Canim

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Chapter 1

Todo List

Global vk_create_device (CanimResult *result, GfxContainer *container, const GfxInitInfo *info)

FIX

FIX

FIX

Chapter 2

Directory Hierarchy

2.1 Directories

Chapter 3

Data Structure Index

3.1 Data Structures

Here are the data structures with brief descriptions:

Chapter 4

File Index

4.1 File List

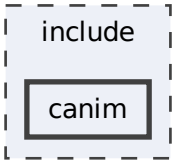
Here is a list of all files with brief descriptions:

Chapter 5

Directory Documentation

5.1 include/canim Directory Reference

Directory dependency graph for canim:



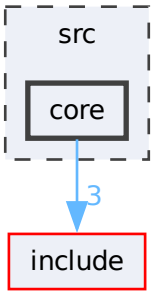
Files

- file canim.h
- file core.h

  This is everything core to Canim that is shared between subsystems.
- file gfx.h
- file loader.h

5.2 src/core Directory Reference

Directory dependency graph for core:

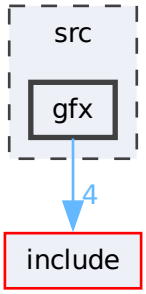


Files

- file core.c
- file endian.c
- file svec.c

5.3 src/gfx Directory Reference

Directory dependency graph for gfx:



Files

- file gl.c
- file vk.c

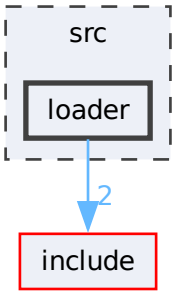
5.4 include Directory Reference

Directories

- directory canim

5.5 src/loader Directory Reference

Directory dependency graph for loader:

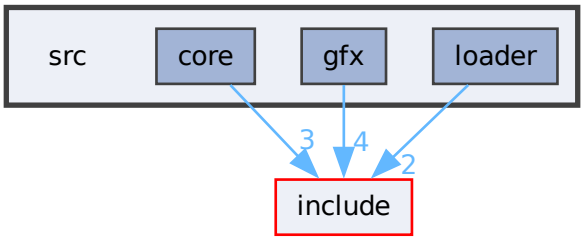


Files

- file loader.c

5.6 src Directory Reference

Directory dependency graph for src:



Directories

- directory core
- directory gfx
- directory loader

Chapter 6

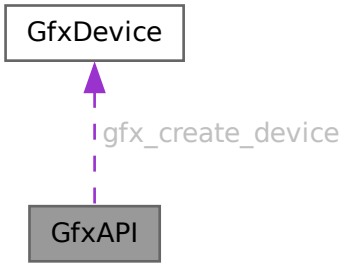
Data Structure Documentation

6.1 GfxAPI Struct Reference

This struct stores the cross platform API functions This struct has a fptr, but i am not gonna document it, because i believe in freedom and you can't stop me.

`#include <gfx.h>`

Collaboration diagram for GfxAPI:



Data Fields

- GfxDeviceGfxDevice *(* gfx_create_device)(CanimResult *, GfxContainer *, const GfxInitInfo *)
- void(* gfx_destroy_device)(CanimResult *, GfxContainer *)

6.1.1 Detailed Description

This struct stores the cross platform API functions This struct has a fptr, but i am not gonna document it, because i believe in freedom and you can't stop me.

Definition at line 35 of file gfx.h.

6.1.2 Field Documentation

6.1.2.1 gfx_create_device

```
GfxDeviceGfxDevice *(* GfxAPI::gfx_create_device) (CanimResult *, GfxContainer *, const GfxInitInfo
*)
```

Definition at line 36 of file gfx.h.

6.1.2.2 gfx_destroy_device

```
void(* GfxAPI::gfx_destroy_device) (CanimResult *, GfxContainer *)
```

Definition at line 38 of file gfx.h.

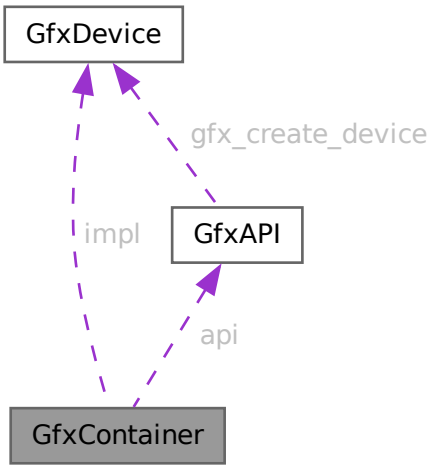
The documentation for this struct was generated from the following file:

- include/canim/gfx.h

6.2 GfxContainer Struct Reference

```
#include <gfx.h>
```

Collaboration diagram for GfxContainer:



Data Fields

- GfxAPI api
  The API.
- GfxDeviceGfxDevice * impl
  The Implementation specfic gfxdevice.
- GfxBackend backend
  The backend.
- void * handle
  Handle to the dynamic lib.

6.2.1 Detailed Description

Definition at line 42 of file gfx.h.

6.2.2 Field Documentation

6.2.2.1 api

```
GfxAPI GfxContainer::api
```

The API.

Definition at line 43 of file gfx.h.

6.2.2.2 backend

```
GfxBackend GfxContainer::backend
```

The backend.

Definition at line 45 of file gfx.h.

6.2.2.3 handle

```
void* GfxContainer::handle
```

Handle to the dynamic lib.

Definition at line 46 of file gfx.h.

6.2.2.4 impl

```
GfxDeviceGfxDevice* GfxContainer::impl
```

The Implementation specfic gfxdevice.

Definition at line 44 of file gfx.h.

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

- include/canim/gfx.h

6.3 GfxDevice Struct Reference

Data Fields

- bool headless
- int width
- int height
- SDL_GLContext glctx
- SDL_Window * win
- EGLDisplay egl_display
- EGLSurface egl_surface
- EGLContext egl_context
- VkInstance inst

6.3.1 Detailed Description

Definition at line 11 of file gl.c.

6.3.2 Field Documentation

6.3.2.1 egl_context

```
EGLContext GfxDevice::egl_context
```

Definition at line 19 of file gl.c.

6.3.2.2 egl_display

```
EGLDisplay GfxDevice::egl_display
```

Definition at line 17 of file gl.c.

6.3.2.3 egl_surface

```
EGLSurface GfxDevice::egl_surface
```

Definition at line 18 of file gl.c.

6.3.2.4 glctx

```
SDL_GLContext GfxDevice::glctx
```

Definition at line 15 of file gl.c.

6.3.2.5 headless

```
bool GfxDevice::headless
```

Definition at line 12 of file gl.c.

6.3.2.6 height

```
int GfxDevice::height
```

Definition at line 14 of file gl.c.

6.3.2.7 inst

```
VkInstance GfxDevice::inst
```

Definition at line 11 of file vk.c.

6.3.2.8 width

```
int GfxDevice::width
```

Definition at line 13 of file gl.c.

6.3.2.9 win

```
SDL_Window * GfxDevice::win
```

Definition at line 16 of file gl.c.

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

- src/gfx/gl.c
- src/gfx/vk.c

6.4 GfxInitInfo Struct Reference

This struct stores info neccesary to initialize graphics.

```
#include <gfx.h>
```

Data Fields

- bool headless

  This stores whether or not the window is headless.
- void * native_window

  This stores a pointer to a native window.
- int width

  The width of the window.
- int height

  The height of it.

6.4.1 Detailed Description

This struct stores info neccesary to initialize graphics.

Definition at line 24 of file gfx.h.

6.4.2 Field Documentation

6.4.2.1 headless

```
bool GfxInitInfo::headless
```

This stores whether or not the window is headless.

Definition at line 25 of file gfx.h.

6.4.2.2 height

```
int GfxInitInfo::height
```

The height of it.

Definition at line 28 of file gfx.h.

6.4.2.3 native_window

```
void* GfxInitInfo::native_window
```

This stores a pointer to a native window.

Definition at line 26 of file gfx.h.

6.4.2.4 width

`int GfxInitInfo::width`

The width of the window.

Definition at line 27 of file gfx.h.

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

- include/canim/gfx.h

6.5 SVec Struct Reference

Minimal growable byte-vector.

`#include <core.h>`

Data Fields

- size_t element_size
  Size of each element in bytes.
- size_t list_size
  Number of elements stored.
- unsigned char * data
  Contiguous raw byte storage.

6.5.1 Detailed Description

Minimal growable byte-vector.

Definition at line 278 of file core.h.

6.5.2 Field Documentation

6.5.2.1 data

`unsigned char* SVec::data`

Contiguous raw byte storage.

Definition at line 281 of file core.h.

6.5.2.2 element_size

`size_t SVec::element_size`

Size of each element in bytes.

Definition at line 279 of file core.h.

6.5.2.3 list_size

`size_t SVec::list_size`

Number of elements stored.

Definition at line 280 of file core.h.

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

- include/canim/core.h

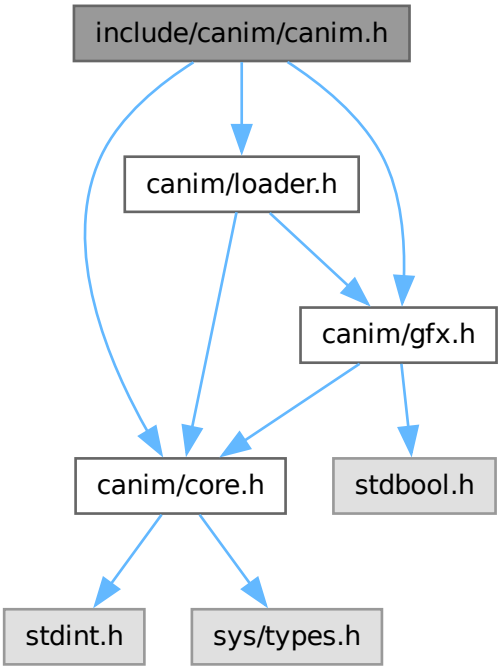
Chapter 7

File Documentation

7.1 include/canim/canim.h File Reference

```
#include "canim/core.h"
#include "canim/gfx.h"
#include "canim/loader.h"
```

Include dependency graph for canim.h:



7.2 canim.h

Go to the documentation of this file.

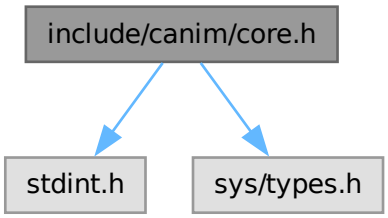
```
00001 // SPDX-License-Identifier: MIT
00002 #pragma once
00003 #include "canim/core.h"
00004 #include "canim/gfx.h"
00005 #include "canim/loader.h"
```

7.3 include/canim/core.h File Reference

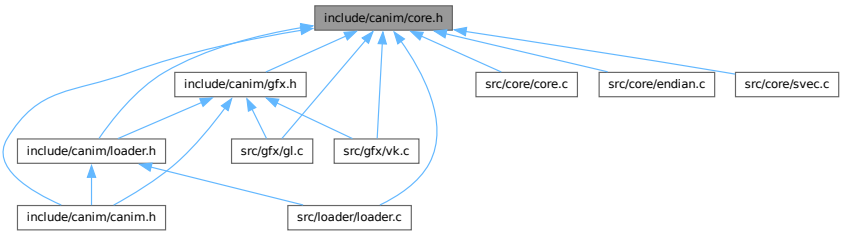
This is everything core to Canim that is shared between subsystems.

```
#include <stdint.h>
#include <sys/types.h>
```

Include dependency graph for core.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct SVec

  Minimal growable byte-vector.

Macros

- #define CANIM_API __attribute__((visibility("default")))

  Meant for a visibility label to all parts of the Canim API.
- #define STATUS_TYPE_SHIFT 24

  The bit shift applied to the value of an error to get it's type.
- #define STATUS_TYPE_MASK 0xFF000000

  The mask applied to the an error to eliminate it's subtype.
- #define SUCCESS 0x00

  This is the status code for success.
- #define NOOP 0x01

  No operation performed.
- #define NONFATAL 0x02

  Non-fatal error (unused).
- #define FATAL 0x03

  Fatal error.
- #define STATUS_TYPE(code)

  Extracts the status type (SUCCESS/NOOP/NONFATAL/FATAL).
- #define IS_AN_ERROR(x)

  True if code is an error (NONFATAL or FATAL).
- #define CANIM_PLATFORM_UNKNOWN 1

  Defined if no known platform could be detected.
- #define max(a, b)

  A max macro.
- #define EPSILON 0.000001

  Tolerance for floating-point comparisons.
- #define null NULL

  I do not want to capitalize NULL.
- #define BUFFER_SIZE 4096

  The size of a buffer.
- #define POPEN popen

  A cross platform alias for opening a pipe.
- #define PCLOSE pclose

  A cross platform alias for closing a pipe.
- #define WB "w"

  Correct mode for writing in binary files on each platform.
- #define BIT_IGNORE 4

  Alignment granularity in bits (round up to 2^ BIT_IGNORE).
- #define BIT_SIZE ((1u << BIT_IGNORE) - 1u)

  2^ BIT_IGNORE - 1
- #define BIT_ALIGN(x)

  Round x up to nearest aligned multiple of 2^ BIT_IGNORE. Always.
- #define REALIGN(a, b)

  True if a and b land in different aligned capacity buckets.

Typedefs

- typedef uint32_t CanimResult

  Result code used across Canim operations.

Enumerations

- enum {
  GFX_DEVICE_CALLOC_ERROR , EGL_NO_DISPLAY_ERROR , EGL_DISPLAY_INIT_ERROR ,
  EGL_DISPLAY_CONFIGURATION_ERROR ,
  EGL_NO_SURFACE_ERROR , EGL_NO_CONTEXT_ERROR , EGL_MAKE_CURRENT_ERROR ,
  SDL_INIT_VIDEO_ERROR ,
  SDL_WINDOW_CREATION_ERROR , SDL_GL_CONTEXT_CREATION_ERROR , SDL_GLAD_LOAD_ERROR
  , EGL_GLAD_LOAD_ERROR ,
  SVEC_ZERO_ELEMENT_SIZE , SVEC_REALLOC_FAIL }

  This are all of the error codes.

