# libgenerics

Generated by Doxygen 1.8.11

# Contents

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## 1.1 Class List

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

# Chapter 2

# File Index

## 2.1 File List

Here is a list of all files with brief descriptions:

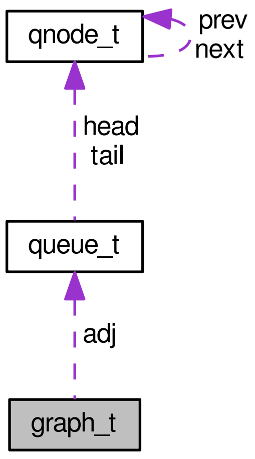
# Chapter 3

# Class Documentation

## 3.1 graph_t Struct Reference

```
#include <graph.h>
```

Collaboration diagram for graph_t:



### Public Attributes

- size_t V
- size_t E
- size_t member_size
- struct queue_t ∗ adj
- void ∗ label

### 3.1.1 Detailed Description

Graph structure and elements.

### 3.1.2 Member Data Documentation

#### 3.1.2.1 struct queue_t∗ graph_t::adj

#### 3.1.2.2 size_t graph_t::E

#### 3.1.2.3 void∗ graph_t::label

#### 3.1.2.4 size_t graph_t::member_size

#### 3.1.2.5 size_t graph_t::V

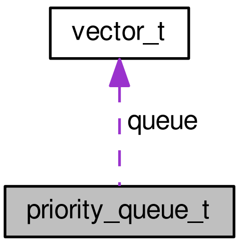
The documentation for this struct was generated from the following file:

- include/graph.h

## 3.2 priority_queue_t Struct Reference

```
#include <priority_queue.h>
```

Collaboration diagram for priority_queue_t:



### Public Attributes

- size_t size
- size_t member_size
- compare_function compare
- void ∗ compare_argument
- struct vector_t queue

### 3.2.1 Member Data Documentation

#### 3.2.1.1 compare_function priority_queue_t::compare

#### 3.2.1.2 void* priority_queue_t::compare_argument

#### 3.2.1.3 size_t priority_queue_t::member_size

#### 3.2.1.4 struct vector_t priority_queue_t::queue

#### 3.2.1.5 size_t priority_queue_t::size

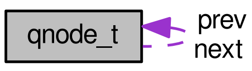
The documentation for this struct was generated from the following file:

- include/priority_queue.h

## 3.3 qnode_t Struct Reference

```
#include <queue.h>
```

Collaboration diagram for qnode_t:



### Public Attributes

- struct qnode_t ∗ next
- struct qnode_t ∗ prev
- void ∗ data

### 3.3.1 Detailed Description

queue node.

### 3.3.2 Member Data Documentation

#### 3.3.2.1 void∗ qnode_t::data

#### 3.3.2.2 struct qnode_t∗ qnode_t::next

#### 3.3.2.3 struct qnode_t∗ qnode_t::prev

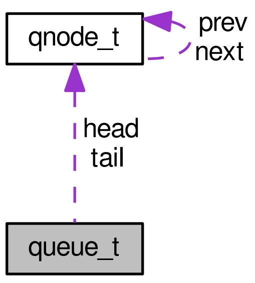
The documentation for this struct was generated from the following file:

- include/queue.h

## 3.4 queue_t Struct Reference

```
#include <queue.h>
```

Collaboration diagram for queue_t:



### Public Attributes

- size_t size
- size_t member_size
- struct qnode_t ∗ head
- struct qnode_t ∗ tail

### 3.4.1 Detailed Description

Represents a queue structure.

### 3.4.2 Member Data Documentation

#### 3.4.2.1 struct qnode_t∗ queue_t::head

#### 3.4.2.2 size_t queue_t::member_size

#### 3.4.2.3 size_t queue_t::size

#### 3.4.2.4 struct qnode_t∗ queue_t::tail

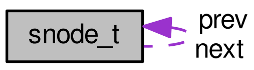
The documentation for this struct was generated from the following file:

- include/queue.h

## 3.5 snode_t Struct Reference

```
#include <stack.h>
```

Collaboration diagram for snode_t:



### Public Attributes

- struct snode_t ∗ next
- struct snode_t ∗ prev
- void ∗ data

### 3.5.1 Detailed Description

node of a stack

### 3.5.2 Member Data Documentation

#### 3.5.2.1 void∗ snode_t::data

#### 3.5.2.2 struct snode_t∗ snode_t::next

#### 3.5.2.3 struct snode_t∗ snode_t::prev

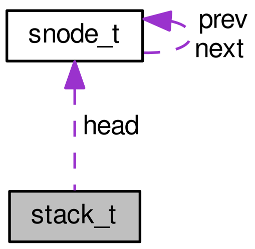
The documentation for this struct was generated from the following file:

- include/stack.h

## 3.6 stack_t Struct Reference

```
#include <stack.h>
```

Collaboration diagram for stack_t:



### Public Attributes

- size_t size
- size_t member_size
- struct snode_t ∗ head

### 3.6.1 Detailed Description

represents the stack structure.

### 3.6.2 Member Data Documentation

#### 3.6.2.1 struct snode_t∗ stack_t::head

#### 3.6.2.2 size_t stack_t::member_size

#### 3.6.2.3 size_t stack_t::size

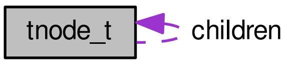
The documentation for this struct was generated from the following file:

- include/stack.h

## 3.7 tnode_t Struct Reference

```
#include <trie.h>
```

Collaboration diagram for tnode_t:



### Public Attributes

- void ∗ value
- struct tnode_t ∗ children [NBYTE]

### 3.7.1 Detailed Description

node of a trie_t element.

### 3.7.2 Member Data Documentation

#### 3.7.2.1 struct **tnode_t**∗ tnode_t::children[**NBYTE**]

#### 3.7.2.2 void∗ tnode_t::value

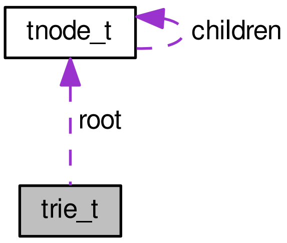
The documentation for this struct was generated from the following file:

- include/trie.h

## 3.8 trie_t Struct Reference

```
#include <trie.h>
```

Collaboration diagram for trie_t:



#### Public Attributes

- size_t size
- size_t member_size
- struct tnode_t root

### 3.8.1 Detailed Description

Represents the trie structure.

