename In, typename Out>
236     static Out toUtf16(In begin, In end, Out output);
237
238
241     template <typename In, typename Out>
242     static Out toUtf32(In begin, In end, Out output);
243
244
247

```

```

248 };
249
254 template <>
255 class Utf<16>
256 {
257 public:
258
273     template <typename In>
274     static In decode(In begin, In end, Uint32& output, Uint32 re
275
289     template <typename Out>
290     static Out encode(Uint32 input, Out output, Uint16 replaceme
291
304     template <typename In>
305     static In next(In begin, In end);
306
320     template <typename In>
321     static std::size_t count(In begin, In end);
322
337     template <typename In, typename Out>
338     static Out fromAnsi(In begin, In end, Out output, const std:
std::locale());
339
350     template <typename In, typename Out>
351     static Out fromWide(In begin, In end, Out output);
352
363     template <typename In, typename Out>
364     static Out fromLatin1(In begin, In end, Out output);
365
381     template <typename In, typename Out>
382     static Out toAnsi(In begin, In end, Out output, char replace
locale = std::locale());
383
395     template <typename In, typename Out>
396     static Out toWide(In begin, In end, Out output, wchar_t repl
397
409     template <typename In, typename Out>
410     static Out toLatin1(In begin, In end, Out output, char repla
411
422     template <typename In, typename Out>
423     static Out toUtf8(In begin, In end, Out output);
424
440     template <typename In, typename Out>
441     static Out toUtf16(In begin, In end, Out output);
442
453     template <typename In, typename Out>
454     static Out toUtf32(In begin, In end, Out output);
455 };
456
461 template <>
462 class Utf<32>
463 {

```

```

464 public:
465
481     template <typename In>
482     static In decode(In begin, In end, Uint32& output, Uint32 re
483
498     template <typename Out>
499     static Out encode(Uint32 input, Out output, Uint32 replaceme
500
513     template <typename In>
514     static In next(In begin, In end);
515
528     template <typename In>
529     static std::size_t count(In begin, In end);
530
545     template <typename In, typename Out>
546     static Out fromAnsi(In begin, In end, Out output, const std:
std::locale());
547
558     template <typename In, typename Out>
559     static Out fromWide(In begin, In end, Out output);
560
571     template <typename In, typename Out>
572     static Out fromLatin1(In begin, In end, Out output);
573
589     template <typename In, typename Out>
590     static Out toAnsi(In begin, In end, Out output, char replace
locale = std::locale());
591
603     template <typename In, typename Out>
604     static Out toWide(In begin, In end, Out output, wchar_t repl
605
617     template <typename In, typename Out>
618     static Out toLatin1(In begin, In end, Out output, char repla
619
630     template <typename In, typename Out>
631     static Out toUtf8(In begin, In end, Out output);
632
643     template <typename In, typename Out>
644     static Out toUtf16(In begin, In end, Out output);
645
661     template <typename In, typename Out>
662     static Out toUtf32(In begin, In end, Out output);
663
677     template <typename In>
678     static Uint32 decodeAnsi(In input, const std::locale& locale
679
692     template <typename In>
693     static Uint32 decodeWide(In input);
694
710     template <typename Out>
711     static Out encodeAnsi(Uint32 codepoint, Out output, char rep
std::locale& locale = std::locale());

```

```
712
727     template <typename Out>
728     static Out encodeWide(UINT32 codepoint, Out output, wchar_t
729 };
730
731 #include <SFML/System/Utf.inl>
732
733 // Make typedefs to get rid of the template syntax
734 typedef Utf<8> Utf8;
735 typedef Utf<16> Utf16;
736 typedef Utf<32> Utf32;
737
738 } // namespace sf
739
740
741 #endif // SFML_UTF_HPP
742
743
```

SFML 2.4.2

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Vector2.hpp

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21 // distribution.
22 //
23 //
24 //
25 #ifndef SFML_VECTOR2_HPP
26 #define SFML_VECTOR2_HPP
27
28
29 namespace sf
30 {
31
32     template <typename T>
33     class Vector2
34     {
```

```

39 public:
40
47     Vector2();
48
56     Vector2(T X, T Y);
57
69     template <typename U>
70     explicit Vector2(const Vector2<U>& vector);
71
73     // Member data
74
75     T x;
76     T y;
77 };
78
88 template <typename T>
89 Vector2<T> operator -(const Vector2<T>& right);
90
104 template <typename T>
105 Vector2<T>& operator +=(Vector2<T>& left, const Vector2<T>& rig
106
120 template <typename T>
121 Vector2<T>& operator -=(Vector2<T>& left, const Vector2<T>& rig
122
133 template <typename T>
134 Vector2<T> operator +(const Vector2<T>& left, const Vector2<T>&
135
146 template <typename T>
147 Vector2<T> operator -(const Vector2<T>& left, const Vector2<T>&
148
159 template <typename T>
160 Vector2<T> operator *(const Vector2<T>& left, T right);
161
172 template <typename T>
173 Vector2<T> operator *(T left, const Vector2<T>& right);
174
188 template <typename T>
189 Vector2<T>& operator *=(Vector2<T>& left, T right);
190
201 template <typename T>
202 Vector2<T> operator /(const Vector2<T>& left, T right);
203
217 template <typename T>
218 Vector2<T>& operator /=(Vector2<T>& left, T right);
219
232 template <typename T>
233 bool operator ==(const Vector2<T>& left, const Vector2<T>& right
234
247 template <typename T>
248 bool operator !=(const Vector2<T>& left, const Vector2<T>& right
249
250 #include <SFML/System/Vector2.inl>
251

```

```
252 // Define the most common types
253 typedef Vector2<int> Vector2i;
254 typedef Vector2<unsigned int> Vector2u;
255 typedef Vector2<float> Vector2f;
256
257 } // namespace sf
258
259
260 #endif // SFML_VECTOR2_HPP
261
262
```

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Vector3.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_VECTOR3_HPP
26 #define SFML_VECTOR3_HPP
27
28
29 namespace sf
30 {
31     template <typename T>
32     class Vector3
33     {
```

```

39 public:
40
47     Vector3();
48
57     Vector3(T X, T Y, T Z);
58
70     template <typename U>
71     explicit Vector3(const Vector3<U>& vector);
72
74     // Member data
76     T x;
77     T y;
78     T z;
79 };
80
90 template <typename T>
91 Vector3<T> operator -(const Vector3<T>& left);
92
106 template <typename T>
107 Vector3<T>& operator +=(Vector3<T>& left, const Vector3<T>& rig
108
122 template <typename T>
123 Vector3<T>& operator -=(Vector3<T>& left, const Vector3<T>& rig
124
135 template <typename T>
136 Vector3<T> operator +(const Vector3<T>& left, const Vector3<T>&
137
148 template <typename T>
149 Vector3<T> operator -(const Vector3<T>& left, const Vector3<T>&
150
161 template <typename T>
162 Vector3<T> operator *(const Vector3<T>& left, T right);
163
174 template <typename T>
175 Vector3<T> operator *(T left, const Vector3<T>& right);
176
190 template <typename T>
191 Vector3<T>& operator *=(Vector3<T>& left, T right);
192
203 template <typename T>
204 Vector3<T> operator /(const Vector3<T>& left, T right);
205
219 template <typename T>
220 Vector3<T>& operator /=(Vector3<T>& left, T right);
221
234 template <typename T>
235 bool operator ==(const Vector3<T>& left, const Vector3<T>& right
236
249 template <typename T>
250 bool operator !=(const Vector3<T>& left, const Vector3<T>& right
251
252 #include <SFML/System/Vector3.inl>

```

```
253
254 // Define the most common types
255 typedef Vector3<int> Vector3i;
256 typedef Vector3<float> Vector3f;
257
258 } // namespace sf
259
260
261 #endif // SFML_VECTOR3_HPP
262
263
```

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Vertex.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_VERTEX_HPP
26 #define SFML_VERTEX_HPP
27
28 // Headers
29
30 #include <SFML/Graphics/Export.hpp>
31 #include <SFML/Graphics/Color.hpp>
32 #include <SFML/System/Vector2.hpp>
33
34
35
```

```

36 namespace sf
37 {
42 class SFML_GRAPHICS_API Vertex
43 {
44 public:
45
46     Vertex();
47
48     Vertex(const Vector2f& thePosition);
49
50     Vertex(const Vector2f& thePosition, const Color& theColor);
51
52     Vertex(const Vector2f& thePosition, const Vector2f& theTexC
53
54     Vertex(const Vector2f& thePosition, const Color& theColor,
55
56     // Member data
57     Vector2f position;
58     Color color;
59     Vector2f texCoords;
60 };
61 } // namespace sf
62
63 #endif // SFML_VERTEX_HPP
64
65
66

```

SFML 2.4.2

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VertexArray.hpp

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22 //
23 //
24 //
25 #ifndef SFML_VERTEXARRAY_HPP
26 #define SFML_VERTEXARRAY_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Graphics/Export.hpp>
32 #include <SFML/Graphics/Vertex.hpp>
33 #include <SFML/Graphics/PrimitiveType.hpp>
34 #include <SFML/Graphics/Rect.hpp>
35 #include <SFML/Graphics/Drawable.hpp>
```

```

36 #include <vector>
37
38
39 namespace sf
40 {
45 class SFML_GRAPHICS_API VertexArray : public Drawable
46 {
47 public:
48
49     VertexArray();
50
51     explicit VertexArray(PrimitiveType type, std::size_t vertexCount);
52
53     std::size_t getVertexCount() const;
54
55     Vertex& operator [](std::size_t index);
56
57     const Vertex& operator [](std::size_t index) const;
58
59     void clear();
60
61     void resize(std::size_t vertexCount);
62
63     void append(const Vertex& vertex);
64
65     void setPrimitiveType(PrimitiveType type);
66
67     PrimitiveType getPrimitiveType() const;
68
69     FloatRect getBounds() const;
70
71 private:
72     virtual void draw(RenderTarget& target, RenderStates states) const;
73
74 private:
75     // Member data
76     std::vector<Vertex> m_vertices;
77     PrimitiveType m_primitiveType;
78 };
79 } // namespace sf
80
81 #endif // SFML_VERTEXARRAY_HPP
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99

```

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VideoMode.hpp

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19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_VIDEOMODE_HPP
26 #define SFML_VIDEOMODE_HPP
27
28 // Headers
29 #include <SFML/Window/Export.hpp>
30 #include <vector>
31
32 namespace sf
```

```

36 {
41 class SFML_WINDOW_API VideoMode
42 {
43 public:
44
51     VideoMode();
52
61     VideoMode(unsigned int modewidth, unsigned int modeHeight, u
32);
62
69     static VideoMode getDesktopMode();
70
85     static const std::vector<VideoMode>& getFullscreenModes();
86
97     bool isValid() const;
98
100    // Member data
102    unsigned int width;
103    unsigned int height;
104    unsigned int bitsPerPixel;
105 };
106
117 SFML_WINDOW_API bool operator ==(const VideoMode& left, const Vi
118
129 SFML_WINDOW_API bool operator !=(const VideoMode& left, const Vi
130
141 SFML_WINDOW_API bool operator <(const VideoMode& left, const Vic
142
153 SFML_WINDOW_API bool operator >(const VideoMode& left, const Vic
154
165 SFML_WINDOW_API bool operator <=(const VideoMode& left, const Vi
166
177 SFML_WINDOW_API bool operator >=(const VideoMode& left, const Vi
178
179 } // namespace sf
180
181
182 #endif // SFML_VIDEOMODE_HPP
183
184

```

SFML 2.4.2

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View.hpp

```
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17 //
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19 //    and must not be misrepresented as being the original softw
20 //
21 // 3. This notice may not be removed or altered from any source
22 //
23 //
24 //
25 #ifndef SFML_VIEW_HPP
26 #define SFML_VIEW_HPP
27 //
28 //
29 // Headers
30 //
31 #include <SFML/Graphics/Export.hpp>
32 #include <SFML/Graphics/Rect.hpp>
33 #include <SFML/Graphics/Transform.hpp>
34 #include <SFML/System/Vector2.hpp>
35
```

```

36
37 namespace sf
38 {
43 class SFML_GRAPHICS_API View
44 {
45 public:
46
53     View();
54
61     explicit View(const FloatRect& rectangle);
62
70     View(const Vector2f& center, const Vector2f& size);
71
81     void setCenter(float x, float y);
82
91     void setCenter(const Vector2f& center);
92
102    void setSize(float width, float height);
103
112    void setSize(const Vector2f& size);
113
124    void setRotation(float angle);
125
141    void setViewport(const FloatRect& viewport);
142
153    void reset(const FloatRect& rectangle);
154
163    const Vector2f& getCenter() const;
164
173    const Vector2f& getSize() const;
174
183    float getRotation() const;
184
193    const FloatRect& getViewport() const;
194
204    void move(float offsetX, float offsetY);
205
214    void move(const Vector2f& offset);
215
224    void rotate(float angle);
225
241    void zoom(float factor);
242
253    const Transform& getTransform() const;
254
265    const Transform& getInverseTransform() const;
266
267 private:
268
270     // Member data
272     Vector2f      m_center;
273     Vector2f      m_size;

```

```
274     float          m_rotation;
275     FloatRect      m_viewport;
276     mutable Transform m_transform;
277     mutable Transform m_inverseTransform;
278     mutable bool    m_transformUpdated;
279     mutable bool    m_invTransformUpdated;
280 };
281
282 } // namespace sf
283
284
285 #endif // SFML_VIEW_HPP
286
287
```

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Window/Window.hpp

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18 // 2. Altered source versions must be plainly marked as such, and must not
19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_WINDOW_HPP
26 #define SFML_WINDOW_HPP
27
28 // Headers
29 #include <SFML/Window/Export.hpp>
30 #include <SFML/Window/ContextSettings.hpp>
31 #include <SFML/Window/VideoMode.hpp>
32 #include <SFML/Window/WindowHandle.hpp>
33 #include <SFML/Window/WindowStyle.hpp>
```

```

36 #include <SFML/Window/GlResource.hpp>
37 #include <SFML/System/Clock.hpp>
38 #include <SFML/System/Vector2.hpp>
39 #include <SFML/System/NonCopyable.hpp>
40 #include <SFML/System/String.hpp>
41
42
43 namespace sf
44 {
45     namespace priv
46     {
47         class GlContext;
48         class WindowImpl;
49     }
50
51     class Event;
52
57     class SFML_WINDOW_API Window : GlResource, NonCopyable
58     {
59     public:
60
68         Window();
69
89         Window(VideoMode mode, const String& title, Uint32 style =
ContextSettings& settings = ContextSettings());
90
105         explicit Window(WindowHandle handle, const ContextSettings&
106
113         virtual ~Window();
114
132         void create(VideoMode mode, const String& title, Uint32 sty:
ContextSettings& settings = ContextSettings());
133
149         void create(WindowHandle handle, const ContextSettings& seti
150
161         void close();
162
173         bool isOpen() const;
174
186         const ContextSettings& getSettings() const;
187
211         bool pollEvent(Event& event);
212
238         bool waitEvent(Event& event);
239
248         Vector2i getPosition() const;
249
262         void setPosition(const Vector2i& position);
263
275         Vector2u getSize() const;
276
285         void setSize(const Vector2u& size);

```