Functions

- void print_error (CanimResult error)

  Print out the error.
- static uint16_t read_be_u16 (const unsigned char *p)

  Read a 16-bit unsigned integer in big endian byte order.
- static uint32_t read_be_u32 (const unsigned char *p)

  Read a 32-bit unsigned integer in big endian byte order.
- static uint64_t read_be_u64 (const unsigned char *p)

  Read a 64-bit unsigned integer in big endian byte order.
- static uint16_t read_le_u16 (const unsigned char *p)

  Read a 16-bit unsigned integer in little endian byte order.
- static uint32_t read_le_u32 (const unsigned char *p)

  Read a 32-bit unsigned integer in little endian byte order.
- static uint64_t read_le_u64 (const unsigned char *p)

  Read a 64-bit unsigned integer in little endian byte order.
- static void write_be_u16 (unsigned char *p, uint16_t v)

  Write a 16-bit unsigned integer in big endian byte order.
- static void write_be_u32 (unsigned char *p, uint32_t v)

  Write a 32-bit unsigned integer in big endian byte order.
- static void write_be_u64 (unsigned char *p, uint64_t v)

  Write a 64-bit unsigned integer in big endian byte order.
- static void write_le_u16 (unsigned char *p, uint16_t v)

  Write a 16-bit unsigned integer in little endian byte order.
- static void write_le_u32 (unsigned char *p, uint32_t v)

  Write a 32-bit unsigned integer in little endian byte order.
- static void write_le_u64 (unsigned char *p, uint64_t v)

  Write a 64-bit unsigned integer in little endian byte order.
- static float read_be_f32 (const unsigned char *p)

  Read a 32-bit float in big endian byte order.
- static double read_be_f64 (const unsigned char *p)

  Read a 64-bit float in big endian byte order.
- static float read_le_f32 (const unsigned char *p)

  Read a 32-bit float in little endian byte order.
- static double read_le_f64 (const unsigned char *p)

  Read a 64-bit float in little endian byte order.
- static void write_be_f32 (unsigned char *p, float f)

  Write a 32 bit float to a big endian buffer.
- static void write_be_f64 (unsigned char *p, double f)

Write a 64 bit ouble to a big endian buffer.

- static void write_le_f32 (unsigned char *p, float f)

  Write a 32 bit float to a little endian buffer.

- static void write_le_f64 (unsigned char *p, double f)

  Write a 64 bit ouble to a little endian buffer.

- static void svec_init (CanimResult *result, SVec *v, size_t elem_size)

  Initialize a vector with a fixed element size.

- static void svec_free (CanimResult *result, SVec *v)

  Free all memory owned by the vector.

- static void svec_push (CanimResult *result, SVec *v, const void *elem)

  Append one element, reallocating only when bucket changes.

- static void svec_pop (CanimResult *result, SVec *v, void *out)

  Remove the last element, shrinking bucket only if needed.

- static void * svec_get (CanimResult *result, SVec *v, size_t i)

  Get a pointer to element at index i.

- static void svec_set (CanimResult *result, SVec *v, size_t i, const void *elem)

  Set the element at index i to the value pointed to by elem.

7.3.1 Detailed Description

This is everything core to Canim that is shared between subsystems.

Definition in file core.h.

7.3.2 Macro Definition Documentation

7.3.2.1 BIT_ALIGN

```
#define BIT_ALIGN(
                x)
```

Value:

```
  (((((x) + BIT_SIZE) & ~BIT_SIZE)) ? (((x) + BIT_SIZE) & ~BIT_SIZE) : 1)
```

Round x up to nearest aligned multiple of 2^BIT_IGNORE. Always.

Definition at line 269 of file core.h.

```
00269 #define BIT_ALIGN(x)                                                    \
00270   (((((x) + BIT_SIZE) & ~BIT_SIZE)) ? (((x) + BIT_SIZE) & ~BIT_SIZE) : 1)
```

7.3.2.2 BIT_IGNORE

```
#define BIT_IGNORE 4
```

Alignment granularity in bits (round up to 2^BIT_IGNORE).

Definition at line 261 of file core.h.

7.3.2.3 BIT_SIZE

```
#define BIT_SIZE ((1u << BIT_IGNORE) - 1u)
```

2^BIT_IGNORE - 1

Definition at line 265 of file core.h.

7.3.2.4 BUFFER_SIZE

```
#define BUFFER_SIZE 4096
```

The size of a buffer.

Definition at line 133 of file core.h.

7.3.2.5 CANIM_API

```
#define CANIM_API __attribute__((visibility("default")))
```

Meant for a visibility label to all parts of the Canim API.

Definition at line 11 of file core.h.

7.3.2.6 CANIM_PLATFORM_UNKNOWN

```
#define CANIM_PLATFORM_UNKNOWN 1
```

Defined if no known platform could be detected.

Definition at line 114 of file core.h.

7.3.2.7 EPSILON

```
#define EPSILON 0.000001
```

Tolerance for floating-point comparisons.

Definition at line 125 of file core.h.

7.3.2.8 FATAL

```
#define FATAL 0x03
```

Fatal error.

Definition at line 35 of file core.h.

7.3.2.9 IS_AN_ERROR

```
#define IS_AN_ERROR(
                x)
```

Value:

```
  ((STATUS_TYPE((x)) == FATAL) || (STATUS_TYPE((x)) == NONFATAL))
```

True if code is an error (NONFATAL or FATAL).

Definition at line 43 of file core.h.

```
00043 #define IS_AN_ERROR(x)                                                  \
00044   ((STATUS_TYPE((x)) == FATAL) || (STATUS_TYPE((x)) == NONFATAL))
```

7.3.2.10 max

```
#define max(
                a,
                b)
```

Value:

```
(((a) > (b)) ? (a) : (b))
```

A max macro.

Definition at line 120 of file core.h.

7.3.2.11 NONFATAL

```
#define NONFATAL 0x02
```

Non-fatal error (unused).

Definition at line 31 of file core.h.

7.3.2.12 NOOP

```
#define NOOP 0x01
```

No operation performed.

Definition at line 27 of file core.h.

7.3.2.13 null

```
#define null NULL
```

I do not want to capitalize NULL.

Definition at line 129 of file core.h.

7.3.2.14 PCLOSE

```
#define PCLOSE pclose
```

A cross platform alias for closing a pipe.

Definition at line 148 of file core.h.

7.3.2.15 POPEN

```
#define POPEN popen
```

A cross platform alias for opening a pipe.

Definition at line 140 of file core.h.

7.3.2.16 REALIGN

```
#define REALIGN(
                a,
                b)
```

Value:

```
(BIT_ALIGN(a) != BIT_ALIGN(b))
```

True if a and b land in different aligned capacity buckets.

Definition at line 274 of file core.h.

7.3.2.17 STATUS_TYPE

```
#define STATUS_TYPE(
                code)
```

Value:

```
(((code) & STATUS_TYPE_MASK) » STATUS_TYPE_SHIFT)
```

Extracts the status type (SUCCESS/NOOP/NONFATAL/FATAL).

Definition at line 39 of file core.h.

7.3.2.18 STATUS_TYPE_MASK

```
#define STATUS_TYPE_MASK 0xFF000000
```

The mask applied to the an error to eliminate it's subtype.

Definition at line 19 of file core.h.

7.3.2.19 STATUS_TYPE_SHIFT

```
#define STATUS_TYPE_SHIFT 24
```

The bit shift applied to the value of an error to get it's type.

Definition at line 15 of file core.h.

7.3.2.20 SUCCESS

```
#define SUCCESS 0x00
```

This is the status code for success.

Definition at line 23 of file core.h.

7.3.2.21 WB

```
#define WB "w"
```

Correct mode for writing in binary files on each platform.

Definition at line 156 of file core.h.

7.3.3 Typedef Documentation

7.3.3.1 CanimResult

```
typedef uint32_t CanimResult
```

Result code used across Canim operations.

Definition at line 77 of file core.h.

7.3.4 Enumeration Type Documentation

7.3.4.1 anonymous enum

```
anonymous enum
```

This are all of the error codes.

Enumerator

GFX_DEVICE_CALLOC_ERROR	When using calloc to allocate memory for a GfxDevice, calloc failed

EGL_NO_DISPLAY_ERROR	When creating an EGL display, no display was created
EGL_DISPLAY_INIT_ERROR	When initializing an EGL display something failed.
EGL_DISPLAY_CONFIGURATION_ERROR	When configuring an EGL display something failed.
EGL_NO_SURFACE_ERROR	When creating an EGL surface, no surface was created
EGL_NO_CONTEXT_ERROR	When creating an EGL context, no context was created.
EGL_MAKE_CURRENT_ERROR	When the making the EGL context, surface and display the current one, something failed.
SDL_INIT_VIDEO_ERROR	When initializing SDL video, something failed.
SDL_WINDOW_CREATION_ERROR	When making a window with SDL2, something failed
SDL_GL_CONTEXT_CREATION_ERROR	When making an OpenGL context with SDL, something failed.
SDL_GLAD_LOAD_ERROR	When loading OpenGL functions with GLAD, using SDL, something failed
EGL_GLAD_LOAD_ERROR	When loading OpenGL functions with GLAD, using EGL, something failed
SVEC_ZERO_ELEMENT_SIZE	When initializing an SVec, the element size was set to zero
SVEC_REALLOC_FAIL	When reallocating space for an SVec, something failed.

Definition at line 47 of file core.h.

```
00047     {
00048   GFX_DEVICE_CALLOC_ERROR =
00049       (uint32_t)0x03000000, ///< When using calloc to allocate memory for a
00050                             ///< GfxDevice, calloc failed
00051   EGL_NO_DISPLAY_ERROR,     ///< When creating an EGL display, no display was
00052                             ///< created
00053   EGL_DISPLAY_INIT_ERROR, ///< When initializing an EGL display something failed
00054   EGL_DISPLAY_CONFIGURATION_ERROR, ///< When configuring an EGL display
00055                                    ///< something failed.
00056   EGL_NO_SURFACE_ERROR,      ///< When creating an EGL surface, no surface was
00057                              ///< created
00058   EGL_NO_CONTEXT_ERROR,      ///< When creating an EGL context, no context was
00059                              ///< created.
00060   EGL_MAKE_CURRENT_ERROR,    ///< When the making the EGL context, surface and
00061                              ///< display the current one, something failed.
00062   SDL_INIT_VIDEO_ERROR,      ///< When initializing SDL video, something failed
00063   SDL_WINDOW_CREATION_ERROR, ///< When making a window with SDL2, something
00064                              ///< failed
00065   SDL_GL_CONTEXT_CREATION_ERROR, ///< When making an OpenGL context with SDL,
00066                                  ///< something failed.
00067   SDL_GLAD_LOAD_ERROR, ///< When loading OpenGL functions with GLAD, using SDL,
00068                        ///< something failed
00069   EGL_GLAD_LOAD_ERROR, ///< When loading OpenGL functions with GLAD, using EGL,
00070                        ///< something failed
00071   SVEC_ZERO_ELEMENT_SIZE, ///< When initializing an SVec, the element size was
00072                           ///< set to zero
00073   SVEC_REALLOC_FAIL ///< When reallocating space for an SVec, something failed
00074 };
```

7.3.5 Function Documentation

7.3.5.1 print_error()

```
void print_error (
            CanimResult error)
```

Print out the error.

Parameters

error	The error to be printed.

Definition at line 5 of file core.c.

```
00005                                       {
00006   if (!IS_AN_ERROR(error)) {
00007     return;
00008   }
00009   switch (error) {
00010   case GFX_DEVICE_CALLOC_ERROR:
00011     fprintf(stderr, "When using calloc to allocate memory for"
00012                     "a GfxDevice, calloc failed\n");
00013     break;
00014   case EGL_NO_DISPLAY_ERROR:
00015     fprintf(stderr, "When creating an EGL display, no display was created\n");
00016     break;
00017   case EGL_DISPLAY_INIT_ERROR:
00018     fprintf(stderr, "When initializing an EGL display something failed.\n");
00019     break;
00020   case EGL_DISPLAY_CONFIGURATION_ERROR:
00021     fprintf(stderr, "When configuring an EGL display something failed.\n");
00022     break;
00023   case EGL_NO_SURFACE_ERROR:
00024     fprintf(stderr, "When creating an EGL surface, no surface was created\n");
00025     break;
00026   case EGL_NO_CONTEXT_ERROR:
00027     fprintf(stderr, "When creating an EGL context, no context was created.\n");
00028     break;
00029   case EGL_MAKE_CURRENT_ERROR:
00030     fprintf(stderr,
00031             "When the making the EGL context, surface and display the current "
00032             "one, something failed.\n");
00033     break;
00034   case SDL_INIT_VIDEO_ERROR:
00035     fprintf(stderr, "When initializing SDL video, something failed\n");
00036     break;
00037   case SDL_WINDOW_CREATION_ERROR:
00038     fprintf(stderr, "When making a window with SDL2, something failed\n");
00039     break;
00040   case SDL_GL_CONTEXT_CREATION_ERROR:
00041     fprintf(stderr,
00042             "When making an OpenGL context with SDL, something failed.\n");
00043     break;
00044   case SDL_GLAD_LOAD_ERROR:
00045     fprintf(stderr, "When loading OpenGL functions with GLAD, using SDL, "
00046                     "something failed\n");
00047     break;
00048   case EGL_GLAD_LOAD_ERROR:
00049     fprintf(stderr, "When loading OpenGL functions with GLAD, using EGL, "
00050                     "something failed\n");
00051     break;
00052   case SVEC_ZERO_ELEMENT_SIZE:
00053     fprintf(stderr,
00054             "When initializing an SVec, the element size was set to zero\n");
00055     break;
00056   case SVEC_REALLOC_FAIL:
00057     fprintf(stderr, "When reallocating space for an SVec, something failed.\n");
00058     break;
00059
00060   default:
00061     fprintf(stderr, "SOMETHING BAD HAPPENED, WE DON'T KNOW WHAT\n");
00062     break;
00063   }
00064 }
```

7.3.5.2 read_be_f32()

```
float read_be_f32 (
            const unsigned char * p)  [inline], [static]
```

Read a 32-bit float in big endian byte order.

Parameters

p	The buffer to be read

Returns

The float

7.3.5.3 read_be_f64()

```
double read_be_f64 (
            const unsigned char * p)  [inline], [static]
```

Read a 64-bit float in big endian byte order.

Parameters

p	The buffer to be read

Returns

The float

7.3.5.4 read_be_u16()

```
uint16_t read_be_u16 (
            const unsigned char * p)  [inline], [static]
```

Read a 16-bit unsigned integer in big endian byte order.

Parameters

p	Pointer to a buffer containing at least 2 bytes

Returns

The 16-bit unsigned integer

7.3.5.5 read_be_u32()

```
uint32_t read_be_u32 (
            const unsigned char * p)  [inline], [static]
```

Read a 32-bit unsigned integer in big endian byte order.

Parameters

p	Pointer to a buffer containing at least 4 bytes

Returns

The 32-bit unsigned integer

7.3.5.6 read_be_u64()

```
uint64_t read_be_u64 (
            const unsigned char * p)  [inline], [static]
```

Read a 64-bit unsigned integer in big endian byte order.

Parameters

p	Pointer to a buffer containing at least 8 bytes

Returns

The 64-bit unsigned integer

7.3.5.7 read_le_f32()

```
float read_le_f32 (
            const unsigned char * p)  [inline], [static]
```

Read a 32-bit float in little endian byte order.

Parameters

p	The buffer to be read

Returns

The float

7.3.5.8 read_le_f64()

```
double read_le_f64 (
            const unsigned char * p)  [inline], [static]
```

Read a 64-bit float in little endian byte order.

Parameters

p	The buffer to be read

Returns

The float

7.3.5.9 read_le_u16()

```
uint16_t read_le_u16 (
            const unsigned char * p)  [inline], [static]
```

Read a 16-bit unsigned integer in little endian byte order.

Parameters

p	Pointer to a buffer containing at least 2 bytes

Returns

The 16-bit unsigned integer

7.3.5.10 read_le_u32()

```
uint32_t read_le_u32 (
            const unsigned char * p)  [inline], [static]
```

Read a 32-bit unsigned integer in little endian byte order.