### 3.8.2 Member Data Documentation

#### 3.8.2.1 size_t trie_t::member_size

#### 3.8.2.2 struct tnode_t trie_t::root

#### 3.8.2.3 size_t trie_t::size

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

- include/trie.h

## 3.9 vector_t Struct Reference

```
#include <vector.h>
```

#### Public Attributes

- void ∗ data
- size_t size
- size_t buffer_size
- size_t member_size

### 3.9.1 Member Data Documentation

#### 3.9.1.1 size_t vector_t::buffer_size

#### 3.9.1.2 void∗ vector_t::data

#### 3.9.1.3 size_t vector_t::member_size

#### 3.9.1.4 size_t vector_t::size

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

- include/vector.h

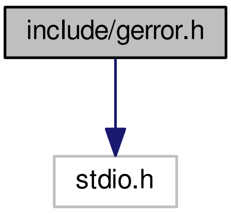
# Chapter 4

# File Documentation

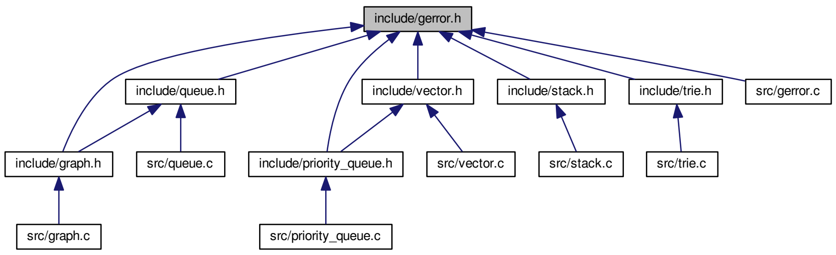
## 4.1 include/gerror.h File Reference

```
#include <stdio.h>
```

Include dependency graph for gerror.h:



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



### Typedefs

- typedef enum gerror_t gerror_t

## Enumerations

- enum gerror_t {
  GERROR_OK, GERROR_NULL_STRUCTURE, GERROR_NULL_HEAD, GERROR_NULL_NODE, GERROR_TRY_REMOVE_EMPTY_STRUCTURE, GERROR_TRY_ADD_EDGE_NO_VERTEX, GERR←
  OR_ACCESS_OUT_OF_BOUND, GERROR_N_ERROR }

## Functions

- char ∗ gerror_to_str (gerror_t g)

### 4.1.1 Typedef Documentation

#### 4.1.1.1 typedef enum **gerror_t gerror_t**

### 4.1.2 Enumeration Type Documentation

#### 4.1.2.1 enum **gerror_t**

Enumerator

***GERROR_OK***

***GERROR_NULL_STRUCTURE***

***GERROR_NULL_HEAD***

***GERROR_NULL_NODE***

***GERROR_TRY_REMOVE_EMPTY_STRUCTURE***

***GERROR_TRY_ADD_EDGE_NO_VERTEX***

***GERROR_ACCESS_OUT_OF_BOUND***

***GERROR_N_ERROR***

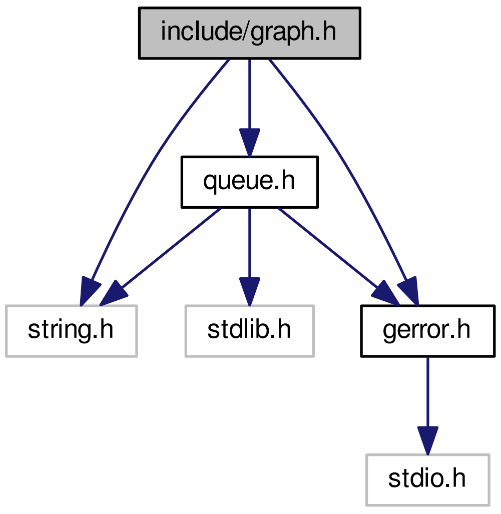
### 4.1.3 Function Documentation

#### 4.1.3.1 char∗ gerror_to_str ( **gerror_t** *g* )

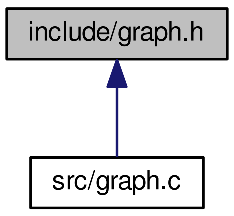
## 4.2 include/graph.h File Reference

```
#include <string.h>
#include "gerror.h"
#include "queue.h"
```

Include dependency graph for graph.h:



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



## Classes

- struct graph_t

## Typedefs

- typedef struct graph_t graph_t

## Functions

- gerror_t graph_create (graph_t ∗g, size_t size, size_t member_size)
- gerror_t graph_add_edge (graph_t ∗g, size_t from, size_t to)
- gerror_t graph_get_label_at (graph_t ∗g, size_t index, void ∗label)
- gerror_t graph_set_label_at (graph_t ∗g, size_t index, void ∗label)
- gerror_t graph_destroy (graph_t ∗g)

### 4.2.1 Typedef Documentation

#### 4.2.1.1 typedef struct **graph_t graph_t**

Graph structure and elements.

### 4.2.2 Function Documentation

#### 4.2.2.1 gerror_t graph_add_edge ( **graph_t** ∗ ***g,*** **size_t *from,*** **size_t *to*** )

Adds an edge on the graph `g` from the vertex `from` to the vertex `to`. Where `from` and `to` are indexes of these vertex.

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |
| *from* | index of the first vertex; |
| *to* | index of the incident vertex. |

**Returns**

GERROR_OK in case of success operation; GERROR_TRY_ADD_EDGE_NO_VERTEX in case that `from` or `to` not exists in the graph

#### 4.2.2.2 gerror_t graph_create ( **graph_t** ∗ ***g,*** **size_t *size,*** **size_t *member_size*** )

Creates a graph and populates the previous allocated structure pointed by `g`;

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |
| *member_size* | size of the elements that will be indexed by `g` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `g` is a NULL

#### 4.2.2.3 gerror_t graph_destroy ( graph_t ∗ *g* )

Deallocates the structures in `g`. This function WILL NOT deallocate the pointer `g`.

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `g` is a NULL

#### 4.2.2.4 gerror_t graph_get_label_at ( graph_t ∗ *g*, size_t *index*, void ∗ *label* )

Gets the label of the vertex in the `index` position of the graph `g`.

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |
| *index* | index of the vertex; |
| *label* | pointer to the memory allocated that will be write with the label in `index` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `g` is a NULL

#### 4.2.2.5 gerror_t graph_set_label_at ( graph_t ∗ *g*, size_t *index*, void ∗ *label* )

Sets the label at the `index` to `label`.

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |
| *index* | index of the vertex; |
| *label* | the new label of the vertex positioned in `index` |

**Returns**

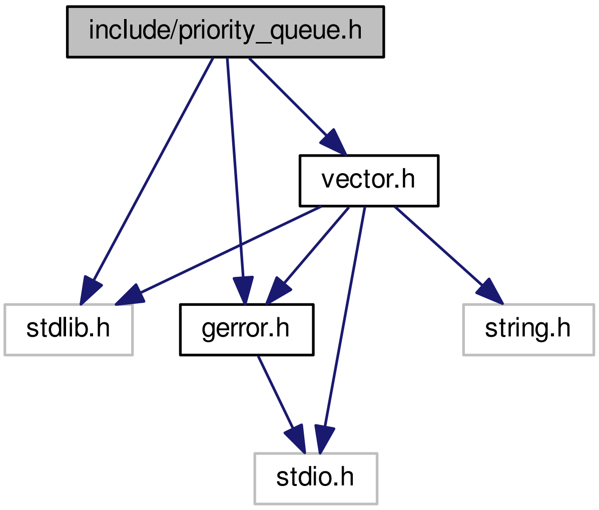
GERROR_OK in case of success operation; GERROR_ACCESS_OUT_OF_BOUND in case that `index` is out of bound

## 4.3 include/priority_queue.h File Reference

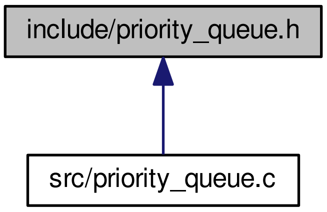
```
#include <stdlib.h>
```

```
#include "gerror.h"
#include "vector.h"
```

Include dependency graph for priority_queue.h:



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



## Classes

- struct priority_queue_t

## Typedefs

- typedef int(∗ compare_function) (void ∗a, void ∗b, void ∗arg)
- typedef struct priority_queue_t priority_queue_t
- typedef struct priority_queue_t pqueue_t

