mkernel

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Chapter 1

Todo List

Member _trace_dynmsg (const char *p_File, const unsigned int p_Line, const char *p_CompilDate, const char *p_CompilTime, const char *p_Function, const char *p_Format,...)

Replace with a portable snprintf function

Member dbg_asprintf (char **p_Ptr, const char *p_Format, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function,...)

Implement a vasprintf wrapping function to catch allocation and use it here

Member modmgr_load (const char *modfile)

critical section

Member MODULE_PATH_ENV

Define in configure.ac with default value

File svcmgr.c

make threadsafe

investigate prefix or b+* trees

Chapter 2

Class Index

2.1 Class List

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

Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

Chapter 4

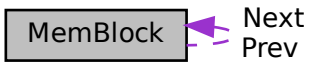
Class Documentation

4.1 MemBlock Struct Reference

Memory block metadata list item.

`#include <memtrack.h>`

Collaboration diagram for MemBlock:



Public Attributes

- struct MemBlock * Prev
  Previous item pointer.
- struct MemBlock * Next
  Next item pointer.
- void * Ptr
  Allocated memory block pointer.
- size_t Size
  Allocated memory block size.
- char * File
  Source file which asked the allocation.
- int Line
  Source line number ch asked the allocation.
- char * CompilDate
  Source file compilation date.
- char * CompilTime
  Source file compilation time.
- char * Function
  Fonction name which asked the allocation.

4.1.1 Detailed Description

Memory block metadata list item.

Double linked list item to store memory block metadata

Definition at line 37 of file memtrack.h.

4.1.2 Member Data Documentation

4.1.2.1 CompilDate

```
char* MemBlock::CompilDate
```

Source file compilation date.

Definition at line 44 of file memtrack.h.

4.1.2.2 CompilTime

```
char* MemBlock::CompilTime
```

Source file compilation time.

Definition at line 45 of file memtrack.h.

4.1.2.3 File

```
char* MemBlock::File
```

Source file which asked the allocation.

Definition at line 42 of file memtrack.h.

4.1.2.4 Function

```
char* MemBlock::Function
```

Fonction name which asked the allocation.

Definition at line 46 of file memtrack.h.

4.1.2.5 Line

```
int MemBlock::Line
```

Source line number ch asked the allocation.

Definition at line 43 of file memtrack.h.

4.1.2.6 Next

```
struct MemBlock* MemBlock::Next
```

Next item pointer.

Definition at line 39 of file memtrack.h.

4.1.2.7 Prev

```
struct MemBlock* MemBlock::Prev
```

Previous item pointer.

Definition at line 38 of file memtrack.h.

4.1.2.8 Ptr

```
void* MemBlock::Ptr
```

Allocated memory block pointer.

Definition at line 40 of file memtrack.h.

4.1.2.9 Size

```
size_t MemBlock::Size
```

Allocated memory block size.

Definition at line 41 of file memtrack.h.

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

- memtrack.h

4.2 mkmod_api_s Struct Reference

`#include <mkmod.h>`

Public Attributes

- void(∗ mkmod_function)()

4.2.1 Detailed Description

Definition at line 24 of file mkmod.h.

4.2.2 Member Data Documentation

4.2.2.1 mkmod_function

`void(* mkmod_api_s::mkmod_function) ()`

Definition at line 25 of file mkmod.h.

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

- mkmod.h

4.3 moduleinfo_s Struct Reference

`#include <module.h>`

Public Attributes

- const char ∗ moduleName
- const char ∗ moduleDesc
- const uint8_t moduleMajor
- const uint8_t moduleMinor
- const uint8_t modulePatch
- const char ∗ moduleAuthor
- const char ∗ moduleEmail
- const char ∗ moduleURL
- const char ∗ moduleLicense

4.3.1 Detailed Description

Definition at line 27 of file module.h.

4.3.2 Member Data Documentation

4.3.2.1 moduleAuthor

```
const char* moduleinfo_s::moduleAuthor
```

Definition at line 33 of file module.h.

4.3.2.2 moduleDesc

```
const char* moduleinfo_s::moduleDesc
```

Definition at line 29 of file module.h.

4.3.2.3 moduleEmail

```
const char* moduleinfo_s::moduleEmail
```

Definition at line 34 of file module.h.

4.3.2.4 moduleLicense

```
const char* moduleinfo_s::moduleLicense
```

Definition at line 36 of file module.h.

4.3.2.5 moduleMajor

```
const uint8_t moduleinfo_s::moduleMajor
```

Definition at line 30 of file module.h.

4.3.2.6 moduleMinor

```
const uint8_t moduleinfo_s::moduleMinor
```

Definition at line 31 of file module.h.

4.3.2.7 moduleName

```
const char* moduleinfo_s::moduleName
```

Definition at line 28 of file module.h.

4.3.2.8 modulePatch

```
const uint8_t moduleinfo_s::modulePatch
```

Definition at line 32 of file module.h.

4.3.2.9 moduleURL

```
const char* moduleinfo_s::moduleURL
```

Definition at line 35 of file module.h.

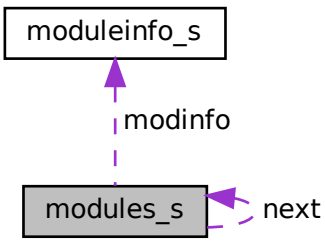
The documentation for this struct was generated from the following file:

- module.h

4.4 modules_s Struct Reference

Module list item structure.

Collaboration diagram for modules_s:



Public Attributes

- lt_dlhandle handle
- moduleinfo_t * modinfo
- struct modules_s * next

4.4.1 Detailed Description

Module list item structure.

Definition at line 42 of file modmgr.c.

4.4.2 Member Data Documentation

4.4.2.1 handle

```
lt_dlhandle modules_s::handle
```

Definition at line 43 of file modmgr.c.

4.4.2.2 modinfo

```
moduleinfo_t* modules_s::modinfo
```

Definition at line 44 of file modmgr.c.

4.4.2.3 next

```
struct modules_s* modules_s::next
```

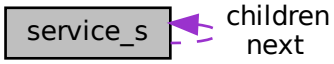
Definition at line 45 of file modmgr.c.

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

- modmgr.c

4.5 service_s Struct Reference

Collaboration diagram for service_s:



Public Attributes

- struct service_s * next
- struct service_s * children
- uint8_t nbArgs
- char * name
- svcfunc_t * function

4.5.1 Detailed Description

Definition at line 35 of file svcmgr.c.

4.5.2 Member Data Documentation

4.5.2.1 children

```
struct service_s* service_s::children
```

Definition at line 37 of file svcmgr.c.

4.5.2.2 function

```
svcfunc_t* service_s::function
```

Definition at line 40 of file svcmgr.c.

4.5.2.3 name

```
char* service_s::name
```

Definition at line 39 of file svcmgr.c.

4.5.2.4 nbArgs

```
uint8_t service_s::nbArgs
```

Definition at line 38 of file svcmgr.c.

4.5.2.5 next

```
struct service_s* service_s::next
```

Definition at line 36 of file svcmgr.c.

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

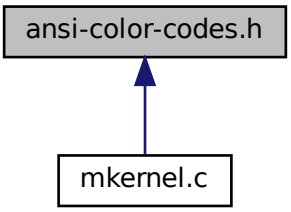
- svcmgr.c

Chapter 5

File Documentation

5.1 ansi-color-codes.h File Reference

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



Macros

- #define BLK "\33[0;30m"
- #define RED "\33[0;31m"
- #define GRN "\33[0;32m"
- #define YEL "\33[0;33m"
- #define BLU "\33[0;34m"
- #define MAG "\33[0;35m"
- #define CYN "\33[0;36m"
- #define WHT "\33[0;37m"
- #define BBLK "\33[1;30m"
- #define BRED "\33[1;31m"
- #define BGRN "\33[1;32m"
- #define BYEL "\33[1;33m"
- #define BBLU "\33[1;34m"
- #define BMAG "\33[1;35m"
- #define BCYN "\33[1;36m"
- #define BWHT "\33[1;37m"