```

286
295     void setTitle(const String& title);
296
314     void setIcon(unsigned int width, unsigned int height, const
315
324     void setVisible(bool visible);
325
339     void setVerticalSyncEnabled(bool enabled);
340
349     void setMouseCursorVisible(bool visible);
350
362     void setMouseCursorGrabbed(bool grabbed);
363
376     void setKeyRepeatEnabled(bool enabled);
377
393     void setFrameRateLimit(unsigned int limit);
394
406     void setJoystickThreshold(float threshold);
407
424     bool setActive(bool active = true) const;
425
440     void requestFocus();
441
453     bool hasFocus() const;
454
463     void display();
464
477     WindowHandle getSystemHandle() const;
478
479 protected:
480
489     virtual void onCreate();
490
498     virtual void onResize();
499
500 private:
501
514     bool filterEvent(const Event& event);
515
520     void initialize();
521
523     // Member data
525     priv::WindowImpl* m_impl;
526     priv::GlContext* m_context;
527     Clock             m_clock;
528     Time              m_frameTimeLimit;
529     Vector2u          m_size;
530 };
531
532 } // namespace sf
533
534

```

```
535 #endif // SFML_WINDOW_HPP
536
537
```

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Window.hpp

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21 //
22 //
23 //
24 //
25 #ifndef SFML_SFML_WINDOW_HPP
26 #define SFML_SFML_WINDOW_HPP
27
28 // Headers
29
30
31
32 #include <SFML/System.hpp>
33 #include <SFML/Window/Context.hpp>
34 #include <SFML/Window/ContextSettings.hpp>
35 #include <SFML/Window/Event.hpp>
```

```
36 #include <SFML/Window/Joystick.hpp>
37 #include <SFML/Window/Keyboard.hpp>
38 #include <SFML/Window/Mouse.hpp>
39 #include <SFML/Window/Sensor.hpp>
40 #include <SFML/Window/Touch.hpp>
41 #include <SFML/Window/VideoMode.hpp>
42 #include <SFML/Window/Window.hpp>
43 #include <SFML/Window/WindowHandle.hpp>
44 #include <SFML/Window/WindowStyle.hpp>
45
46
47
48 #endif // SFML_SFML_WINDOW_HPP
49
```

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WindowHandle.hpp

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19 //    be misrepresented as being the original software.
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21 //
22 //
23 //
24 //
25 #ifndef SFML_WINDOWHANDLE_HPP
26 #define SFML_WINDOWHANDLE_HPP
27
28 // Headers
29 #include <SFML/Config.hpp>
30
31 // Windows' HWND is a typedef on struct HWND__*
32 #if defined(SFML_SYSTEM_WINDOWS)
33     struct HWND__;
34 #endif
```

```

36 #endif
37
38 namespace sf
39 {
40 #if defined(SFML_SYSTEM_WINDOWS)
41
42     // Window handle is HWND (HWND__*) on Windows
43     typedef HWND__* WindowHandle;
44
45 #elif defined(SFML_SYSTEM_LINUX) || defined(SFML_SYSTEM_FREEBSD)
46
47     // Window handle is Window (unsigned long) on Unix - X11
48     typedef unsigned long WindowHandle;
49
50 #elif defined(SFML_SYSTEM_MACOS)
51
52     // Window handle is NSWindow or NSView (void*) on Mac OS X -
53     typedef void* WindowHandle;
54
55 #elif defined(SFML_SYSTEM_IOS)
56
57     // Window handle is UIWindow (void*) on iOS - UIKit
58     typedef void* WindowHandle;
59
60 #elif defined(SFML_SYSTEM_ANDROID)
61
62     // Window handle is ANativeWindow* (void*) on Android
63     typedef void* WindowHandle;
64
65 #elif defined(SFML_DOXYGEN)
66
67     // Define typedef symbol so that Doxygen can attach some doc
68     typedef "platform-specific" WindowHandle;
69
70 #endif
71
72 } // namespace sf
73
74
75 #endif // SFML_WINDOWHANDLE_HPP
76

```

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WindowStyle.hpp

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19 //    be misrepresented as being the original software.
20 // 3. This notice may not be removed or altered from any source distribution.
21 //
22 //
23 //
24 //
25 #ifndef SFML_WINDOWSTYLE_HPP
26 #define SFML_WINDOWSTYLE_HPP
27
28
29 namespace sf
30 {
31     namespace Style
32     {
33
34         enum
35         {
36             Default = 0,
37             TitleBar = 1,
38             CloseButton = 2,
39             ResizeHandle = 4,
40             ScrollBars = 8,
41             MaximizeButton = 16,
42             MinimizeButton = 32,
43             NoTitleBar = 64,
44             NoCloseButton = 128,
45             NoResizeHandle = 256,
46             NoScrollBars = 512,
47             NoMaximizeButton = 1024,
48             NoMinimizeButton = 2048,
49             NoDefault = 4095
50         };
51     };
52 }
```

```
39     {
40         None          = 0,
41         Titlebar      = 1 << 0,
42         Resize        = 1 << 1,
43         Close         = 1 << 2,
44         Fullscreen    = 1 << 3,
45
46         Default = Titlebar | Resize | Close
47     };
48 }
49
50 } // namespace sf
51
52
53 #endif // SFML_WINDOWSTYLE_HPP
```

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sf::AIResource Member List

This is the complete list of members for `sf::AIResource`, including all inher

`AIResource()` `sf::AIResource` `protected`

`~AIResource()` `sf::AIResource` `protected`

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sf::InputSoundFile Member List

This is the complete list of members for `sf::InputSoundFile`, including all in

`getChannelCount()` const

`getDuration()` const

`getSampleCount()` const

`getSampleRate()` const

`InputSoundFile()`

`NonCopyable()`

`openForWriting(const std::string &filename, unsigned int channelCount, u`

`openFromFile(const std::string &filename)`

`openFromMemory(const void *data, std::size_t sizeInBytes)`

`openFromStream(InputStream &stream)`

`read(Int16 *samples, UInt64 maxCount)`

`seek(UInt64 sampleOffset)`

`seek(Time timeOffset)`

`~InputSoundFile()`

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sf::Listener Member List

This is the complete list of members for `sf::Listener`, including all inherited

<code>getDirection()</code>	<code>sf::Listener</code>	static
<code>getGlobalVolume()</code>	<code>sf::Listener</code>	static
<code>getPosition()</code>	<code>sf::Listener</code>	static
<code>setUpVector()</code>	<code>sf::Listener</code>	static
<code>setDirection(float x, float y, float z)</code>	<code>sf::Listener</code>	static
<code>setDirection(const Vector3f &direction)</code>	<code>sf::Listener</code>	static
<code>setGlobalVolume(float volume)</code>	<code>sf::Listener</code>	static
<code>setPosition(float x, float y, float z)</code>	<code>sf::Listener</code>	static
<code>setPosition(const Vector3f &position)</code>	<code>sf::Listener</code>	static
<code>setUpVector(float x, float y, float z)</code>	<code>sf::Listener</code>	static
<code>setUpVector(const Vector3f &upVector)</code>	<code>sf::Listener</code>	static

Music()

onGetData(Chunk &data)

onSeek(Time timeOffset)

openFromFile(const std::string &filename)

openFromMemory(const void *data, std::size_t sizeInBytes)

openFromStream(InputStream &stream)

operator=(const SoundSource &right)

pause()

Paused enum value

play()

Playing enum value

setAttenuation(float attenuation)

setLoop(bool loop)

setMinDistance(float distance)

setPitch(float pitch)

setPlayingOffset(Time timeOffset)

setPosition(float x, float y, float z)

setPosition(const Vector3f &position)

setRelativeToListener(bool relative)

setVolume(float volume)

SoundSource(const SoundSource ©)

SoundSource()

SoundStream()

Status enum name

stop()

Stopped enum value

~Music()

~SoundSource()

~SoundStream()

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sf::OutputSoundFile Member List

This is the complete list of members for `sf::OutputSoundFile`, including all

`NonCopyable()`

`openFromFile(const std::string &filename, unsigned int sampleRate, unsigned int channelCount)`

`OutputSoundFile()`

`write(const Int16 *samples, Uint64 count)`

`~OutputSoundFile()`

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sf::Sound Member List

This is the complete list of members for `sf::Sound`, including all inherited r

<code>getAttenuation() const</code>	<code>sf::SoundSource</code>
<code>getBuffer() const</code>	<code>sf::Sound</code>
<code>getLoop() const</code>	<code>sf::Sound</code>
<code>getMinDistance() const</code>	<code>sf::SoundSource</code>
<code>getPitch() const</code>	<code>sf::SoundSource</code>
<code>getPlayingOffset() const</code>	<code>sf::Sound</code>
<code>getPosition() const</code>	<code>sf::SoundSource</code>
<code>getStatus() const</code>	<code>sf::Sound</code>
<code>getVolume() const</code>	<code>sf::SoundSource</code>
<code>isRelativeToListener() const</code>	<code>sf::SoundSource</code>
<code>m_source</code>	<code>sf::SoundSource</code>
<code>operator=(const Sound &right)</code>	<code>sf::Sound</code>
<code>sf::SoundSource::operator=(const SoundSource &right)</code>	<code>sf::SoundSource</code>
<code>pause()</code>	<code>sf::Sound</code>

Paused enum value	sf::SoundSource
play()	sf::Sound
Playing enum value	sf::SoundSource
resetBuffer()	sf::Sound
setAttenuation(float attenuation)	sf::SoundSource
setBuffer(const SoundBuffer &buffer)	sf::Sound
setLoop(bool loop)	sf::Sound
setMinDistance(float distance)	sf::SoundSource
setPitch(float pitch)	sf::SoundSource
setPlayingOffset(Time timeOffset)	sf::Sound
setPosition(float x, float y, float z)	sf::SoundSource
setPosition(const Vector3f &position)	sf::SoundSource
setRelativeToListener(bool relative)	sf::SoundSource
setVolume(float volume)	sf::SoundSource
Sound()	sf::Sound
Sound(const SoundBuffer &buffer)	sf::Sound
Sound(const Sound ©)	sf::Sound
SoundSource(const SoundSource ©)	sf::SoundSource
SoundSource()	sf::SoundSource
Status enum name	sf::SoundSource
stop()	sf::Sound
Stopped enum value	sf::SoundSource
~Sound()	sf::Sound
~SoundSource()	sf::SoundSource

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sf::SoundBuffer Member List

This is the complete list of members for `sf::SoundBuffer`, including all inherited members.

`AIResource()`

`getChannelCount() const`

`getDuration() const`

`getSampleCount() const`

`getSampleRate() const`

`getSamples() const`

`loadFromFile(const std::string &filename)`

`loadFromMemory(const void *data, std::size_t sizeInBytes)`

`loadFromSamples(const Int16 *samples, Uint64 sampleCount, unsigned int channelCount)`

`loadFromStream(InputStream &stream)`

`operator=(const SoundBuffer &right)`

`saveToFile(const std::string &filename) const`

Sound (defined in `sf::SoundBuffer`)

`SoundBuffer()`

`SoundBuffer(const SoundBuffer ©)`

`~AIResource()`

`~SoundBuffer()`

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sf::SoundBufferRecorder Member List

This is the complete list of members for `sf::SoundBufferRecorder`, including

<code>getAvailableDevices()</code>	<code>sf::S</code>
<code>getBuffer() const</code>	<code>sf::S</code>
<code>getChannelCount() const</code>	<code>sf::S</code>
<code>getDefaultDevice()</code>	<code>sf::S</code>
<code>getDevice() const</code>	<code>sf::S</code>
<code>getSampleRate() const</code>	<code>sf::S</code>
<code>isAvailable()</code>	<code>sf::S</code>
<code>onProcessSamples(const Int16 *samples, std::size_t sampleCount)</code>	<code>sf::S</code>
<code>onStart()</code>	<code>sf::S</code>
<code>onStop()</code>	<code>sf::S</code>
<code>setChannelCount(unsigned int channelCount)</code>	<code>sf::S</code>
<code>setDevice(const std::string &name)</code>	<code>sf::S</code>
<code>setProcessingInterval(Time interval)</code>	<code>sf::S</code>
<code>SoundRecorder()</code>	<code>sf::S</code>

<code>start(unsigned int sampleRate=44100)</code>	<code>sf::S</code>
<code>stop()</code>	<code>sf::S</code>
<code>~SoundBufferRecorder()</code>	<code>sf::S</code>
<code>~SoundRecorder()</code>	<code>sf::S</code>

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sf::SoundFileFactory Member List

This is the complete list of members for `sf::SoundFileFactory`, including all

<code>createReaderFromFilename(const std::string &filename)</code>	<code>sf::S</code>
<code>createReaderFromMemory(const void *data, std::size_t sizeInBytes)</code>	<code>sf::S</code>
<code>createReaderFromStream(InputStream &stream)</code>	<code>sf::S</code>
<code>createWriterFromFilename(const std::string &filename)</code>	<code>sf::S</code>
<code>registerReader()</code>	<code>sf::S</code>
<code>registerWriter()</code>	<code>sf::S</code>
<code>unregisterReader()</code>	<code>sf::S</code>
<code>unregisterWriter()</code>	<code>sf::S</code>

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sf::SoundFileReader Member List

This is the complete list of members for `sf::SoundFileReader`, including all

<code>open(InputStream &stream, Info &info)=0</code>	<code>sf::SoundFileReader</code>	<code>pure virtual</code>
<code>read(Int16 *samples, Uint64 maxCount)=0</code>	<code>sf::SoundFileReader</code>	<code>pure virtual</code>
<code>seek(Uint64 sampleOffset)=0</code>	<code>sf::SoundFileReader</code>	<code>pure virtual</code>
<code>~SoundFileReader()</code>	<code>sf::SoundFileReader</code>	<code>inline</code> <code>virtua</code>

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sf::SoundFileReader::Info Member List

This is the complete list of members for `sf::SoundFileReader::Info`, including:

`channelCount` `sf::SoundFileReader::Info`

`sampleCount` `sf::SoundFileReader::Info`

`sampleRate` `sf::SoundFileReader::Info`

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sf::SoundFileWriter Member List

This is the complete list of members for `sf::SoundFileWriter`, including all inherited members.