### Enumerations

- enum queue_priority_t { G_PQUEUE_FIRST_PRIORITY = -1, G_PQUEUE_EQUAL_PRIORITY, G_PQU←
  EUE_SECOND_PRIORITY }

### Functions

- gerror_t pqueue_create (pqueue_t ∗p, size_t member_size)
- gerror_t pqueue_destroy (pqueue_t ∗p)
- gerror_t pqueue_set_compare_function (pqueue_t ∗p, compare_function function, void ∗argument)
- gerror_t pqueue_add (pqueue_t ∗p, void ∗e)
- gerror_t pqueue_max_priority (pqueue_t ∗p, void ∗e)
- gerror_t pqueue_extract (pqueue_t ∗p, void ∗e)

## 4.3.1 Typedef Documentation

#### 4.3.1.1 typedef int(∗ compare_function) (void ∗a, void ∗b, void ∗arg)

#### 4.3.1.2 typedef struct **priority_queue_t pqueue_t**

#### 4.3.1.3 typedef struct **priority_queue_t priority_queue_t**

## 4.3.2 Enumeration Type Documentation

#### 4.3.2.1 enum **queue_priority_t**

**Enumerator**

***G_PQUEUE_FIRST_PRIORITY***

***G_PQUEUE_EQUAL_PRIORITY***

***G_PQUEUE_SECOND_PRIORITY***

## 4.3.3 Function Documentation

#### 4.3.3.1 gerror_t pqueue_add ( **pqueue_t** ∗ *p*, void ∗ *e* )

Adds an element in the queue and max heap the queue. TODO: A more datailed description of pqueue_add.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *e* | the element to be added |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.3.3.2 gerror_t pqueue_create ( pqueue_t * *p*, size_t *member_size* )

Populates the `p` structure and inicialize it. A priority queue needs a compare_function. The default function will only work for char, int and long. If you need a double or float you need to implement the compare function and set with the function `pqueue_set_compare_function`

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *member_size* | size in bytes of the indexed elements |
| *function* | comparison function callback that has the following prototype: int compare(void* a, void* b) the a and b are the arguments returns -1 if `a` has priority BIG than `B` returns 0 if `a` has priority EQUAL than `B` return 1 if `a` has priority LE |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `p` is a NULL

#### 4.3.3.3 gerror_t pqueue_destroy ( pqueue_t * *p* )

Destroy (i.e. desallocates) the `p` structure fields. TODO: A more datailed description of pqueue_destroy.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |

**Returns**

TODO

#### 4.3.3.4 gerror_t pqueue_extract ( pqueue_t * *p*, void * *e* )

Extracts the highest priority element in the queue and writes in `e` pointer.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *e* | pointer to previous allocated variable |

**Returns**

GERROR_OK in case of success operation; GERROR_ACESS_OUT_OF_BOUND in case the queue is empty GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.3.3.5 gerror_t pqueue_max_priority ( pqueue_t * *p*, void * *e* )

Returns and does not remove the highest priority of the queue. TODO: A more datailed description of pqueue_↩ max_priority.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *e* | pointer to previous allocated variable with `member_size` size that will receive a copy of the highest priority element of the queue. |

**Returns**

GERROR_OK in case of success operation; GERROR_ACESS_OUT_OF_BOUND in case the queue is empty GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.3.3.6 gerror_t pqueue_set_compare_function ( pqueue_t * *p*, compare_function *function*, void * *argument* )

Change the default comparison function of the priority queue `p` by `function` with the argument `argument`.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *function* | comparison function callback that has the following prototype: int compare(void* a, void* b) the a and b are the arguments returns -1 if `a` has priority BIG than `B` returns 0 if `a` has priority EQUAL than `B` return 1 if `a` has priority LE |
| *argument* | allocated pqueue_t struct |

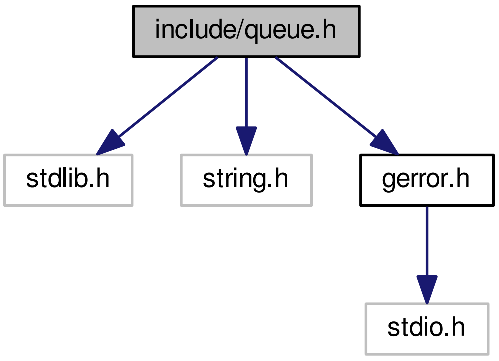
**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

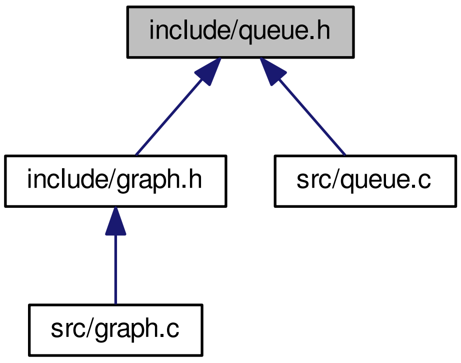
## 4.4 include/queue.h File Reference

```
#include <stdlib.h>
#include <string.h>
#include "gerror.h"
```

Include dependency graph for queue.h:



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



## Classes

- struct qnode_t
- struct queue_t

## Typedefs

- typedef struct qnode_t qnode_t
- typedef struct queue_t queue_t

## Functions

- gerror_t queue_create (struct queue_t ∗q, size_t member_size)
- gerror_t queue_enqueue (struct queue_t ∗q, void ∗e)
- gerror_t queue_dequeue (struct queue_t ∗q, void ∗e)
- gerror_t queue_destroy (struct queue_t ∗q)
- gerror_t queue_remove (struct queue_t ∗q, struct qnode_t ∗node, void ∗e)

## 4.4.1 Typedef Documentation

### 4.4.1.1 typedef struct qnode_t qnode_t

queue node.

### 4.4.1.2 typedef struct queue_t queue_t

Represents a queue structure.

## 4.4.2 Function Documentation

### 4.4.2.1 gerror_t queue_create ( struct queue_t ∗ *q*, size_t *member_size* )

Creates a queue and populates the previous allocated structure pointed by `q`;

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *member_size* | size of the elements that will be indexed by `q` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer

### 4.4.2.2 gerror_t queue_dequeue ( struct queue_t ∗ *q*, void ∗ *e* )

Dequeues the first element of the queue `q`

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *e* | pointer to the previous allocated element memory that will be write with de dequeued element. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_HEAD in case that the head `q->head` is a null pointer. GERROR_NULL_STRUCURE in case `q` is a NULL pointer GERROR_TRY_REMOVE_EMPT↩ Y_STRUCTURE in case that `q` has no element.

#### 4.4.2.3 gerror_t queue_destroy ( struct queue_t ∗ *q* )

Deallocate the nodes of the queue q. This function WILL NOT deallocate the pointer q.

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer

#### 4.4.2.4 gerror_t queue_enqueue ( struct queue_t ∗ *q,* void ∗ *e* )

Enqueues the element pointed by `e` in the queue `q`.

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *e* | pointer to the element that will be indexed by q. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer

#### 4.4.2.5 gerror_t queue_remove ( struct queue_t ∗ *q,* struct qnode_t ∗ *node,* void ∗ *e* )

Removes the element `node` of the queue `q`.