- #define UBLK "\33[4;30m"
- #define URED "\33[4;31m"
- #define UGRN "\33[4;32m"
- #define UYEL "\33[4;33m"
- #define UBLU "\33[4;34m"
- #define UMAG "\33[4;35m"
- #define UCYN "\33[4;36m"
- #define UWHT "\33[4;37m"
- #define BLKB "\33[40m"
- #define REDB "\33[41m"
- #define GRNB "\33[42m"
- #define YELB "\33[43m"
- #define BLUB "\33[44m"
- #define MAGB "\33[45m"
- #define CYNB "\33[46m"
- #define WHTB "\33[47m"
- #define BLKHB "\33[0;100m"
- #define REDHB "\33[0;101m"
- #define GRNHB "\33[0;102m"
- #define YELHB "\33[0;103m"
- #define BLUHB "\33[0;104m"
- #define MAGHB "\33[0;105m"
- #define CYNHB "\33[0;106m"
- #define WHTHB "\33[0;107m"
- #define HBLK "\33[0;90m"
- #define HRED "\33[0;91m"
- #define HGRN "\33[0;92m"
- #define HYEL "\33[0;93m"
- #define HBLU "\33[0;94m"
- #define HMAG "\33[0;95m"
- #define HCYN "\33[0;96m"
- #define HWHT "\33[0;97m"
- #define BHBLK "\33[1;90m"
- #define BHRED "\33[1;91m"
- #define BHGRN "\33[1;92m"
- #define BHYEL "\33[1;93m"
- #define BHBLU "\33[1;94m"
- #define BHMAG "\33[1;95m"
- #define BHCYN "\33[1;96m"
- #define BHWHT "\33[1;97m"
- #define RESET "\33[0m"
- #define DIM "\33[22m"
- #define BLINK "\33[5m"
- #define HIDDEN "\33[8m"
- #define REVERSE "\33[7m"
- #define BOLD "\33[1m"
- #define UNDERLINE "\33[4m"
- #define STRIKE "\33[9m"

5.1.1 Macro Definition Documentation

5.1.1.1 BBLK

```
#define BBLK "\33[1;30m"
```

Definition at line 20 of file ansi-color-codes.h.

5.1.1.2 BBLU

```
#define BBLU "\33[1;34m"
```

Definition at line 24 of file ansi-color-codes.h.

5.1.1.3 BCYN

```
#define BCYN "\33[1;36m"
```

Definition at line 26 of file ansi-color-codes.h.

5.1.1.4 BGRN

```
#define BGRN "\33[1;32m"
```

Definition at line 22 of file ansi-color-codes.h.

5.1.1.5 BHBLK

```
#define BHBLK "\33[1;90m"
```

Definition at line 70 of file ansi-color-codes.h.

5.1.1.6 BHBLU

```
#define BHBLU "\33[1;94m"
```

Definition at line 74 of file ansi-color-codes.h.

5.1.1.7 BHCYN

```
#define BHCYN "\33[1;96m"
```

Definition at line 76 of file ansi-color-codes.h.

5.1.1.8 BHGRN

```
#define BHGRN "\33[1;92m"
```

Definition at line 72 of file ansi-color-codes.h.

5.1.1.9 BHMAG

```
#define BHMAG "\33[1;95m"
```

Definition at line 75 of file ansi-color-codes.h.

5.1.1.10 BHRED

```
#define BHRED "\33[1;91m"
```

Definition at line 71 of file ansi-color-codes.h.

5.1.1.11 BHWHT

```
#define BHWHT "\33[1;97m"
```

Definition at line 77 of file ansi-color-codes.h.

5.1.1.12 BHYEL

```
#define BHYEL "\33[1;93m"
```

Definition at line 73 of file ansi-color-codes.h.

5.1.1.13 BLINK

```
#define BLINK "\33[5m"
```

Definition at line 82 of file ansi-color-codes.h.

5.1.1.14 BLK

```
#define BLK "\33[0;30m"
```

Definition at line 10 of file ansi-color-codes.h.

5.1.1.15 BLKB

```
#define BLKB "\33[40m"
```

Definition at line 40 of file ansi-color-codes.h.

5.1.1.16 BLKHB

```
#define BLKHB "\33[0;100m"
```

Definition at line 50 of file ansi-color-codes.h.

5.1.1.17 BLU

```
#define BLU "\33[0;34m"
```

Definition at line 14 of file ansi-color-codes.h.

5.1.1.18 BLUB

```
#define BLUB "\33[44m"
```

Definition at line 44 of file ansi-color-codes.h.

5.1.1.19 BLUHB

```
#define BLUHB "\33[0;104m"
```

Definition at line 54 of file ansi-color-codes.h.

5.1.1.20 BMAG

```
#define BMAG "\33[1;35m"
```

Definition at line 25 of file ansi-color-codes.h.

5.1.1.21 BOLD

```
#define BOLD "\33[1m"
```

Definition at line 85 of file ansi-color-codes.h.

5.1.1.22 BRED

```
#define BRED "\33[1;31m"
```

Definition at line 21 of file ansi-color-codes.h.

5.1.1.23 BWHT

```
#define BWHT "\33[1;37m"
```

Definition at line 27 of file ansi-color-codes.h.

5.1.1.24 BYEL

```
#define BYEL "\33[1;33m"
```

Definition at line 23 of file ansi-color-codes.h.

5.1.1.25 CYN

```
#define CYN "\33[0;36m"
```

Definition at line 16 of file ansi-color-codes.h.

5.1.1.26 CYNB

```
#define CYNB "\33[46m"
```

Definition at line 46 of file ansi-color-codes.h.

5.1.1.27 CYNHB

```
#define CYNHB "\33[0;106m"
```

Definition at line 56 of file ansi-color-codes.h.

5.1.1.28 DIM

```
#define DIM "\33[22m"
```

Definition at line 81 of file ansi-color-codes.h.

5.1.1.29 GRN

```
#define GRN "\33[0;32m"
```

Definition at line 12 of file ansi-color-codes.h.

5.1.1.30 GRNB

```
#define GRNB "\33[42m"
```

Definition at line 42 of file ansi-color-codes.h.

5.1.1.31 GRNHB

```
#define GRNHB "\33[0;102m"
```

Definition at line 52 of file ansi-color-codes.h.

5.1.1.32 HBLK

```
#define HBLK "\33[0;90m"
```

Definition at line 60 of file ansi-color-codes.h.

5.1.1.33 HBLU

```
#define HBLU "\33[0;94m"
```

Definition at line 64 of file ansi-color-codes.h.

5.1.1.34 HCYN

```
#define HCYN "\33[0;96m"
```

Definition at line 66 of file ansi-color-codes.h.

5.1.1.35 HGRN

```
#define HGRN "\33[0;92m"
```

Definition at line 62 of file ansi-color-codes.h.

5.1.1.36 HIDDEN

```
#define HIDDEN "\33[8m"
```

Definition at line 83 of file ansi-color-codes.h.

5.1.1.37 HMAG

```
#define HMAG "\33[0;95m"
```

Definition at line 65 of file ansi-color-codes.h.

5.1.1.38 HRED

```
#define HRED "\33[0;91m"
```

Definition at line 61 of file ansi-color-codes.h.

5.1.1.39 HWHT

```
#define HWHT "\33[0;97m"
```

Definition at line 67 of file ansi-color-codes.h.

5.1.1.40 HYEL

```
#define HYEL "\33[0;93m"
```

Definition at line 63 of file ansi-color-codes.h.

5.1.1.41 MAG

```
#define MAG "\33[0;35m"
```

Definition at line 15 of file ansi-color-codes.h.

5.1.1.42 MAGB

```
#define MAGB "\33[45m"
```

Definition at line 45 of file ansi-color-codes.h.

5.1.1.43 MAGHB

```
#define MAGHB "\33[0;105m"
```

Definition at line 55 of file ansi-color-codes.h.

5.1.1.44 RED

```
#define RED "\33[0;31m"
```

Definition at line 11 of file ansi-color-codes.h.

5.1.1.45 REDB

```
#define REDB "\33[41m"
```

Definition at line 41 of file ansi-color-codes.h.

5.1.1.46 REDHB

```
#define REDHB "\33[0;101m"
```

Definition at line 51 of file ansi-color-codes.h.

5.1.1.47 RESET

```
#define RESET "\33[0m"
```

Definition at line 80 of file ansi-color-codes.h.

5.1.1.48 REVERSE

```
#define REVERSE "\33[7m"
```

Definition at line 84 of file ansi-color-codes.h.

5.1.1.49 STRIKE

```
#define STRIKE "\33[9m"
```

Definition at line 87 of file ansi-color-codes.h.

5.1.1.50 UBLK

```
#define UBLK "\33[4;30m"
```

Definition at line 30 of file ansi-color-codes.h.

5.1.1.51 UBLU

```
#define UBLU "\33[4;34m"
```

Definition at line 34 of file ansi-color-codes.h.

5.1.1.52 UCYN

```
#define UCYN "\33[4;36m"
```

Definition at line 36 of file ansi-color-codes.h.

5.1.1.53 UGRN

```
#define UGRN "\33[4;32m"
```

Definition at line 32 of file ansi-color-codes.h.