Parameters

p	Pointer to a buffer containing at least 4 bytes

Returns

The 32-bit unsigned integer

7.3.5.11 read_le_u64()

```
uint64_t read_le_u64 (
            const unsigned char * p)  [inline], [static]
```

Read a 64-bit unsigned integer in little endian byte order.

Parameters

p	Pointer to a buffer containing at least 8 bytes

Returns

The 64-bit unsigned integer

7.3.5.12 svec_free()

```
void svec_free (
            CanimResult * result,
            SVec * v)  [inline], [static]
```

Free all memory owned by the vector.

Parameters

out	*result*	A status code
	v	Pointer to SVec

7.3.5.13 svec_get()

```
void * svec_get (
            CanimResult * result,
            SVec * v,
            size_t i)  [inline], [static]
```

Get a pointer to element at index i.

Parameters

out	*result*	A status code
	v	Pointer to SVec
	i	Index to read from

Returns

A pointer to the element

7.3.5.14 svec_init()

```
void svec_init (
            CanimResult * result,
            SVec * v,
            size_t elem_size)  [inline], [static]
```

Initialize a vector with a fixed element size.

Parameters

out	*result*	A status code
	v	Pointer to SVec
	elem_size	Number of bytes per element

7.3.5.15 svec_pop()

```
void svec_pop (
            CanimResult * result,
            SVec * v,
            void * out)  [inline], [static]
```

Remove the last element, shrinking bucket only if needed.

Parameters

out	*result*	A status code
	v	Pointer to SVec
	out	Optional output location

7.3.5.16 svec_push()

```
void svec_push (
            CanimResult * result,
            SVec * v,
            const void * elem)  [inline], [static]
```

Append one element, reallocating only when bucket changes.

Parameters

out	*result*	A status code
	v	Pointer to SVec
	elem	Pointer to element data

7.3.5.17 svec_set()

```
void svec_set (
            CanimResult * result,
            SVec * v,
            size_t i,
            const void * elem)  [inline], [static]
```

Set the element at index i to the value pointed to by elem.

Parameters

out	*result*	A status code
	v	Pointer to SVec
	i	Index to write to
	elem	Pointer to source data

7.3.5.18 write_be_f32()

```
void write_be_f32 (
            unsigned char * p,
            float f)  [inline], [static]
```

Write a 32 bit float to a big endian buffer.

Parameters

The	buffer to be written to
f	The float

7.3.5.19 write_be_f64()

```
void write_be_f64 (
            unsigned char * p,
            double f)  [inline], [static]
```

Write a 64 bit ouble to a big endian buffer.

Parameters

The	buffer to be written to
f	The double

7.3.5.20 write_be_u16()

```
void write_be_u16 (
            unsigned char * p,
            uint16_t v)  [inline], [static]
```

Write a 16-bit unsigned integer in big endian byte order.

Parameters

p	The buffer to be written to
v	The integer to be converted

7.3.5.21 write_be_u32()

```
void write_be_u32 (
            unsigned char * p,
            uint32_t v)  [inline], [static]
```

Write a 32-bit unsigned integer in big endian byte order.

Parameters

p	The buffer to be written to
v	The integer to be converted

7.3.5.22 write_be_u64()

```
void write_be_u64 (
            unsigned char * p,
            uint64_t v)  [inline], [static]
```

Write a 64-bit unsigned integer in big endian byte order.

Parameters

p	The buffer to be written to
v	The integer to be converted

7.3.5.23 write_le_f32()

```
void write_le_f32 (
            unsigned char * p,
            float f)  [inline], [static]
```

Write a 32 bit float to a little endian buffer.

Parameters

The	buffer to be written to
f	The float

7.3.5.24 write_le_f64()

```
void write_le_f64 (
            unsigned char * p,
            double f)  [inline], [static]
```

Write a 64 bit ouble to a little endian buffer.

Parameters

The	buffer to be written to
f	The double

7.3.5.25 write_le_u16()

```
void write_le_u16 (
            unsigned char * p,
            uint16_t v)  [inline], [static]
```

Write a 16-bit unsigned integer in little endian byte order.

Parameters

p	The buffer to be written to
v	The integer to be converted

7.3.5.26 write_le_u32()

```
void write_le_u32 (
            unsigned char * p,
            uint32_t v)  [inline], [static]
```

Write a 32-bit unsigned integer in little endian byte order.

Parameters

p	The buffer to be written to
v	The integer to be converted

7.3.5.27 write_le_u64()

```
void write_le_u64 (
            unsigned char * p,
            uint64_t v)  [inline], [static]
```

Write a 64-bit unsigned integer in little endian byte order.

Parameters

p	The buffer to be written to
v	The integer to be converted

7.4 core.h

Go to the documentation of this file.

```
00001 // SPDX-License-Identifier: MIT
00002 #pragma once
00003
00004 /// @file core.h
00005 /// @brief This is everything core to Canim that is shared between subsystems
00006
00007 #include <stdint.h>
00008 #include <sys/types.h>
00009 /// @def CANIM_API
00010 /// @brief Meant for a visibility label to all parts of the Canim API
00011 #define CANIM_API __attribute__((visibility("default")))
00012
00013 /// @def STATUS_TYPE_SHIFT
00014 /// @brief The bit shift applied to the value of an error to get it's type
00015 #define STATUS_TYPE_SHIFT 24
00016
00017 /// @def STATUS_TYPE_MASK
00018 /// @brief The mask applied to the an error to eliminate it's subtype.
00019 #define STATUS_TYPE_MASK 0xFF000000
00020
00021 /// @def SUCCESS
00022 /// @brief This is the status code for success
00023 #define SUCCESS 0x00
00024
00025 /// @def NOOP
00026 /// @brief No operation performed.
00027 #define NOOP 0x01
00028
00029 /// @def NONFATAL
00030 /// @brief Non-fatal error (unused)
00031 #define NONFATAL 0x02
00032
00033 /// @def FATAL
00034 /// @brief Fatal error.
00035 #define FATAL 0x03
00036
00037 /// @def STATUS_TYPE
00038 /// @brief Extracts the status type (SUCCESS/NOOP/NONFATAL/FATAL).
00039 #define STATUS_TYPE(code) (((code) & STATUS_TYPE_MASK) » STATUS_TYPE_SHIFT)
00040
00041 /// @def IS_AN_ERROR
00042 /// @brief True if code is an error (NONFATAL or FATAL).
00043 #define IS_AN_ERROR(x)                                                    \
00044   ((STATUS_TYPE((x)) == FATAL) || (STATUS_TYPE((x)) == NONFATAL))
00045
00046 /// @brief This are all of the error codes
00047 enum {
00048   GFX_DEVICE_CALLOC_ERROR =
00049       (uint32_t)0x03000000, ///< When using calloc to allocate memory for a
00050                             ///< GfxDevice, calloc failed
00051   EGL_NO_DISPLAY_ERROR,     ///< When creating an EGL display, no display was
00052                             ///< created
00053   EGL_DISPLAY_INIT_ERROR, ///< When initializing an EGL display something failed
00054   EGL_DISPLAY_CONFIGURATION_ERROR, ///< When configuring an EGL display
00055                                    ///< something failed.
00056   EGL_NO_SURFACE_ERROR,      ///< When creating an EGL surface, no surface was
00057                              ///< created
00058   EGL_NO_CONTEXT_ERROR,      ///< When creating an EGL context, no context was
00059                              ///< created.
00060   EGL_MAKE_CURRENT_ERROR,    ///< When the making the EGL context, surface and
00061                              ///< display the current one, something failed.
00062   SDL_INIT_VIDEO_ERROR,      ///< When initializing SDL video, something failed
00063   SDL_WINDOW_CREATION_ERROR, ///< When making a window with SDL2, something
00064                              ///< failed
00065   SDL_GL_CONTEXT_CREATION_ERROR, ///< When making an OpenGL context with SDL,
00066                                  ///< something failed.
00067   SDL_GLAD_LOAD_ERROR, ///< When loading OpenGL functions with GLAD, using SDL,
00068                        ///< something failed
00069   EGL_GLAD_LOAD_ERROR, ///< When loading OpenGL functions with GLAD, using EGL,
00070                        ///< something failed
00071   SVEC_ZERO_ELEMENT_SIZE, ///< When initializing an SVec, the element size was
00072                           ///< set to zero
00073   SVEC_REALLOC_FAIL ///< When reallocating space for an SVec, something failed
00074 };
00075
00076 /// @brief Result code used across Canim operations.
00077 typedef uint32_t CanimResult;
00078
00079 /// @brief Print out the error
00080 /// @param error The error to be printed.
00081 void print_error(CanimResult error);
00082
```

```
00083 /// @def CANIM_PLATFORM_WINDOWS
00084 /// @brief Defined on Windows (_WIN32).
00085 #ifdef _WIN32
00086 #define CANIM_PLATFORM_WINDOWS 1
00087 #define CANIM_PLATFORM_KNOWN 1
00088 #endif
00089
00090 /// @def CANIM_PLATFORM_MAC
00091 /// @brief Defined on macOS (__APPLE__).
00092 #ifdef __APPLE__
00093 #define CANIM_PLATFORM_MAC 1
00094 #define CANIM_PLATFORM_KNOWN 1
00095 #endif
00096
00097 /// @def CANIM_PLATFORM_LINUX
00098 /// @brief Defined on Linux (__linux__).
00099 #ifdef __linux__
00100 #define CANIM_PLATFORM_LINUX 1
00101 #define CANIM_PLATFORM_KNOWN 1
00102 #endif
00103
00104 /// @def CANIM_PLATFORM_POSIX
00105 /// @brief Defined on POSIX platforms (macOS or Linux).
00106 #if defined(CANIM_PLATFORM_LINUX) || defined(CANIM_PLATFORM_MAC)
00107 #define CANIM_PLATFORM_POSIX 1
00108 #define CANIM_PLATFORM_KNOWN 1
00109 #endif
00110
00111 /// @def CANIM_PLATFORM_UNKNOWN
00112 /// @brief Defined if no known platform could be detected.
00113 #ifndef CANIM_PLATFORM_KNOWN
00114 #define CANIM_PLATFORM_UNKNOWN 1
00115 #endif
00116
00117 /// @def max
00118 /// @brief A max macro
00119 #ifndef max
00120 #define max(a, b) (((a) > (b)) ? (a) : (b))
00121 #endif
00122
00123 /// @def EPSILON
00124 /// @brief Tolerance for floating-point comparisons.
00125 #define EPSILON 0.000001
00126
00127 /// @def null
00128 /// @brief I do not want to capitalize NULL
00129 #define null NULL
00130
00131 /// @def BUFFER_SIZE
00132 /// @brief The size of a buffer
00133 #define BUFFER_SIZE 4096
00134
00135 /// @def POPEN
00136 /// @brief A cross platform alias for opening a pipe.
00137 #ifdef CANIM_PLATFORM_WINDOWS
00138 #define POPEN _popen
00139 #else
00140 #define POPEN popen
00141 #endif
00142
00143 /// @def PCLOSE
00144 /// @brief A cross platform alias for closing a pipe.
00145 #ifdef CANIM_PLATFORM_WINDOWS
00146 #define PCLOSE _pclose
00147 #else
00148 #define PCLOSE pclose
00149 #endif
00150
00151 /// @def WB
00152 /// @brief Correct mode for writing in binary files on each platform
00153 #ifdef CANIM_PLATFORM_WINDOWS
00154 #define WB "wb"
00155 #else
00156 #define WB "w"
00157 #endif
00158
00159 /// @brief Read a 16-bit unsigned integer in big endian byte order
00160 /// @param p Pointer to a buffer containing at least 2 bytes
00161 /// @return The 16-bit unsigned integer
00162 static inline uint16_t read_be_u16(const unsigned char *p);
00163
00164 /// @brief Read a 32-bit unsigned integer in big endian byte order
00165 /// @param p Pointer to a buffer containing at least 4 bytes
00166 /// @return The 32-bit unsigned integer
00167 static inline uint32_t read_be_u32(const unsigned char *p);
00168
00169 /// @brief Read a 64-bit unsigned integer in big endian byte order
```