`open(const std::string &filename, unsigned int sampleRate, unsigned int channels)`

`write(const Int16 *samples, UInt64 count)=0`

`~SoundFileWriter()`

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sf::SoundRecorder Member List

This is the complete list of members for `sf::SoundRecorder`, including all in

<code>AIResource()</code>	sf:
<code>getAvailableDevices()</code>	sf:
<code>getChannelCount() const</code>	sf:
<code>getDefaultDevice()</code>	sf:
<code>getDevice() const</code>	sf:
<code>getSampleRate() const</code>	sf:
<code>isAvailable()</code>	sf:
<code>onProcessSamples(const Int16 *samples, std::size_t sampleCount)=0</code>	sf:
<code>onStart()</code>	sf:
<code>onStop()</code>	sf:
<code>setChannelCount(unsigned int channelCount)</code>	sf:
<code>setDevice(const std::string &name)</code>	sf:
<code>setProcessingInterval(Time interval)</code>	sf:
<code>SoundRecorder()</code>	sf:

<code>start(unsigned int sampleRate=44100)</code>	<code>sf:</code>
<code>stop()</code>	<code>sf:</code>
<code>~AIResource()</code>	<code>sf:</code>
<code>~SoundRecorder()</code>	<code>sf:</code>

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sf::SoundSource Member List

This is the complete list of members for sf::SoundSource, including all inh

AIResource()	sf::AIResource	private
getAttenuation() const	sf::SoundSource	
getMinDistance() const	sf::SoundSource	
getPitch() const	sf::SoundSource	
getPosition() const	sf::SoundSource	
getStatus() const	sf::SoundSource	protected
getVolume() const	sf::SoundSource	
isRelativeToListener() const	sf::SoundSource	
m_source	sf::SoundSource	protected
operator=(const SoundSource &right)	sf::SoundSource	
Paused enum value	sf::SoundSource	
Playing enum value	sf::SoundSource	
setAttenuation(float attenuation)	sf::SoundSource	
setMinDistance(float distance)	sf::SoundSource	

<code>setPitch(float pitch)</code>	<code>sf::SoundSource</code>	
<code>setPosition(float x, float y, float z)</code>	<code>sf::SoundSource</code>	
<code>setPosition(const Vector3f &position)</code>	<code>sf::SoundSource</code>	
<code>setRelativeToListener(bool relative)</code>	<code>sf::SoundSource</code>	
<code>setVolume(float volume)</code>	<code>sf::SoundSource</code>	
<code>SoundSource(const SoundSource &copy)</code>	<code>sf::SoundSource</code>	
<code>SoundSource()</code>	<code>sf::SoundSource</code>	protected
Status enum name	<code>sf::SoundSource</code>	
Stopped enum value	<code>sf::SoundSource</code>	
<code>~AIResource()</code>	<code>sf::AIResource</code>	private
<code>~SoundSource()</code>	<code>sf::SoundSource</code>	virtual

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sf::SoundStream Member List

This is the complete list of members for `sf::SoundStream`, including all inh

<code>getAttenuation() const</code>	<code>sf::Sound:</code>
<code>getChannelCount() const</code>	<code>sf::Sound:</code>
<code>getLoop() const</code>	<code>sf::Sound:</code>
<code>getMinDistance() const</code>	<code>sf::Sound:</code>
<code>getPitch() const</code>	<code>sf::Sound:</code>
<code>getPlayingOffset() const</code>	<code>sf::Sound:</code>
<code>getPosition() const</code>	<code>sf::Sound:</code>
<code>getSampleRate() const</code>	<code>sf::Sound:</code>
<code>getStatus() const</code>	<code>sf::Sound:</code>
<code>getVolume() const</code>	<code>sf::Sound:</code>
<code>initialize(unsigned int channelCount, unsigned int sampleRate)</code>	<code>sf::Sound:</code>
<code>isRelativeToListener() const</code>	<code>sf::Sound:</code>
<code>m_source</code>	<code>sf::Sound:</code>
<code>onGetData(Chunk &data)=0</code>	<code>sf::Sound:</code>

<code>onSeek(Time timeOffset)=0</code>	<code>sf::Sound</code>
<code>operator=(const SoundSource &right)</code>	<code>sf::Sound</code>
<code>pause()</code>	<code>sf::Sound</code>
<code>Paused</code> enum value	<code>sf::Sound</code>
<code>play()</code>	<code>sf::Sound</code>
<code>Playing</code> enum value	<code>sf::Sound</code>
<code>setAttenuation(float attenuation)</code>	<code>sf::Sound</code>
<code>setLoop(bool loop)</code>	<code>sf::Sound</code>
<code>setMinDistance(float distance)</code>	<code>sf::Sound</code>
<code>setPitch(float pitch)</code>	<code>sf::Sound</code>
<code>setPlayingOffset(Time timeOffset)</code>	<code>sf::Sound</code>
<code>setPosition(float x, float y, float z)</code>	<code>sf::Sound</code>
<code>setPosition(const Vector3f &position)</code>	<code>sf::Sound</code>
<code>setRelativeToListener(bool relative)</code>	<code>sf::Sound</code>
<code>setVolume(float volume)</code>	<code>sf::Sound</code>
<code>SoundSource(const SoundSource &copy)</code>	<code>sf::Sound</code>
<code>SoundSource()</code>	<code>sf::Sound</code>
<code>SoundStream()</code>	<code>sf::Sound</code>
<code>Status</code> enum name	<code>sf::Sound</code>
<code>stop()</code>	<code>sf::Sound</code>
<code>Stopped</code> enum value	<code>sf::Sound</code>
<code>~SoundSource()</code>	<code>sf::Sound</code>
<code>~SoundStream()</code>	<code>sf::Sound</code>

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sf::SoundStream::Chunk Member List

This is the complete list of members for `sf::SoundStream::Chunk`, including

`sampleCount` `sf::SoundStream::Chunk`

`samples` `sf::SoundStream::Chunk`

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sf::BlendMode Member List

This is the complete list of members for `sf::BlendMode`, including all inherited members.

Add enum value

`alphaDstFactor`

`alphaEquation`

`alphaSrcFactor`

`BlendMode()`

`BlendMode(Factor sourceFactor, Factor destinationFactor, Equation blendEquation)`

`BlendMode(Factor colorSourceFactor, Factor colorDestinationFactor, Equation blendEquation)`

`colorDstFactor`

`colorEquation`

`colorSrcFactor`

DstAlpha enum value

DstColor enum value

Equation enum name

Factor enum name

One enum value

OneMinusDstAlpha enum value

OneMinusDstColor enum value

OneMinusSrcAlpha enum value

OneMinusSrcColor enum value

operator!=(const BlendMode &left, const BlendMode &right)

operator==(const BlendMode &left, const BlendMode &right)

ReverseSubtract enum value

SrcAlpha enum value

SrcColor enum value

Subtract enum value

Zero enum value

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sf::CircleShape Member List

This is the complete list of members for `sf::CircleShape`, including all inhe

<code>CircleShape(float radius=0, std::size_t pointCount=30)</code>	sf::CircleShape
<code>getFillColor() const</code>	sf::Shape
<code>getGlobalBounds() const</code>	sf::Shape
<code>getInverseTransform() const</code>	sf::Transformabl
<code>getLocalBounds() const</code>	sf::Shape
<code>getOrigin() const</code>	sf::Transformabl
<code>getOutlineColor() const</code>	sf::Shape
<code>getOutlineThickness() const</code>	sf::Shape
<code>getPoint(std::size_t index) const</code>	sf::CircleShape
<code>getPointCount() const</code>	sf::CircleShape
<code>getPosition() const</code>	sf::Transformabl
<code>getRadius() const</code>	sf::CircleShape
<code>getRotation() const</code>	sf::Transformabl
<code>getScale() const</code>	sf::Transformabl

<code>getTexture() const</code>	<code>sf::Shape</code>
<code>getTextureRect() const</code>	<code>sf::Shape</code>
<code>getTransform() const</code>	<code>sf::Transformable</code>
<code>move(float offsetX, float offsetY)</code>	<code>sf::Transformable</code>
<code>move(const Vector2f &offset)</code>	<code>sf::Transformable</code>
<code>rotate(float angle)</code>	<code>sf::Transformable</code>
<code>scale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>scale(const Vector2f &factor)</code>	<code>sf::Transformable</code>
<code>setFillColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOrigin(float x, float y)</code>	<code>sf::Transformable</code>
<code>setOrigin(const Vector2f &origin)</code>	<code>sf::Transformable</code>
<code>setOutlineColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOutlineThickness(float thickness)</code>	<code>sf::Shape</code>
<code>setPointCount(std::size_t count)</code>	<code>sf::CircleShape</code>
<code>setPosition(float x, float y)</code>	<code>sf::Transformable</code>
<code>setPosition(const Vector2f &position)</code>	<code>sf::Transformable</code>
<code>setRadius(float radius)</code>	<code>sf::CircleShape</code>
<code>setRotation(float angle)</code>	<code>sf::Transformable</code>
<code>setScale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>setScale(const Vector2f &factors)</code>	<code>sf::Transformable</code>
<code>setTexture(const Texture *texture, bool resetRect=false)</code>	<code>sf::Shape</code>
<code>setTextureRect(const IntRect &rect)</code>	<code>sf::Shape</code>
<code>Shape()</code>	<code>sf::Shape</code>
<code>Transformable()</code>	<code>sf::Transformable</code>
<code>update()</code>	<code>sf::Shape</code>
<code>~Drawable()</code>	<code>sf::Drawable</code>

~Shape()

sf::Shape

~Transformable()

sf::Transformable

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sf::Color Member List

This is the complete list of members for `sf::Color`, including all inherited m

<code>a</code>	<code>sf::Color</code>	
<code>b</code>	<code>sf::Color</code>	
<code>Black</code>	<code>sf::Color</code>	<code>static</code>
<code>Blue</code>	<code>sf::Color</code>	<code>static</code>
<code>Color()</code>	<code>sf::Color</code>	
<code>Color(Uint8 red, Uint8 green, Uint8 blue, Uint8 alpha=255)</code>	<code>sf::Color</code>	
<code>Color(Uint32 color)</code>	<code>sf::Color</code>	<code>explicit</code>
<code>Cyan</code>	<code>sf::Color</code>	<code>static</code>
<code>g</code>	<code>sf::Color</code>	
<code>Green</code>	<code>sf::Color</code>	<code>static</code>
<code>Magenta</code>	<code>sf::Color</code>	<code>static</code>
<code>operator!=(const Color &left, const Color &right)</code>	<code>sf::Color</code>	<code>related</code>
<code>operator*(const Color &left, const Color &right)</code>	<code>sf::Color</code>	<code>related</code>
<code>operator*=(Color &left, const Color &right)</code>	<code>sf::Color</code>	<code>related</code>

<code>operator+(const Color &left, const Color &right)</code>	<code>sf::Color</code>	related
<code>operator+=(Color &left, const Color &right)</code>	<code>sf::Color</code>	related
<code>operator-(const Color &left, const Color &right)</code>	<code>sf::Color</code>	related
<code>operator-=(Color &left, const Color &right)</code>	<code>sf::Color</code>	related
<code>operator==(const Color &left, const Color &right)</code>	<code>sf::Color</code>	related
<code>r</code>	<code>sf::Color</code>	
<code>Red</code>	<code>sf::Color</code>	static
<code>toInteger() const</code>	<code>sf::Color</code>	
<code>Transparent</code>	<code>sf::Color</code>	static
<code>White</code>	<code>sf::Color</code>	static
<code>Yellow</code>	<code>sf::Color</code>	static

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sf::ConvexShape Member List

This is the complete list of members for `sf::ConvexShape`, including all inherited members.

<code>ConvexShape(std::size_t pointCount=0)</code>	<code>sf::ConvexShape</code>
<code>getFillColor() const</code>	<code>sf::Shape</code>
<code>getGlobalBounds() const</code>	<code>sf::Shape</code>
<code>getInverseTransform() const</code>	<code>sf::Transformable</code>
<code>getLocalBounds() const</code>	<code>sf::Shape</code>
<code>getOrigin() const</code>	<code>sf::Transformable</code>
<code>getOutlineColor() const</code>	<code>sf::Shape</code>
<code>getOutlineThickness() const</code>	<code>sf::Shape</code>
<code>getPoint(std::size_t index) const</code>	<code>sf::ConvexShape</code>
<code>getPointCount() const</code>	<code>sf::ConvexShape</code>
<code>getPosition() const</code>	<code>sf::Transformable</code>
<code>getRotation() const</code>	<code>sf::Transformable</code>
<code>getScale() const</code>	<code>sf::Transformable</code>
<code>getTexture() const</code>	<code>sf::Shape</code>

<code>getTextureRect() const</code>	<code>sf::Shape</code>
<code>getTransform() const</code>	<code>sf::Transformable</code>
<code>move(float offsetX, float offsetY)</code>	<code>sf::Transformable</code>
<code>move(const Vector2f &offset)</code>	<code>sf::Transformable</code>
<code>rotate(float angle)</code>	<code>sf::Transformable</code>
<code>scale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>scale(const Vector2f &factor)</code>	<code>sf::Transformable</code>
<code>setFillColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOrigin(float x, float y)</code>	<code>sf::Transformable</code>
<code>setOrigin(const Vector2f &origin)</code>	<code>sf::Transformable</code>
<code>setOutlineColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOutlineThickness(float thickness)</code>	<code>sf::Shape</code>
<code>setPoint(std::size_t index, const Vector2f &point)</code>	<code>sf::ConvexShape</code>
<code>setPointCount(std::size_t count)</code>	<code>sf::ConvexShape</code>
<code>setPosition(float x, float y)</code>	<code>sf::Transformable</code>
<code>setPosition(const Vector2f &position)</code>	<code>sf::Transformable</code>
<code>setRotation(float angle)</code>	<code>sf::Transformable</code>
<code>setScale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>setScale(const Vector2f &factors)</code>	<code>sf::Transformable</code>
<code>setTexture(const Texture *texture, bool resetRect=false)</code>	<code>sf::Shape</code>
<code>setTextureRect(const IntRect &rect)</code>	<code>sf::Shape</code>
<code>Shape()</code>	<code>sf::Shape</code>
<code>Transformable()</code>	<code>sf::Transformable</code>
<code>update()</code>	<code>sf::Shape</code>
<code>~Drawable()</code>	<code>sf::Drawable</code>
<code>~Shape()</code>	<code>sf::Shape</code>

~Transformable()

sf::Transformabl

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sf::Drawable Member List

This is the complete list of members for `sf::Drawable`, including all inherited

<code>draw(RenderTarget &target, RenderStates states) const =0</code>	<code>sf::Drawable</code>
<code>RenderTarget</code> (defined in <code>sf::Drawable</code>)	<code>sf::Drawable</code>
<code>~Drawable()</code>	<code>sf::Drawable</code>

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sf::Font Member List

This is the complete list of members for `sf::Font`, including all inherited me

`Font()`

`Font(const Font ©)`

`getGlyph(Uint32 codePoint, unsigned int characterSize, bool bold, float or`

`getInfo() const`

`getKerning(Uint32 first, Uint32 second, unsigned int characterSize) const`

`getLineSpacing(unsigned int characterSize) const`

`getTexture(unsigned int characterSize) const`

`getUnderlinePosition(unsigned int characterSize) const`

`getUnderlineThickness(unsigned int characterSize) const`

`loadFromFile(const std::string &filename)`

`loadFromMemory(const void *data, std::size_t sizeInBytes)`

`loadFromStream(InputStream &stream)`

`operator=(const Font &right)`

`~Font()`

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sf::Font::Info Member List

This is the complete list of members for `sf::Font::Info`, including all inherited

`family` `sf::Font::Info`

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sf::Glyph Member List

This is the complete list of members for `sf::Glyph`, including all inherited members.