5.1.1.54 UMAG

```
#define UMAG "\33[4;35m"
```

Definition at line 35 of file ansi-color-codes.h.

5.1.1.55 UNDERLINE

```
#define UNDERLINE "\33[4m"
```

Definition at line 86 of file ansi-color-codes.h.

5.1.1.56 URED

```
#define URED "\33[4;31m"
```

Definition at line 31 of file ansi-color-codes.h.

5.1.1.57 UWHT

```
#define UWHT "\33[4;37m"
```

Definition at line 37 of file ansi-color-codes.h.

5.1.1.58 UYEL

```
#define UYEL "\33[4;33m"
```

Definition at line 33 of file ansi-color-codes.h.

5.1.1.59 WHT

```
#define WHT "\33[0;37m"
```

Definition at line 17 of file ansi-color-codes.h.

5.1.1.60 WHTB

```
#define WHTB "\33[47m"
```

Definition at line 47 of file ansi-color-codes.h.

5.1.1.61 WHTHB

```
#define WHTHB "\33[0;107m"
```

Definition at line 57 of file ansi-color-codes.h.

5.1.1.62 YEL

```
#define YEL "\33[0;33m"
```

Definition at line 13 of file ansi-color-codes.h.

5.1.1.63 YELB

```
#define YELB "\33[43m"
```

Definition at line 43 of file ansi-color-codes.h.

5.1.1.64 YELHB

```
#define YELHB "\33[0;103m"
```

Definition at line 53 of file ansi-color-codes.h.

5.2 ansi-color-codes.h

Go to the documentation of this file.

```
00001 /*
00002 * This is free and unencumbered software released into the public domain.
00003 *
00004 * For more information, please refer to <https://unlicense.org>
00005 *
00006 * Downloaded from https://gist.github.com/federicheddu/036ddc1624c12c073d1d481f3044628a
00007 */
00008
00009 /* Regular text */
00010 #define BLK "\33[0;30m"
00011 #define RED "\33[0;31m"
00012 #define GRN "\33[0;32m"
00013 #define YEL "\33[0;33m"
00014 #define BLU "\33[0;34m"
00015 #define MAG "\33[0;35m"
00016 #define CYN "\33[0;36m"
00017 #define WHT "\33[0;37m"
00018
00019 /* Regular bold text */
00020 #define BBLK "\33[1;30m"
00021 #define BRED "\33[1;31m"
00022 #define BGRN "\33[1;32m"
00023 #define BYEL "\33[1;33m"
00024 #define BBLU "\33[1;34m"
00025 #define BMAG "\33[1;35m"
00026 #define BCYN "\33[1;36m"
```

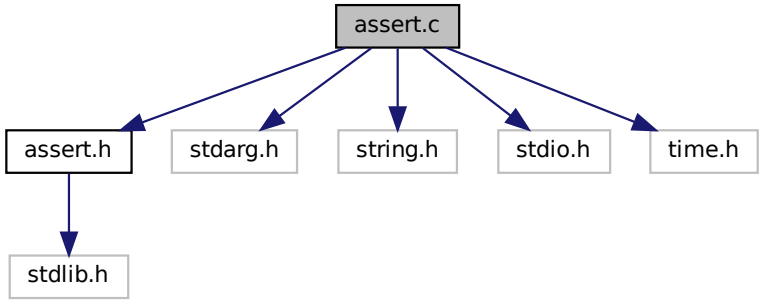
```
00027 #define BWHT "\33[1;37m"
00028
00029 /* Regular underline text */
00030 #define UBLK "\33[4;30m"
00031 #define URED "\33[4;31m"
00032 #define UGRN "\33[4;32m"
00033 #define UYEL "\33[4;33m"
00034 #define UBLU "\33[4;34m"
00035 #define UMAG "\33[4;35m"
00036 #define UCYN "\33[4;36m"
00037 #define UWHT "\33[4;37m"
00038
00039 /* Regular background */
00040 #define BLKB "\33[40m"
00041 #define REDB "\33[41m"
00042 #define GRNB "\33[42m"
00043 #define YELB "\33[43m"
00044 #define BLUB "\33[44m"
00045 #define MAGB "\33[45m"
00046 #define CYNB "\33[46m"
00047 #define WHTB "\33[47m"
00048
00049 /* High intensty background */
00050 #define BLKHB "\33[0;100m"
00051 #define REDHB "\33[0;101m"
00052 #define GRNHB "\33[0;102m"
00053 #define YELHB "\33[0;103m"
00054 #define BLUHB "\33[0;104m"
00055 #define MAGHB "\33[0;105m"
00056 #define CYNHB "\33[0;106m"
00057 #define WHTHB "\33[0;107m"
00058
00059 /* High intensty text */
00060 #define HBLK "\33[0;90m"
00061 #define HRED "\33[0;91m"
00062 #define HGRN "\33[0;92m"
00063 #define HYEL "\33[0;93m"
00064 #define HBLU "\33[0;94m"
00065 #define HMAG "\33[0;95m"
00066 #define HCYN "\33[0;96m"
00067 #define HWHT "\33[0;97m"
00068
00069 /* Bold high intensity text */
00070 #define BHBLK "\33[1;90m"
00071 #define BHRED "\33[1;91m"
00072 #define BHGRN "\33[1;92m"
00073 #define BHYEL "\33[1;93m"
00074 #define BHBLU "\33[1;94m"
00075 #define BHMAG "\33[1;95m"
00076 #define BHCYN "\33[1;96m"
00077 #define BHWHT "\33[1;97m"
00078
00079 /* Reset */
00080 #define RESET "\33[0m"
00081 #define DIM "\33[22m"
00082 #define BLINK "\33[5m"
00083 #define HIDDEN "\33[8m"
00084 #define REVERSE "\33[7m"
00085 #define BOLD "\33[1m"
00086 #define UNDERLINE "\33[4m"
00087 #define STRIKE "\33[9m"
```

5.3 assert.c File Reference

Compiled functions used by debugging macros to write on stderr.

```
#include "assert.h"
#include <stdarg.h>
#include <string.h>
#include <stdio.h>
#include <time.h>
```

Include dependency graph for assert.c:



Functions

- void _trace (const char *p_File, const unsigned int p_Line, const char *p_CompilDate, const char *p_↩ CompilTime, const char *p_Function)

  Print a debug trace (checkpoint)
- void _trace_msg (const char *p_File, const unsigned int p_Line, const char *p_CompilDate, const char *p↩ _CompilTime, const char *p_Function, const char *p_Message)

  Print a debug trace (checkpoint) with a static message.
- void _trace_dynmsg (const char *p_File, const unsigned int p_Line, const char *p_CompilDate, const char *p_CompilTime, const char *p_Function, const char *p_Format,...)

  Print a debug trace (checkpoint) with a formatted message.

5.3.1 Detailed Description

Compiled functions used by debugging macros to write on stderr.

Date

11/05/1997

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Copyright (c) 1997-2024, François Cerbelle

Originally inspired by "L'art du code", Steve Maguire, Microsoft Press

Definition in file assert.c.

5.3.2 Function Documentation

5.3.2.1 _trace()

```
void _trace (
            const char * p_File,
            const unsigned int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function )
```

Print a debug trace (checkpoint)

Parameters

in	*p_File*	Source file
in	*p_Line*	Source line in the source file
in	*p_CompilDate*	Compilation date
in	*p_CompilTime*	Compilation time
in	*p_Function*	Function name in the source file

Outputs on stderr a timestamp, with the filename, the sourceline, the compilation date and time, the function name.

Definition at line 75 of file assert.c.

5.3.2.2 _trace_dynmsg()

```
void _trace_dynmsg (
            const char * p_File,
            const unsigned int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function,
            const char * p_Format,
             ...  )
```

Print a debug trace (checkpoint) with a formatted message.

Parameters

in	*p_File*	Source file
in	*p_Line*	Source line in the source file
in	*p_CompilDate*	Compilation date
in	*p_CompilTime*	Compilation time
in	*p_Function*	Function name in the source file
in	*p_Format*	format string
in	*...*	Formatted string parameters

Outputs on stderr a timestamp, with the filename, the sourceline, the compilation date and time, the function name and a formatted message.

Todo Replace with a portable snprintf function

Definition at line 101 of file assert.c.

5.3.2.3 _trace_msg()

```
void _trace_msg (
             const char * p_File,
             const unsigned int p_Line,
             const char * p_CompilDate,
             const char * p_CompilTime,
             const char * p_Function,
             const char * p_Message )
```

Print a debug trace (checkpoint) with a static message.