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *node* | element to be removed from the queue |
| *e* | pointer to the memory that will be write with the removed element |

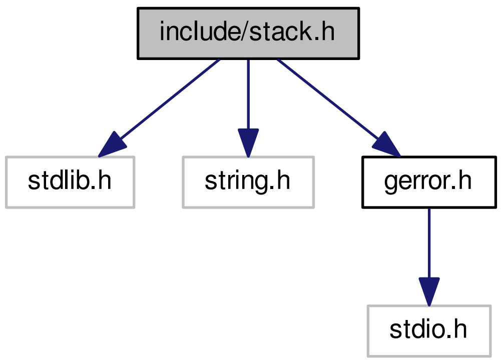
**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer GE↩ RROR_NULL_NODE in case `node` is NULL; GERROR_TRY_REMOVE_EMPTY_STRUCTURE in case that `q` has no element.

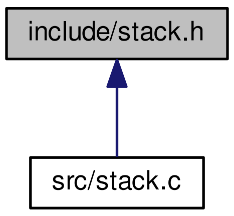
## 4.5 include/stack.h File Reference

```
#include <stdlib.h>
#include <string.h>
#include "gerror.h"
```

Include dependency graph for stack.h:



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



### Classes

- struct snode_t
- struct stack_t

### Typedefs

- typedef struct snode_t snode_t
- typedef struct stack_t stack_t

## Functions

- gerror_t stack_create (struct stack_t ∗q, size_t member_size)
- gerror_t stack_push (struct stack_t ∗q, void ∗e)
- gerror_t stack_pop (struct stack_t ∗q, void ∗e)
- gerror_t stack_destroy (struct stack_t ∗q)

### 4.5.1 Typedef Documentation

#### 4.5.1.1 typedef struct **snode_t snode_t**

node of a stack

#### 4.5.1.2 typedef struct **stack_t stack_t**

represents the stack structure.

### 4.5.2 Function Documentation

#### 4.5.2.1 gerror_t stack_create ( struct **stack_t** ∗ ***s***, size_t ***member_size*** )

Creates a stack and populates the previous allocated structure pointed by `s`;

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |
| *member_size* | size of the elements that will be indexed by `s` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_ELEMENT in case that `e` is empty.

#### 4.5.2.2 gerror_t stack_destroy ( struct **stack_t** ∗ ***s*** )

Deallocates the nodes of the structure pointed by `s`. This function WILL NOT deallocate the pointer `q`.

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `s` is a NULL

#### 4.5.2.3 gerror_t stack_pop ( struct stack_t ∗ *s*, void ∗ *e* )

Pops the first element of the stack `s`.

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |
| *e* | pointer to the previous allocated element |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `s` is a NULL GERRO↩ R_NULL_HEAD in case that the head `s->head` GERROR_TRY_REMOVE_EMPTY_STRUCTURE in case that `s` is empty

#### 4.5.2.4 gerror_t stack_push ( struct stack_t ∗ *s*, void ∗ *e* )

Add the element `e` in the beginning of the stack `s`.

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |
| *e* | pointer to the element that will be indexed by s. |

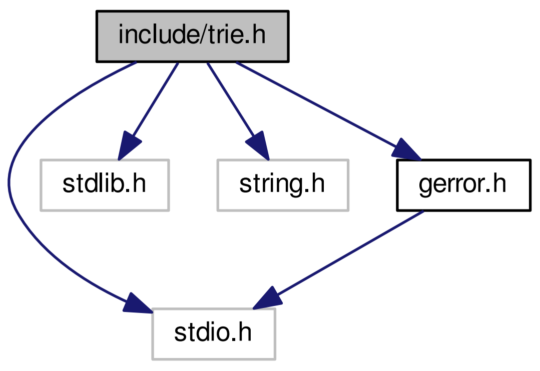
**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `s` is a NULL

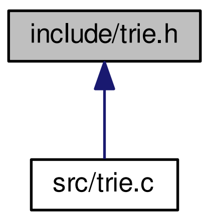
## 4.6 include/trie.h File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "gerror.h"
```

Include dependency graph for trie.h:



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



## Classes

- struct tnode_t
- struct trie_t

## Macros

- #define NBYTE (0x100)

## Typedefs

- typedef struct tnode_t tnode_t
- typedef struct trie_t trie_t

## Functions

- gerror_t trie_create (struct trie_t ∗t, size_t member_size)
- gerror_t trie_destroy (struct trie_t ∗t)
- gerror_t trie_add_element (struct trie_t ∗t, void ∗string, size_t size, void ∗elem)
- gerror_t trie_remove_element (struct trie_t ∗t, void ∗string, size_t size)
- gerror_t trie_get_element (struct trie_t ∗t, void ∗string, size_t size, void ∗elem)
- gerror_t trie_set_element (struct trie_t ∗t, void ∗string, size_t size, void ∗elem)
- tnode_t ∗ trie_get_node_or_allocate (struct trie_t ∗t, void ∗string, size_t size)

## 4.6.1 Macro Definition Documentation

### 4.6.1.1 #define NBYTE (0x100)

## 4.6.2 Typedef Documentation

### 4.6.2.1 typedef struct tnode_t tnode_t

node of a trie_t element.

### 4.6.2.2 typedef struct trie_t trie_t

Represents the trie structure.

## 4.6.3 Function Documentation

### 4.6.3.1 gerror_t trie_add_element ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size*, void ∗ *elem* )

Adds the `elem` and maps it with the `string` with size `size`. This function overwrite any data left in the trie mapped with string.

**Parameters**

| | |
|---|---|
| *t* | pointer to the trie structure; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes |
| *elem* | pointer to the element to add |

### 4.6.3.2 gerror_t trie_create ( struct trie_t ∗ *t*, size_t *member_size* )

Inicialize structure `t` with `member_size` size. The t has to be allocated.

**Parameters**

| | |
|---|---|
| *t* | pointer to the allocated struct trie_t; |
| *member_size* | size in bytes of the indexed elements by the trie. |

#### 4.6.3.3 gerror_t trie_destroy ( struct trie_t ∗ *t* )

Destroy the members pointed by `t`. The structure is not freed.

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.6.3.4 gerror_t trie_get_element ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size*, void ∗ *elem* )

Returns the element mapped by `string`. If the map does not exist, returns NULL.

**Parameters**

| | |
|---|---|
| *t* | pointer to the structure; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes. |
| *elem* | pointer to the memory allocated that will be write with the elem mapped by `string` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.6.3.5 tnode_t∗ trie_get_node_or_allocate ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size* )

#### 4.6.3.6 gerror_t trie_remove_element ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size* )

Removes the element mapped by `string`.

**Parameters**

| | |
|---|---|
| *t* | pointer to the structure trie_t; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL GERROR↩
_OUT_OF_BOUND the `elem` does not exist in `string map`

#### 4.6.3.7 gerror_t trie_set_element ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size*, void ∗ *elem* )

Sets the value mapped by `string`. Encapsulates the remove and add functions.

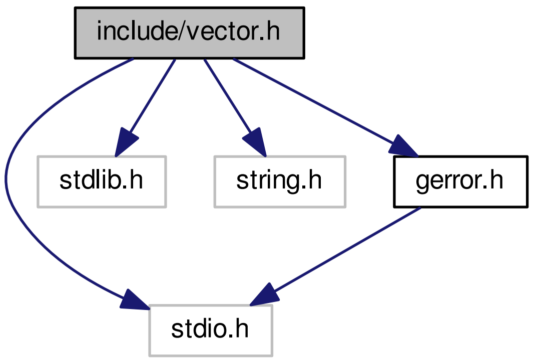
**Parameters**

| | |
|---|---|
| *t* | pointer to the structure; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes. |
| *elem* | pointer to the element to add |

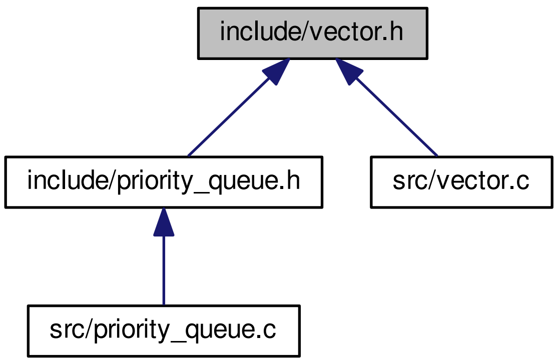
## 4.7 include/vector.h File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "gerror.h"
```