`advance` `sf::Glyph`

`bounds` `sf::Glyph`

`Glyph()` `sf::Glyph` `inline`

`textureRect` `sf::Glyph`

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sf::Image Member List

This is the complete list of members for `sf::Image`, including all inherited n

`copy(const Image &source, unsigned int destX, unsigned int destY, const`

`create(unsigned int width, unsigned int height, const Color &color=Color((`

`create(unsigned int width, unsigned int height, const Uint8 *pixels)`

`createMaskFromColor(const Color &color, Uint8 alpha=0)`

`flipHorizontally()`

`flipVertically()`

`getPixel(unsigned int x, unsigned int y) const`

`getPixelsPtr() const`

`getSize() const`

`Image()`

`loadFromFile(const std::string &filename)`

`loadFromMemory(const void *data, std::size_t size)`

`loadFromStream(InputStream &stream)`

`saveToFile(const std::string &filename) const`

`setPixel(unsigned int x, unsigned int y, const Color &color)`

`~Image()`

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sf::Rect< T > Member List

This is the complete list of members for `sf::Rect< T >`, including all inherited

<code>contains(T x, T y) const</code>	sf::
<code>contains(const Vector2< T > &point) const</code>	sf::
<code>height</code>	sf::
<code>intersects(const Rect< T > &rectangle) const</code>	sf::
<code>intersects(const Rect< T > &rectangle, Rect< T > &intersection) const</code>	sf::
<code>left</code>	sf::
<code>operator!=(const Rect< T > &left, const Rect< T > &right)</code>	sf::
<code>operator==(const Rect< T > &left, const Rect< T > &right)</code>	sf::
<code>Rect()</code>	sf::
<code>Rect(T rectLeft, T rectTop, T rectWidth, T rectHeight)</code>	sf::
<code>Rect(const Vector2< T > &position, const Vector2< T > &size)</code>	sf::
<code>Rect(const Rect< U > &rectangle)</code>	sf::
<code>top</code>	sf::
<code>width</code>	sf::

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sf::RectangleShape Member List

This is the complete list of members for `sf::RectangleShape`, including all

<code>getFillColor() const</code>	<code>sf::Shape</code>
<code>getGlobalBounds() const</code>	<code>sf::Shape</code>
<code>getInverseTransform() const</code>	<code>sf::Transformable</code>
<code>getLocalBounds() const</code>	<code>sf::Shape</code>
<code>getOrigin() const</code>	<code>sf::Transformable</code>
<code>getOutlineColor() const</code>	<code>sf::Shape</code>
<code>getOutlineThickness() const</code>	<code>sf::Shape</code>
<code>getPoint(std::size_t index) const</code>	<code>sf::RectangleShape</code>
<code>getPointCount() const</code>	<code>sf::RectangleShape</code>
<code>getPosition() const</code>	<code>sf::Transformable</code>
<code>getRotation() const</code>	<code>sf::Transformable</code>
<code>getScale() const</code>	<code>sf::Transformable</code>
<code>getSize() const</code>	<code>sf::RectangleShape</code>
<code>getTexture() const</code>	<code>sf::Shape</code>

<code>getTextureRect() const</code>	<code>sf::Shape</code>
<code>getTransform() const</code>	<code>sf::Transformable</code>
<code>move(float offsetX, float offsetY)</code>	<code>sf::Transformable</code>
<code>move(const Vector2f &offset)</code>	<code>sf::Transformable</code>
<code>RectangleShape(const Vector2f &size=Vector2f(0, 0))</code>	<code>sf::RectangleSha</code>
<code>rotate(float angle)</code>	<code>sf::Transformable</code>
<code>scale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>scale(const Vector2f &factor)</code>	<code>sf::Transformable</code>
<code>setFillColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOrigin(float x, float y)</code>	<code>sf::Transformable</code>
<code>setOrigin(const Vector2f &origin)</code>	<code>sf::Transformable</code>
<code>setOutlineColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOutlineThickness(float thickness)</code>	<code>sf::Shape</code>
<code>setPosition(float x, float y)</code>	<code>sf::Transformable</code>
<code>setPosition(const Vector2f &position)</code>	<code>sf::Transformable</code>
<code>setRotation(float angle)</code>	<code>sf::Transformable</code>
<code>setScale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>setScale(const Vector2f &factors)</code>	<code>sf::Transformable</code>
<code>setSize(const Vector2f &size)</code>	<code>sf::RectangleSha</code>
<code>setTexture(const Texture *texture, bool resetRect=false)</code>	<code>sf::Shape</code>
<code>setTextureRect(const IntRect &rect)</code>	<code>sf::Shape</code>
<code>Shape()</code>	<code>sf::Shape</code>
<code>Transformable()</code>	<code>sf::Transformable</code>
<code>update()</code>	<code>sf::Shape</code>
<code>~Drawable()</code>	<code>sf::Drawable</code>
<code>~Shape()</code>	<code>sf::Shape</code>

~Transformable()

sf::Transformabl

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sf::RenderStates Member List

This is the complete list of members for `sf::RenderStates`, including all inh

`blendMode`

`Default`

`RenderStates()`

`RenderStates(const BlendMode &theBlendMode)`

`RenderStates(const Transform &theTransform)`

`RenderStates(const Texture *theTexture)`

`RenderStates(const Shader *theShader)`

`RenderStates(const BlendMode &theBlendMode, const Transform &theT`

`shader`

`texture`

`transform`

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sf::RenderTarget Member List

This is the complete list of members for `sf::RenderTarget`, including all inheritance.

```
clear(const Color &color=Color(0, 0, 0, 255))
```

```
draw(const Drawable &drawable, const RenderStates &states=RenderStates::Default)
```

```
draw(const Vertex *vertices, std::size_t vertexCount, PrimitiveType type, const RenderStates &states=RenderStates::Default)
```

```
getDefaultView() const
```

```
getSize() const =0
```

```
getView() const
```

```
getViewport(const View &view) const
```

```
initialize()
```

```
mapCoordsToPixel(const Vector2f &point) const
```

```
mapCoordsToPixel(const Vector2f &point, const View &view) const
```

```
mapPixelToCoords(const Vector2i &point) const
```

```
mapPixelToCoords(const Vector2i &point, const View &view) const
```

```
NonCopyable()
```

```
popGLStates()
```

`pushGLStates()`

`RenderTarget()`

`resetGLStates()`

`setView(const View &view)`

`~RenderTarget()`

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sf::RenderTarget Member List

This is the complete list of members for `sf::RenderTarget`, including all in

`clear(const Color &color=Color(0, 0, 0, 255))`

`create(unsigned int width, unsigned int height, bool depthBuffer=false)`

`display()`

`draw(const Drawable &drawable, const RenderStates &states=RenderSta`

`draw(const Vertex *vertices, std::size_t vertexCount, PrimitiveType type, c`

`generateMipmap()`

`getDefaultView() const`

`getSize() const`

`getTexture() const`

`getView() const`

`getViewport(const View &view) const`

`initialize()`

`isRepeated() const`

`isSmooth() const`

```
mapCoordsToPixel(const Vector2f &point) const
mapCoordsToPixel(const Vector2f &point, const View &view) const
mapPixelToCoords(const Vector2i &point) const
mapPixelToCoords(const Vector2i &point, const View &view) const
popGLStates()
pushGLStates()
RenderTarget()
RenderTexture()
resetGLStates()
setActive(bool active=true)
setRepeated(bool repeated)
setSmooth(bool smooth)
setView(const View &view)
~RenderTarget()
~RenderTexture()
```

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sf::RenderWindow Member List

This is the complete list of members for `sf::RenderWindow`, including all in

`capture()` const

`clear(const Color &color=Color(0, 0, 0, 255))`

`close()`

`create(VideoMode mode, const String &title, Uint32 style=Style::Default, c`

`create(WindowHandle handle, const ContextSettings &settings=ContextS`

`display()`

`draw(const Drawable &drawable, const RenderStates &states=RenderSta`

`draw(const Vertex *vertices, std::size_t vertexCount, PrimitiveType type, c`

`getDefaultView()` const

`getPosition()` const

`getSettings()` const

`getSize()` const

`getSystemHandle()` const

`getView()` const

`getViewport(const View &view) const`
`hasFocus() const`
`initialize()`
`isOpen() const`
`mapCoordsToPixel(const Vector2f &point) const`
`mapCoordsToPixel(const Vector2f &point, const View &view) const`
`mapPixelToCoords(const Vector2i &point) const`
`mapPixelToCoords(const Vector2i &point, const View &view) const`
`NonCopyable()`
`onCreate()`
`onResize()`
`pollEvent(Event &event)`
`popGLStates()`
`pushGLStates()`
`RenderTarget()`
`RenderWindow()`
`RenderWindow(VideoMode mode, const String &title, Uint32 style=Style::`
`RenderWindow(WindowHandle handle, const ContextSettings &settings=`
`requestFocus()`
`resetGLStates()`
`setActive(bool active=true) const`
`setFramerateLimit(unsigned int limit)`
`setIcon(unsigned int width, unsigned int height, const Uint8 *pixels)`
`setJoystickThreshold(float threshold)`
`setKeyRepeatEnabled(bool enabled)`
`setMouseCursorGrabbed(bool grabbed)`

`setMouseCursorVisible`(bool visible)

`setPosition`(const Vector2i &position)

`setSize`(const Vector2u &size)

`setTitle`(const String &title)

`setVerticalSyncEnabled`(bool enabled)

`setView`(const View &view)

`setVisible`(bool visible)

`waitEvent`(Event &event)

`Window`()

`Window`(VideoMode mode, const String &title, Uint32 style=Style::Default)

`Window`(WindowHandle handle, const ContextSettings &settings=ContextSettings::Default)

`~RenderTarget`()

`~RenderWindow`()

`~Window`()

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sf::Shader Member List

This is the complete list of members for `sf::Shader`, including all inherited

`bind(const Shader *shader)`

`CurrentTexture`

`ensureGLContext()`

`Fragment` enum value

`Geometry` enum value

`getNativeHandle() const`

`GLResource()`

`isAvailable()`

`isGeometryAvailable()`

`loadFromFile(const std::string &filename, Type type)`

`loadFromFile(const std::string &vertexShaderFilename, const std::string &`

`loadFromFile(const std::string &vertexShaderFilename, const std::string &`

`loadFromMemory(const std::string &shader, Type type)`

`loadFromMemory(const std::string &vertexShader, const std::string &frag`

`loadFromMemory(const std::string &vertexShader, const std::string &geom`

`loadFromStream(InputStream &stream, Type type)`

`loadFromStream(InputStream &vertexShaderStream, InputStream &fragr`

`loadFromStream(InputStream &vertexShaderStream, InputStream &geor`

`NonCopyable()`

`setParameter(const std::string &name, float x)`

`setParameter(const std::string &name, float x, float y)`

`setParameter(const std::string &name, float x, float y, float z)`

`setParameter(const std::string &name, float x, float y, float z, float w)`

`setParameter(const std::string &name, const Vector2f &vector)`

`setParameter(const std::string &name, const Vector3f &vector)`

`setParameter(const std::string &name, const Color &color)`

`setParameter(const std::string &name, const Transform &transform)`

`setParameter(const std::string &name, const Texture &texture)`

`setParameter(const std::string &name, CurrentTextureType)`

`setUniform(const std::string &name, float x)`

`setUniform(const std::string &name, const Glsl::Vec2 &vector)`

`setUniform(const std::string &name, const Glsl::Vec3 &vector)`

`setUniform(const std::string &name, const Glsl::Vec4 &vector)`

`setUniform(const std::string &name, int x)`

`setUniform(const std::string &name, const Glsl::Ivec2 &vector)`

`setUniform(const std::string &name, const Glsl::Ivec3 &vector)`

`setUniform(const std::string &name, const Glsl::Ivec4 &vector)`

`setUniform(const std::string &name, bool x)`

`setUniform(const std::string &name, const Glsl::Bvec2 &vector)`

`setUniform(const std::string &name, const Glsl::Bvec3 &vector)`

```
setUniform(const std::string &name, const Gsl::Bvec4 &vector)
```

```
setUniform(const std::string &name, const Gsl::Mat3 &matrix)
```

```
setUniform(const std::string &name, const Gsl::Mat4 &matrix)
```

```
setUniform(const std::string &name, const Texture &texture)
```

```
setUniform(const std::string &name, CurrentTextureType)
```

```
setUniformArray(const std::string &name, const float *scalarArray, std::siz
```

```
setUniformArray(const std::string &name, const Gsl::Vec2 *vectorArray, s
```

```
setUniformArray(const std::string &name, const Gsl::Vec3 *vectorArray, s
```

```
setUniformArray(const std::string &name, const Gsl::Vec4 *vectorArray, s
```

```
setUniformArray(const std::string &name, const Gsl::Mat3 *matrixArray, s
```

```
setUniformArray(const std::string &name, const Gsl::Mat4 *matrixArray, s
```

```
Shader()
```

```
Type enum name
```

```
Vertex enum value
```

```
~GResource()
```

```
~Shader()
```

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sf::Shape Member List

This is the complete list of members for `sf::Shape`, including all inherited members.

<code>getFillColor() const</code>	<code>sf::Shape</code>
<code>getGlobalBounds() const</code>	<code>sf::Shape</code>
<code>getInverseTransform() const</code>	<code>sf::Transformable</code>
<code>getLocalBounds() const</code>	<code>sf::Shape</code>
<code>getOrigin() const</code>	<code>sf::Transformable</code>
<code>getOutlineColor() const</code>	<code>sf::Shape</code>
<code>getOutlineThickness() const</code>	<code>sf::Shape</code>
<code>getPoint(std::size_t index) const =0</code>	<code>sf::Shape</code>
<code>getPointCount() const =0</code>	<code>sf::Shape</code>
<code>getPosition() const</code>	<code>sf::Transformable</code>
<code>getRotation() const</code>	<code>sf::Transformable</code>
<code>getScale() const</code>	<code>sf::Transformable</code>
<code>getTexture() const</code>	<code>sf::Shape</code>
<code>getTextureRect() const</code>	<code>sf::Shape</code>

<code>getTransform() const</code>	<code>sf::Transformable</code>
<code>move(float offsetX, float offsetY)</code>	<code>sf::Transformable</code>
<code>move(const Vector2f &offset)</code>	<code>sf::Transformable</code>
<code>rotate(float angle)</code>	<code>sf::Transformable</code>
<code>scale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>scale(const Vector2f &factor)</code>	<code>sf::Transformable</code>
<code>setFillColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOrigin(float x, float y)</code>	<code>sf::Transformable</code>
<code>setOrigin(const Vector2f &origin)</code>	<code>sf::Transformable</code>
<code>setOutlineColor(const Color &color)</code>	<code>sf::Shape</code>
<code>setOutlineThickness(float thickness)</code>	<code>sf::Shape</code>
<code>setPosition(float x, float y)</code>	<code>sf::Transformable</code>
<code>setPosition(const Vector2f &position)</code>	<code>sf::Transformable</code>
<code>setRotation(float angle)</code>	<code>sf::Transformable</code>
<code>setScale(float factorX, float factorY)</code>	<code>sf::Transformable</code>
<code>setScale(const Vector2f &factors)</code>	<code>sf::Transformable</code>
<code>setTexture(const Texture *texture, bool resetRect=false)</code>	<code>sf::Shape</code>
<code>setTextureRect(const IntRect &rect)</code>	<code>sf::Shape</code>
<code>Shape()</code>	<code>sf::Shape</code>
<code>Transformable()</code>	<code>sf::Transformable</code>
<code>update()</code>	<code>sf::Shape</code>
<code>~Drawable()</code>	<code>sf::Drawable</code>
<code>~Shape()</code>	<code>sf::Shape</code>
<code>~Transformable()</code>	<code>sf::Transformable</code>

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sf::Sprite Member List

This is the complete list of members for `sf::Sprite`, including all inherited members.