Parameters

in	*p_File*	Source file
in	*p_Line*	Source line in the source file
in	*p_CompilDate*	Compilation date
in	*p_CompilTime*	Compilation time
in	*p_Function*	Function name in the source file
in	*p_Message*	Static message

Outputs on stderr a timestamp, with the filename, the sourceline, the compilation date and time, the function name and a static message.

Definition at line 87 of file assert.c.

5.4 assert.c

Go to the documentation of this file.

```
00001
00020 #include "assert.h"
00021 #include <stdarg.h>                          /* va_list, va_start, va_arg, va_end */
00022 #include <string.h>                          /* strcpy */
00023 #include <stdio.h>                           /* fprintf */
00024 #include <time.h>                            /* time, localtime */
00025
00041 static const char*_timestamp(const char* p_File,
00042                              const unsigned int p_Line,
00043                              const char* p_CompilDate,
00044                              const char* p_CompilTime,
00045                              const char* p_Function)
00046 {
00047     /* Get local time and format it */
00048     char l_Time[24];
00049     static char l_tmp[120];
00050     time_t l_CurrentTime = time(NULL);
00051
```

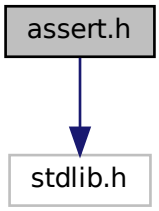
```
00052     /* Parameter validity check against invalid parameters such as NULL or
00053 * empty string values.  */
00054     if ((NULL==p_File)|| (0==p_File[0])||
00055         (0==p_Line)||
00056         (NULL==p_CompilDate)|| (0==p_CompilDate[0])||
00057         (NULL==p_CompilTime)|| (0==p_CompilTime[0])||
00058         (NULL==p_Function)|| (0==p_Function[0])) {
00059         fprintf(stderr,"%s:%d Unexpected and invalid parameters\n",__FILE__, __LINE__);
00060         abort();
00061     }
00062
00063     strftime(l_Time, sizeof(l_Time), "%Y-%m-%d %H:%M:%S", localtime(&l_CurrentTime));
00064
00065     /* Timestamp build with the filename, file line, function name */
00067     snprintf(l_tmp,sizeof(l_tmp),
00068              "%19s [%20s:%-4ud] (%11s @ %8s) %30s()",
00069              l_Time,p_File,p_Line,p_CompilDate,p_CompilTime,p_Function
00070             );
00071     return &l_tmp[0];
00072 }
00073
00074 /* Documentation in header file */
00075 void _trace(const char* p_File,
00076             const unsigned int p_Line,
00077             const char* p_CompilDate,
00078             const char* p_CompilTime, const char* p_Function)
00079 {
00080     /* Parameter validity enforced by _timestamp */
00081     fprintf (stderr,"%s\n",
00082              _timestamp( p_File, p_Line, p_CompilDate, p_CompilTime, p_Function)
00083             );
00084 }
00085
00086 /* Documentation in header file */
00087 void _trace_msg(const char* p_File,
00088                 const unsigned int p_Line,
00089                 const char* p_CompilDate,
00090                 const char* p_CompilTime,
00091                 const char* p_Function, const char* p_Message)
00092 {
00093     /* Parameter validity enforced by _timestamp */
00094     fprintf (stderr,"%s :  %s\n",
00095              _timestamp( p_File, p_Line, p_CompilDate, p_CompilTime, p_Function),
00096              p_Message
00097             );
00098 }
00099
00100 /* Documentation in header file */
00101 void _trace_dynmsg(const char* p_File,
00102                    const unsigned int p_Line,
00103                    const char* p_CompilDate,
00104                    const char* p_CompilTime,
00105                    const char* p_Function, const char* p_Format, ...
00106                   )
00107 {
00108     /* Formatted message string */
00109     char l_tmp[100];
00110     /* Formatted message length */
00111     unsigned int l_length;
00112
00113     /* Limit variadic processing scope in a block */
00114     {
00115         /* Build the formatted message */
00116         va_list l_ap;
00117         va_start(l_ap, p_Format);
00119         l_length = vsnprintf(l_tmp,sizeof(l_tmp),p_Format,l_ap);
00120         va_end(l_ap);
00121     }
00122
00123     if (l_length >= sizeof(l_tmp)-1) {
00124         /* Indicate that message was truncated */
00125         strcpy(&(l_tmp[sizeof(l_tmp)-6]),"[...]");
00126     }
00127
00128     /* Parameter validity enforced by _timestamp */
00129     fprintf (stderr,"%s :  %s\n",
00130              _timestamp( p_File, p_Line, p_CompilDate, p_CompilTime, p_Function),
00131              l_tmp
00132             );
00133 }
00134
```

5.5 assert.h File Reference

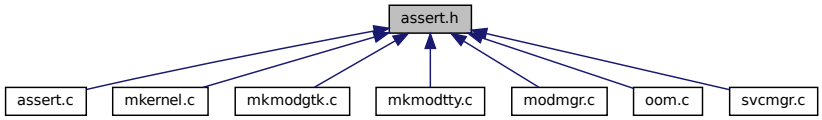
Debugging macros.

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

Include dependency graph for assert.h:



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



Macros

- #define ASSERT(condition)

  Assertion check macro.
- #define DBG_TRACE _trace(__FILE__,__LINE__, __DATE__, __TIME__, __func__)

  Checkpoint on stderr.
- #define DBG_MSG(msg) _trace_msg(__FILE__,__LINE__, __DATE__, __TIME__, __func__,msg)

  Checkpoint on stderr with a static message.
- #define DBG_ITRACE(inst)

  Instruction checkpint.
- #define DBG_PRINTF(p_Format, ...) _trace_dynmsg(__FILE__,__LINE__, __DATE__, __TIME__, __func__, p_Format, __VA_ARGS__)

  Log a timestamped debugging message on stderr.

Functions

- void _trace (const char *p_File, const unsigned int p_Line, const char *p_CompilDate, const char *p_CompilTime, const char *p_Function)

  Print a debug trace (checkpoint)
- void _trace_msg (const char *p_File, const unsigned int p_Line, const char *p_CompilDate, const char *p_CompilTime, const char *p_Function, const char *p_Message)

  Print a debug trace (checkpoint) with a static message.
- void _trace_dynmsg (const char *p_File, const unsigned int p_Line, const char *p_CompilDate, const char *p_CompilTime, const char *p_Function, const char *p_Format,...)

  Print a debug trace (checkpoint) with a formatted message.

5.5.1 Detailed Description

Debugging macros.

Date

11/05/1997

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Copyright (c) 1997-2024, François Cerbelle

Originally inspired by "L'art du code", Steve Maguire, Microsoft Press

Definition in file assert.h.

5.5.2 Macro Definition Documentation

5.5.2.1 ASSERT

```
#define ASSERT(
               condition )
```

Value:

```
    if (!(condition)) { \
        _trace_dynmsg(__FILE__,__LINE__, __DATE__, __TIME__, __func__,"Assertion failed (%s)" , #condition);
      \
        abort(); \
    }
```

Assertion check macro.

Parameters

in	*condition*	to check

If NDEBUG is set, does nothing. If NDEBUG is not defined, checks that the condition is true, otherwise stop the process

Definition at line 104 of file assert.h.

5.5.2.2 DBG_ITRACE

```
#define DBG_ITRACE(
              inst )
```

Value:

```
  _trace_msg(__FILE__,__LINE__, __DATE__, __TIME__, __func__,#inst), \
  inst
```

Instruction checkpint.

Writes a checkpoint trace with timestamp, filename, function name and line number when executing an instruction.

Definition at line 143 of file assert.h.

5.5.2.3 DBG_MSG

```
#define DBG_MSG(
              msg )  _trace_msg(__FILE__,__LINE__, __DATE__, __TIME__, __func__,msg)
```

Checkpoint on stderr with a static message.

Writes a timestamped checkpoint with filename, function and line number on stderr.

Definition at line 131 of file assert.h.

5.5.2.4 DBG_PRINTF

```
#define DBG_PRINTF(
              p_Format,
              ...  )   _trace_dynmsg(__FILE__,__LINE__, __DATE__, __TIME__, __func__, p_↩
Format, __VA_ARGS__)
```

Log a timestamped debugging message on stderr.

Writes a timestamped message on stderr with the filename, function name, line number.

Definition at line 156 of file assert.h.

5.5.2.5 DBG_TRACE

```
#define DBG_TRACE  _trace(__FILE__,__LINE__, __DATE__, __TIME__, __func__)
```

Checkpoint on stderr.

Writes a timestamped checkpoint with filename, function and line number on stderr.

Definition at line 119 of file assert.h.