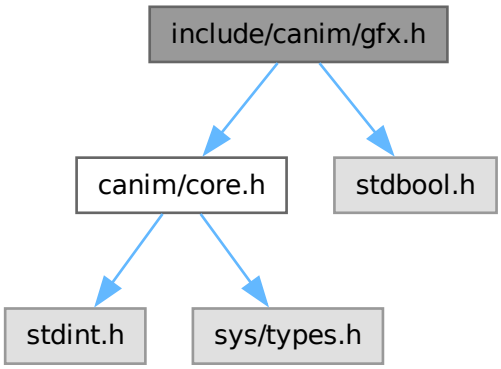
```
00170 /// @param p Pointer to a buffer containing at least 8 bytes
00171 /// @return The 64-bit unsigned integer
00172 static inline uint64_t read_be_u64(const unsigned char *p);
00173
00174 /// @brief Read a 16-bit unsigned integer in little endian byte order
00175 /// @param p Pointer to a buffer containing at least 2 bytes
00176 /// @return The 16-bit unsigned integer
00177 static inline uint16_t read_le_u16(const unsigned char *p);
00178
00179 /// @brief Read a 32-bit unsigned integer in little endian byte order
00180 /// @param p Pointer to a buffer containing at least 4 bytes
00181 /// @return The 32-bit unsigned integer
00182 static inline uint32_t read_le_u32(const unsigned char *p);
00183
00184 /// @brief Read a 64-bit unsigned integer in little endian byte order
00185 /// @param p Pointer to a buffer containing at least 8 bytes
00186 /// @return The 64-bit unsigned integer
00187 static inline uint64_t read_le_u64(const unsigned char *p);
00188
00189 /// @brief Write a 16-bit unsigned integer in big endian byte order
00190 /// @param p The buffer to be written to
00191 /// @param v The integer to be converted
00192 static inline void write_be_u16(unsigned char *p, uint16_t v);
00193
00194 /// @brief Write a 32-bit unsigned integer in big endian byte order
00195 /// @param p The buffer to be written to
00196 /// @param v The integer to be converted
00197 static inline void write_be_u32(unsigned char *p, uint32_t v);
00198
00199 /// @brief Write a 64-bit unsigned integer in big endian byte order
00200 /// @param p The buffer to be written to
00201 /// @param v The integer to be converted
00202 static inline void write_be_u64(unsigned char *p, uint64_t v);
00203
00204 /// @brief Write a 16-bit unsigned integer in little endian byte order
00205 /// @param p The buffer to be written to
00206 /// @param v The integer to be converted
00207 static inline void write_le_u16(unsigned char *p, uint16_t v);
00208
00209 /// @brief Write a 32-bit unsigned integer in little endian byte order
00210 /// @param p The buffer to be written to
00211 /// @param v The integer to be converted
00212 static inline void write_le_u32(unsigned char *p, uint32_t v);
00213
00214 /// @brief Write a 64-bit unsigned integer in little endian byte order
00215 /// @param p The buffer to be written to
00216 /// @param v The integer to be converted
00217 static inline void write_le_u64(unsigned char *p, uint64_t v);
00218
00219 /// @brief Read a 32-bit float in big endian byte order
00220 /// @param p The buffer to be read
00221 /// @return The float
00222 static inline float read_be_f32(const unsigned char *p);
00223
00224 /// @brief Read a 64-bit float in big endian byte order
00225 /// @param p The buffer to be read
00226 /// @return The float
00227 static inline double read_be_f64(const unsigned char *p);
00228
00229 /// @brief Read a 32-bit float in little endian byte order
00230 /// @param p The buffer to be read
00231 /// @return The float
00232 static inline float read_le_f32(const unsigned char *p);
00233
00234 /// @brief Read a 64-bit float in little endian byte order
00235 /// @param p The buffer to be read
00236 /// @return The float
00237 static inline double read_le_f64(const unsigned char *p);
00238
00239 /// @brief Write a 32 bit float to a big endian buffer
00240 /// @param The buffer to be written to
00241 /// @param f The float
00242 static inline void write_be_f32(unsigned char *p, float f);
00243
00244 /// @brief Write a 64 bit ouble to a big endian buffer
00245 /// @param The buffer to be written to
00246 /// @param f The double
00247 static inline void write_be_f64(unsigned char *p, double f);
00248
00249 /// @brief Write a 32 bit float to a little endian buffer
00250 /// @param The buffer to be written to
00251 /// @param f The float
00252 static inline void write_le_f32(unsigned char *p, float f);
00253
00254 /// @brief Write a 64 bit ouble to a little endian buffer
00255 /// @param The buffer to be written to
00256 /// @param f The double
```

```
00257 static inline void write_le_f64(unsigned char *p, double f);
00258
00259 /// @def BIT_IGNORE
00260 /// @brief Alignment granularity in bits (round up to 2^BIT_IGNORE).
00261 #define BIT_IGNORE 4
00262
00263 /// @def BIT_SIZE
00264 /// @brief 2^BIT_IGNORE - 1
00265 #define BIT_SIZE ((1u << BIT_IGNORE) - 1u)
00266
00267 /// @def BIT_ALIGN(x)
00268 /// @brief Round x up to nearest aligned multiple of 2^BIT_IGNORE. Always
00269 #define BIT_ALIGN(x)                                                    \
00270   (((((x) + BIT_SIZE) & ~BIT_SIZE)) ? (((x) + BIT_SIZE) & ~BIT_SIZE) : 1)
00271
00272 /// @def REALIGN(a, b)
00273 /// @brief True if a and b land in different aligned capacity buckets.
00274 #define REALIGN(a, b) (BIT_ALIGN(a) != BIT_ALIGN(b))
00275
00276 /// @struct SVec
00277 /// @brief Minimal growable byte-vector.
00278 typedef struct {
00279   size_t element_size; ///< Size of each element in bytes.
00280   size_t list_size;    ///< Number of elements stored.
00281   unsigned char *data; ///< Contiguous raw byte storage
00282 } SVec;
00283
00284 /// @brief Initialize a vector with a fixed element size.
00285 /// @param[out] result A status code
00286 /// @param v Pointer to SVec
00287 /// @param elem_size Number of bytes per element
00288 static inline void svec_init(CanimResult *result, SVec *v, size_t elem_size);
00289
00290 /// @brief Free all memory owned by the vector.
00291 /// @param[out] result A status code
00292 /// @param v Pointer to SVec
00293 static inline void svec_free(CanimResult *result, SVec *v);
00294
00295 /// @brief Append one element, reallocating only when bucket changes.
00296 /// @param[out] result A status code
00297 /// @param v Pointer to SVec
00298 /// @param elem Pointer to element data
00299 static inline void svec_push(CanimResult *result, SVec *v, const void *elem);
00300
00301 /// @brief Remove the last element, shrinking bucket only if needed.
00302 /// @param[out] result A status code
00303 /// @param v Pointer to SVec
00304 /// @param out Optional output location
00305 static inline void svec_pop(CanimResult *result, SVec *v, void *out);
00306
00307 /// @brief Get a pointer to element at index i
00308 /// @param[out] result A status code
00309 /// @param v Pointer to SVec
00310 /// @param i Index to read from
00311 /// @return A pointer to the element
00312 static inline void *svec_get(CanimResult *result, SVec *v, size_t i);
00313
00314 /// @brief Set the element at index i to the value pointed to by elem.
00315 /// @param[out] result A status code
00316 /// @param v Pointer to SVec
00317 /// @param i Index to write to
00318 /// @param elem Pointer to source data
00319 static inline void svec_set(CanimResult *result, SVec *v, size_t i,
00320                             const void *elem);
```

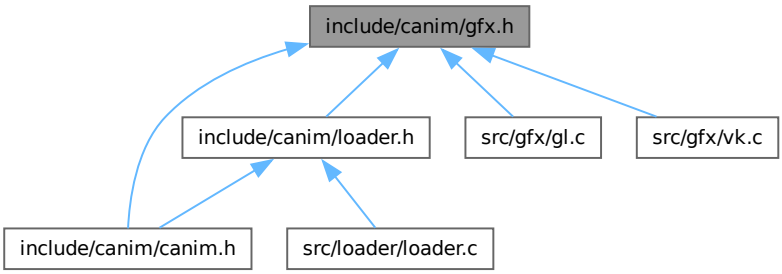
7.5 include/canim/gfx.h File Reference

```
#include "canim/core.h"
#include <stdbool.h>
```

Include dependency graph for gfx.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct GfxInitInfo

  This struct stores info neccesary to initialize graphics.
- struct GfxAPI

  This struct stores the cross platform API functions This struct has a fptr, but i am not gonna document it, because i believe in freedom and you can't stop me.
- struct GfxContainer

Typedefs

- typedef struct GfxDevice GfxDevice

  GFX API Specific struct.
- typedef struct GfxContainer GfxContainer

  This container contains the graphics stuff.
- typedef struct GfxAPI GfxAPI

  This stores the function pointers for implementation of gfx api's.

Enumerations

- enum GfxBackend { CANIM_GFX_NONE = 0 , CANIM_GFX_GL = 1 }
  This is a list of available backends.

7.5.1 Typedef Documentation

7.5.1.1 GfxAPI

```
typedef struct GfxAPI GfxAPI
```

This stores the function pointers for implementation of gfx api's.

Definition at line 20 of file gfx.h.

7.5.1.2 GfxContainer

```
typedef struct GfxContainer GfxContainer
```

This container contains the graphics stuff.

Definition at line 17 of file gfx.h.

7.5.1.3 GfxDevice

```
typedef struct GfxDevice GfxDevice
```

GFX API Specific struct.

Definition at line 14 of file gfx.h.

7.5.2 Enumeration Type Documentation

7.5.2.1 GfxBackend

```
enum GfxBackend
```

This is a list of available backends.

Enumerator

CANIM_GFX_NONE	No Graphics API used.
CANIM_GFX_GL	OpenGL in use.

Definition at line 8 of file gfx.h.

```
00008             {
00009   CANIM_GFX_NONE = 0, ///< No Graphics API used
00010   CANIM_GFX_GL = 1,   ///< OpenGL in use
00011 } GfxBackend;
```

7.6 gfx.h

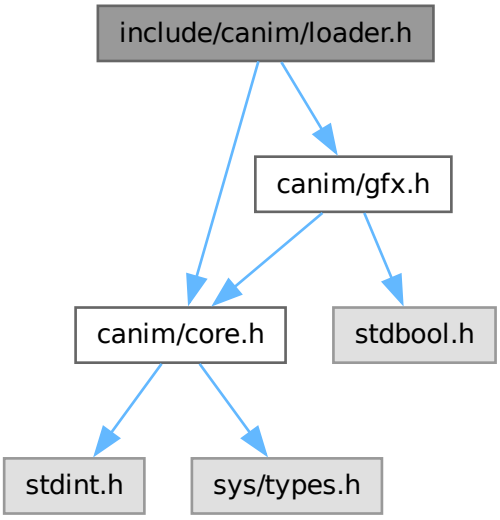
Go to the documentation of this file.

```
00001 // SPDX-License-Identifier: MIT
00002 #pragma once
00003 #include "canim/core.h"
00004 #include <stdbool.h>
00005
00006 /// @enum GfxBackend
00007 /// @brief This is a list of available backends
00008 typedef enum {
00009   CANIM_GFX_NONE = 0, ///< No Graphics API used
00010   CANIM_GFX_GL = 1,   ///< OpenGL in use
00011 } GfxBackend;
00012
00013 /// @brief GFX API Specific struct
00014 typedef struct GfxDevice GfxDevice;
00015
00016 /// @brief This container contains the graphics stuff
00017 typedef struct GfxContainer GfxContainer;
00018
00019 /// @brief This stores the function pointers for implementation of gfx api's
00020 typedef struct GfxAPI GfxAPI;
00021
00022 /// @struct GfxInitInfo
00023 /// @brief This struct stores info neccesary to initialize graphics
00024 typedef struct {
00025   bool headless;       ///< This stores whether or not the window is headless
00026   void *native_window; ///< This stores a pointer to a native window
00027   int width;           ///< The width of the window
00028   int height;          ///< The height of it
00029 } GfxInitInfo;
00030
00031 /// @struct GfxAPI
00032 /// @brief This struct stores the cross platform API functions
00033 /// This struct has a fptr, but i am not gonna document it, because i believe in
00034 /// freedom and you can't stop me
00035 struct GfxAPI {
00036   GfxDevice *(*gfx_create_device)(CanimResult *, GfxContainer *,
00037                                   const GfxInitInfo *);
00038   void (*gfx_destroy_device)(CanimResult *, GfxContainer *);
00039 };
00040
00041 /// @struct GfxContainer
00042 struct GfxContainer {
00043   GfxAPI api;         ///< The API
00044   GfxDevice *impl;    ///< The Implementation specfic gfxdevice
00045   GfxBackend backend; ///< The backend
00046   void *handle;       ///< Handle to the dynamic lib
00047 };
```

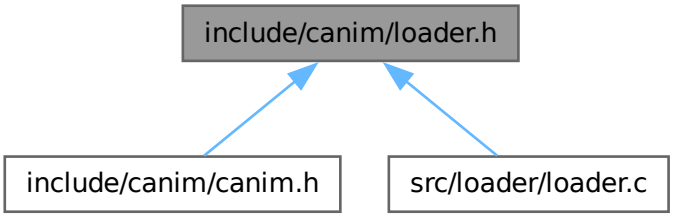
7.7 include/canim/loader.h File Reference

```
#include "canim/core.h"
#include "canim/gfx.h"
```

Include dependency graph for loader.h:



This graph shows which files directly or indirectly include this file:



Functions

- CANIM_API GfxContainer * gfx_load_backend (CanimResult *result, GfxBackend backend, const GfxInitInfo *info)

  This loads a backend and makes a graphics container.
- CANIM_API void gfx_unload_backend (CanimResult *result, GfxContainer *gfx)

  This unloads a backend.

7.7.1 Function Documentation

7.7.1.1 gfx_load_backend()

```
CANIM_API GfxContainer * gfx_load_backend (
            CanimResult * result,
            GfxBackend backend,
            const GfxInitInfo * info)
```

This loads a backend and makes a graphics container.

Parameters

result	This is the result of the output
backend	This is the gfx api
info	The relevant info to create the container

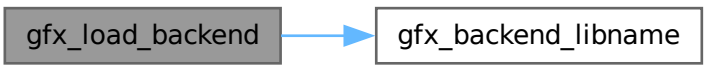
Returns

A gfx container

Definition at line 36 of file loader.c.

```
00037                                                    {
00038   const char *libname = gfx_backend_libname(backend);
00039   LIB_HANDLE handle = LIB_LOAD(libname);
00040   const GfxAPI *const *entry =
00041       (const GfxAPI *const *)LIB_SYM(handle, "GFX_API_ENTRY");
00042   GfxContainer *gfx = calloc(1, sizeof(*gfx));
00043   const GfxAPI *api = *entry;
00044   gfx->api = *api;
00045   gfx->impl = NULL;
00046   gfx->backend = backend;
00047   GfxDevice *dev = gfx->api.gfx_create_device(result, gfx, info);
00048   if (IS_AN_ERROR(*result)) {
00049     return NULL;
00050   }
00051   gfx->handle = (void *)handle;
00052   gfx->impl = dev;
00053   *result = SUCCESS;
00054   return gfx;
00055 }
```

Here is the call graph for this function:



7.7.1.2 gfx_unload_backend()

```
CANIM_API void gfx_unload_backend (
            CanimResult * result,
            GfxContainer * gfx)
```

This unloads a backend.

Parameters

result	This is the result of the output
gfx	This is the container

Definition at line 57 of file loader.c.

```
00057                                                                   {
00058   LIB_CLOSE((LIB_HANDLE)gfx->handle);
00059   *result = SUCCESS;
00060 }
```

7.8 loader.h

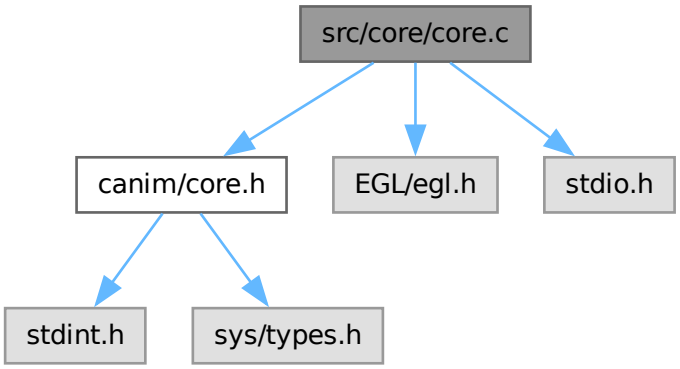
Go to the documentation of this file.

```
00001 // SPDX-License-Identifier: MIT
00002 #pragma once
00003 #include "canim/core.h"
00004 #include "canim/gfx.h"
00005
00006 /// @brief This loads a backend and makes a graphics container
00007 /// @param result This is the result of the output
00008 /// @param backend This is the gfx api
00009 /// @param info The relevant info to create the container
00010 /// @return A gfx container
00011 CANIM_API GfxContainer *gfx_load_backend(CanimResult *result,
00012                                          GfxBackend backend,
00013                                          const GfxInitInfo *info);
00014
00015 /// @brief This unloads a backend
00016 /// @param result This is the result of the output
00017 /// @param gfx This is the container
00018 CANIM_API void gfx_unload_backend(CanimResult *result, GfxContainer *gfx);
```

7.9 src/core/core.c File Reference

```
#include "canim/core.h"
#include <EGL/egl.h>
#include <stdio.h>
```

Include dependency graph for core.c:



Functions

- void print_error (CanimResult error)

  Print out the error.

7.9.1 Function Documentation

7.9.1.1 print_error()

```
void print_error (
            CanimResult error)
```

Print out the error.

Parameters

error	The error to be printed.