Include dependency graph for vector.h:



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



## Classes

- struct vector_t

## Typedefs

- typedef struct vector_t vector_t

## Functions

- gerror_t vector_create (vector_t ∗v, size_t initial_size, size_t member_size)
- gerror_t vector_destroy (vector_t ∗v)
- gerror_t vector_resize_buffer (vector_t ∗v, size_t new_size)
- gerror_t vector_at (vector_t ∗v, size_t index, void ∗elem)
- void ∗ vector_ptr_at (vector_t ∗v, size_t index)
- gerror_t vector_set_elem_at (vector_t ∗v, size_t index, void ∗elem)
- gerror_t vector_add (vector_t ∗v, void ∗elem)
- void vector_set_min_buf_siz (size_t new_min_buf_size)
- size_t vector_get_min_buf_siz (void)

## 4.7.1 Typedef Documentation

### 4.7.1.1 typedef struct vector_t vector_t

## 4.7.2 Function Documentation

### 4.7.2.1 gerror_t vector_add ( vector_t ∗ *v*, void ∗ *elem* )

adds the `elem` in the structure `vector_t` pointed by `v`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` |
| *elem* | the element to be add in `v` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCTURE in case `v` is a NULL pointer

### 4.7.2.2 gerror_t vector_at ( vector_t ∗ *v*, size_t *index*, void ∗ *elem* )

Get the element in the `index` position indexed by the `vector_t` structure pointed by `v`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` |
| *index* | index of the position |
| *elem* | pointer to a previous allocated memory that will receive the element |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `v` is a NULL pointer

#### 4.7.2.3 gerror_t vector_create ( vector_t ∗ *v*, size_t *initial_buf_siz*, size_t *member_size* )

Populate the `vetor_t` structure pointed by `v` and allocates `member_size*initial_size` for initial buffer←_size.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` structure already allocated; |
| *inicial_buf_size* | number of the members of the initial allocated buffer; |
| *member_size* | size of every member indexed by `v`. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `v` is a NULL pointer

#### 4.7.2.4 gerror_t vector_destroy ( vector_t ∗ *v* )

Destroy the structure `vector_t` pointed by `v`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` structure |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `v` is a NULL pointer

#### 4.7.2.5 size_t vector_get_min_buf_siz ( void )

Returns the `vector_min_siz`: a private variable that holds the minimal number of elements that `vector_t` will index. This variable is important for avoid multiple small resizes in the `vector_t` container.

**Returns**

vector_min_siz

#### 4.7.2.6 void∗ vector_ptr_at ( vector_t ∗ *v*, size_t *index* )

Calculate the pointer at `index` position.

**Parameters**

| | |
|---|---|
| *v* | a pointer to vector_t |
| *index* | index of the pointer |

**Returns**

a pointer to the `index` element NULL in case of out of bound

#### 4.7.2.7 gerror_t vector_resize_buffer ( vector_t ∗ *v*, size_t *n_elements* )

Resize the buffer in the vector_t strucuture pointed by `v`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to vector_t structure. |
| *new_size* | the new size of the `v` |

#### 4.7.2.8 gerror_t vector_set_elem_at ( vector_t ∗ *v*, size_t *index*, void ∗ *elem* )

set the element at `index` pointed by `v` with the element pointed by `elem`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to vector_t |
| *index* | index of the position |
| *elem* | the element to be set in `v` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `v` is a NULL pointer

#### 4.7.2.9 void vector_set_min_buf_siz ( size_t *new_min_buf_siz* )

Set the `vector_min_siz`: a private variable that holds the minimal number of elements that vector_t will index. This variable is important for avoid multiple small resizes in the vector_t container.

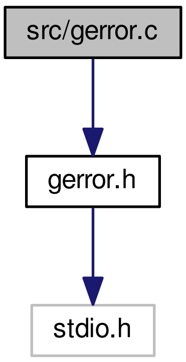
**Parameters**

| | |
|---|---|
| *new_min_buf_siz* | the new size of `vector_min_siz` |

## 4.8 src/gerror.c File Reference

```
#include "gerror.h"
```

Include dependency graph for gerror.c:



### Functions

- char ∗ gerror_to_str (gerror_t g)

### Variables

- char ∗ gerror_to_string [GERROR_N_ERROR]

### 4.8.1 Function Documentation

#### 4.8.1.1 char∗ gerror_to_str ( gerror_t *g* )

### 4.8.2 Variable Documentation

#### 4.8.2.1 char∗ gerror_to_string[GERROR_N_ERROR]

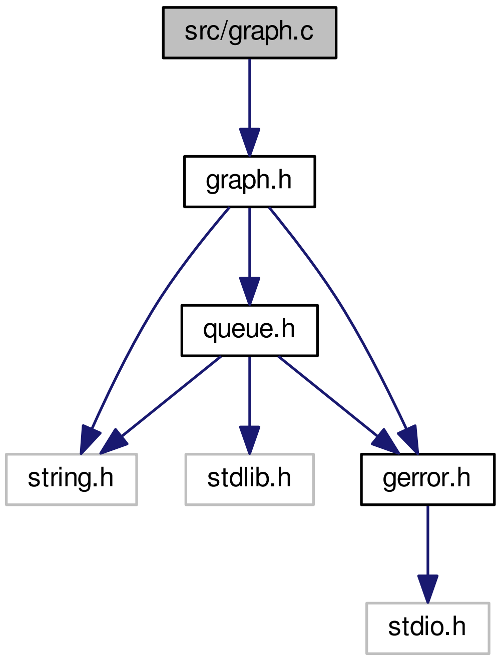
**Initial value:**

```
= {
    "Success",
    "Null pointer to structure",
    "Null pointer to the head of structure",
    "Null pointer to the node",
    "Attempt to remove an element but the structure is empty",
    "Attempt to add a edge with inexistent vertex",
    "Attempt to access a position out of the container or buffer",
}
```

## 4.9 src/graph.c File Reference

```
#include "graph.h"
```

Include dependency graph for graph.c:



### Functions

- gerror_t graph_create (graph_t ∗g, size_t size, size_t member_size)
- gerror_t graph_add_edge (graph_t ∗g, size_t from, size_t to)
- gerror_t graph_get_label_at (graph_t ∗g, size_t index, void ∗label)
- gerror_t graph_set_label_at (graph_t ∗g, size_t index, void ∗label)
- gerror_t graph_destroy (graph_t ∗g)

### 4.9.1 Function Documentation

#### 4.9.1.1 gerror_t graph_add_edge ( graph_t ∗ *g*, size_t *from*, size_t *to* )

Adds an edge on the graph `g` from the vertex `from` to the vertex `to`. Where `from` and `to` are indexes of these vertex.