<code>getColor() const</code>	<code>sf::Sprite</code>
<code>getGlobalBounds() const</code>	<code>sf::Sprite</code>
<code>getInverseTransform() const</code>	<code>sf::Transformable</code>
<code>getLocalBounds() const</code>	<code>sf::Sprite</code>
<code>getOrigin() const</code>	<code>sf::Transformable</code>
<code>getPosition() const</code>	<code>sf::Transformable</code>
<code>getRotation() const</code>	<code>sf::Transformable</code>
<code>getScale() const</code>	<code>sf::Transformable</code>
<code>getTexture() const</code>	<code>sf::Sprite</code>
<code>getTextureRect() const</code>	<code>sf::Sprite</code>
<code>getTransform() const</code>	<code>sf::Transformable</code>
<code>move(float offsetX, float offsetY)</code>	<code>sf::Transformable</code>
<code>move(const Vector2f &offset)</code>	<code>sf::Transformable</code>
<code>rotate(float angle)</code>	<code>sf::Transformable</code>

<code>scale(float factorX, float factorY)</code>	<code>sf::Transformab</code>
<code>scale(const Vector2f &factor)</code>	<code>sf::Transformab</code>
<code>setColor(const Color &color)</code>	<code>sf::Sprite</code>
<code>setOrigin(float x, float y)</code>	<code>sf::Transformab</code>
<code>setOrigin(const Vector2f &origin)</code>	<code>sf::Transformab</code>
<code>setPosition(float x, float y)</code>	<code>sf::Transformab</code>
<code>setPosition(const Vector2f &position)</code>	<code>sf::Transformab</code>
<code>setRotation(float angle)</code>	<code>sf::Transformab</code>
<code>setScale(float factorX, float factorY)</code>	<code>sf::Transformab</code>
<code>setScale(const Vector2f &factors)</code>	<code>sf::Transformab</code>
<code>setTexture(const Texture &texture, bool resetRect=false)</code>	<code>sf::Sprite</code>
<code>setTextureRect(const IntRect &rectangle)</code>	<code>sf::Sprite</code>
<code>Sprite()</code>	<code>sf::Sprite</code>
<code>Sprite(const Texture &texture)</code>	<code>sf::Sprite</code>
<code>Sprite(const Texture &texture, const IntRect &rectangle)</code>	<code>sf::Sprite</code>
<code>Transformable()</code>	<code>sf::Transformab</code>
<code>~Drawable()</code>	<code>sf::Drawable</code>
<code>~Transformable()</code>	<code>sf::Transformab</code>

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sf::Text Member List

This is the complete list of members for `sf::Text`, including all inherited me

enum value

`findCharacterPos(std::size_t index) const`

`getCharacterSize() const`

`getColor() const`

`getFillColor() const`

`getFont() const`

`getGlobalBounds() const`

`getInverseTransform() const`

`getLocalBounds() const`

`getOrigin() const`

`getOutlineColor() const`

`getOutlineThickness() const`

`getPosition() const`

`getRotation() const`

`getScale()` const

`getString()` const

`getStyle()` const

`getTransform()` const

Italic enum value

`move(float offsetX, float offsetY)`

`move(const Vector2f &offset)`

Regular enum value

`rotate(float angle)`

`scale(float factorX, float factorY)`

`scale(const Vector2f &factor)`

`setCharacterSize(unsigned int size)`

`setColor(const Color &color)`

`setFillColor(const Color &color)`

`setFont(const Font &font)`

`setOrigin(float x, float y)`

`setOrigin(const Vector2f &origin)`

`setOutlineColor(const Color &color)`

`setOutlineThickness(float thickness)`

`setPosition(float x, float y)`

`setPosition(const Vector2f &position)`

`setRotation(float angle)`

`setScale(float factorX, float factorY)`

`setScale(const Vector2f &factors)`

`setString(const String &string)`

`setStyle(Uint32 style)`

StrikeThrough enum value

Style enum name

Text()

Text(const String &string, const Font &font, unsigned int characterSize=30)

Transformable()

Underlined enum value

~Drawable()

~Transformable()

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sf::Texture Member List

This is the complete list of members for `sf::Texture`, including all inherited

`bind(const Texture *texture, CoordinateType coordinateType=Normalized,`

`CoordinateType enum name`

`copyToImage() const`

`create(unsigned int width, unsigned int height)`

`ensureGLContext()`

`generateMipmap()`

`getMaximumSize()`

`getNativeHandle() const`

`getSize() const`

`GLResource()`

`isRepeated() const`

`isSmooth() const`

`isSrgb() const`

`loadFromFile(const std::string &filename, const IntRect &area=IntRect())`

`loadFromImage(const Image &image, const IntRect &area=IntRect())`

`loadFromMemory(const void *data, std::size_t size, const IntRect &area=`

`loadFromStream(InputStream &stream, const IntRect &area=IntRect())`

Normalized enum value

`operator=(const Texture &right)`

Pixels enum value

RenderTarget (defined in `sf::Texture`)

RenderTexture (defined in `sf::Texture`)

`setRepeated(bool repeated)`

`setSmooth(bool smooth)`

`setSrgb(bool sRgb)`

`Texture()`

`Texture(const Texture ©)`

`update(const Uint8 *pixels)`

`update(const Uint8 *pixels, unsigned int width, unsigned int height, unsig`

`update(const Image &image)`

`update(const Image &image, unsigned int x, unsigned int y)`

`update(const Window &window)`

`update(const Window &window, unsigned int x, unsigned int y)`

`~GLResource()`

`~Texture()`

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sf::Transform Member List

This is the complete list of members for `sf::Transform`, including all inheritance

`combine(const Transform &transform)`

`getInverse() const`

`getMatrix() const`

`Identity`

`operator*(const Transform &left, const Transform &right)`

`operator*(const Transform &left, const Vector2f &right)`

`operator*=(Transform &left, const Transform &right)`

`rotate(float angle)`

`rotate(float angle, float centerX, float centerY)`

`rotate(float angle, const Vector2f ¢er)`

`scale(float scaleX, float scaleY)`

`scale(float scaleX, float scaleY, float centerX, float centerY)`

`scale(const Vector2f &factors)`

`scale(const Vector2f &factors, const Vector2f ¢er)`

`Transform()`

`Transform(float a00, float a01, float a02, float a10, float a11, float a12, float a20, float a21, float a22) const`

`transformPoint(float x, float y) const`

`transformPoint(const Vector2f &point) const`

`transformRect(const FloatRect &rectangle) const`

`translate(float x, float y)`

`translate(const Vector2f &offset)`

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sf::Transformable Member List

This is the complete list of members for `sf::Transformable`, including all inl

<code>getInverseTransform() const</code>	<code>sf::Transformable</code>	
<code>getOrigin() const</code>	<code>sf::Transformable</code>	
<code>getPosition() const</code>	<code>sf::Transformable</code>	
<code>getRotation() const</code>	<code>sf::Transformable</code>	
<code>getScale() const</code>	<code>sf::Transformable</code>	
<code>getTransform() const</code>	<code>sf::Transformable</code>	
<code>move(float offsetX, float offsetY)</code>	<code>sf::Transformable</code>	
<code>move(const Vector2f &offset)</code>	<code>sf::Transformable</code>	
<code>rotate(float angle)</code>	<code>sf::Transformable</code>	
<code>scale(float factorX, float factorY)</code>	<code>sf::Transformable</code>	
<code>scale(const Vector2f &factor)</code>	<code>sf::Transformable</code>	
<code>setOrigin(float x, float y)</code>	<code>sf::Transformable</code>	
<code>setOrigin(const Vector2f &origin)</code>	<code>sf::Transformable</code>	
<code>setPosition(float x, float y)</code>	<code>sf::Transformable</code>	

<code>setPosition(const Vector2f &position)</code>	<code>sf::Transformable</code>	
<code>setRotation(float angle)</code>	<code>sf::Transformable</code>	
<code>setScale(float factorX, float factorY)</code>	<code>sf::Transformable</code>	
<code>setScale(const Vector2f &factors)</code>	<code>sf::Transformable</code>	
<code>Transformable()</code>	<code>sf::Transformable</code>	
<code>~Transformable()</code>	<code>sf::Transformable</code>	<code>virtual</code>

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sf::Vertex Member List

This is the complete list of members for `sf::Vertex`, including all inherited n

`color`

`position`

`texCoords`

`Vertex()`

`Vertex(const Vector2f &thePosition)`

`Vertex(const Vector2f &thePosition, const Color &theColor)`

`Vertex(const Vector2f &thePosition, const Vector2f &theTexCoords)`

`Vertex(const Vector2f &thePosition, const Color &theColor, const Vector2`

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sf::VertexArray Member List

This is the complete list of members for `sf::VertexArray`, including all inher

<code>append(const Vertex &vertex)</code>	<code>sf::VertexArra</code>
<code>clear()</code>	<code>sf::VertexArra</code>
<code>getBounds() const</code>	<code>sf::VertexArra</code>
<code>getPrimitiveType() const</code>	<code>sf::VertexArra</code>
<code>getVertexCount() const</code>	<code>sf::VertexArra</code>
<code>operator[] (std::size_t index)</code>	<code>sf::VertexArra</code>
<code>operator[] (std::size_t index) const</code>	<code>sf::VertexArra</code>
<code>resize(std::size_t vertexCount)</code>	<code>sf::VertexArra</code>
<code>setPrimitiveType(PrimitiveType type)</code>	<code>sf::VertexArra</code>
<code>VertexArray()</code>	<code>sf::VertexArra</code>
<code>VertexArray(PrimitiveType type, std::size_t vertexCount=0)</code>	<code>sf::VertexArra</code>
<code>~Drawable()</code>	<code>sf::Drawable</code>

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sf::View Member List

This is the complete list of members for `sf::View`, including all inherited members.

<code>getCenter() const</code>	<code>sf::View</code>	
<code>getInverseTransform() const</code>	<code>sf::View</code>	
<code>getRotation() const</code>	<code>sf::View</code>	
<code>getSize() const</code>	<code>sf::View</code>	
<code>getTransform() const</code>	<code>sf::View</code>	
<code>getViewport() const</code>	<code>sf::View</code>	
<code>move(float offsetX, float offsetY)</code>	<code>sf::View</code>	
<code>move(const Vector2f &offset)</code>	<code>sf::View</code>	
<code>reset(const FloatRect &rectangle)</code>	<code>sf::View</code>	
<code>rotate(float angle)</code>	<code>sf::View</code>	
<code>setCenter(float x, float y)</code>	<code>sf::View</code>	
<code>setCenter(const Vector2f &center)</code>	<code>sf::View</code>	
<code>setRotation(float angle)</code>	<code>sf::View</code>	
<code>setSize(float width, float height)</code>	<code>sf::View</code>	

<code>setSize(const Vector2f &size)</code>	<code>sf::View</code>	
<code>setViewport(const FloatRect &viewport)</code>	<code>sf::View</code>	
<code>View()</code>	<code>sf::View</code>	
<code>View(const FloatRect &rectangle)</code>	<code>sf::View</code>	explicit
<code>View(const Vector2f &center, const Vector2f &size)</code>	<code>sf::View</code>	
<code>zoom(float factor)</code>	<code>sf::View</code>	

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sf::Ftp Member List

This is the complete list of members for `sf::Ftp`, including all inherited members.

`Ascii` enum value

`Binary` enum value

`changeDirectory(const std::string &directory)`

`connect(const IpAddress &server, unsigned short port=21, Time timeout=`

`createDirectory(const std::string &name)`

DataChannel (defined in `sf::Ftp`)

`deleteDirectory(const std::string &name)`

`deleteFile(const std::string &name)`

`disconnect()`

`download(const std::string &remoteFile, const std::string &localPath, Tran`

`Ebcdic` enum value

`getDirectoryListing(const std::string &directory="")`

`getWorkingDirectory()`

`keepAlive()`

`login()`

`login(const std::string &name, const std::string &password)`

`NonCopyable()`

`parentDirectory()`

`renameFile(const std::string &file, const std::string &newName)`

`sendCommand(const std::string &command, const std::string ¶meter)`

`TransferMode` enum name

`upload(const std::string &localFile, const std::string &remotePath, TransferMode mode)`

`~Ftp()`

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sf::Ftp::DirectoryResponse Member List

This is the complete list of members for `sf::Ftp::DirectoryResponse`, including

`BadCommandSequence` enum value

`ClosingConnection` enum value

`ClosingDataConnection` enum value

`CommandNotImplemented` enum value

`CommandUnknown` enum value

`ConnectionClosed` enum value

`ConnectionFailed` enum value

`DataConnectionAlreadyOpened` enum value

`DataConnectionOpened` enum value

`DataConnectionUnavailable` enum value

`DirectoryOk` enum value

`DirectoryResponse(const Response &response)`

`DirectoryStatus` enum value

`EnteringPassiveMode` enum value

FileActionAborted enum value

FileActionOk enum value

FilenameNotAllowed enum value

FileStatus enum value

FileUnavailable enum value

getDirectory() const

getMessage() const

getStatus() const

HelpMessage enum value

InsufficientStorageSpace enum value

InvalidFile enum value

InvalidResponse enum value

isOk() const

LocalError enum value

LoggedIn enum value

NeedAccountToLogin enum value

NeedAccountToStore enum value

NeedInformation enum value

NeedPassword enum value

NotEnoughMemory enum value

NotLoggedIn enum value

Ok enum value

OpeningDataConnection enum value

PageTypeUnknown enum value

ParameterNotImplemented enum value

ParametersUnknown enum value

`PointlessCommand` enum value

`Response`(Status code=InvalidResponse, const std::string &message="")

`RestartMarkerReply` enum value

`ServiceReady` enum value

`ServiceReadySoon` enum value

`ServiceUnavailable` enum value

`Status` enum name

`SystemStatus` enum value

`SystemType` enum value

`TransferAborted` enum value

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sf::Ftp::ListingResponse Member List

This is the complete list of members for `sf::Ftp::ListingResponse`, including:

`BadCommandSequence` enum value

`ClosingConnection` enum value

`ClosingDataConnection` enum value

`CommandNotImplemented` enum value

`CommandUnknown` enum value

`ConnectionClosed` enum value

`ConnectionFailed` enum value

`DataConnectionAlreadyOpened` enum value

`DataConnectionOpened` enum value

`DataConnectionUnavailable` enum value

`DirectoryOk` enum value

`DirectoryStatus` enum value

`EnteringPassiveMode` enum value

`FileActionAborted` enum value

FileActionOk enum value

FilenameNotAllowed enum value

FileStatus enum value

FileUnavailable enum value

getListing() const

getMessage() const

getStatus() const

HelpMessage enum value

InsufficientStorageSpace enum value

InvalidFile enum value

InvalidResponse enum value

isOk() const

ListingResponse(const Response &response, const std::string &data)

LocalError enum value

LoggedIn enum value

NeedAccountToLogin enum value

NeedAccountToStore enum value

NeedInformation enum value

NeedPassword enum value

NotEnoughMemory enum value

NotLoggedIn enum value

Ok enum value

OpeningDataConnection enum value

PageTypeUnknown enum value

ParameterNotImplemented enum value

ParametersUnknown enum value

PointlessCommand enum value

Response(Status code=InvalidResponse, const std::string &message="")

RestartMarkerReply enum value

ServiceReady enum value

ServiceReadySoon enum value

ServiceUnavailable enum value

Status enum name

SystemStatus enum value

SystemType enum value

TransferAborted enum value

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sf::Ftp::Response Member List

This is the complete list of members for `sf::Ftp::Response`, including all in

`BadCommandSequence` enum value

`ClosingConnection` enum value

`ClosingDataConnection` enum value

`CommandNotImplemented` enum value

`CommandUnknown` enum value

`ConnectionClosed` enum value

`ConnectionFailed` enum value

`DataConnectionAlreadyOpened` enum value

`DataConnectionOpened` enum value

`DataConnectionUnavailable` enum value

`DirectoryOk` enum value

`DirectoryStatus` enum value

`EnteringPassiveMode` enum value

`FileActionAborted` enum value

FileActionOk enum value

FilenameNotAllowed enum value

FileStatus enum value

FileUnavailable enum value

getMessage() const

getStatus() const

HelpMessage enum value

InsufficientStorageSpace enum value

InvalidFile enum value

InvalidResponse enum value

isOk() const

LocalError enum value

LoggedIn enum value

NeedAccountToLogin enum value

NeedAccountToStore enum value

NeedInformation enum value

NeedPassword enum value

NotEnoughMemory enum value

NotLoggedIn enum value

Ok enum value

OpeningDataConnection enum value

PageTypeUnknown enum value

ParameterNotImplemented enum value

ParametersUnknown enum value

PointlessCommand enum value

Response(Status code=InvalidResponse, const std::string &message="")

RestartMarkerReply enum value

ServiceReady enum value

ServiceReadySoon enum value

ServiceUnavailable enum value

Status enum name

SystemStatus enum value

SystemType enum value

TransferAborted enum value

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sf::Http Member List

This is the complete list of members for `sf::Http`, including all inherited me

<code>Http()</code>	<code>sf::Http</code>
<code>Http(const std::string &host, unsigned short port=0)</code>	<code>sf::Http</code>
<code>NonCopyable()</code>	<code>sf::Nor</code>
<code>sendRequest(const Request &request, Time timeout=Time::Zero)</code>	<code>sf::Http</code>
<code>setHost(const std::string &host, unsigned short port=0)</code>	<code>sf::Http</code>

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sf::Http::Request Member List

This is the complete list of members for `sf::Http::Request`, including all inheritance.