Definition at line 5 of file core.c.

```
00005                                       {
00006   if (!IS_AN_ERROR(error)) {
00007     return;
00008   }
00009   switch (error) {
00010   case GFX_DEVICE_CALLOC_ERROR:
00011     fprintf(stderr, "When using calloc to allocate memory for"
00012                     "a GfxDevice, calloc failed\n");
00013     break;
00014   case EGL_NO_DISPLAY_ERROR:
00015     fprintf(stderr, "When creating an EGL display, no display was created\n");
00016     break;
00017   case EGL_DISPLAY_INIT_ERROR:
00018     fprintf(stderr, "When initializing an EGL display something failed.\n");
00019     break;
00020   case EGL_DISPLAY_CONFIGURATION_ERROR:
00021     fprintf(stderr, "When configuring an EGL display something failed.\n");
00022     break;
00023   case EGL_NO_SURFACE_ERROR:
00024     fprintf(stderr, "When creating an EGL surface, no surface was created\n");
00025     break;
00026   case EGL_NO_CONTEXT_ERROR:
00027     fprintf(stderr, "When creating an EGL context, no context was created.\n");
00028     break;
00029   case EGL_MAKE_CURRENT_ERROR:
00030     fprintf(stderr,
00031             "When the making the EGL context, surface and display the current "
00032             "one, something failed.\n");
00033     break;
00034   case SDL_INIT_VIDEO_ERROR:
00035     fprintf(stderr, "When initializing SDL video, something failed\n");
00036     break;
00037   case SDL_WINDOW_CREATION_ERROR:
00038     fprintf(stderr, "When making a window with SDL2, something failed\n");
00039     break;
00040   case SDL_GL_CONTEXT_CREATION_ERROR:
00041     fprintf(stderr,
00042             "When making an OpenGL context with SDL, something failed.\n");
00043     break;
00044   case SDL_GLAD_LOAD_ERROR:
00045     fprintf(stderr, "When loading OpenGL functions with GLAD, using SDL, "
00046                     "something failed\n");
00047     break;
00048   case EGL_GLAD_LOAD_ERROR:
00049     fprintf(stderr, "When loading OpenGL functions with GLAD, using EGL, "
00050                     "something failed\n");
00051     break;
00052   case SVEC_ZERO_ELEMENT_SIZE:
00053     fprintf(stderr,
00054             "When initializing an SVec, the element size was set to zero\n");
00055     break;
```

```
00056   case SVEC_REALLOC_FAIL:
00057     fprintf(stderr, "When reallocating space for an SVec, something failed.\n");
00058     break;
00059
00060   default:
00061     fprintf(stderr, "SOMETHING BAD HAPPENED, WE DON'T KNOW WHAT\n");
00062     break;
00063   }
00064 }
```

7.10 core.c

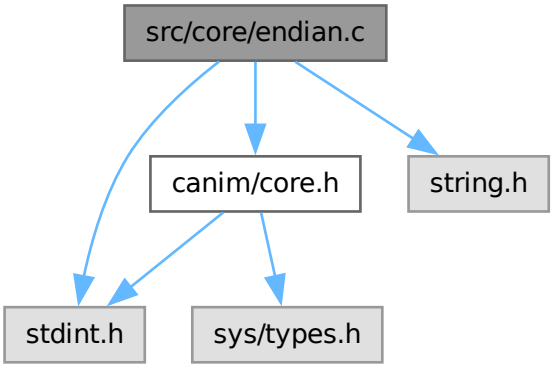
Go to the documentation of this file.

```
00001 // SPDX-License-Identifier: MIT
00002 #include "canim/core.h"
00003 #include <EGL/egl.h>
00004 #include <stdio.h>
00005 void print_error(CanimResult error) {
00006   if (!IS_AN_ERROR(error)) {
00007     return;
00008   }
00009   switch (error) {
00010   case GFX_DEVICE_CALLOC_ERROR:
00011     fprintf(stderr, "When using calloc to allocate memory for"
00012                     "a GfxDevice, calloc failed\n");
00013     break;
00014   case EGL_NO_DISPLAY_ERROR:
00015     fprintf(stderr, "When creating an EGL display, no display was created\n");
00016     break;
00017   case EGL_DISPLAY_INIT_ERROR:
00018     fprintf(stderr, "When initializing an EGL display something failed.\n");
00019     break;
00020   case EGL_DISPLAY_CONFIGURATION_ERROR:
00021     fprintf(stderr, "When configuring an EGL display something failed.\n");
00022     break;
00023   case EGL_NO_SURFACE_ERROR:
00024     fprintf(stderr, "When creating an EGL surface, no surface was created\n");
00025     break;
00026   case EGL_NO_CONTEXT_ERROR:
00027     fprintf(stderr, "When creating an EGL context, no context was created.\n");
00028     break;
00029   case EGL_MAKE_CURRENT_ERROR:
00030     fprintf(stderr,
00031             "When the making the EGL context, surface and display the current "
00032             "one, something failed.\n");
00033     break;
00034   case SDL_INIT_VIDEO_ERROR:
00035     fprintf(stderr, "When initializing SDL video, something failed\n");
00036     break;
00037   case SDL_WINDOW_CREATION_ERROR:
00038     fprintf(stderr, "When making a window with SDL2, something failed\n");
00039     break;
00040   case SDL_GL_CONTEXT_CREATION_ERROR:
00041     fprintf(stderr,
00042             "When making an OpenGL context with SDL, something failed.\n");
00043     break;
00044   case SDL_GLAD_LOAD_ERROR:
00045     fprintf(stderr, "When loading OpenGL functions with GLAD, using SDL, "
00046                     "something failed\n");
00047     break;
00048   case EGL_GLAD_LOAD_ERROR:
00049     fprintf(stderr, "When loading OpenGL functions with GLAD, using EGL, "
00050                     "something failed\n");
00051     break;
00052   case SVEC_ZERO_ELEMENT_SIZE:
00053     fprintf(stderr,
00054             "When initializing an SVec, the element size was set to zero\n");
00055     break;
00056   case SVEC_REALLOC_FAIL:
00057     fprintf(stderr, "When reallocating space for an SVec, something failed.\n");
00058     break;
00059
00060   default:
00061     fprintf(stderr, "SOMETHING BAD HAPPENED, WE DON'T KNOW WHAT\n");
00062     break;
00063   }
00064 }
```

7.11 src/core/endian.c File Reference

```
#include "canim/core.h"
#include <stdint.h>
#include <string.h>
```

Include dependency graph for endian.c:



Functions

- static uint16_t read_be_u16 (const unsigned char *p)
- static uint32_t read_be_u32 (const unsigned char *p)
- static uint64_t read_be_u64 (const unsigned char *p)
- static uint16_t read_le_u16 (const unsigned char *p)
- static uint32_t read_le_u32 (const unsigned char *p)
- static uint64_t read_le_u64 (const unsigned char *p)
- static void write_be_u16 (unsigned char *p, uint16_t v)
- static void write_be_u32 (unsigned char *p, uint32_t v)
- static void write_be_u64 (unsigned char *p, uint64_t v)
- static void write_le_u16 (unsigned char *p, uint16_t v)
- static void write_le_u32 (unsigned char *p, uint32_t v)
- static void write_le_u64 (unsigned char *p, uint64_t v)
- static float read_be_f32 (const unsigned char *p)
- static float read_le_f32 (const unsigned char *p)
- static void write_be_f32 (unsigned char *p, float f)
- static void write_le_f32 (unsigned char *p, float f)
- static double read_be_f64 (const unsigned char *p)
- static double read_le_f64 (const unsigned char *p)
- static void write_be_f64 (unsigned char *p, double d)
- static void write_le_f64 (unsigned char *p, double d)

7.11.1 Function Documentation

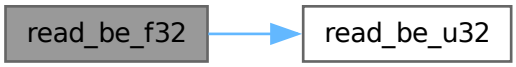
7.11.1.1 read_be_f32()

```
float read_be_f32 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 84 of file endian.c.

```
00084                                                    {
00085   uint32_t u = read_be_u32(p);
00086   float f;
00087   memcpy(&f, &u, sizeof(f));
00088   return f;
00089 }
```

Here is the call graph for this function:



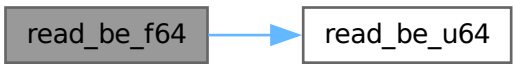
7.11.1.2 read_be_f64()

```
double read_be_f64 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 110 of file endian.c.

```
00110                                                    {
00111   uint64_t u = read_be_u64(p);
00112   double d;
00113   memcpy(&d, &u, sizeof(d));
00114   return d;
00115 }
```

Here is the call graph for this function:



7.11.1.3 read_be_u16()

```
uint16_t read_be_u16 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 6 of file endian.c.

```
00006                                                    {
00007   return ((uint16_t)p[0] « 010) | ((uint16_t)p[1] « 000);
00008 }
```

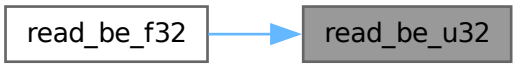
7.11.1.4 read_be_u32()

```
uint32_t read_be_u32 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 10 of file endian.c.

```
00010                                                    {
00011   return ((uint32_t)p[0] « 030) | ((uint32_t)p[1] « 020) |
00012          ((uint32_t)p[2] « 010) | ((uint32_t)p[3] « 000);
00013 }
```

Here is the caller graph for this function:



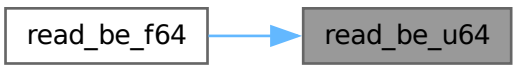
7.11.1.5 read_be_u64()

```
uint64_t read_be_u64 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 15 of file endian.c.

```
00015                                                    {
00016   return ((uint64_t)p[0] « 070) | ((uint64_t)p[1] « 060) |
00017          ((uint64_t)p[2] « 050) | ((uint64_t)p[3] « 040) |
00018          ((uint64_t)p[4] « 030) | ((uint64_t)p[5] « 020) |
00019          ((uint64_t)p[6] « 010) | ((uint64_t)p[7] « 000);
00020 }
```

Here is the caller graph for this function:



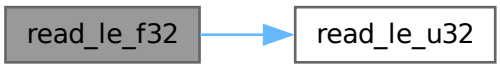
7.11.1.6 read_le_f32()

```
float read_le_f32 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 91 of file endian.c.

```
00091                                                    {
00092   uint32_t u = read_le_u32(p);
00093   float f;
00094   memcpy(&f, &u, sizeof(f));
00095   return f;
00096 }
```

Here is the call graph for this function:



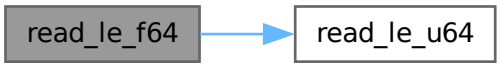
7.11.1.7 read_le_f64()

```
double read_le_f64 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 117 of file endian.c.

```
00117                                                    {
00118   uint64_t u = read_le_u64(p);
00119   double d;
00120   memcpy(&d, &u, sizeof(d));
00121   return d;
00122 }
```

Here is the call graph for this function:



7.11.1.8 read_le_u16()

```
uint16_t read_le_u16 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 22 of file endian.c.

```
00022                                                    {
00023   return ((uint16_t)p[1] « 010) | ((uint16_t)p[0] « 000);
00024 }
```

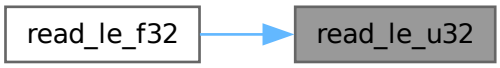
7.11.1.9 read_le_u32()

```
uint32_t read_le_u32 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 26 of file endian.c.

```
00026                                                       {
00027   return ((uint32_t)p[3] « 030) | ((uint32_t)p[2] « 020) |
00028          ((uint32_t)p[1] « 010) | ((uint32_t)p[0] « 000);
00029 }
```

Here is the caller graph for this function:



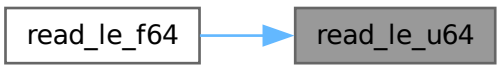
7.11.1.10 read_le_u64()

```
uint64_t read_le_u64 (
            const unsigned char * p)  [inline], [static]
```

Definition at line 31 of file endian.c.

```
00031                                                       {
00032   return ((uint64_t)p[7] « 070) | ((uint64_t)p[6] « 060) |
00033          ((uint64_t)p[5] « 050) | ((uint64_t)p[4] « 040) |
00034          ((uint64_t)p[3] « 030) | ((uint64_t)p[2] « 020) |
00035          ((uint64_t)p[1] « 010) | ((uint64_t)p[0] « 000);
00036 }
```

Here is the caller graph for this function:



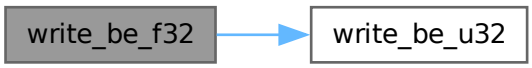
7.11.1.11 write_be_f32()

```
void write_be_f32 (
            unsigned char * p,
            float f)  [inline], [static]
```

Definition at line 98 of file endian.c.

```
00098                                                 {
00099   uint32_t u;
00100   memcpy(&u, &f, sizeof(u));
00101   write_be_u32(p, u);
00102 }
```

Here is the call graph for this function:



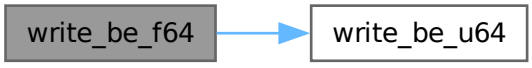
7.11.1.12 write_be_f64()

```
void write_be_f64 (
            unsigned char * p,
            double d)  [inline], [static]
```

Definition at line 124 of file endian.c.

```
00124                                                 {
00125   uint64_t u;
00126   memcpy(&u, &d, sizeof(u));
00127   write_be_u64(p, u);
00128 }
```

Here is the call graph for this function:



7.11.1.13 write_be_u16()

```
void write_be_u16 (
            unsigned char * p,
            uint16_t v)  [inline], [static]
```

Definition at line 38 of file endian.c.

```
00038                                                 {
00039   p[0] = (unsigned char)(v » 010);
00040   p[1] = (unsigned char)(v » 000);
00041 }
```

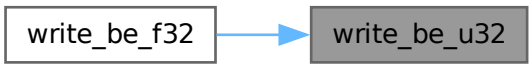
7.11.1.14 write_be_u32()

```
void write_be_u32 (
            unsigned char * p,
            uint32_t v)  [inline], [static]
```

Definition at line 43 of file endian.c.

```
00043                                                                {
00044   p[0] = (unsigned char)(v » 030);
00045   p[1] = (unsigned char)(v » 020);
00046   p[2] = (unsigned char)(v » 010);
00047   p[3] = (unsigned char)(v » 000);
00048 }
```

Here is the caller graph for this function:



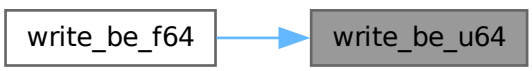
7.11.1.15 write_be_u64()

```
void write_be_u64 (
            unsigned char * p,
            uint64_t v)  [inline], [static]
```

Definition at line 50 of file endian.c.

```
00050                                                                {
00051   p[0] = (unsigned char)(v » 070);
00052   p[1] = (unsigned char)(v » 060);
00053   p[2] = (unsigned char)(v » 050);
00054   p[3] = (unsigned char)(v » 040);
00055   p[4] = (unsigned char)(v » 030);
00056   p[5] = (unsigned char)(v » 020);
00057   p[6] = (unsigned char)(v » 010);
00058   p[7] = (unsigned char)(v » 000);
00059 }
```

Here is the caller graph for this function:



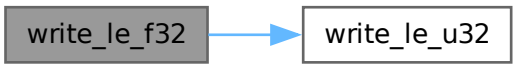
7.11.1.16 write_le_f32()

```
void write_le_f32 (
            unsigned char * p,
            float f)  [inline], [static]
```

Definition at line 104 of file endian.c.