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |
| *from* | index of the first vertex; |
| *to* | index of the incident vertex. |

**Returns**

GERROR_OK in case of success operation; GERROR_TRY_ADD_EDGE_NO_VERTEX in case that `from` or `to` not exists in the graph

#### 4.9.1.2 gerror_t graph_create ( graph_t * *g*, size_t *size*, size_t *member_size* )

Creates a graph and populates the previous allocated structure pointed by `g`;

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |
| *member_size* | size of the elements that will be indexed by `g` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `g` is a NULL

#### 4.9.1.3 gerror_t graph_destroy ( graph_t * *g* )

Deallocates the structures in `g`. This function WILL NOT deallocate the pointer `g`.

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `g` is a NULL

#### 4.9.1.4 gerror_t graph_get_label_at ( graph_t * *g*, size_t *index*, void * *label* )

Gets the label of the vertex in the `index` position of the graph `g`.

**Parameters**

| | |
|---|---|
| *g* | pointer to a graph structure; |
| *index* | index of the vertex; |
| *label* | pointer to the memory allocated that will be write with the label in `index` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `g` is a NULL

#### 4.9.1.5 gerror_t graph_set_label_at ( graph_t * *g,* size_t *index,* void * *label* )

Sets the label at the `index` to `label`.

**Parameters**

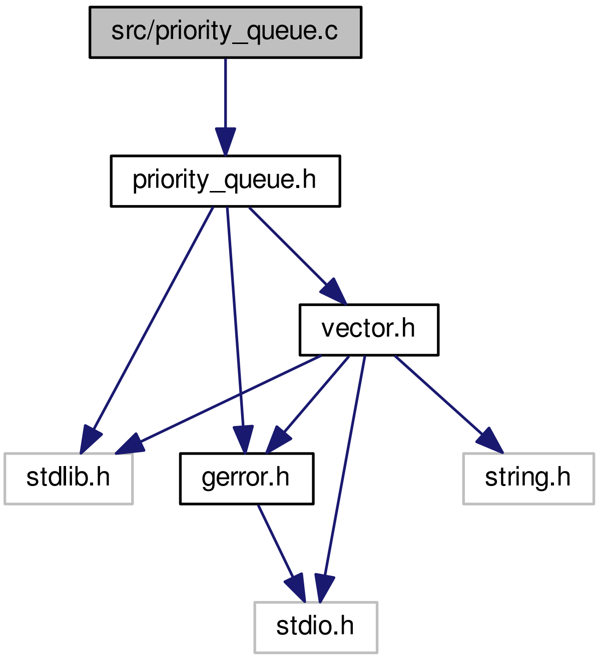
| | |
|---|---|
| *g* | pointer to a graph structure; |
| *index* | index of the vertex; |
| *label* | the new label of the vertex positioned in `index` |

**Returns**

GERROR_OK in case of success operation; GERROR_ACCESS_OUT_OF_BOUND in case that `index` is out of bound

## 4.10 src/priority_queue.c File Reference

`#include "priority_queue.h"`
Include dependency graph for priority_queue.c:



### Macros

- #define PARENT(i) ((i-1)/2)
- #define LEFT(i) (((i+1)*2)-1)
- #define RIGHT(i) (LEFT(i)+1)

### Functions

- void nswap (void ∗a, void ∗b, size_t n)
- int default_compare_function (void ∗a, void ∗b, void ∗arg)
- void max_heapify (pqueue_t ∗p, size_t i)
- gerror_t pqueue_create (pqueue_t ∗p, size_t member_size)
- gerror_t pqueue_destroy (pqueue_t ∗p)
- gerror_t pqueue_set_compare_function (pqueue_t ∗p, compare_function function, void ∗argument)
- gerror_t pqueue_add (pqueue_t ∗p, void ∗e)
- gerror_t pqueue_max_priority (pqueue_t ∗p, void ∗e)
- gerror_t pqueue_extract (pqueue_t ∗p, void ∗e)

## 4.10.1 Macro Definition Documentation

#### 4.10.1.1 #define LEFT( *i* ) (((i+1)∗2)-1)

#### 4.10.1.2 #define PARENT( *i* ) ((i-1)/2)

#### 4.10.1.3 #define RIGHT( *i* ) (LEFT(i)+1)

## 4.10.2 Function Documentation

#### 4.10.2.1 int default_compare_function ( void ∗ *a*, void ∗ *b*, void ∗ *arg* )

#### 4.10.2.2 void max_heapify ( pqueue_t ∗ *p*, size_t *i* )

#### 4.10.2.3 void nswap ( void ∗ *a*, void ∗ *b*, size_t *n* )

#### 4.10.2.4 gerror_t pqueue_add ( pqueue_t ∗ *p*, void ∗ *e* )

Adds an element in the queue and max heap the queue. TODO: A more datailed description of pqueue_add.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *e* | the element to be added |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.10.2.5 gerror_t pqueue_create ( pqueue_t ∗ *p*, size_t *member_size* )

Populates the `p` structure and inicialize it. A priority queue needs a compare_function. The default function will only work for char, int and long. If you need a double or float you need to implement the compare function and set with the function `pqueue_set_compare_function`

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *member_size* | size in bytes of the indexed elements |
| *function* | comparison function callback that has the following prototype: int compare(void∗ a, void∗ b) the a and b are the arguments returns -1 if `a` has priority BIG than `B` returns 0 if `a` has priority EQUAL than `B` return 1 if `a` has priority LE |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `p` is a NULL

#### 4.10.2.6 gerror_t pqueue_destroy ( pqueue_t ∗ *p* )

Destroy (i.e. desallocates) the `p` structure fields. TODO: A more datailed description of pqueue_destroy.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |

**Returns**

TODO

#### 4.10.2.7 gerror_t pqueue_extract ( pqueue_t ∗ *p*, void ∗ *e* )

Extracts the highest priority element in the queue and writes in `e` pointer.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *e* | pointer to previous allocated variable |

**Returns**

GERROR_OK in case of success operation; GERROR_ACESS_OUT_OF_BOUND in case the queue is empty GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.10.2.8 gerror_t pqueue_max_priority ( pqueue_t ∗ *p*, void ∗ *e* )

Returns and does not remove the highest priority of the queue. TODO: A more datailed description of pqueue_↩ max_priority.

**Parameters**

| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| ~~*e*~~ | ~~pointer to previous allocated variable with `member_size` size that will receive a copy of the highest priority~~ element of the queue. |

**Returns**

GERROR_OK in case of success operation; GERROR_ACESS_OUT_OF_BOUND in case the queue is empty GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.10.2.9 gerror_t pqueue_set_compare_function ( pqueue_t ∗ *p*, compare_function *function*, void ∗ *argument* )

Change the default comparison function of the priority queue `p` by `function` with the argument `argument`.