5.5.3 Function Documentation

5.5.3.1 _trace()

```
void _trace (
            const char * p_File,
            const unsigned int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function )
```

Print a debug trace (checkpoint)

Parameters

in	*p_File*	Source file
in	*p_Line*	Source line in the source file
in	*p_CompilDate*	Compilation date
in	*p_CompilTime*	Compilation time
in	*p_Function*	Function name in the source file

Outputs on stderr a timestamp, with the filename, the sourceline, the compilation date and time, the function name.

Definition at line 75 of file assert.c.

5.5.3.2 _trace_dynmsg()

```
void _trace_dynmsg (
            const char * p_File,
            const unsigned int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function,
            const char * p_Format,
             ...  )
```

Print a debug trace (checkpoint) with a formatted message.

Parameters

in	*p_File*	Source file
in	*p_Line*	Source line in the source file
in	*p_CompilDate*	Compilation date
in	*p_CompilTime*	Compilation time
in	*p_Function*	Function name in the source file
in	*p_Format*	format string
in	...	Formatted string parameters

Outputs on stderr a timestamp, with the filename, the sourceline, the compilation date and time, the function name and a formatted message.

Todo Replace with a portable snprintf function

Definition at line 101 of file assert.c.

5.5.3.3 _trace_msg()

```
void _trace_msg (
            const char * p_File,
            const unsigned int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function,
            const char * p_Message )
```

Print a debug trace (checkpoint) with a static message.

Parameters

in	*p_File*	Source file
in	*p_Line*	Source line in the source file
in	*p_CompilDate*	Compilation date
in	*p_CompilTime*	Compilation time
in	*p_Function*	Function name in the source file
in	*p_Message*	Static message

Outputs on stderr a timestamp, with the filename, the sourceline, the compilation date and time, the function name and a static message.

Definition at line 87 of file assert.c.

5.6 assert.h

Go to the documentation of this file.

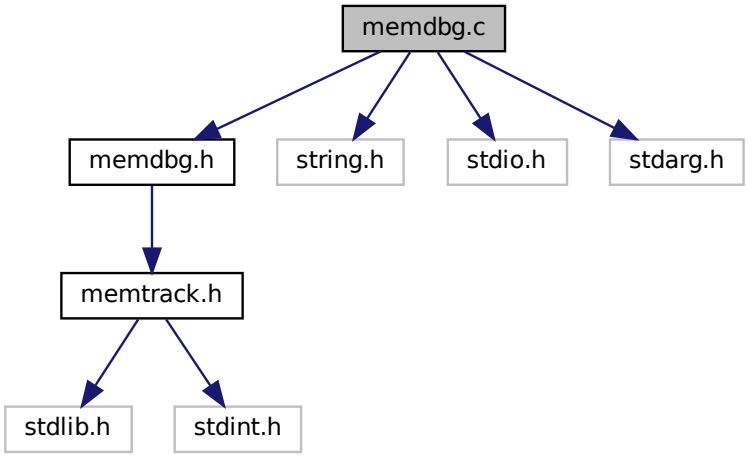
```
00001
00019 #ifndef __ASSERT_H__
00020 #define __ASSERT_H__
00021
00022 #ifdef HAVE_CONFIG_H
00023 #include "config.h"
00024 #endif
00025
00026 #include <stdlib.h> /* abort */
00027
00028 #ifndef NDEBUG
00029
00030 #ifdef __cplusplus
00031 extern "C" {
00032 #endif
00033
00045 void _trace(const char *p_File,
00046             const unsigned int p_Line,
00047             const char *p_CompilDate,
00048             const char *p_CompilTime, const char *p_Function);
00049
00063 void _trace_msg(const char *p_File,
00064                 const unsigned int p_Line,
00065                 const char *p_CompilDate,
00066                 const char *p_CompilTime,
00067                 const char *p_Function, const char *p_Message);
00068
00083 void _trace_dynmsg(const char *p_File,
00084                    const unsigned int p_Line,
00085                    const char *p_CompilDate,
00086                    const char *p_CompilTime,
00087                    const char *p_Function, const char *p_Format, ...
00088                   );
00089
00090 #ifdef __cplusplus
00091 }
00092 #endif
00093
00094 #    endif                      /* NDEBUG */
00095
00103 #ifndef NDEBUG
00104 #define ASSERT(condition) \
00105 if (!(condition)) { \
00106 _trace_dynmsg(__FILE__,__LINE__, __DATE__, __TIME__, __func__,"Assertion failed (%s)" , #condition); \
00107         abort(); \
00108     }
00109 #else                           /* NDEBUG */
00110 #define ASSERT(condition)
00111 #endif                          /* NDEBUG */
00112
00118 #ifndef NDEBUG
00119 #define DBG_TRACE \
00120 _trace(__FILE__,__LINE__, __DATE__, __TIME__, __func__)
00121 #else                           /* NDEBUG */
00122 #define DBG_TRACE
00123 #endif                          /* NDEBUG */
00124
00130 #ifndef NDEBUG
00131 #define DBG_MSG(msg) \
00132 _trace_msg(__FILE__,__LINE__, __DATE__, __TIME__, __func__,msg)
00133 #else                           /* NDEBUG */
00134 #define DBG_MSG(msg)
00135 #endif                          /* NDEBUG */
00136
00142 #ifndef NDEBUG
00143 #define DBG_ITRACE(inst) \
00144 _trace_msg(__FILE__,__LINE__, __DATE__, __TIME__, __func__,#inst), \
00145 inst
00146 #else                           /* NDEBUG */
00147 #define DBG_ITRACE(inst) inst
00148 #endif                          /* NDEBUG */
00149
00155 #ifndef NDEBUG
00156 #define DBG_PRINTF(p_Format, ...)  \
00157 _trace_dynmsg(__FILE__,__LINE__, __DATE__, __TIME__, __func__, p_Format, __VA_ARGS__)
00158 #else                           /* NDEBUG */
00159 #define DBG_PRINTF(p_Format, ...)
00160 #endif                          /* NDEBUG */
00161
00162 #endif                          /* _ASSERT_H */
00163
```

5.7 memdbg.c File Reference

Memory leak tracker implementation.

```
#include "memdbg.h"
#include <string.h>
#include <stdio.h>
#include <stdarg.h>
```

Include dependency graph for memdbg.c:



Functions

- void * dbg_malloc (const size_t Size, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Malloc compatible standard allocation.
- void dbg_free (void *Ptr, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Free compatible standard memory release.
- void * dbg_calloc (const size_t NMemb, const size_t Size, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Allocate a table of item from the size of each and number.
- void * dbg_realloc (void *Ptr, const size_t Size, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Resize an already allocated and tracked block.
- char * dbg_strdup (const char *Ptr, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  String duplication with allocation.
- int dbg_asprintf (char **p_Ptr, const char *p_Format, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function,...)

  Build a formatted string with allocation.

5.7.1 Detailed Description

Memory leak tracker implementation.

Date

25/09/2006

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Originally inspired by "L'art du code", Steve Maguire, Microsoft Press

Definition in file memdbg.c.

5.7.2 Function Documentation

5.7.2.1 dbg_asprintf()

```
int dbg_asprintf (
              char ** p_Ptr,
              const char * p_Format,
              const char * File,
              const int Line,
              const char * CompilDate,
              const char * CompilTime,
              const char * Function,
               ...  )
```

Build a formatted string with allocation.

Parameters

in,out	*p_Ptr*	: Pointer on the to be built string
in	*p_Format*	: Pointer on the format string
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name
in	...	: Values referenced by the format string

Returns

Status of the formatting

Return values

>=0	number of chars in the output string (as strdup)
-1	in case of error (*p_Ptr contents is undefined)

Todo Implement a vasprintf wrapping function to catch allocation and use it here

Definition at line 203 of file memdbg.c.

5.7.2.2 dbg_calloc()

```
void * dbg_calloc (
            const size_t NMemb,
            const size_t Size,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Allocate a table of item from the size of each and number.

Uses malloc to allocate and track the memory bloc. If allocation and tracking succeed, fill the memory block with zeros.

Parameters

in	*NMemb*	: Item number in the table
in	*Size*	: Item size in bytes
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

Allocated block address

Return values

Address	if succeeded,
NULL	if not possible.

Definition at line 83 of file memdbg.c.

Here is the call graph for this function:

5.7.2.3 dbg_free()

```
void dbg_free (
            void * Ptr,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Free compatible standard memory release.

If the Ptr value is not NULL, try to untrack it. If it can not be found in the tracked list, because it was not tracked, it was allocated by a non monitored function, the function abort the process for investigation (missing a monitoring macro/function in the tracker, bug in the tracker, allocation from an external non-instrumented library). If the Ptr value was tracked, found and removed from the list successfully, forward it to free for actual free.