```
00104                                                   {
00105   uint32_t u;
00106   memcpy(&u, &f, sizeof(u));
00107   write_le_u32(p, u);
00108 }
```

Here is the call graph for this function:



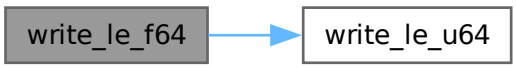
7.11.1.17 write_le_f64()

```
void write_le_f64 (
            unsigned char * p,
            double d)  [inline], [static]
```

Definition at line 130 of file endian.c.

```
00130                                                   {
00131   uint64_t u;
00132   memcpy(&u, &d, sizeof(u));
00133   write_le_u64(p, u);
00134 }
```

Here is the call graph for this function:



7.11.1.18 write_le_u16()

```
void write_le_u16 (
            unsigned char * p,
            uint16_t v)  [inline], [static]
```

Definition at line 61 of file endian.c.

```
00061                                                   {
00062   p[0] = (unsigned char)(v >> 000);
00063   p[1] = (unsigned char)(v >> 010);
00064 }
```

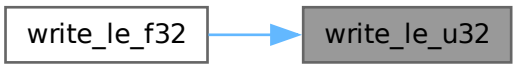
7.11.1.19 write_le_u32()

```
void write_le_u32 (
            unsigned char * p,
            uint32_t v)  [inline], [static]
```

Definition at line 66 of file endian.c.

```
00066                                                                   {
00067   p[0] = (unsigned char)(v » 000);
00068   p[1] = (unsigned char)(v » 010);
00069   p[2] = (unsigned char)(v » 020);
00070   p[3] = (unsigned char)(v » 030);
00071 }
```

Here is the caller graph for this function:



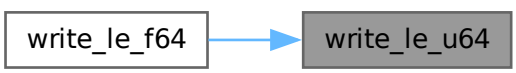
7.11.1.20 write_le_u64()

```
void write_le_u64 (
            unsigned char * p,
            uint64_t v)  [inline], [static]
```

Definition at line 73 of file endian.c.

```
00073                                                                   {
00074   p[0] = (unsigned char)(v » 000);
00075   p[1] = (unsigned char)(v » 010);
00076   p[2] = (unsigned char)(v » 020);
00077   p[3] = (unsigned char)(v » 030);
00078   p[4] = (unsigned char)(v » 040);
00079   p[5] = (unsigned char)(v » 050);
00080   p[6] = (unsigned char)(v » 060);
00081   p[7] = (unsigned char)(v » 070);
00082 }
```

Here is the caller graph for this function:



7.12 endian.c

Go to the documentation of this file.

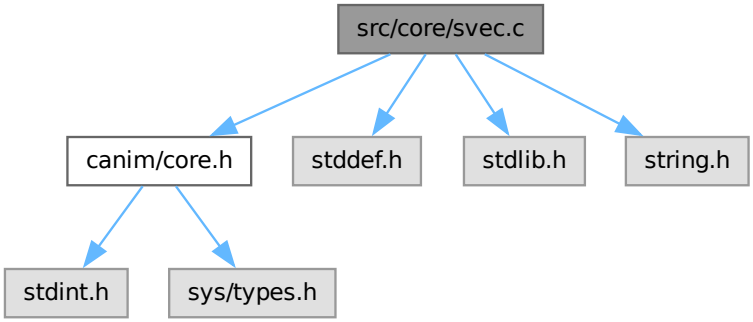
```
00001 // SPDX-License-Identifier: MIT
00002 #include "canim/core.h"
00003 #include <stdint.h>
00004 #include <string.h>
00005
00006 static inline uint16_t read_be_u16(const unsigned char *p) {
00007   return ((uint16_t)p[0] « 010) | ((uint16_t)p[1] « 000);
00008 }
00009
00010 static inline uint32_t read_be_u32(const unsigned char *p) {
00011   return ((uint32_t)p[0] « 030) | ((uint32_t)p[1] « 020) |
00012          ((uint32_t)p[2] « 010) | ((uint32_t)p[3] « 000);
00013 }
00014
00015 static inline uint64_t read_be_u64(const unsigned char *p) {
00016   return ((uint64_t)p[0] « 070) | ((uint64_t)p[1] « 060) |
00017          ((uint64_t)p[2] « 050) | ((uint64_t)p[3] « 040) |
00018          ((uint64_t)p[4] « 030) | ((uint64_t)p[5] « 020) |
00019          ((uint64_t)p[6] « 010) | ((uint64_t)p[7] « 000);
00020 }
00021
00022 static inline uint16_t read_le_u16(const unsigned char *p) {
00023   return ((uint16_t)p[1] « 010) | ((uint16_t)p[0] « 000);
00024 }
00025
00026 static inline uint32_t read_le_u32(const unsigned char *p) {
00027   return ((uint32_t)p[3] « 030) | ((uint32_t)p[2] « 020) |
00028          ((uint32_t)p[1] « 010) | ((uint32_t)p[0] « 000);
00029 }
00030
00031 static inline uint64_t read_le_u64(const unsigned char *p) {
00032   return ((uint64_t)p[7] « 070) | ((uint64_t)p[6] « 060) |
00033          ((uint64_t)p[5] « 050) | ((uint64_t)p[4] « 040) |
00034          ((uint64_t)p[3] « 030) | ((uint64_t)p[2] « 020) |
00035          ((uint64_t)p[1] « 010) | ((uint64_t)p[0] « 000);
00036 }
00037
00038 static inline void write_be_u16(unsigned char *p, uint16_t v) {
00039   p[0] = (unsigned char)(v » 010);
00040   p[1] = (unsigned char)(v » 000);
00041 }
00042
00043 static inline void write_be_u32(unsigned char *p, uint32_t v) {
00044   p[0] = (unsigned char)(v » 030);
00045   p[1] = (unsigned char)(v » 020);
00046   p[2] = (unsigned char)(v » 010);
00047   p[3] = (unsigned char)(v » 000);
00048 }
00049
00050 static inline void write_be_u64(unsigned char *p, uint64_t v) {
00051   p[0] = (unsigned char)(v » 070);
00052   p[1] = (unsigned char)(v » 060);
00053   p[2] = (unsigned char)(v » 050);
00054   p[3] = (unsigned char)(v » 040);
00055   p[4] = (unsigned char)(v » 030);
00056   p[5] = (unsigned char)(v » 020);
00057   p[6] = (unsigned char)(v » 010);
00058   p[7] = (unsigned char)(v » 000);
00059 }
00060
00061 static inline void write_le_u16(unsigned char *p, uint16_t v) {
00062   p[0] = (unsigned char)(v » 000);
00063   p[1] = (unsigned char)(v » 010);
00064 }
00065
00066 static inline void write_le_u32(unsigned char *p, uint32_t v) {
00067   p[0] = (unsigned char)(v » 000);
00068   p[1] = (unsigned char)(v » 010);
00069   p[2] = (unsigned char)(v » 020);
00070   p[3] = (unsigned char)(v » 030);
00071 }
00072
00073 static inline void write_le_u64(unsigned char *p, uint64_t v) {
00074   p[0] = (unsigned char)(v » 000);
00075   p[1] = (unsigned char)(v » 010);
00076   p[2] = (unsigned char)(v » 020);
00077   p[3] = (unsigned char)(v » 030);
00078   p[4] = (unsigned char)(v » 040);
00079   p[5] = (unsigned char)(v » 050);
00080   p[6] = (unsigned char)(v » 060);
00081   p[7] = (unsigned char)(v » 070);
00082 }
```

```
00083
00084 static inline float read_be_f32(const unsigned char *p) {
00085   uint32_t u = read_be_u32(p);
00086   float f;
00087   memcpy(&f, &u, sizeof(f));
00088   return f;
00089 }
00090
00091 static inline float read_le_f32(const unsigned char *p) {
00092   uint32_t u = read_le_u32(p);
00093   float f;
00094   memcpy(&f, &u, sizeof(f));
00095   return f;
00096 }
00097
00098 static inline void write_be_f32(unsigned char *p, float f) {
00099   uint32_t u;
00100   memcpy(&u, &f, sizeof(u));
00101   write_be_u32(p, u);
00102 }
00103
00104 static inline void write_le_f32(unsigned char *p, float f) {
00105   uint32_t u;
00106   memcpy(&u, &f, sizeof(u));
00107   write_le_u32(p, u);
00108 }
00109
00110 static inline double read_be_f64(const unsigned char *p) {
00111   uint64_t u = read_be_u64(p);
00112   double d;
00113   memcpy(&d, &u, sizeof(d));
00114   return d;
00115 }
00116
00117 static inline double read_le_f64(const unsigned char *p) {
00118   uint64_t u = read_le_u64(p);
00119   double d;
00120   memcpy(&d, &u, sizeof(d));
00121   return d;
00122 }
00123
00124 static inline void write_be_f64(unsigned char *p, double d) {
00125   uint64_t u;
00126   memcpy(&u, &d, sizeof(u));
00127   write_be_u64(p, u);
00128 }
00129
00130 static inline void write_le_f64(unsigned char *p, double d) {
00131   uint64_t u;
00132   memcpy(&u, &d, sizeof(u));
00133   write_le_u64(p, u);
00134 }
```

7.13 src/core/svec.c File Reference

```
#include "canim/core.h"
#include <stddef.h>
#include <stdlib.h>
#include <string.h>
```

Include dependency graph for svec.c:



Functions

- static void svec_init (CanimResult *result, SVec *v, size_t elem_size)
- static void svec_free (CanimResult *result, SVec *v)
- static void svec_push (CanimResult *result, SVec *v, const void *elem)
- static void svec_pop (CanimResult *result, SVec *v, void *out)
- static void svec_set (CanimResult *result, SVec *v, size_t i, const void *elem)
- static void * svec_get (CanimResult *result, SVec *v, size_t i)

7.13.1 Function Documentation

7.13.1.1 svec_free()

```
void svec_free (
            CanimResult * result,
            SVec * v)  [inline], [static]
```

Definition at line 18 of file svec.c.

```
00018                                                    {
00019   free(v->data);
00020   v->data = NULL;
00021   v->list_size = 0;
00022
00023   *result = SUCCESS;
00024 }
```

7.13.1.2 svec_get()

```
void * svec_get (
            CanimResult * result,
            SVec * v,
            size_t i)  [inline], [static]
```

Definition at line 74 of file svec.c.

```
00074                                                                {
00075   *result = SUCCESS;
00076   return v->data + i * v->element_size;
00077 }
```

7.13.1.3 svec_init()

```
void svec_init (
            CanimResult * result,
            SVec * v,
            size_t elem_size)  [inline], [static]
```

Definition at line 7 of file svec.c.

```
00007                                                                        {
00008   if (elem_size == 0) {
00009     *result = SVEC_ZERO_ELEMENT_SIZE;
00010     return;
00011   }
00012   v->element_size = elem_size;
00013   v->list_size = 0;
00014   v->data = NULL;
00015   *result = SUCCESS;
00016 }
```

7.13.1.4 svec_pop()

```
void svec_pop (
            CanimResult * result,
            SVec * v,
            void * out)  [inline], [static]
```

Definition at line 48 of file svec.c.

```
00048                                                                              {
00049   size_t old_size = v->list_size;
00050   size_t new_size = old_size - 1;
00051   if (out) {
00052     memcpy(out, v->data + (old_size - 1) * v->element_size, v->element_size);
00053   }
00054   if (REALIGN(old_size, new_size)) {
00055     size_t new_cap = BIT_ALIGN(new_size);
00056     void *new_data = realloc(v->data, new_cap * v->element_size);
00057
00058     if (!new_data) {
00059       *result = SVEC_REALLOC_FAIL;
00060       return;
00061     }
00062     v->data = new_data;
00063   }
00064   v->list_size--;
00065   *result = SUCCESS;
00066 }
```

7.13.1.5 svec_push()

```
void svec_push (
            CanimResult * result,
            SVec * v,
            const void * elem)  [inline], [static]
```

Definition at line 26 of file svec.c.

```
00026                                                                        {
00027
00028   size_t old_size = v->list_size;
00029   size_t new_size = old_size + 1;
00030
00031   if (REALIGN(old_size, new_size)) {
00032     size_t new_cap = BIT_ALIGN(new_size);
00033     void *new_data = realloc(v->data, new_cap * v->element_size);
00034
00035     if (!new_data) {
00036       *result = SVEC_REALLOC_FAIL;
00037       return;
```

```
00038     }
00039     v->data = new_data;
00040   }
00041
00042   memcpy(v->data + old_size * v->element_size, elem, v->element_size);
00043   v->list_size++;
00044
00045   *result = SUCCESS;
00046 }
```

7.13.1.6 svec_set()

```
void svec_set (
            CanimResult * result,
            SVec * v,
            size_t i,
            const void * elem)  [inline], [static]
```

Definition at line 68 of file svec.c.

```
00069                                           {
00070   memcpy(v->data + i * v->element_size, elem, v->element_size);
00071   *result = SUCCESS;
00072 }
```

7.14 svec.c

Go to the documentation of this file.

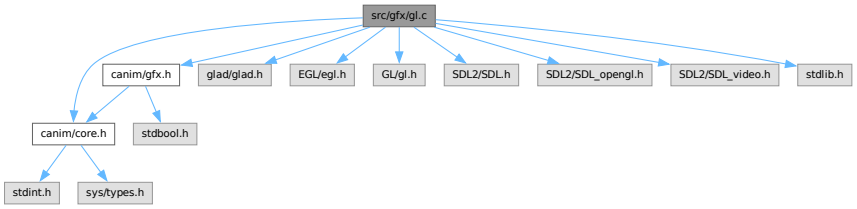
```
00001 // SPDX-License-Identifier: MIT
00002 #include "canim/core.h"
00003 #include <stddef.h>
00004 #include <stdlib.h>
00005 #include <string.h>
00006
00007 static inline void svec_init(CanimResult *result, SVec *v, size_t elem_size) {
00008   if (elem_size == 0) {
00009     *result = SVEC_ZERO_ELEMENT_SIZE;
00010     return;
00011   }
00012   v->element_size = elem_size;
00013   v->list_size = 0;
00014   v->data = NULL;
00015   *result = SUCCESS;
00016 }
00017
00018 static inline void svec_free(CanimResult *result, SVec *v) {
00019   free(v->data);
00020   v->data = NULL;
00021   v->list_size = 0;
00022
00023   *result = SUCCESS;
00024 }
00025
00026 static inline void svec_push(CanimResult *result, SVec *v, const void *elem) {
00027
00028   size_t old_size = v->list_size;
00029   size_t new_size = old_size + 1;
00030
00031   if (REALIGN(old_size, new_size)) {
00032     size_t new_cap = BIT_ALIGN(new_size);
00033     void *new_data = realloc(v->data, new_cap * v->element_size);
00034
00035     if (!new_data) {
00036       *result = SVEC_REALLOC_FAIL;
00037       return;
00038     }
00039     v->data = new_data;
00040   }
00041
00042   memcpy(v->data + old_size * v->element_size, elem, v->element_size);
00043   v->list_size++;
00044
00045   *result = SUCCESS;
00046 }
```

```
00047
00048 static inline void svec_pop(CanimResult *result, SVec *v, void *out) {
00049   size_t old_size = v->list_size;
00050   size_t new_size = old_size - 1;
00051   if (out) {
00052     memcpy(out, v->data + (old_size - 1) * v->element_size, v->element_size);
00053   }
00054   if (REALIGN(old_size, new_size)) {
00055     size_t new_cap = BIT_ALIGN(new_size);
00056     void *new_data = realloc(v->data, new_cap * v->element_size);
00057
00058     if (!new_data) {
00059       *result = SVEC_REALLOC_FAIL;
00060       return;
00061     }
00062     v->data = new_data;
00063   }
00064   v->list_size--;
00065   *result = SUCCESS;
00066 }
00067
00068 static inline void svec_set(CanimResult *result, SVec *v, size_t i,
00069                             const void *elem) {
00070   memcpy(v->data + i * v->element_size, elem, v->element_size);
00071   *result = SUCCESS;
00072 }
00073
00074 static inline void *svec_get(CanimResult *result, SVec *v, size_t i) {
00075   *result = SUCCESS;
00076   return v->data + i * v->element_size;
00077 }
```

7.15 src/gfx/gl.c File Reference

```
#include "canim/core.h"
#include "canim/gfx.h"
#include "glad/glad.h"
#include <EGL/egl.h>
#include <GL/gl.h>
#include <SDL2/SDL.h>
#include <SDL2/SDL_opengl.h>
#include <SDL2/SDL_video.h>
#include <stdlib.h>
```

Include dependency graph for gl.c:



Data Structures

- struct GfxDevice

Functions

- GfxDevice * gl_create_device (CanimResult *result, GfxContainer *container, const GfxInitInfo *info)
- void gl_destroy_device (CanimResult *result, GfxContainer *container)

Variables

- const GfxAPI GFX_GL_API

7.15.1 Function Documentation

7.15.1.1 gl_create_device()

```
GfxDevice * gl_create_device (
            CanimResult * result,
            GfxContainer * container,
            const GfxInitInfo * info)
```

Definition at line 21 of file gl.c.