**Parameters**

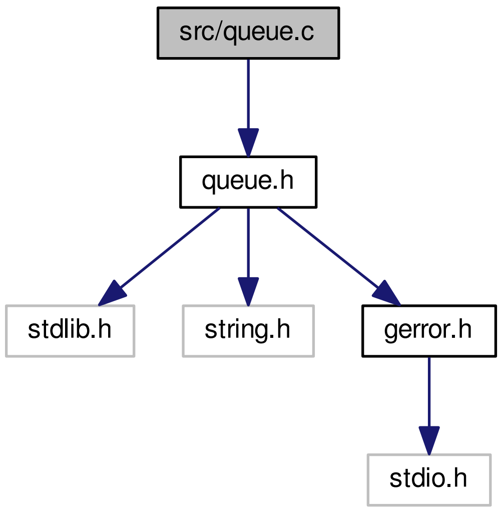
| | |
|---|---|
| *p* | previous allocated pqueue_t struct |
| *function* | comparison function callback that has the following prototype: int compare(void∗ a, void∗ b) the a and b are the arguments returns -1 if `a` has priority BIG than `B` returns 0 if `a` has priority EQUAL than `B` return 1 if `a` has priority LE |
| *argument* | allocated pqueue_t struct |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

## 4.11 src/queue.c File Reference

`#include "queue.h"`
Include dependency graph for queue.c:



## Functions

- gerror_t queue_create (struct queue_t ∗q, size_t member_size)
- gerror_t queue_enqueue (struct queue_t ∗q, void ∗e)
- gerror_t queue_dequeue (struct queue_t ∗q, void ∗e)
- gerror_t queue_remove (struct queue_t ∗q, struct qnode_t ∗node, void ∗e)
- gerror_t queue_destroy (struct queue_t ∗q)

### 4.11.1 Function Documentation

#### 4.11.1.1 gerror_t queue_create ( struct queue_t ∗ *q*, size_t *member_size* )

Creates a queue and populates the previous allocated structure pointed by `q`;

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *member_size* | size of the elements that will be indexed by `q` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer

#### 4.11.1.2 gerror_t queue_dequeue ( struct queue_t ∗ *q*, void ∗ *e* )

Dequeues the first element of the queue `q`

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *e* | pointer to the previous allocated element memory that will be write with de dequeued element. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_HEAD in case that the head `q->head` is a null pointer. GERROR_NULL_STRUCURE in case `q` is a NULL pointer GERROR_TRY_REMOVE_EMPT↩ Y_STRUCTURE in case that `q` has no element.

#### 4.11.1.3 gerror_t queue_destroy ( struct queue_t ∗ *q* )

Deallocate the nodes of the queue q. This function WILL NOT deallocate the pointer q.

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer

#### 4.11.1.4 gerror_t queue_enqueue ( struct queue_t ∗ *q*, void ∗ *e* )

Enqueues the element pointed by `e` in the queue `q`.

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *e* | pointer to the element that will be indexed by q. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer

#### 4.11.1.5 gerror_t queue_remove ( struct queue_t ∗ *q*, struct qnode_t ∗ *node*, void ∗ *e* )

Removes the element `node` of the queue `q`.

**Parameters**

| | |
|---|---|
| *q* | pointer to a queue structure; |
| *node* | element to be removed from the queue |
| *e* | pointer to the memory that will be write with the removed element |

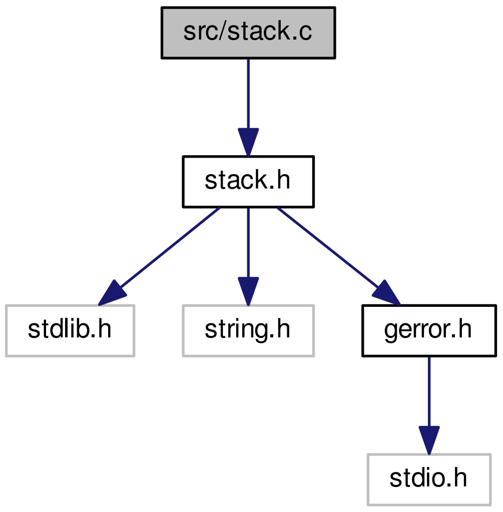
**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `q` is a NULL pointer GE↩
RROR_NULL_NODE in case `node` is NULL; GERROR_TRY_REMOVE_EMPTY_STRUCTURE in case that `q` has no element.

## 4.12 src/stack.c File Reference

```
#include "stack.h"
```

Include dependency graph for stack.c:



## Functions

- gerror_t stack_create (struct stack_t ∗s, size_t member_size)
- gerror_t stack_push (struct stack_t ∗s, void ∗e)
- gerror_t stack_pop (struct stack_t ∗s, void ∗e)
- gerror_t stack_destroy (struct stack_t ∗s)

## 4.12.1 Function Documentation

### 4.12.1.1 gerror_t stack_create ( struct stack_t ∗ *s*, size_t *member_size* )

Creates a stack and populates the previous allocated structure pointed by `s`;

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |
| *member_size* | size of the elements that will be indexed by `s` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_ELEMENT in case that `e` is empty.

### 4.12.1.2 gerror_t stack_destroy ( struct stack_t ∗ *s* )

Deallocates the nodes of the structure pointed by `s`. This function WILL NOT deallocate the pointer `q`.

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `s` is a NULL

#### 4.12.1.3 gerror_t stack_pop ( struct stack_t ∗ *s*, void ∗ *e* )

Pops the first element of the stack `s`.

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |
| *e* | pointer to the previous allocated element |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `s` is a NULL GERRO↩
R_NULL_HEAD in case that the head `s->head` GERROR_TRY_REMOVE_EMPTY_STRUCTURE in case that `s` is empty

#### 4.12.1.4 gerror_t stack_push ( struct stack_t ∗ *s*, void ∗ *e* )

Add the element `e` in the beginning of the stack `s`.

**Parameters**

| | |
|---|---|
| *s* | pointer to a stack structure; |
| *e* | pointer to the element that will be indexed by s. |

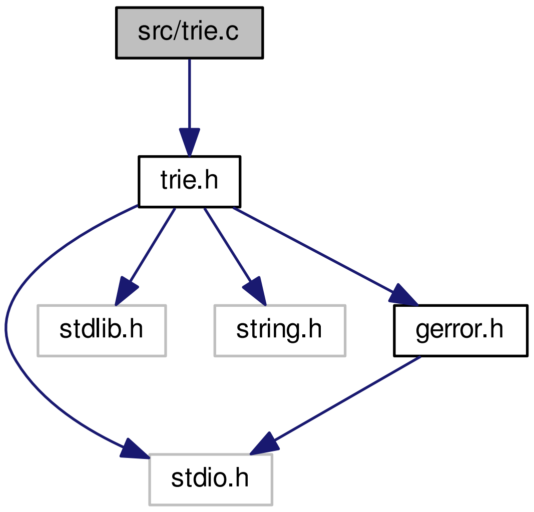
**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `s` is a NULL

## 4.13 src/trie.c File Reference

```
#include "trie.h"
```

Include dependency graph for trie.c:



## Functions

- tnode_t ∗ trie_get_node_or_allocate (struct trie_t ∗t, void ∗string, size_t size)
- tnode_t ∗ node_at (struct trie_t ∗t, void ∗string, size_t size)
- gerror_t trie_create (struct trie_t ∗t, size_t member_size)
- void trie_destroy_tnode (struct tnode_t ∗node)
- gerror_t trie_destroy (struct trie_t ∗t)
- gerror_t trie_add_element (struct trie_t ∗t, void ∗string, size_t size, void ∗elem)
- gerror_t trie_remove_element (struct trie_t ∗t, void ∗string, size_t size)
- gerror_t trie_get_element (struct trie_t ∗t, void ∗string, size_t size, void ∗elem)
- gerror_t trie_set_element (struct trie_t ∗t, void ∗string, size_t size, void ∗elem)

### 4.13.1 Function Documentation

#### 4.13.1.1 tnode_t∗ node_at ( struct trie_t ∗ *t,* void ∗ *string,* size_t *size* )

#### 4.13.1.2 gerror_t trie_add_element ( struct trie_t ∗ *t,* void ∗ *string,* size_t *size,* void ∗ *elem* )

Adds the `elem` and maps it with the `string` with size `size`. This function overwrite any data left in the trie mapped with string.