Parameters

in	*Ptr*	: Pointer on the memory to free
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Definition at line 59 of file memdbg.c.

Here is the caller graph for this function:

5.7.2.4 dbg_malloc()

```
void * dbg_malloc (
            const size_t Size,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Malloc compatible standard allocation.

Parameters

in	*Size*	: Requested size in bytes
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

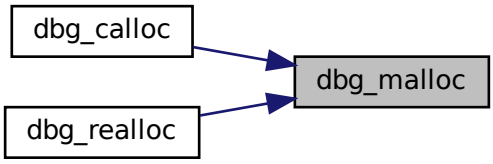
Allocated block address

Return values

Address	if succeeded,
NULL	if not possible.

Definition at line 25 of file memdbg.c.

Here is the caller graph for this function:



5.7.2.5 dbg_realloc()

```
void * dbg_realloc (
            void * Ptr,
            const size_t Size,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Resize an already allocated and tracked block.

This function always uses malloc to allocate a new block and force an address change, and a data loss in case of shrink, which is the worst case scenario for realloc.

As for realloc, a NULL source pointer makes realloc act as malloc, and a new size set to 0 acts as free. The input pointer is left untouched but should not be used or freed anymore. It is always different than the return value. The input values referenced by the input pointer are not wiped.

This implementation can not be used if realloc is used to reduce a huge bloc in order to manage an OOM situation. Real realloc can succeed by actually downsizing the same memory block, inplace, but this implementation will fail because it first allocate a new block.

Parameters

in	*Ptr*	: Pointer on the memory to resize
in	*Size*	: New size in bytes
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

Resized block address

Return values

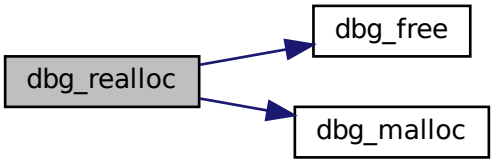
Address	if succeeded,
NULL	if not possible.

< Existing bloc size

< New block

Definition at line 109 of file memdbg.c.

Here is the call graph for this function:



5.7.2.6 dbg_strdup()

```
char * dbg_strdup (
            const char * Ptr,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

String duplication with allocation.

Parameters

in	*Ptr*	: Pointer on the string to copy
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

Copied string address

Return values

Address	if succeeded,
NULL	if not possible.

Copy address

Definition at line 170 of file memdbg.c.

5.8 memdbg.c

Go to the documentation of this file.

```
00001
00019 #include "memdbg.h"
00020 #include <string.h> /* memset, memcpy, memmove */
00021 #include <stdio.h> /* asprintf */
00022 #include <stdarg.h> /* va_list, va_start, va_arg, va_end */
00023
00024 /* Documented in header file */
00025 void* dbg_malloc(
00026     const size_t Size,
00027     const char* File,
00028     const int Line,
00029     const char* CompilDate,
00030     const char* CompilTime,
00031     const char* Function
00032 )
00033 {
00034     /* Memory allocation */
00035     void* l_tmp = malloc(Size);
00036     if (NULL == l_tmp) return (l_tmp);
00037
00038     /* If successful, track the memory block */
00039 #pragma GCC diagnostic push                              /* save the actual diag context */
00040 #ifdef __clang__
00041 #elif __GNUC__
00042 #pragma GCC diagnostic ignored "-Wmaybe-uninitialized"  /* locally disable maybe warnings */
00043 #elif _MSC_VER
00044 /*usually has the version number in _MSC_VER*/
00045 #elif __BORLANDC__
00046 #elif __MINGW32__
00047 #endif
00048     if (0!=memtrack_addblock( l_tmp, Size, File,Line,CompilDate,CompilTime,Function)) {
00049 #pragma GCC diagnostic pop                               /* restore previous diag context */
00050         /* If tracking fails, the whole allocation fails */
00051         free(l_tmp);
00052         l_tmp = NULL;
00053     };
00054
00055     return l_tmp;
00056 }
00057
00058 /* Documented in header file */
00059 void dbg_free(
00060     void* Ptr,
00061     const char* File,
00062     const int Line,
00063     const char* CompilDate,
00064     const char* CompilTime,
00065     const char* Function
00066 )
00067 {
00068     /* If the pointer was not NULL, it was tracked, remove it from the tracked
00069 * list.  If it was not tracked, removing returns an error.  Abort the
00070 * process as it should never have an untracked pointer.  Either it was
00071 * allocated from a non instrumented binary, or it was allocated from
00072 * a non monitored function (see memory.h) or there is a bug in the
00073 * memory leak tracker.  */
00074     if (NULL!=Ptr)
```

```
00075         if (0!=memtrack_delblock(Ptr,File,Line,CompilDate,CompilTime,Function))
00076             abort();
00077
00078     /* If the pointer was NULL or tracked, forward it to the real free */
00079     free(Ptr);
00080 }
00081
00082 /* Documented in header file */
00083 void* dbg_calloc(
00084     const size_t NMemb,
00085     const size_t Size,
00086     const char* File,
00087     const int Line,
00088     const char* CompilDate,
00089     const char* CompilTime,
00090     const char* Function
00091 )
00092 {
00093     void* l_tmp;
00094
00095     /* Use the dbg_malloc function to allocate the memory */
00096     l_tmp = dbg_malloc(
00097                 NMemb*Size,
00098                 File,Line,CompilDate,CompilTime,Function);
00099
00100     /* Implement the calloc specific behavior compared to simple malloc:
00101 * it fills the allocated memory block with 0 */
00102     if (NULL != l_tmp)
00103         memset((char*)l_tmp, 0, NMemb*Size);
00104
00105     return l_tmp;
00106 }
00107
00108 /* Documented in header file */
00109 void* dbg_realloc(
00110     void* Ptr,
00111     const size_t Size,
00112     const char* File,
00113     const int Line,
00114     const char* CompilDate,
00115     const char* CompilTime,
00116     const char* Function
00117 )
00118 {
00119     size_t l_oldsize;
00120     char *newblk;
00122     /* NULL is not tracked but valid */
00123     if (NULL==Ptr) {
00124         l_oldsize=0;
00125     } else {
00126         /* Fetch existing block size */
00127         l_oldsize = memtrack_getblocksize(Ptr);
00128
00129         /* This is probably a bug in the memory tracker.
00130 * It should not track zero sized blocks */
00131         if (0==l_oldsize)
00132             abort();
00133     }
00134
00135     /* If new size is 0, then act as free, like realloc */
00136     if (0==Size) {
00137         dbg_free(Ptr,
00138                  File,Line,CompilDate,CompilTime,Function
00139                 );
00140         return Ptr;
00141     }
00142
00143     /* New sized block allocation to simulate the worst case scenario and
00144 * test a pointer change, a data loss (in case of shrink) */
00145     newblk=(char*)dbg_malloc(
00146                 Size,
00147                 File,Line,CompilDate,CompilTime,Function
00148             );
00149     /* The new block can fail */
00150     /* The real realloc function could succeed here, in case of inplace
00151 * shrink in an OOM situation.  */
00152     if (NULL == newblk) return (newblk);
00153
00154     /* Copy only the relevant data from old block to new block, loosing extra
00155 * data in case of shrink, and not initializing new data in case of
00156 * increase */
00157     memcpy(newblk,(char*)Ptr,(l_oldsize<Size?l_oldsize:Size));
00158
00159     /* Free old block */
00160     dbg_free(
00161         Ptr,
00162         File,Line,CompilDate,CompilTime,Function
```

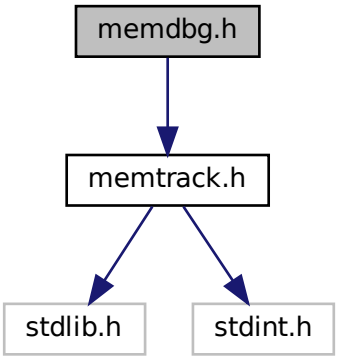
```
00163     );
00164
00165     return (void*) newblk;
00166 }
00167
00168
00169 /* Documented in header file */
00170 char* dbg_strdup(
00171     const char* Ptr,
00172     const char* File,
00173     const int Line,
00174     const char* CompilDate,
00175     const char* CompilTime,
00176     const char* Function
00177 )
00178 {
00179     char* l_newblk;
00181     /* Use strdup to actually copy the string with its own return values and
00182 * abort (SIGSEGV in case of NULL) */
00183     l_newblk=NULL;
00184     l_newblk=strdup(Ptr);
00185
00186     /* If the copy succeeded, try to track the memory allocation */
00187     if (NULL != l_newblk)
00188         if (0!=memtrack_addblock(
00189                 l_newblk,
00190                 strlen(l_newblk)+1,
00191                 File,Line,CompilDate,CompilTime,Function
00192             )) {
00193             /* If tracking fails, the whole operation is reverted and fails */
00194             free(l_newblk);
00195             l_newblk=NULL;
00196         };
00197
00198     return l_newblk;
00199 }
00200
00201
00202 /* Documented in header file */
00203 int dbg_asprintf(char **p_Ptr,
00204                  const char* p_Format,
00205                  const char *File,
00206                  const int Line,
00207                  const char *CompilDate,
00208                  const char *CompilTime, const char *Function,
00209                  ...)
00210 {
00211     int l_returncode;
00212
00213     /* NULL is not allowed, where would we store the result, then ?  */
00214     if(NULL==p_Ptr)
00215         abort();
00216
00217     /* Limit the scope of the variadic manipulation variables */
00218     {
00219         va_list l_ap;
00220         va_start (l_ap, Function);
00221         /* Use the original vasprintf to build the formatted string */
00224         l_returncode = vasprintf(p_Ptr, p_Format, l_ap);
00225         va_end(l_ap);
00226     }
00227
00228     /* If formatting succeeded, try to track the memory allocation */
00229     if (-1 != l_returncode)
00230         if (1==memtrack_addblock(
00231                 *p_Ptr,
00232                 strlen (*p_Ptr)+1,
00233                 File,Line,CompilDate,CompilTime,Function
00234             )) {
00235             /* If tracking fails, the whole operation is reverted and fails */
00236             free(*p_Ptr);
00237             l_returncode=-2;
00238         };
00239
00240     return l_returncode;
00241 }
00242
```

5.9 memdbg.h File Reference

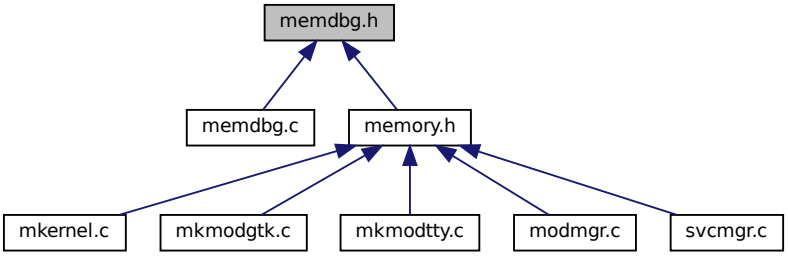
Memory leak tracker header.