```
00022                                                   {
00023   GfxDevice *dev = (GfxDevice *)calloc(1, sizeof(GfxDevice));
00024   if (!dev) {
00025     *result = GFX_DEVICE_CALLOC_ERROR;
00026     return NULL;
00027   }
00028   dev->headless = info->headless;
00029   dev->height = info->height;
00030   dev->width = info->width;
00031   if (dev->headless) {
00032     dev->egl_display = eglGetDisplay(EGL_DEFAULT_DISPLAY);
00033     if (dev->egl_display == EGL_NO_DISPLAY) {
00034       free(dev);
00035       *result = EGL_NO_DISPLAY_ERROR;
00036       return NULL;
00037     }
00038
00039     if (!eglInitialize(dev->egl_display, 0, 0)) {
00040       free(dev);
00041       *result = EGL_DISPLAY_INIT_ERROR;
00042       return NULL;
00043     }
00044     EGLint cfg_attr[] = {EGL_SURFACE_TYPE, EGL_PBUFFER_BIT, EGL_RENDERABLE_TYPE,
00045                          EGL_OPENGL_BIT, EGL_NONE};
00046     EGLConfig cfg;
00047     EGLint N;
00048     if (!eglChooseConfig(dev->egl_display, cfg_attr, &cfg, 1, &N) || N == 0) {
00049       eglTerminate(dev->egl_display);
00050       free(dev);
00051       *result = EGL_DISPLAY_CONFIGURATION_ERROR;
00052       return NULL;
00053     }
00054     EGLint pb_attr[] = {EGL_WIDTH, info->width, EGL_HEIGHT, info->height,
00055                         EGL_NONE};
00056     dev->egl_surface = eglCreatePbufferSurface(dev->egl_display, cfg, pb_attr);
00057     if (dev->egl_surface == EGL_NO_DISPLAY) {
00058       *result = EGL_NO_SURFACE_ERROR;
00059       eglTerminate(dev->egl_display);
00060       free(dev);
00061       return NULL;
00062     }
00063     eglBindAPI(EGL_OPENGL_API);
00064     dev->egl_context =
00065         eglCreateContext(dev->egl_display, cfg, EGL_NO_CONTEXT, NULL);
00066     if (dev->egl_context == EGL_NO_CONTEXT) {
00067       *result = EGL_NO_CONTEXT_ERROR;
00068       eglDestroySurface(dev->egl_display, dev->egl_surface);
00069       eglTerminate(dev->egl_display);
00070       free(dev);
00071       return NULL;
00072     }
00073     if (!eglMakeCurrent(dev->egl_display, dev->egl_surface, dev->egl_surface,
00074                         dev->egl_context)) {
00075       *result = EGL_MAKE_CURRENT_ERROR;
00076       eglDestroySurface(dev->egl_display, dev->egl_surface);
00077       eglDestroyContext(dev->egl_display, dev->egl_context);
00078       eglTerminate(dev->egl_display);
00079       free(dev);
00080       return NULL;
00081     }
00082   } else {
```

```
00083     if (SDL_Init(SDL_INIT_VIDEO) < 0) {
00084       *result = SDL_INIT_VIDEO_ERROR;
00085       free(dev);
00086       return NULL;
00087     }
00088     dev->win = info->native_window
00089                    ? (SDL_Window *)info->native_window
00090                    : SDL_CreateWindow("Canim", SDL_WINDOWPOS_CENTERED,
00091                                       SDL_WINDOWPOS_CENTERED, info->width,
00092                                       info->height,
00093                                       SDL_WINDOW_OPENGL | SDL_WINDOW_RESIZABLE);
00094     if (!dev->win) {
00095       *result = SDL_WINDOW_CREATION_ERROR;
00096       SDL_QuitSubSystem(SDL_INIT_VIDEO);
00097       free(dev);
00098       return NULL;
00099     }
00100     dev->glctx = SDL_GL_CreateContext(dev->win);
00101     if (!dev->glctx) {
00102       *result = SDL_GL_CONTEXT_CREATION_ERROR;
00103       SDL_DestroyWindow(dev->win);
00104       SDL_QuitSubSystem(SDL_INIT_VIDEO);
00105       free(dev);
00106       return NULL;
00107     }
00108
00109     SDL_GL_MakeCurrent(dev->win, dev->glctx);
00110   }
00111   glViewport(0, 0, dev->width, dev->height);
00112   glClearColor(1.0f, 0.0f, 1.0f, 1.0f);
00113   glClear(GL_COLOR_BUFFER_BIT);
00114   if (dev->headless) {
00115     eglSwapBuffers(dev->egl_display, dev->egl_surface);
00116     gladLoadGLLoader((GLADloadproc)eglGetProcAddress);
00117   } else {
00118     SDL_GL_SwapWindow(dev->win);
00119     gladLoadGLLoader((GLADloadproc)SDL_GL_GetProcAddress);
00120   }
00121
00122   return dev;
00123 }
```

7.15.1.2 gl_destroy_device()

```
void gl_destroy_device (
            CanimResult * result,
            GfxContainer * container)
```

Definition at line 124 of file gl.c.

```
00124                                                                    {
00125   GfxDevice *device = container->impl;
00126   if (!device) {
00127     return;
00128   }
00129   if (device->headless) {
00130     eglDestroySurface(device->egl_display, device->egl_surface);
00131     eglDestroyContext(device->egl_display, device->egl_context);
00132     eglTerminate(device->egl_display);
00133   } else {
00134     if (device->glctx) {
00135       SDL_GL_DeleteContext(device->glctx);
00136     }
00137     if (device->win) {
00138       SDL_DestroyWindow(device->win);
00139     }
00140     SDL_QuitSubSystem(SDL_INIT_VIDEO);
00141   }
00142   free(device);
00143 };
```

7.15.2 Variable Documentation

7.15.2.1 GFX_GL_API

```
const GfxAPI GFX_GL_API
```

Initial value:

```
= {.gfx_create_device = gl_create_device,
                           .gfx_destroy_device = gl_destroy_device}
```

Definition at line 145 of file gl.c.

```
00145                           {.gfx_create_device = gl_create_device,
00146                            .gfx_destroy_device = gl_destroy_device};
```

7.16 gl.c

Go to the documentation of this file.

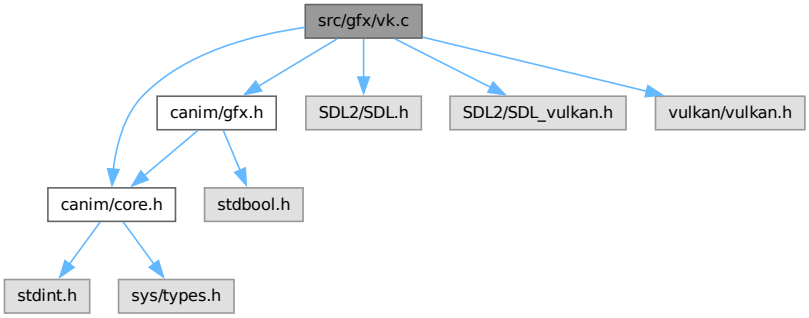
```
00001 // SPDX-License-Identifier: MIT
00002 #include "canim/core.h"
00003 #include "canim/gfx.h"
00004 #include "glad/glad.h"
00005 #include <EGL/egl.h>
00006 #include <GL/gl.h>
00007 #include <SDL2/SDL.h>
00008 #include <SDL2/SDL_opengl.h>
00009 #include <SDL2/SDL_video.h>
00010 #include <stdlib.h>
00011 struct GfxDevice {
00012   bool headless;
00013   int width;
00014   int height;
00015   SDL_GLContext glctx;
00016   SDL_Window *win;
00017   EGLDisplay egl_display;
00018   EGLSurface egl_surface;
00019   EGLContext egl_context;
00020 };
00021 GfxDevice *gl_create_device(CanimResult *result, GfxContainer *container,
00022                             const GfxInitInfo *info) {
00023   GfxDevice *dev = (GfxDevice *)calloc(1, sizeof(GfxDevice));
00024   if (!dev) {
00025     *result = GFX_DEVICE_CALLOC_ERROR;
00026     return NULL;
00027   }
00028   dev->headless = info->headless;
00029   dev->height = info->height;
00030   dev->width = info->width;
00031   if (dev->headless) {
00032     dev->egl_display = eglGetDisplay(EGL_DEFAULT_DISPLAY);
00033     if (dev->egl_display == EGL_NO_DISPLAY) {
00034       free(dev);
00035       *result = EGL_NO_DISPLAY_ERROR;
00036       return NULL;
00037     }
00038
00039     if (!eglInitialize(dev->egl_display, 0, 0)) {
00040       free(dev);
00041       *result = EGL_DISPLAY_INIT_ERROR;
00042       return NULL;
00043     }
00044     EGLint cfg_attr[] = {EGL_SURFACE_TYPE, EGL_PBUFFER_BIT, EGL_RENDERABLE_TYPE,
00045                          EGL_OPENGL_BIT, EGL_NONE};
00046     EGLConfig cfg;
00047     EGLint N;
00048     if (!eglChooseConfig(dev->egl_display, cfg_attr, &cfg, 1, &N) || N == 0) {
00049       eglTerminate(dev->egl_display);
00050       free(dev);
00051       *result = EGL_DISPLAY_CONFIGURATION_ERROR;
00052       return NULL;
00053     }
00054     EGLint pb_attr[] = {EGL_WIDTH, info->width, EGL_HEIGHT, info->height,
00055                         EGL_NONE};
00056     dev->egl_surface = eglCreatePbufferSurface(dev->egl_display, cfg, pb_attr);
00057     if (dev->egl_surface == EGL_NO_DISPLAY) {
00058       *result = EGL_NO_SURFACE_ERROR;
00059       eglTerminate(dev->egl_display);
00060       free(dev);
00061       return NULL;
00062     }
00063     eglBindAPI(EGL_OPENGL_API);
00064     dev->egl_context =
00065         eglCreateContext(dev->egl_display, cfg, EGL_NO_CONTEXT, NULL);
00066     if (dev->egl_context == EGL_NO_CONTEXT) {
00067       *result = EGL_NO_CONTEXT_ERROR;
00068       eglDestroySurface(dev->egl_display, dev->egl_surface);
```

```
00069       eglTerminate(dev->egl_display);
00070       free(dev);
00071       return NULL;
00072     }
00073     if (!eglMakeCurrent(dev->egl_display, dev->egl_surface, dev->egl_surface,
00074                         dev->egl_context)) {
00075       *result = EGL_MAKE_CURRENT_ERROR;
00076       eglDestroySurface(dev->egl_display, dev->egl_surface);
00077       eglDestroyContext(dev->egl_display, dev->egl_context);
00078       eglTerminate(dev->egl_display);
00079       free(dev);
00080       return NULL;
00081     }
00082   } else {
00083     if (SDL_Init(SDL_INIT_VIDEO) < 0) {
00084       *result = SDL_INIT_VIDEO_ERROR;
00085       free(dev);
00086       return NULL;
00087     }
00088     dev->win = info->native_window
00089                    ? (SDL_Window *)info->native_window
00090                    : SDL_CreateWindow("Canim", SDL_WINDOWPOS_CENTERED,
00091                                       SDL_WINDOWPOS_CENTERED, info->width,
00092                                       info->height,
00093                                       SDL_WINDOW_OPENGL | SDL_WINDOW_RESIZABLE);
00094     if (!dev->win) {
00095       *result = SDL_WINDOW_CREATION_ERROR;
00096       SDL_QuitSubSystem(SDL_INIT_VIDEO);
00097       free(dev);
00098       return NULL;
00099     }
00100     dev->glctx = SDL_GL_CreateContext(dev->win);
00101     if (!dev->glctx) {
00102       *result = SDL_GL_CONTEXT_CREATION_ERROR;
00103       SDL_DestroyWindow(dev->win);
00104       SDL_QuitSubSystem(SDL_INIT_VIDEO);
00105       free(dev);
00106       return NULL;
00107     }
00108
00109     SDL_GL_MakeCurrent(dev->win, dev->glctx);
00110   }
00111   glViewport(0, 0, dev->width, dev->height);
00112   glClearColor(1.0f, 0.0f, 1.0f, 1.0f);
00113   glClear(GL_COLOR_BUFFER_BIT);
00114   if (dev->headless) {
00115     eglSwapBuffers(dev->egl_display, dev->egl_surface);
00116     gladLoadGLLoader((GLADloadproc)eglGetProcAddress);
00117   } else {
00118     SDL_GL_SwapWindow(dev->win);
00119     gladLoadGLLoader((GLADloadproc)SDL_GL_GetProcAddress);
00120   }
00121
00122   return dev;
00123 }
00124 void gl_destroy_device(CanimResult *result, GfxContainer *container) {
00125   GfxDevice *device = container->impl;
00126   if (!device) {
00127     return;
00128   }
00129   if (device->headless) {
00130     eglDestroySurface(device->egl_display, device->egl_surface);
00131     eglDestroyContext(device->egl_display, device->egl_context);
00132     eglTerminate(device->egl_display);
00133   } else {
00134     if (device->glctx) {
00135       SDL_GL_DeleteContext(device->glctx);
00136     }
00137     if (device->win) {
00138       SDL_DestroyWindow(device->win);
00139     }
00140     SDL_QuitSubSystem(SDL_INIT_VIDEO);
00141   }
00142   free(device);
00143 };
00144
00145 const GfxAPI GFX_GL_API = {.gfx_create_device = gl_create_device,
00146                            .gfx_destroy_device = gl_destroy_device};
00147
00148 __attribute__((visibility("default"))) const GfxAPI *GFX_API_ENTRY =
00149     &GFX_GL_API;
```

7.17 src/gfx/vk.c File Reference

```
#include "canim/core.h"
#include "canim/gfx.h"
#include <SDL2/SDL.h>
#include <SDL2/SDL_vulkan.h>
#include <vulkan/vulkan.h>
```

Include dependency graph for vk.c:



Data Structures

- struct GfxDevice

Functions

- GfxDevice * vk_create_device (CanimResult *result, GfxContainer *container, const GfxInitInfo *info)

7.17.1 Function Documentation

7.17.1.1 vk_create_device()

```
GfxDevice * vk_create_device (
            CanimResult * result,
            GfxContainer * container,
            const GfxInitInfo * info)
```

Todo FIX

Todo FIX

Todo FIX

Definition at line 15 of file vk.c.