`Delete` enum value

`Get` enum value

`Head` enum value

Http (defined in `sf::Http::Request`)

`Method` enum name

`Post` enum value

`Put` enum value

`Request`(const std::string &uri="", Method method=Get, const std::string &headers)

`setBody`(const std::string &body)

`setField`(const std::string &field, const std::string &value)

`setHttpVersion`(unsigned int major, unsigned int minor)

`setMethod`(Method method)

`setUri`(const std::string &uri)

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sf::Http::Response Member List

This is the complete list of members for sf::Http::Response, including all in

Accepted enum value	sf::Http::Response	
BadGateway enum value	sf::Http::Response	
BadRequest enum value	sf::Http::Response	
ConnectionFailed enum value	sf::Http::Response	
Created enum value	sf::Http::Response	
Forbidden enum value	sf::Http::Response	
GatewayTimeout enum value	sf::Http::Response	
getBody() const	sf::Http::Response	
getField(const std::string &field) const	sf::Http::Response	
getMajorHttpVersion() const	sf::Http::Response	
getMinorHttpVersion() const	sf::Http::Response	
getStatus() const	sf::Http::Response	
Http (defined in sf::Http::Response)	sf::Http::Response	friend
InternalServerError enum value	sf::Http::Response	

InvalidResponse enum value	sf::Http::Response	
MovedPermanently enum value	sf::Http::Response	
MovedTemporarily enum value	sf::Http::Response	
MultipleChoices enum value	sf::Http::Response	
NoContent enum value	sf::Http::Response	
NotFound enum value	sf::Http::Response	
NotImplemented enum value	sf::Http::Response	
NotModified enum value	sf::Http::Response	
Ok enum value	sf::Http::Response	
PartialContent enum value	sf::Http::Response	
RangeNotSatisfiable enum value	sf::Http::Response	
ResetContent enum value	sf::Http::Response	
Response()	sf::Http::Response	
ServiceNotAvailable enum value	sf::Http::Response	
Status enum name	sf::Http::Response	
Unauthorized enum value	sf::Http::Response	
VersionNotSupported enum value	sf::Http::Response	

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sf::IpAddress Member List

This is the complete list of members for `sf::IpAddress`, including all inheritance.

<code>Any</code>	<code>sf::IpAddre</code>
<code>Broadcast</code>	<code>sf::IpAddre</code>
<code>getLocalAddress()</code>	<code>sf::IpAddre</code>
<code>getPublicAddress(Time timeout=Time::Zero)</code>	<code>sf::IpAddre</code>
<code>IpAddress()</code>	<code>sf::IpAddre</code>
<code>IpAddress(const std::string &address)</code>	<code>sf::IpAddre</code>
<code>IpAddress(const char *address)</code>	<code>sf::IpAddre</code>
<code>IpAddress(UInt8 byte0, UInt8 byte1, UInt8 byte2, UInt8 byte3)</code>	<code>sf::IpAddre</code>
<code>IpAddress(UInt32 address)</code>	<code>sf::IpAddre</code>
<code>LocalHost</code>	<code>sf::IpAddre</code>
<code>None</code>	<code>sf::IpAddre</code>
<code>operator<(const IpAddress &left, const IpAddress &right)</code>	<code>sf::IpAddre</code>
<code>toInteger() const</code>	<code>sf::IpAddre</code>
<code>toString() const</code>	<code>sf::IpAddre</code>

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sf::Packet Member List

This is the complete list of members for `sf::Packet`, including all inherited members.

<code>append(const void *data, std::size_t sizeInBytes)</code>	sf::Packet
<code>clear()</code>	sf::Packet
<code>endOfPacket() const</code>	sf::Packet
<code>getData() const</code>	sf::Packet
<code>getDataSize() const</code>	sf::Packet
<code>onReceive(const void *data, std::size_t size)</code>	sf::Packet <small>private</small>
<code>onSend(std::size_t &size)</code>	sf::Packet <small>private</small>
<code>operator BoolType() const</code>	sf::Packet
<code>operator<<(bool data)</code>	sf::Packet
<code>operator<<(Int8 data) (defined in sf::Packet)</code>	sf::Packet
<code>operator<<(UInt8 data) (defined in sf::Packet)</code>	sf::Packet
<code>operator<<(Int16 data) (defined in sf::Packet)</code>	sf::Packet
<code>operator<<(UInt16 data) (defined in sf::Packet)</code>	sf::Packet
<code>operator<<(Int32 data) (defined in sf::Packet)</code>	sf::Packet

operator<< (Uint32 data) (defined in sf::Packet)	sf::Packet
operator<< (Int64 data) (defined in sf::Packet)	sf::Packet
operator<< (Uint64 data) (defined in sf::Packet)	sf::Packet
operator<< (float data) (defined in sf::Packet)	sf::Packet
operator<< (double data) (defined in sf::Packet)	sf::Packet
operator<< (const char *data) (defined in sf::Packet)	sf::Packet
operator<< (const std::string &data) (defined in sf::Packet)	sf::Packet
operator<< (const wchar_t *data) (defined in sf::Packet)	sf::Packet
operator<< (const std::wstring &data) (defined in sf::Packet)	sf::Packet
operator<< (const String &data) (defined in sf::Packet)	sf::Packet
operator>> (bool &data)	sf::Packet
operator>> (Int8 &data) (defined in sf::Packet)	sf::Packet
operator>> (Uint8 &data) (defined in sf::Packet)	sf::Packet
operator>> (Int16 &data) (defined in sf::Packet)	sf::Packet
operator>> (Uint16 &data) (defined in sf::Packet)	sf::Packet
operator>> (Int32 &data) (defined in sf::Packet)	sf::Packet
operator>> (Uint32 &data) (defined in sf::Packet)	sf::Packet
operator>> (Int64 &data) (defined in sf::Packet)	sf::Packet
operator>> (Uint64 &data) (defined in sf::Packet)	sf::Packet
operator>> (float &data) (defined in sf::Packet)	sf::Packet
operator>> (double &data) (defined in sf::Packet)	sf::Packet
operator>> (char *data) (defined in sf::Packet)	sf::Packet
operator>> (std::string &data) (defined in sf::Packet)	sf::Packet
operator>> (wchar_t *data) (defined in sf::Packet)	sf::Packet
operator>> (std::wstring &data) (defined in sf::Packet)	sf::Packet
operator>> (String &data) (defined in sf::Packet)	sf::Packet

<code>Packet()</code>	<code>sf::Packet</code>	
<code>TcpSocket</code> (defined in <code>sf::Packet</code>)	<code>sf::Packet</code>	fri
<code>UdpSocket</code> (defined in <code>sf::Packet</code>)	<code>sf::Packet</code>	fri
<code>~Packet()</code>	<code>sf::Packet</code>	vi

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sf::Socket Member List

This is the complete list of members for `sf::Socket`, including all inherited members.

<code>AnyPort</code> enum value	<code>sf::Socket</code>	
<code>close()</code>	<code>sf::Socket</code>	protected
<code>create()</code>	<code>sf::Socket</code>	protected
<code>create(SocketHandle handle)</code>	<code>sf::Socket</code>	protected
<code>Disconnected</code> enum value	<code>sf::Socket</code>	
<code>Done</code> enum value	<code>sf::Socket</code>	
<code>Error</code> enum value	<code>sf::Socket</code>	
<code>getHandle() const</code>	<code>sf::Socket</code>	protected
<code>isBlocking() const</code>	<code>sf::Socket</code>	
<code>NonCopyable()</code>	<code>sf::NonCopyable</code>	inline private
<code>NotReady</code> enum value	<code>sf::Socket</code>	
<code>Partial</code> enum value	<code>sf::Socket</code>	
<code>setBlocking(bool blocking)</code>	<code>sf::Socket</code>	
<code>Socket(Type type)</code>	<code>sf::Socket</code>	protected

SocketSelector (defined in <code>sf::Socket</code>)	<code>sf::Socket</code>	friend
Status enum name	<code>sf::Socket</code>	
Tcp enum value	<code>sf::Socket</code>	protected
Type enum name	<code>sf::Socket</code>	protected
Udp enum value	<code>sf::Socket</code>	protected
<code>~Socket()</code>	<code>sf::Socket</code>	virtual

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sf::SocketSelector Member List

This is the complete list of members for `sf::SocketSelector`, including all in

<code>add(Socket &socket)</code>	<code>sf::SocketSelector</code>
<code>clear()</code>	<code>sf::SocketSelector</code>
<code>isReady(Socket &socket) const</code>	<code>sf::SocketSelector</code>
<code>operator=(const SocketSelector &right)</code>	<code>sf::SocketSelector</code>
<code>remove(Socket &socket)</code>	<code>sf::SocketSelector</code>
<code>SocketSelector()</code>	<code>sf::SocketSelector</code>
<code>SocketSelector(const SocketSelector &copy)</code>	<code>sf::SocketSelector</code>
<code>wait(Time timeout=Time::Zero)</code>	<code>sf::SocketSelector</code>
<code>~SocketSelector()</code>	<code>sf::SocketSelector</code>

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sf::TcpListener Member List

This is the complete list of members for `sf::TcpListener`, including all inher

<code>accept(TcpSocket &socket)</code>	sf
<code>AnyPort</code> enum value	sf
<code>close()</code>	sf
<code>create()</code>	sf
<code>create(SocketHandle handle)</code>	sf
<code>Disconnected</code> enum value	sf
<code>Done</code> enum value	sf
<code>Error</code> enum value	sf
<code>getHandle() const</code>	sf
<code>getLocalPort() const</code>	sf
<code>isBlocking() const</code>	sf
<code>listen(unsigned short port, const IpAddress &address=IpAddress::Any)</code>	sf
<code>NotReady</code> enum value	sf
<code>Partial</code> enum value	sf

<code>setBlocking(bool blocking)</code>	sf
<code>Socket(Type type)</code>	sf
<code>Status</code> enum name	sf
<code>Tcp</code> enum value	sf
<code>TcpListener()</code>	sf
<code>Type</code> enum name	sf
<code>Udp</code> enum value	sf
<code>~Socket()</code>	sf

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sf::TcpSocket Member List

This is the complete list of members for `sf::TcpSocket`, including all inherit

`AnyPort` enum value

`close()`

`connect(const IpAddress &remoteAddress, unsigned short remotePort, Ti`

`create()`

`create(SocketHandle handle)`

`disconnect()`

`Disconnected` enum value

`Done` enum value

`Error` enum value

`getHandle() const`

`getLocalPort() const`

`getRemoteAddress() const`

`getRemotePort() const`

`isBlocking() const`

NotReady enum value

Partial enum value

receive(void *data, std::size_t size, std::size_t &received)

receive(Packet &packet)

send(const void *data, std::size_t size)

send(const void *data, std::size_t size, std::size_t &sent)

send(Packet &packet)

setBlocking(bool blocking)

Socket(Type type)

Status enum name

Tcp enum value

TcpListener (defined in `sf::TcpSocket`)

TcpSocket()

Type enum name

Udp enum value

~Socket()

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sf::UdpSocket Member List

This is the complete list of members for `sf::UdpSocket`, including all inheri

`AnyPort` enum value

`bind(unsigned short port, const IpAddress &address=IpAddress::Any)`

`close()`

`create()`

`create(SocketHandle handle)`

`Disconnected` enum value

`Done` enum value

`Error` enum value

`getHandle() const`

`getLocalPort() const`

`isBlocking() const`

`MaxDatagramSize` enum value

`NotReady` enum value

`Partial` enum value

`receive(void *data, std::size_t size, std::size_t &received, IpAddress &rem`

`receive(Packet &packet, IpAddress &remoteAddress, unsigned short &re`

`send(const void *data, std::size_t size, const IpAddress &remoteAddress,`

`send(Packet &packet, const IpAddress &remoteAddress, unsigned short`

`setBlocking(bool blocking)`

`Socket(Type type)`

`Status` enum name

`Tcp` enum value

`Type` enum name

`Udp` enum value

`UdpSocket()`

`unbind()`

`~Socket()`

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sf::Clock Member List

This is the complete list of members for `sf::Clock`, including all inherited m

<code>Clock()</code>	<code>sf::Clock</code>
<code>getElapsedTime() const</code>	<code>sf::Clock</code>
<code>restart()</code>	<code>sf::Clock</code>

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sf::FileInputStream Member List

This is the complete list of members for sf::FileInputStream, including all inherited members.

FileInputStream()	sf::FileInputStream	
getSize()	sf::FileInputStream	virtual
NonCopyable()	sf::NonCopyable	inline private
open(const std::string &filename)	sf::FileInputStream	
read(void *data, Int64 size)	sf::FileInputStream	virtual
seek(Int64 position)	sf::FileInputStream	virtual
tell()	sf::FileInputStream	virtual
~FileInputStream()	sf::FileInputStream	virtual
~InputStream()	sf::InputStream	inline virtual

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sf::InputStream Member List

This is the complete list of members for `sf::InputStream`, including all inhe

<code>getSize()</code> =0	<code>sf::InputStream</code>	<code>pure virtual</code>
<code>read(void *data, Int64 size)</code> =0	<code>sf::InputStream</code>	<code>pure virtual</code>
<code>seek(Int64 position)</code> =0	<code>sf::InputStream</code>	<code>pure virtual</code>
<code>tell()</code> =0	<code>sf::InputStream</code>	<code>pure virtual</code>
<code>~InputStream()</code>	<code>sf::InputStream</code>	<code>inline</code> <code>virtual</code>

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sf::Lock Member List

This is the complete list of members for `sf::Lock`, including all inherited members.