```
#include "memtrack.h"
```

Include dependency graph for memdbg.h:



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



Functions

- void * dbg_malloc (const size_t Size, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Malloc compatible standard allocation.
- void dbg_free (void *Ptr, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Free compatible standard memory release.
- void * dbg_calloc (const size_t NMemb, const size_t Size, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Allocate a table of item from the size of each and number.
- void * dbg_realloc (void *Ptr, const size_t Size, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

  Resize an already allocated and tracked block.
- char * dbg_strdup (const char *Ptr, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function)

String duplication with allocation.

- int dbg_asprintf (char **p_Ptr, const char *p_Format, const char *File, const int Line, const char *CompilDate, const char *CompilTime, const char *Function,...)

  Build a formatted string with allocation.

5.9.1 Detailed Description

Memory leak tracker header.

Date

25/09/2006

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Originally inspired by "L'art du code", Steve Maguire, Microsoft Press

Definition in file memdbg.h.

5.9.2 Function Documentation

5.9.2.1 dbg_asprintf()

```
int dbg_asprintf (
            char ** p_Ptr,
            const char * p_Format,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function,
             ...  )
```

Build a formatted string with allocation.

Parameters

in,out	*p_Ptr*	: Pointer on the to be built string
in	*p_Format*	: Pointer on the format string
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name
in	...	: Values referenced by the format string

Returns

Status of the formatting

Return values

>=0	number of chars in the output string (as strdup)
-1	in case of error (*p_Ptr contents is undefined)

Todo Implement a vasprintf wrapping function to catch allocation and use it here

Definition at line 203 of file memdbg.c.

5.9.2.2 dbg_calloc()

```
void * dbg_calloc (
            const size_t NMemb,
            const size_t Size,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Allocate a table of item from the size of each and number.

Uses malloc to allocate and track the memory bloc. If allocation and tracking succeed, fill the memory block with zeros.

Parameters

in	*NMemb*	: Item number in the table
in	*Size*	: Item size in bytes
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

Allocated block address

Return values

Address	if succeeded,
NULL	if not possible.

Definition at line 83 of file memdbg.c.

Here is the call graph for this function:

5.9.2.3 dbg_free()

```
void dbg_free (
            void * Ptr,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Free compatible standard memory release.

If the Ptr value is not NULL, try to untrack it. If it can not be found in the tracked list, because it was not tracked, it was allocated by a non monitored function, the function abort the process for investigation (missing a monitoring macro/function in the tracker, bug in the tracker, allocation from an external non-instrumented library). If the Ptr value was tracked, found and removed from the list successfully, forward it to free for actual free.

Parameters

in	*Ptr*	: Pointer on the memory to free
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Definition at line 59 of file memdbg.c.

Here is the caller graph for this function:

5.9.2.4 dbg_malloc()

```
void * dbg_malloc (
            const size_t Size,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Malloc compatible standard allocation.

Parameters

in	*Size*	: Requested size in bytes
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

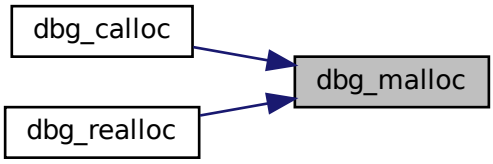
Allocated block address

Return values

Address	if succeeded,
NULL	if not possible.

Definition at line 25 of file memdbg.c.

Here is the caller graph for this function:



5.9.2.5 dbg_realloc()

```
void * dbg_realloc (
            void * Ptr,
            const size_t Size,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

Resize an already allocated and tracked block.

This function always uses malloc to allocate a new block and force an address change, and a data loss in case of shrink, which is the worst case scenario for realloc.

As for realloc, a NULL source pointer makes realloc act as malloc, and a new size set to 0 acts as free. The input pointer is left untouched but should not be used or freed anymore. It is always different than the return value. The input values referenced by the input pointer are not wiped.

This implementation can not be used if realloc is used to reduce a huge bloc in order to manage an OOM situation. Real realloc can succeed by actually downsizing the same memory block, inplace, but this implementation will fail because it first allocate a new block.

Parameters

in	*Ptr*	: Pointer on the memory to resize
in	*Size*	: New size in bytes
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

Resized block address

Return values

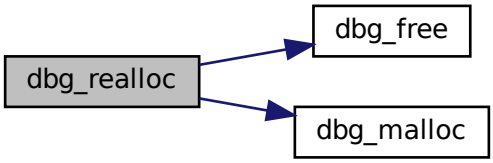
Address	if succeeded,
NULL	if not possible.

< Existing bloc size

< New block

Definition at line 109 of file memdbg.c.

Here is the call graph for this function:



5.9.2.6 dbg_strdup()