```
00016                                                 {
00017   GfxDevice *dev = calloc(1, sizeof(GfxDevice));
00018   if (!dev) {
00019     *result = GFX_DEVICE_CALLOC_ERROR;
00020     return NULL;
00021   }
00022
00023   dev->headless = info->headless;
00024   dev->width = info->width;
00025   dev->height = info->height;
00026   dev->win = NULL;
00027   if (!info->headless) {
00028     dev->win = SDL_CreateWindow(
00029         "Canim Vulkan", SDL_WINDOWPOS_CENTERED, SDL_WINDOWPOS_CENTERED,
00030         info->width, info->height, SDL_WINDOW_VULKAN | SDL_WINDOW_SHOWN);
00031
00032     if (!dev->win) {
00033       free(dev);
00034       *result = SDL_WINDOW_CREATION_ERROR;
00035       return NULL;
00036     }
00037   }
00038   uint32_t extCount = 0;
00039   const char **extNames = NULL;
00040
00041   if (!info->headless) {
00042     if (!SDL_Vulkan_GetInstanceExtensions(dev->win, &extCount, NULL)) {
00043       SDL_DestroyWindow(dev->win);
00044       free(dev);
00045       *result = 0x03ffffff; /// @todo FIX
00046       return NULL;
00047     }
00048
00049     extNames = malloc(sizeof(char *) * extCount);
00050     if (!extNames) {
00051       SDL_DestroyWindow(dev->win);
00052       free(dev);
00053       *result = 0x03ffffff; /// @todo FIX
00054
00055       return NULL;
00056     }
00057
00058     SDL_Vulkan_GetInstanceExtensions(dev->win, &extCount, extNames);
00059   }
00060
00061   VkApplicationInfo app = {.sType = VK_STRUCTURE_TYPE_APPLICATION_INFO,
00062                            .pApplicationName = "Canim",
00063                            .applicationVersion = VK_MAKE_VERSION(1, 0, 0),
00064                            .pEngineName = "Canim",
00065                            .engineVersion = VK_MAKE_VERSION(1, 0, 0),
00066                            .apiVersion = VK_API_VERSION_1_3};
00067
00068   VkInstanceCreateInfo ci = {.sType = VK_STRUCTURE_TYPE_INSTANCE_CREATE_INFO,
00069                              .pApplicationInfo = &app,
00070                              .enabledLayerCount = 0,
00071                              .ppEnabledLayerNames = NULL,
00072                              .enabledExtensionCount = extCount,
00073                              .ppEnabledExtensionNames = extNames};
00074
00075   VkResult vkres = vkCreateInstance(&ci, NULL, &dev->inst);
00076
00077   free(extNames);
00078   if (vkres != VK_SUCCESS) {
00079     if (dev->win)
00080       SDL_DestroyWindow(dev->win);
00081     free(dev);
00082     *result = 0x03ffffff; /// @todo FIX
00083
00084     return NULL;
00085   }
00086
00087   *result = SUCCESS;
00088   return dev;
00089 }
```

7.18 vk.c

Go to the documentation of this file.

```
00001 // SPDX-License-Identifier: MIT
```

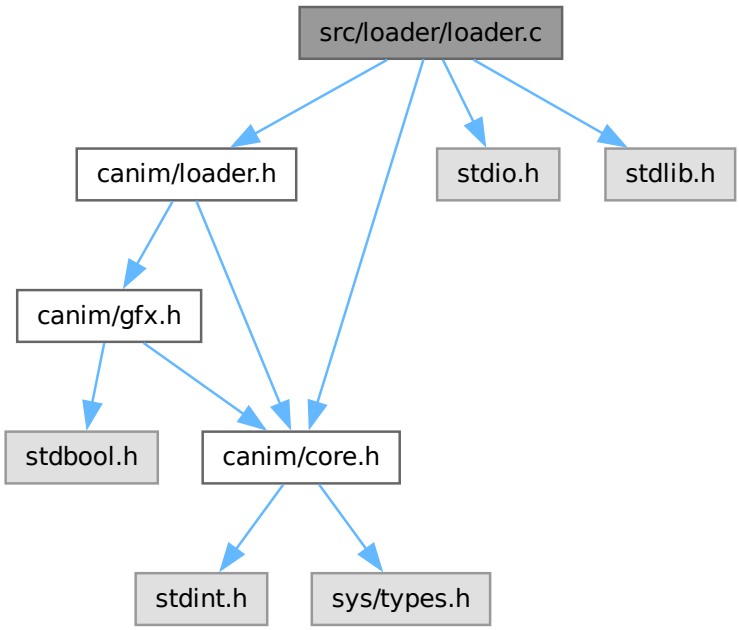
```
00002 #include "canim/core.h"
00003 #include "canim/gfx.h"
00004 #include <SDL2/SDL.h>
00005 #include <SDL2/SDL_vulkan.h>
00006 #include <vulkan/vulkan.h>
00007 struct GfxDevice {
00008   bool headless;
00009   int width;
00010   int height;
00011   VkInstance inst;
00012   SDL_Window *win;
00013 };
00014
00015 GfxDevice *vk_create_device(CanimResult *result, GfxContainer *container,
00016                             const GfxInitInfo *info) {
00017   GfxDevice *dev = calloc(1, sizeof(GfxDevice));
00018   if (!dev) {
00019     *result = GFX_DEVICE_CALLOC_ERROR;
00020     return NULL;
00021   }
00022
00023   dev->headless = info->headless;
00024   dev->width = info->width;
00025   dev->height = info->height;
00026   dev->win = NULL;
00027   if (!info->headless) {
00028     dev->win = SDL_CreateWindow(
00029         "Canim Vulkan", SDL_WINDOWPOS_CENTERED, SDL_WINDOWPOS_CENTERED,
00030         info->width, info->height, SDL_WINDOW_VULKAN | SDL_WINDOW_SHOWN);
00031
00032     if (!dev->win) {
00033       free(dev);
00034       *result = SDL_WINDOW_CREATION_ERROR;
00035       return NULL;
00036     }
00037   }
00038   uint32_t extCount = 0;
00039   const char **extNames = NULL;
00040
00041   if (!info->headless) {
00042     if (!SDL_Vulkan_GetInstanceExtensions(dev->win, &extCount, NULL)) {
00043       SDL_DestroyWindow(dev->win);
00044       free(dev);
00045       *result = 0x03ffffff; /// @todo FIX
00046       return NULL;
00047     }
00048
00049     extNames = malloc(sizeof(char *) * extCount);
00050     if (!extNames) {
00051       SDL_DestroyWindow(dev->win);
00052       free(dev);
00053       *result = 0x03ffffff; /// @todo FIX
00054
00055       return NULL;
00056     }
00057
00058     SDL_Vulkan_GetInstanceExtensions(dev->win, &extCount, extNames);
00059   }
00060
00061   VkApplicationInfo app = {.sType = VK_STRUCTURE_TYPE_APPLICATION_INFO,
00062                            .pApplicationName = "Canim",
00063                            .applicationVersion = VK_MAKE_VERSION(1, 0, 0),
00064                            .pEngineName = "Canim",
00065                            .engineVersion = VK_MAKE_VERSION(1, 0, 0),
00066                            .apiVersion = VK_API_VERSION_1_3};
00067
00068   VkInstanceCreateInfo ci = {.sType = VK_STRUCTURE_TYPE_INSTANCE_CREATE_INFO,
00069                              .pApplicationInfo = &app,
00070                              .enabledLayerCount = 0,
00071                              .ppEnabledLayerNames = NULL,
00072                              .enabledExtensionCount = extCount,
00073                              .ppEnabledExtensionNames = extNames};
00074
00075   VkResult vkres = vkCreateInstance(&ci, NULL, &dev->inst);
00076
00077   free(extNames);
00078   if (vkres != VK_SUCCESS) {
00079     if (dev->win)
00080       SDL_DestroyWindow(dev->win);
00081     free(dev);
00082     *result = 0x03ffffff; /// @todo FIX
00083
00084     return NULL;
00085   }
00086
00087   *result = SUCCESS;
00088   return dev;
```

```
00089 }
```

7.19 src/loader/loader.c File Reference

```
#include "canim/loader.h"
#include "canim/core.h"
#include <stdio.h>
#include <stdlib.h>
```

Include dependency graph for loader.c:



Functions

- const char * gfx_backend_libname (GfxBackend backend)
- GfxContainer * gfx_load_backend (CanimResult *result, GfxBackend backend, const GfxInitInfo *info)

  This loads a backend and makes a graphics container.
- void gfx_unload_backend (CanimResult *result, GfxContainer *gfx)

  This unloads a backend.

7.19.1 Function Documentation

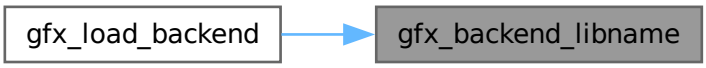
7.19.1.1 gfx_backend_libname()

```
const char * gfx_backend_libname (
            GfxBackend backend)
```

Definition at line 27 of file loader.c.

```
00027                                                 {
00028   switch (backend) {
00029   case CANIM_GFX_GL:
00030     return "libgl" LIB_EXT;
00031
00032   default:
00033     return NULL;
00034   }
00035 }
```

Here is the caller graph for this function:



7.19.1.2 gfx_load_backend()

```
GfxContainer * gfx_load_backend (
            CanimResult * result,
            GfxBackend backend,
            const GfxInitInfo * info)
```

This loads a backend and makes a graphics container.

Parameters

result	This is the result of the output
backend	This is the gfx api
info	The relevant info to create the container

Returns

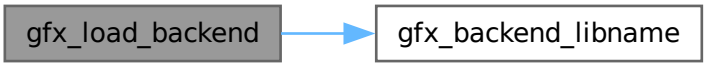
A gfx container

Definition at line 36 of file loader.c.

```
00037                                                         {
00038   const char *libname = gfx_backend_libname(backend);
00039   LIB_HANDLE handle = LIB_LOAD(libname);
00040   const GfxAPI *const *entry =
00041       (const GfxAPI *const *)LIB_SYM(handle, "GFX_API_ENTRY");
00042   GfxContainer *gfx = calloc(1, sizeof(*gfx));
00043   const GfxAPI *api = *entry;
00044   gfx->api = *api;
00045   gfx->impl = NULL;
00046   gfx->backend = backend;
00047   GfxDevice *dev = gfx->api.gfx_create_device(result, gfx, info);
00048   if (IS_AN_ERROR(*result)) {
00049     return NULL;
00050   }
00051   gfx->handle = (void *)handle;
00052   gfx->impl = dev;
00053   *result = SUCCESS;
```

```
00054   return gfx;
00055 }
```

Here is the call graph for this function:



7.19.1.3 gfx_unload_backend()

```
void gfx_unload_backend (
            CanimResult * result,
            GfxContainer * gfx)
```

This unloads a backend.

Parameters

result	This is the result of the output
gfx	This is the container

Definition at line 57 of file loader.c.

```
00057                                                                   {
00058   LIB_CLOSE((LIB_HANDLE)gfx->handle);
00059   *result = SUCCESS;
00060 }
```

7.20 loader.c

Go to the documentation of this file.

```
00001 // SPDX-License-Identifier: MIT
00002 #include "canim/loader.h"
00003 #include "canim/core.h"
00004 #include <stdio.h>
00005 #include <stdlib.h>
00006 #ifdef CANIM_PLATFORM_POSIX
00007 #include <dlfcn.h>
00008 #define LIB_HANDLE void *
00009 #define LIB_LOAD(name) dlopen(name, RTLD_NOW | RTLD_LOCAL)
00010 #define LIB_SYM(h, sym) dlsym(h, sym)
00011 #define LIB_CLOSE(h) dlclose(h)
00012 #endif
00013 #ifdef CANIM_PLATFORM_LINUX
00014 #define LIB_EXT ".so"
00015 #endif
00016 #ifdef CANIM_PLATFORM_MAC
00017 #define LIB_EXT ".dylib"
00018 #endif
00019 #ifdef CANIM_PLATFORM_WINDOWS
00020 #include <windows.h>
00021 #define LIB_HANDLE HMODULE
00022 #define LIB_LOAD(name) LoadLibraryA(name)
```

```
00023 #define LIB_SYM(h, sym) GetProcAddress(h, sym)
00024 #define LIB_CLOSE(h) FreeLibrary(h)
00025 #define LIB_EXT ".dll"
00026 #endif
00027 const char *gfx_backend_libname(GfxBackend backend) {
00028   switch (backend) {
00029   case CANIM_GFX_GL:
00030     return "libgl" LIB_EXT;
00031
00032   default:
00033     return NULL;
00034   }
00035 }
00036 GfxContainer *gfx_load_backend(CanimResult *result, GfxBackend backend,
00037                                const GfxInitInfo *info) {
00038   const char *libname = gfx_backend_libname(backend);
00039   LIB_HANDLE handle = LIB_LOAD(libname);
00040   const GfxAPI *const *entry =
00041       (const GfxAPI *const *)LIB_SYM(handle, "GFX_API_ENTRY");
00042   GfxContainer *gfx = calloc(1, sizeof(*gfx));
00043   const GfxAPI *api = *entry;
00044   gfx->api = *api;
00045   gfx->impl = NULL;
00046   gfx->backend = backend;
00047   GfxDevice *dev = gfx->api.gfx_create_device(result, gfx, info);
00048   if (IS_AN_ERROR(*result)) {
00049     return NULL;
00050   }
00051   gfx->handle = (void *)handle;
00052   gfx->impl = dev;
00053   *result = SUCCESS;
00054   return gfx;
00055 }
00056
00057 void gfx_unload_backend(CanimResult *result, GfxContainer *gfx) {
00058   LIB_CLOSE((LIB_HANDLE)gfx->handle);
00059   *result = SUCCESS;
00060 }
```

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