<code>Lock(Mutex &mutex)</code>	<code>sf::Lock</code>	<code>explicit</code>
<code>NonCopyable()</code>	<code>sf::NonCopyable</code>	<code>inline</code> <code>private</code>
<code>~Lock()</code>	<code>sf::Lock</code>	

sf::MemoryInputStream Member List

This is the complete list of members for `sf::MemoryInputStream`, including

<code>getSize()</code>	<code>sf::MemoryInputStream</code>	vi
<code>MemoryInputStream()</code>	<code>sf::MemoryInputStream</code>	
<code>open(const void *data, std::size_t sizeInBytes)</code>	<code>sf::MemoryInputStream</code>	
<code>read(void *data, Int64 size)</code>	<code>sf::MemoryInputStream</code>	vi
<code>seek(Int64 position)</code>	<code>sf::MemoryInputStream</code>	vi
<code>tell()</code>	<code>sf::MemoryInputStream</code>	vi
<code>~InputStream()</code>	<code>sf::InputStream</code>	in

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sf::Mutex Member List

This is the complete list of members for `sf::Mutex`, including all inherited members.

<code>lock()</code>	<code>sf::Mutex</code>	
<code>Mutex()</code>	<code>sf::Mutex</code>	
<code>NonCopyable()</code>	<code>sf::NonCopyable</code>	<code>inline</code> <code>private</code>
<code>unlock()</code>	<code>sf::Mutex</code>	
<code>~Mutex()</code>	<code>sf::Mutex</code>	

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sf::NonCopyable Member List

This is the complete list of members for `sf::NonCopyable`, including all inh

`NonCopyable()` `sf::NonCopyable` `inline` `protected`

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sf::String Member List

This is the complete list of members for `sf::String`, including all inherited members.

`begin()``begin() const``clear()``ConstIterator` typedef`end()``end() const``erase(std::size_t position, std::size_t count=1)``find(const String &str, std::size_t start=0) const``fromUtf16(T begin, T end)``fromUtf32(T begin, T end)``fromUtf8(T begin, T end)``getData() const``getSize() const``insert(std::size_t position, const String &str)`

InvalidPos

isEmpty() const

Iterator typedef

operator std::string() const

operator std::wstring() const

operator!=(const String &left, const String &right)

operator+(const String &left, const String &right)

operator+=(const String &right)

operator< (defined in `sf::String`)

operator<(const String &left, const String &right)

operator<=(const String &left, const String &right)

operator=(const String &right)

operator== (defined in `sf::String`)

operator==(const String &left, const String &right)

operator>(const String &left, const String &right)

operator>=(const String &left, const String &right)

operator[](std::size_t index) const

operator[](std::size_t index)

replace(std::size_t position, std::size_t length, const String &replaceWith)

replace(const String &searchFor, const String &replaceWith)

String()

String(char ansiChar, const std::locale &locale=std::locale())

String(wchar_t wideChar)

String(UINT32 utf32Char)

String(const char *ansiString, const std::locale &locale=std::locale())

`String(const std::string &ansiString, const std::locale &locale=std::locale())`

`String(const wchar_t *wideString)`

`String(const std::wstring &wideString)`

`String(const Uint32 *utf32String)`

`String(const std::basic_string< Uint32 > &utf32String)`

`String(const String ©)`

`substring(std::size_t position, std::size_t length=InvalidPos) const`

`toAnsiString(const std::locale &locale=std::locale()) const`

`toUtf16() const`

`toUtf32() const`

`toUtf8() const`

`toWideString() const`

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sf::Thread Member List

This is the complete list of members for `sf::Thread`, including all inherited members.

<code>launch()</code>	<code>sf::Thread</code>	
<code>NonCopyable()</code>	<code>sf::NonCopyable</code>	<code>inline</code> <code>private</code>
<code>terminate()</code>	<code>sf::Thread</code>	
<code>Thread(F function)</code>	<code>sf::Thread</code>	
<code>Thread(F function, A argument)</code>	<code>sf::Thread</code>	
<code>Thread(void(C::*function)(), C *object)</code>	<code>sf::Thread</code>	
<code>wait()</code>	<code>sf::Thread</code>	
<code>~Thread()</code>	<code>sf::Thread</code>	

sf::ThreadLocal Member List

This is the complete list of members for `sf::ThreadLocal`, including all inhe

<code>getValue() const</code>	<code>sf::ThreadLocal</code>	
<code>NonCopyable()</code>	<code>sf::NonCopyable</code>	<code>inline</code> <code>private</code>
<code>setValue(void *value)</code>	<code>sf::ThreadLocal</code>	
<code>ThreadLocal(void *value=NULL)</code>	<code>sf::ThreadLocal</code>	
<code>~ThreadLocal()</code>	<code>sf::ThreadLocal</code>	

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sf::ThreadLocalPtr< T > Member List

This is the complete list of members for sf::ThreadLocalPtr< T >, including

getValue() const	sf::ThreadLocal	private
operator T *() const	sf::ThreadLocalPtr< T >	
operator*() const	sf::ThreadLocalPtr< T >	
operator->() const	sf::ThreadLocalPtr< T >	
operator=(T *value)	sf::ThreadLocalPtr< T >	
operator=(const ThreadLocalPtr< T > &right)	sf::ThreadLocalPtr< T >	
setValue(void *value)	sf::ThreadLocal	private
ThreadLocal(void *value=NULL)	sf::ThreadLocal	private
ThreadLocalPtr(T *value=NULL)	sf::ThreadLocalPtr< T >	
~ThreadLocal()	sf::ThreadLocal	private

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sf::Time Member List

This is the complete list of members for `sf::Time`, including all inherited members.

<code>asMicroseconds()</code> const	sf::Time	
<code>asMilliseconds()</code> const	sf::Time	
<code>asSeconds()</code> const	sf::Time	
microseconds (defined in <code>sf::Time</code>)	sf::Time	friend
<code>microseconds(Int64 amount)</code>	sf::Time	related
milliseconds (defined in <code>sf::Time</code>)	sf::Time	friend
<code>milliseconds(Int32 amount)</code>	sf::Time	related
<code>operator!=(Time left, Time right)</code>	sf::Time	related
<code>operator%(Time left, Time right)</code>	sf::Time	related
<code>operator%=(Time &left, Time right)</code>	sf::Time	related
<code>operator*(Time left, float right)</code>	sf::Time	related
<code>operator*(Time left, Int64 right)</code>	sf::Time	related
<code>operator*(float left, Time right)</code>	sf::Time	related
<code>operator*(Int64 left, Time right)</code>	sf::Time	related

<code>operator*=(Time &left, float right)</code>	<code>sf::Time</code>	related
<code>operator*=(Time &left, Int64 right)</code>	<code>sf::Time</code>	related
<code>operator+(Time left, Time right)</code>	<code>sf::Time</code>	related
<code>operator+=(Time &left, Time right)</code>	<code>sf::Time</code>	related
<code>operator-(Time right)</code>	<code>sf::Time</code>	related
<code>operator-(Time left, Time right)</code>	<code>sf::Time</code>	related
<code>operator-=(Time &left, Time right)</code>	<code>sf::Time</code>	related
<code>operator/(Time left, float right)</code>	<code>sf::Time</code>	related
<code>operator/(Time left, Int64 right)</code>	<code>sf::Time</code>	related
<code>operator/(Time left, Time right)</code>	<code>sf::Time</code>	related
<code>operator/=(Time &left, float right)</code>	<code>sf::Time</code>	related
<code>operator/=(Time &left, Int64 right)</code>	<code>sf::Time</code>	related
<code>operator<(Time left, Time right)</code>	<code>sf::Time</code>	related
<code>operator<=(Time left, Time right)</code>	<code>sf::Time</code>	related
<code>operator==(Time left, Time right)</code>	<code>sf::Time</code>	related
<code>operator>(Time left, Time right)</code>	<code>sf::Time</code>	related
<code>operator>=(Time left, Time right)</code>	<code>sf::Time</code>	related
seconds (defined in <code>sf::Time</code>)	<code>sf::Time</code>	friend
<code>seconds(float amount)</code>	<code>sf::Time</code>	related
<code>Time()</code>	<code>sf::Time</code>	
<code>Zero</code>	<code>sf::Time</code>	static

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sf::Vector2< T > Member List

This is the complete list of members for `sf::Vector2< T >`, including all inhe

<code>operator!=(const Vector2< T > &left, const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>operator*(const Vector2< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator*(T left, const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>operator*=(Vector2< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator+(const Vector2< T > &left, const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>operator+=(Vector2< T > &left, const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>operator-(const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>operator-(const Vector2< T > &left, const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>operator-=(Vector2< T > &left, const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>operator/(const Vector2< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator/=(Vector2< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator==(const Vector2< T > &left, const Vector2< T > &right)</code>	<code>sf::Vecto</code>
<code>Vector2()</code>	<code>sf::Vecto</code>
<code>Vector2(T X, T Y)</code>	<code>sf::Vecto</code>

<code>Vector2(const Vector2< U > &vector)</code>	<code>sf::Vecto</code>
<code>x</code>	<code>sf::Vecto</code>
<code>y</code>	<code>sf::Vecto</code>

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sf::Vector3< T > Member List

This is the complete list of members for `sf::Vector3< T >`, including all inhe

<code>operator!=(const Vector3< T > &left, const Vector3< T > &right)</code>	<code>sf::Vecto</code>
<code>operator*(const Vector3< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator*(T left, const Vector3< T > &right)</code>	<code>sf::Vecto</code>
<code>operator*=(Vector3< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator+(const Vector3< T > &left, const Vector3< T > &right)</code>	<code>sf::Vecto</code>
<code>operator+=(Vector3< T > &left, const Vector3< T > &right)</code>	<code>sf::Vecto</code>
<code>operator-(const Vector3< T > &left)</code>	<code>sf::Vecto</code>
<code>operator-(const Vector3< T > &left, const Vector3< T > &right)</code>	<code>sf::Vecto</code>
<code>operator-=(Vector3< T > &left, const Vector3< T > &right)</code>	<code>sf::Vecto</code>
<code>operator/(const Vector3< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator/=(Vector3< T > &left, T right)</code>	<code>sf::Vecto</code>
<code>operator==(const Vector3< T > &left, const Vector3< T > &right)</code>	<code>sf::Vecto</code>
<code>Vector3()</code>	<code>sf::Vecto</code>
<code>Vector3(T X, T Y, T Z)</code>	<code>sf::Vecto</code>

<code>Vector3(const Vector3< U > &vector)</code>	<code>sf::Vecto</code>
<code>x</code>	<code>sf::Vecto</code>
<code>y</code>	<code>sf::Vecto</code>
<code>z</code>	<code>sf::Vecto</code>

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sf::Context Member List

This is the complete list of members for `sf::Context`, including all inherited

`Context()`

`Context(const ContextSettings &settings, unsigned int width, unsigned int`

`ensureGLContext()`

`getActiveContext()`

`getFunction(const char *name)`

`getSettings() const`

`GLResource()`

`isExtensionAvailable(const char *name)`

`NonCopyable()`

`setActive(bool active)`

`~Context()`

`~GLResource()`

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sf::ContextSettings Member List

This is the complete list of members for `sf::ContextSettings`, including all inherited members.

`antialiasingLevel`

`Attribute` enum name

`attributeFlags`

`ContextSettings`(unsigned int depth=0, unsigned int stencil=0, unsigned int

`Core` enum value

`Debug` enum value

`Default` enum value

`depthBits`

`majorVersion`

`minorVersion`

`sRgbCapable`

`stencilBits`

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sf::Event Member List

This is the complete list of members for `sf::Event`, including all inherited m

Closed enum value	sf::Event
Count enum value	sf::Event
EventType enum name	sf::Event
GainedFocus enum value	sf::Event
joystickButton	sf::Event
JoystickButtonPressed enum value	sf::Event
JoystickButtonReleased enum value	sf::Event
joystickConnect	sf::Event
JoystickConnected enum value	sf::Event
JoystickDisconnected enum value	sf::Event
joystickMove	sf::Event
JoystickMoved enum value	sf::Event
key	sf::Event
KeyPressed enum value	sf::Event

KeyReleased enum value	sf::Event
LostFocus enum value	sf::Event
mouseButton	sf::Event
MouseButtonPressed enum value	sf::Event
MouseButtonReleased enum value	sf::Event
MouseEntered enum value	sf::Event
MouseLeft enum value	sf::Event
mouseMove	sf::Event
MouseMoved enum value	sf::Event
mouseWheel	sf::Event
MouseWheelMoved enum value	sf::Event
mouseWheelScroll	sf::Event
MouseWheelScrolled enum value	sf::Event
Resized enum value	sf::Event
sensor	sf::Event
SensorChanged enum value	sf::Event
size	sf::Event
text	sf::Event
TextEntered enum value	sf::Event
touch	sf::Event
TouchBegan enum value	sf::Event
TouchEnded enum value	sf::Event
TouchMoved enum value	sf::Event
type	sf::Event

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sf::Event::JoystickButtonEvent Member List

This is the complete list of members for `sf::Event::JoystickButtonEvent`, in

`button` `sf::Event::JoystickButtonEvent`

`joystickId` `sf::Event::JoystickButtonEvent`

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sf::Event::JoystickConnectEvent Member List

This is the complete list of members for `sf::Event::JoystickConnectEvent`,

`joystickId` `sf::Event::JoystickConnectEvent`

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sf::Event::JoystickMoveEvent Member List

This is the complete list of members for `sf::Event::JoystickMoveEvent`, including:

<code>axis</code>	<code>sf::Event::JoystickMoveEvent</code>
<code>joystickId</code>	<code>sf::Event::JoystickMoveEvent</code>
<code>position</code>	<code>sf::Event::JoystickMoveEvent</code>

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sf::Event::KeyEvent Member List

This is the complete list of members for `sf::Event::KeyEvent`, including all

`alt` `sf::Event::KeyEvent`

`code` `sf::Event::KeyEvent`

`control` `sf::Event::KeyEvent`

`shift` `sf::Event::KeyEvent`

`system` `sf::Event::KeyEvent`

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sf::Event::MouseEvent Member List

This is the complete list of members for `sf::Event::MouseEvent`, including:

<code>button</code>	<code>sf::Event::MouseEvent</code>
<code>x</code>	<code>sf::Event::MouseEvent</code>
<code>y</code>	<code>sf::Event::MouseEvent</code>

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sf::Event::MouseMoveEvent Member List

This is the complete list of members for `sf::Event::MouseMoveEvent`, inclu

x `sf::Event::MouseMoveEvent`

y `sf::Event::MouseMoveEvent`

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sf::Event::MouseEvent Member List

This is the complete list of members for `sf::Event::MouseEvent`, including:

<code>delta</code>	<code>sf::Event::MouseEvent</code>
<code>x</code>	<code>sf::Event::MouseEvent</code>
<code>y</code>	<code>sf::Event::MouseEvent</code>

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sf::Event::MouseWheelScrollEvent Member

This is the complete list of members for `sf::Event::MouseWheelScrollEvent` members.