**Parameters**

| | |
|---|---|
| *t* | pointer to the trie structure; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes |
| *elem* | pointer to the element to add |

#### 4.13.1.3 gerror_t trie_create ( struct trie_t ∗ *t*, size_t *member_size* )

Inicialize structure `t` with `member_size` size. The t has to be allocated.

**Parameters**

| | |
|---|---|
| *t* | pointer to the allocated struct trie_t; |
| *member_size* | size in bytes of the indexed elements by the trie. |

#### 4.13.1.4 gerror_t trie_destroy ( struct trie_t ∗ *t* )

Destroy the members pointed by `t`. The structure is not freed.

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.13.1.5 void trie_destroy_tnode ( struct tnode_t ∗ *node* )

#### 4.13.1.6 gerror_t trie_get_element ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size*, void ∗ *elem* )

Returns the element mapped by `string`. If the map does not exist, returns NULL.

**Parameters**

| | |
|---|---|
| *t* | pointer to the structure; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes. |
| *elem* | pointer to the memory allocated that will be write with the elem mapped by `string` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL

#### 4.13.1.7 tnode_t∗ trie_get_node_or_allocate ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size* )

#### 4.13.1.8 gerror_t trie_remove_element ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size* )

Removes the element mapped by `string`.

**Parameters**

| | |
|---|---|
| *t* | pointer to the structure trie_t; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `t` is a NULL GERROR↩
_OUT_OF_BOUND the `elem` does not exist in `string map`

#### 4.13.1.9 gerror_t trie_set_element ( struct trie_t ∗ *t*, void ∗ *string*, size_t *size*, void ∗ *elem* )

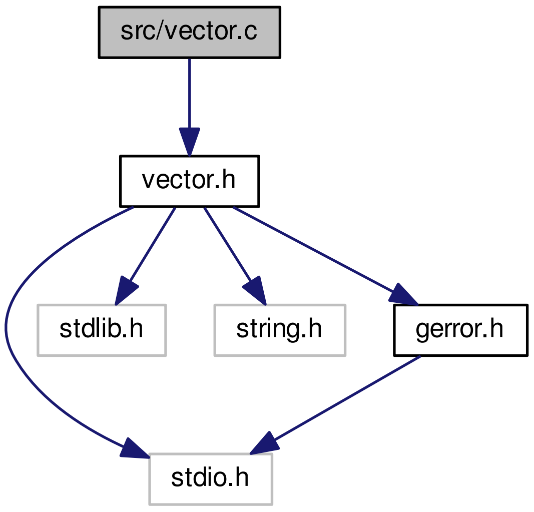
Sets the value mapped by `string`. Encapsulates the remove and add functions.

**Parameters**

| | |
|---|---|
| *t* | pointer to the structure; |
| *string* | pointer to the string of bytes to map elem; |
| *size* | size of the string of bytes. |
| *elem* | pointer to the element to add |

## 4.14 src/vector.c File Reference

```
#include "vector.h"
```
Include dependency graph for vector.c:



### Macros

- #define VECTOR_MIN_SIZ 8

## Functions

- gerror_t vector_create (vector_t ∗v, size_t initial_buf_siz, size_t member_size)
- gerror_t vector_destroy (vector_t ∗v)
- size_t vector_get_min_buf_siz (void)
- void vector_set_min_buf_siz (size_t new_min_buf_siz)
- gerror_t vector_resize_buffer (vector_t ∗v, size_t n_elements)
- gerror_t vector_at (vector_t ∗v, size_t index, void ∗elem)
- gerror_t vector_set_elem_at (vector_t ∗v, size_t index, void ∗elem)
- gerror_t vector_add (vector_t ∗v, void ∗elem)
- void ∗ vector_ptr_at (vector_t ∗v, size_t index)

## Variables

- size_t vector_min_siz = VECTOR_MIN_SIZ

### 4.14.1 Macro Definition Documentation

#### 4.14.1.1 #define VECTOR_MIN_SIZ 8

### 4.14.2 Function Documentation

#### 4.14.2.1 gerror_t vector_add ( vector_t ∗ *v*, void ∗ *elem* )

adds the `elem` in the structure `vector_t` pointed by `v`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` |
| *elem* | the element to be add in `v` |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCTURE in case `v` is a NULL pointer

#### 4.14.2.2 gerror_t vector_at ( vector_t ∗ *v*, size_t *index*, void ∗ *elem* )

Get the element in the `index` position indexed by the `vector_t` structure pointed by `v`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` |
| *index* | index of the position |
| *elem* | pointer to a previous allocated memory that will receive the element |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `v` is a NULL pointer

#### 4.14.2.3 gerror_t vector_create ( vector_t ∗ *v*, size_t *initial_buf_siz*, size_t *member_size* )

Populate the `vetor_t` structure pointed by `v` and allocates `member_size*initial_size` for initial buffer←_size.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` structure already allocated; |
| *inicial_buf_size* | number of the members of the initial allocated buffer; |
| *member_size* | size of every member indexed by `v`. |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `v` is a NULL pointer

#### 4.14.2.4 gerror_t vector_destroy ( vector_t ∗ *v* )

Destroy the structure `vector_t` pointed by `v`.

**Parameters**

| | |
|---|---|
| *v* | a pointer to `vector_t` structure |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case `v` is a NULL pointer

#### 4.14.2.5 size_t vector_get_min_buf_siz ( void )

Returns the `vector_min_siz`: a private variable that holds the minimal number of elements that `vector_t` will index. This variable is important for avoid multiple small resizes in the `vector_t` container.

**Returns**

vector_min_siz

#### 4.14.2.6 void∗ vector_ptr_at ( vector_t ∗ *v*, size_t *index* )

Calculate the pointer at `index` position.

**Parameters**

| | |
|---|---|
| *v* | a pointer to vector_t |
| *index* | index of the pointer |

**Returns**

a pointer to the index element NULL in case of out of bound

#### 4.14.2.7 gerror_t vector_resize_buffer ( vector_t ∗ *v*, size_t *n_elements* )

Resize the buffer in the vector_t strucuture pointed by v.

**Parameters**

| | |
|---|---|
| *v* | a pointer to vector_t structure. |
| *new_size* | the new size of the v |

#### 4.14.2.8 gerror_t vector_set_elem_at ( vector_t ∗ *v*, size_t *index*, void ∗ *elem* )

set the element at index pointed by v with the element pointed by elem.

**Parameters**

| | |
|---|---|
| *v* | a pointer to vector_t |
| *index* | index of the position |
| *elem* | the element to be set in v |

**Returns**

GERROR_OK in case of success operation; GERROR_NULL_STRUCURE in case v is a NULL pointer

#### 4.14.2.9 void vector_set_min_buf_siz ( size_t *new_min_buf_siz* )

Set the vector_min_siz: a private variable that holds the minimal number of elements that vector_t will index. This variable is important for avoid multiple small resizes in the vector_t container.

**Parameters**

| | |
|---|---|
| *new_min_buf_siz* | the new size of vector_min_siz |

### 4.14.3 Variable Documentation

#### 4.14.3.1 size_t vector_min_siz = VECTOR_MIN_SIZ

# Index