`delta` `sf::Event::MouseWheelScrollEvent`

`wheel` `sf::Event::MouseWheelScrollEvent`

`x` `sf::Event::MouseWheelScrollEvent`

`y` `sf::Event::MouseWheelScrollEvent`

sf::Event::SensorEvent Member List

This is the complete list of members for `sf::Event::SensorEvent`, including

```
type sf::Event::SensorEvent
x    sf::Event::SensorEvent
y    sf::Event::SensorEvent
z    sf::Event::SensorEvent
```

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sf::Event::SizeEvent Member List

This is the complete list of members for `sf::Event::SizeEvent`, including all

`height` `sf::Event::SizeEvent`

`width` `sf::Event::SizeEvent`

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sf::Event::TextEvent Member List

This is the complete list of members for `sf::Event::TextEvent`, including all

`unicode` `sf::Event::TextEvent`

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sf::Event::TouchEvent Member List

This is the complete list of members for `sf::Event::TouchEvent`, including a

`finger` `sf::Event::TouchEvent`

`x` `sf::Event::TouchEvent`

`y` `sf::Event::TouchEvent`

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sf::GResource Member List

This is the complete list of members for `sf::GResource`, including all inher

<code>ensureGContext()</code>	<code>sf::GResource</code>	<code>protected</code>	<code>static</code>
<code>GResource()</code>	<code>sf::GResource</code>	<code>protected</code>	
<code>~GResource()</code>	<code>sf::GResource</code>	<code>protected</code>	

sf::GResource::TransientContextLock Memk

This is the complete list of members for `sf::GResource::TransientCo` members.

<code>NonCopyable()</code>	<code>sf::NonCopyable</code>	<code>inline</code>	<code>privat</code>
<code>TransientContextLock()</code>	<code>sf::GResource::TransientContextLock</code>		
<code>~TransientContextLock()</code>	<code>sf::GResource::TransientContextLock</code>		

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sf::Joystick Member List

This is the complete list of members for `sf::Joystick`, including all inherited

<code>Axis</code> enum name	<code>sf::Joystick</code>	
<code>AxisCount</code> enum value	<code>sf::Joystick</code>	
<code>ButtonCount</code> enum value	<code>sf::Joystick</code>	
<code>Count</code> enum value	<code>sf::Joystick</code>	
<code>getAxisPosition(unsigned int joystick, Axis axis)</code>	<code>sf::Joystick</code>	st
<code>getButtonCount(unsigned int joystick)</code>	<code>sf::Joystick</code>	st
<code>getIdentification(unsigned int joystick)</code>	<code>sf::Joystick</code>	st
<code>hasAxis(unsigned int joystick, Axis axis)</code>	<code>sf::Joystick</code>	st
<code>isButtonPressed(unsigned int joystick, unsigned int button)</code>	<code>sf::Joystick</code>	st
<code>isConnected(unsigned int joystick)</code>	<code>sf::Joystick</code>	st
<code>PovX</code> enum value	<code>sf::Joystick</code>	
<code>PovY</code> enum value	<code>sf::Joystick</code>	
<code>R</code> enum value	<code>sf::Joystick</code>	
<code>U</code> enum value	<code>sf::Joystick</code>	

<code>update()</code>	<code>sf::Joystick</code>
<code>V</code> enum value	<code>sf::Joystick</code>
<code>X</code> enum value	<code>sf::Joystick</code>
<code>Y</code> enum value	<code>sf::Joystick</code>
<code>Z</code> enum value	<code>sf::Joystick</code>

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sf::Joystick::Identification Member List

This is the complete list of members for `sf::Joystick::Identification`, including

Identification() (defined in <code>sf::Joystick::Identification</code>)	<code>sf::Joystick::Identifi</code>
<code>name</code>	<code>sf::Joystick::Identifi</code>
<code>productId</code>	<code>sf::Joystick::Identifi</code>
<code>vendorId</code>	<code>sf::Joystick::Identifi</code>

sf::Keyboard Member List

This is the complete list of members for `sf::Keyboard`, including all inherited members.

A enum value	sf::Keyboard	
Add enum value	sf::Keyboard	
B enum value	sf::Keyboard	
BackSlash enum value	sf::Keyboard	
BackSpace enum value	sf::Keyboard	
C enum value	sf::Keyboard	
Comma enum value	sf::Keyboard	
D enum value	sf::Keyboard	
Dash enum value	sf::Keyboard	
Delete enum value	sf::Keyboard	
Divide enum value	sf::Keyboard	
Down enum value	sf::Keyboard	
E enum value	sf::Keyboard	
End enum value	sf::Keyboard	

Equal enum value	sf::Keyboard	
Escape enum value	sf::Keyboard	
F enum value	sf::Keyboard	
F1 enum value	sf::Keyboard	
F10 enum value	sf::Keyboard	
F11 enum value	sf::Keyboard	
F12 enum value	sf::Keyboard	
F13 enum value	sf::Keyboard	
F14 enum value	sf::Keyboard	
F15 enum value	sf::Keyboard	
F2 enum value	sf::Keyboard	
F3 enum value	sf::Keyboard	
F4 enum value	sf::Keyboard	
F5 enum value	sf::Keyboard	
F6 enum value	sf::Keyboard	
F7 enum value	sf::Keyboard	
F8 enum value	sf::Keyboard	
F9 enum value	sf::Keyboard	
G enum value	sf::Keyboard	
H enum value	sf::Keyboard	
Home enum value	sf::Keyboard	
I enum value	sf::Keyboard	
Insert enum value	sf::Keyboard	
isKeyPressed(Key key)	sf::Keyboard	static
J enum value	sf::Keyboard	
K enum value	sf::Keyboard	

Key enum name	sf::Keyboard	
KeyCount enum value	sf::Keyboard	
L enum value	sf::Keyboard	
LAlt enum value	sf::Keyboard	
LBracket enum value	sf::Keyboard	
LControl enum value	sf::Keyboard	
Left enum value	sf::Keyboard	
LShift enum value	sf::Keyboard	
LSystem enum value	sf::Keyboard	
M enum value	sf::Keyboard	
Menu enum value	sf::Keyboard	
Multiply enum value	sf::Keyboard	
N enum value	sf::Keyboard	
Num0 enum value	sf::Keyboard	
Num1 enum value	sf::Keyboard	
Num2 enum value	sf::Keyboard	
Num3 enum value	sf::Keyboard	
Num4 enum value	sf::Keyboard	
Num5 enum value	sf::Keyboard	
Num6 enum value	sf::Keyboard	
Num7 enum value	sf::Keyboard	
Num8 enum value	sf::Keyboard	
Num9 enum value	sf::Keyboard	
Numpad0 enum value	sf::Keyboard	
Numpad1 enum value	sf::Keyboard	

Numpad2 enum value	sf::Keyboard	
Numpad3 enum value	sf::Keyboard	
Numpad4 enum value	sf::Keyboard	
Numpad5 enum value	sf::Keyboard	
Numpad6 enum value	sf::Keyboard	
Numpad7 enum value	sf::Keyboard	
Numpad8 enum value	sf::Keyboard	
Numpad9 enum value	sf::Keyboard	
O enum value	sf::Keyboard	
P enum value	sf::Keyboard	
PageDown enum value	sf::Keyboard	
PageUp enum value	sf::Keyboard	
Pause enum value	sf::Keyboard	
Period enum value	sf::Keyboard	
Q enum value	sf::Keyboard	
Quote enum value	sf::Keyboard	
R enum value	sf::Keyboard	
RAlt enum value	sf::Keyboard	
RBracket enum value	sf::Keyboard	
RControl enum value	sf::Keyboard	
Return enum value	sf::Keyboard	
Right enum value	sf::Keyboard	
RShift enum value	sf::Keyboard	
RSystem enum value	sf::Keyboard	
S enum value	sf::Keyboard	
SemiColon enum value	sf::Keyboard	

<code>setVirtualKeyboardVisible</code> (bool visible)	<code>sf::Keyboard</code>	static
<code>Slash</code> enum value	<code>sf::Keyboard</code>	
<code>Space</code> enum value	<code>sf::Keyboard</code>	
<code>Subtract</code> enum value	<code>sf::Keyboard</code>	
<code>T</code> enum value	<code>sf::Keyboard</code>	
<code>Tab</code> enum value	<code>sf::Keyboard</code>	
<code>Tilde</code> enum value	<code>sf::Keyboard</code>	
<code>U</code> enum value	<code>sf::Keyboard</code>	
<code>Unknown</code> enum value	<code>sf::Keyboard</code>	
<code>Up</code> enum value	<code>sf::Keyboard</code>	
<code>V</code> enum value	<code>sf::Keyboard</code>	
<code>W</code> enum value	<code>sf::Keyboard</code>	
<code>X</code> enum value	<code>sf::Keyboard</code>	
<code>Y</code> enum value	<code>sf::Keyboard</code>	
<code>Z</code> enum value	<code>sf::Keyboard</code>	

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sf::Mouse Member List

This is the complete list of members for `sf::Mouse`, including all inherited r

<code>Button</code> enum name	sf::Mous
<code>ButtonCount</code> enum value	sf::Mous
<code>getPosition()</code>	sf::Mous
<code>getPosition(const Window &relativeTo)</code>	sf::Mous
<code>HorizontalWheel</code> enum value	sf::Mous
<code>isButtonPressed(Button button)</code>	sf::Mous
<code>Left</code> enum value	sf::Mous
<code>Middle</code> enum value	sf::Mous
<code>Right</code> enum value	sf::Mous
<code>setPosition(const Vector2i &position)</code>	sf::Mous
<code>setPosition(const Vector2i &position, const Window &relativeTo)</code>	sf::Mous
<code>VerticalWheel</code> enum value	sf::Mous
<code>Wheel</code> enum name	sf::Mous
<code>XButton1</code> enum value	sf::Mous

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sf::Sensor Member List

This is the complete list of members for `sf::Sensor`, including all inherited members.

<code>Accelerometer</code> enum value	<code>sf::Sensor</code>	
<code>Count</code> enum value	<code>sf::Sensor</code>	
<code>getValue</code> (Type sensor)	<code>sf::Sensor</code>	static
<code>Gravity</code> enum value	<code>sf::Sensor</code>	
<code>Gyroscope</code> enum value	<code>sf::Sensor</code>	
<code>isAvailable</code> (Type sensor)	<code>sf::Sensor</code>	static
<code>Magnetometer</code> enum value	<code>sf::Sensor</code>	
<code>Orientation</code> enum value	<code>sf::Sensor</code>	
<code>setEnabled</code> (Type sensor, bool enabled)	<code>sf::Sensor</code>	static
<code>Type</code> enum name	<code>sf::Sensor</code>	
<code>UserAcceleration</code> enum value	<code>sf::Sensor</code>	

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sf::Touch Member List

This is the complete list of members for `sf::Touch`, including all inherited members.

<code>getPosition(unsigned int finger)</code>	<code>sf::Touch</code>	<code>static</code>
<code>getPosition(unsigned int finger, const Window &relativeTo)</code>	<code>sf::Touch</code>	<code>static</code>
<code>isDown(unsigned int finger)</code>	<code>sf::Touch</code>	<code>static</code>

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sf::VideoMode Member List

This is the complete list of members for `sf::VideoMode`, including all inherited members.

`bitsPerPixel`

`getDesktopMode()`

`getFullscreenModes()`

`height`

`isValid() const`

`operator!=(const VideoMode &left, const VideoMode &right)`

`operator<(const VideoMode &left, const VideoMode &right)`

`operator<=(const VideoMode &left, const VideoMode &right)`

`operator==(const VideoMode &left, const VideoMode &right)`

`operator>(const VideoMode &left, const VideoMode &right)`

`operator>=(const VideoMode &left, const VideoMode &right)`

`VideoMode()`

`VideoMode(unsigned int modeWidth, unsigned int modeHeight, unsigned int bitsPerPixel, unsigned int refreshRate)`

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sf::Window Member List

This is the complete list of members for `sf::Window`, including all inherited

`close()`

`create(VideoMode mode, const String &title, Uint32 style=Style::Default, c`

`create(WindowHandle handle, const ContextSettings &settings=ContextS`

`display()`

`ensureGLContext()`

`getPosition() const`

`getSettings() const`

`getSize() const`

`getSystemHandle() const`

`GLResource()`

`hasFocus() const`

`isOpen() const`

`NonCopyable()`

`onCreate()`

`onResize()`

`pollEvent(Event &event)`

`requestFocus()`

`setActive(bool active=true) const`

`setFramerateLimit(unsigned int limit)`

`setIcon(unsigned int width, unsigned int height, const Uint8 *pixels)`

`setJoystickThreshold(float threshold)`

`setKeyRepeatEnabled(bool enabled)`

`setMouseCursorGrabbed(bool grabbed)`

`setMouseCursorVisible(bool visible)`

`setPosition(const Vector2i &position)`

`setSize(const Vector2u &size)`

`setTitle(const String &title)`

`setVerticalSyncEnabled(bool enabled)`

`setVisible(bool visible)`

`waitEvent(Event &event)`

`Window()`

`Window(VideoMode mode, const String &title, Uint32 style=Style::Default)`

`Window(WindowHandle handle, const ContextSettings &settings=ContextSettings::Default)`

`~GLResource()`

`~Window()`

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sf::Utf< 16 > Member List

This is the complete list of members for `sf::Utf< 16 >`, including all inherited

`count(In begin, In end)`

`decode(In begin, In end, Uint32 &output, Uint32 replacement=0)`

`encode(Uint32 input, Out output, Uint16 replacement=0)`

`fromAnsi(In begin, In end, Out output, const std::locale &locale=std::local`

`fromLatin1(In begin, In end, Out output)`

`fromWide(In begin, In end, Out output)`

`next(In begin, In end)`

`toAnsi(In begin, In end, Out output, char replacement=0, const std::locale`

`toLatin1(In begin, In end, Out output, char replacement=0)`

`toUtf16(In begin, In end, Out output)`

`toUtf32(In begin, In end, Out output)`

`toUtf8(In begin, In end, Out output)`

`toWide(In begin, In end, Out output, wchar_t replacement=0)`

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sf::Utf< 32 > Member List

This is the complete list of members for `sf::Utf< 32 >`, including all inherited

`count(In begin, In end)`

`decode(In begin, In end, Uint32 &output, Uint32 replacement=0)`

`decodeAnsi(In input, const std::locale &locale=std::locale())`

`decodeWide(In input)`

`encode(Uint32 input, Out output, Uint32 replacement=0)`

`encodeAnsi(Uint32 codepoint, Out output, char replacement=0, const std`

`encodeWide(Uint32 codepoint, Out output, wchar_t replacement=0)`

`fromAnsi(In begin, In end, Out output, const std::locale &locale=std::local`

`fromLatin1(In begin, In end, Out output)`

`fromWide(In begin, In end, Out output)`

`next(In begin, In end)`

`toAnsi(In begin, In end, Out output, char replacement=0, const std::locale`

`toLatin1(In begin, In end, Out output, char replacement=0)`

`toUtf16(In begin, In end, Out output)`

`toUtf32(In begin, In end, Out output)`

`toUtf8(In begin, In end, Out output)`

`toWide(In begin, In end, Out output, wchar_t replacement=0)`

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sf::Utf< 8 > Member List

This is the complete list of members for `sf::Utf< 8 >`, including all inherited

`count(In begin, In end)`

`decode(In begin, In end, Uint32 &output, Uint32 replacement=0)`

`encode(Uint32 input, Out output, Uint8 replacement=0)`

`fromAnsi(In begin, In end, Out output, const std::locale &locale=std::local`

`fromLatin1(In begin, In end, Out output)`

`fromWide(In begin, In end, Out output)`

`next(In begin, In end)`

`toAnsi(In begin, In end, Out output, char replacement=0, const std::locale`

`toLatin1(In begin, In end, Out output, char replacement=0)`

`toUtf16(In begin, In end, Out output)`

`toUtf32(In begin, In end, Out output)`

`toUtf8(In begin, In end, Out output)`

`toWide(In begin, In end, Out output, wchar_t replacement=0)`

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