```
char * dbg_strdup (
            const char * Ptr,
            const char * File,
            const int Line,
            const char * CompilDate,
            const char * CompilTime,
            const char * Function )
```

String duplication with allocation.

Parameters

in	*Ptr*	: Pointer on the string to copy
in	*File*	: Source file
in	*Line*	: Source line number
in	*CompilDate*	: File compilation date
in	*CompilTime*	: File compilation time
in	*Function*	: Source function name

Returns

Copied string address

Return values

Address	if succeeded,
NULL	if not possible.

Copy address

Definition at line 170 of file memdbg.c.

5.10 memdbg.h

Go to the documentation of this file.

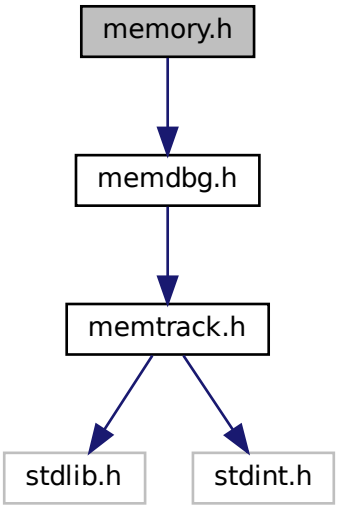
```
00001
00019 #ifndef __MEMDBG_H__
00020 #define __MEMDBG_H__
00021
00022 #ifdef HAVE_CONFIG_H
00023 #  include "config.h"
00024 #endif
00025
00026 #include "memtrack.h"
00027
00028 #ifdef __cplusplus
00029 extern "C" {
00030 #endif
00031
00046 void *dbg_malloc(const size_t Size,
00047                  const char *File,
00048                  const int Line,
00049                  const char *CompilDate,
00050                  const char *CompilTime,
00051                  const char *Function);
00052
00071 void dbg_free(void *Ptr,
00072               const char *File,
00073               const int Line,
00074               const char *CompilDate,
00075               const char *CompilTime,
00076               const char *Function);
00077
00096 void *dbg_calloc(const size_t NMemb,
00097                  const size_t Size,
00098                  const char *File,
00099                  const int Line,
00100                  const char *CompilDate,
00101                  const char *CompilTime,
00102                  const char *Function);
00103
00132 void *dbg_realloc(void *Ptr,
00133                   const size_t Size,
00134                   const char *File,
00135                   const int Line,
00136                   const char *CompilDate,
00137                   const char *CompilTime,
00138                   const char *Function);
00139
00154 char *dbg_strdup(const char *Ptr,
00155                  const char *File,
00156                  const int Line,
00157                  const char *CompilDate,
00158                  const char *CompilTime,
00159                  const char *Function);
00160
00177 int dbg_asprintf(char **p_Ptr,
00178                  const char *p_Format,
00179                  const char *File,
00180                  const int Line,
00181                  const char *CompilDate,
00182                  const char *CompilTime,
```

```
00183                 const char *Function,
00184                 ...);
00185
00186 #ifdef __cplusplus
00187 }
00188 #endif
00189
00190 #endif                          /* __MEMDBG_H__ */
00191
```

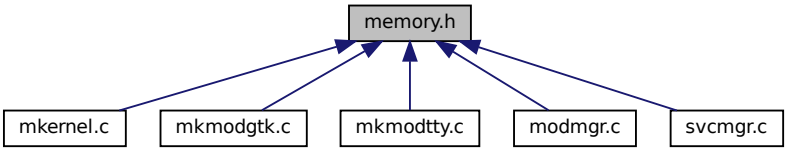
5.11 memory.h File Reference

Tracks memory allocation and leaks when compiled without NDEBUG.

`#include "memdbg.h"`
Include dependency graph for memory.h:



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



Macros

- #define malloc(size) dbg_malloc(size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)

  Same syntaxt and same behavior than regular malloc function, with memory leaks tracking.
- #define realloc(ptr, size) dbg_realloc(ptr,size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)

  Same syntaxt and same behavior than regular realloc function, with memory leaks tracking.
- #define calloc(nmemb, size) dbg_calloc(nmemb,size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)

  Same syntaxt and same behavior than regular calloc function, with memory leaks tracking.
- #define free(ptr) dbg_free(ptr,__FILE__,__LINE__,__DATE__,__TIME__,__func__)

  Same syntaxt and same behavior than regular free function, with memory leaks tracking.
- #define strdup(chaine) dbg_strdup(chaine,__FILE__,__LINE__,__DATE__,__TIME__,__func__)

  Same syntaxt and same behavior than regular strdup function, with memory leaks tracking.
- #define asprintf(out, format, ...) dbg_asprintf(out,format,__FILE__,__LINE__,__DATE__,__TIME__,__func↩__,__VA_ARGS__)

  Same syntaxt and same behavior than regular asprintf function, with memory leaks tracking.
- #define memreport() memtrack_dumpblocks()

  Prints a list of currently allocated blocks on stderr.

5.11.1 Detailed Description

Tracks memory allocation and leaks when compiled without NDEBUG.

Date

25/09/2006

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Copyright (c) 2017-2024, François Cerbelle

Originally inspired by "L'art du code", Steve Maguire, Microsoft Press This header needs to be included after most of the standard headers, ideally the last one.

Definition in file memory.h.

5.11.2 Macro Definition Documentation

5.11.2.1 asprintf

```
#define asprintf(
              out,
              format,
              ...  ) dbg_asprintf(out,format,__FILE__,__LINE__,__DATE__,__TIME__,__func__,__↩
VA_ARGS__)
```

Same syntaxt and same behavior than regular asprintf function, with memory leaks tracking.

Definition at line 47 of file memory.h.

5.11.2.2 calloc

```
#define calloc(
              nmemb,
              size ) dbg_calloc(nmemb,size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
```

Same syntaxt and same behavior than regular calloc function, with memory leaks tracking.

Definition at line 38 of file memory.h.

5.11.2.3 free

```
#define free(
              ptr ) dbg_free(ptr,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
```

Same syntaxt and same behavior than regular free function, with memory leaks tracking.

Definition at line 41 of file memory.h.

5.11.2.4 malloc

```
#define malloc(
              size ) dbg_malloc(size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
```

Same syntaxt and same behavior than regular malloc function, with memory leaks tracking.

Definition at line 32 of file memory.h.

5.11.2.5 memreport

```
#define memreport( ) memtrack_dumpblocks()
```

Prints a list of currently allocated blocks on stderr.

Definition at line 50 of file memory.h.

5.11.2.6 realloc

```
#define realloc(
              ptr,
              size ) dbg_realloc(ptr,size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
```

Same syntaxt and same behavior than regular realloc function, with memory leaks tracking.

Definition at line 35 of file memory.h.

5.11.2.7 strdup

```
#define strdup(
              chaine ) dbg_strdup(chaine,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
```

Same syntaxt and same behavior than regular strdup function, with memory leaks tracking.

Definition at line 44 of file memory.h.

5.12 memory.h

Go to the documentation of this file.

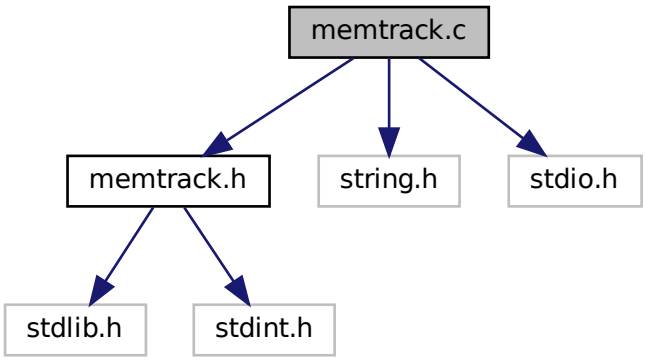
```
00001
00020 #ifndef __MEMORY_H__
00021 #define __MEMORY_H__
00022
00023 #ifdef HAVE_CONFIG_H
00024 #  include "config.h"
00025 #endif
00026
00027 #ifndef NDEBUG
00028
00029 #include "memdbg.h"
00030
00032 #define malloc(size) dbg_malloc(size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
00033
00035 #define realloc(ptr,size) dbg_realloc(ptr,size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
00036
00038 #define calloc(nmemb,size) dbg_calloc(nmemb,size,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
00039
00041 #define free(ptr) dbg_free(ptr,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
00042
00044 #define strdup(chaine) dbg_strdup(chaine,__FILE__,__LINE__,__DATE__,__TIME__,__func__)
00045
00047 #define asprintf(out,format,...)
      dbg_asprintf(out,format,__FILE__,__LINE__,__DATE__,__TIME__,__func__,__VA_ARGS__)
00048
00050 #define memreport() memtrack_dumpblocks()
00051
00052 #else
00053
00055 #define memreport()
00056
00057 #endif                          /* NDEBUG */
00058 #endif                          /* __MEMORY_H__ */
00059
```

5.13 memtrack.c File Reference

Memory block metadata tracking implementation.

```
#include "memtrack.h"
#include <string.h>
#include <stdio.h>
```

Include dependency graph for memtrack.c:



Functions

- void memtrack_reset ()

  Memory block metadata list reset.

Variables

- unsigned int(∗ memtrack_addblock)(const void ∗p_Ptr, const size_t p_Size, const char ∗p_File, const int p_Line, const char ∗p_CompilDate, const char ∗p_CompilTime, const char ∗p_Function)

  Functor to register an allocated memory block metadata.
- unsigned int(∗ memtrack_delblock)(const void ∗p_Ptr, const char ∗p_File, const int p_Line, const char ∗p↩_CompilDate, const char ∗p_CompilTime, const char ∗p_Function)

  Functor to unregister an allocated memory block metadata.
- uint64_t(∗ memtrack_dumpblocks)() = memtrack_dumpblocks_preinit

  Functor to list allocated memory blocks metadata.
- uint64_t(∗ memtrack_getallocatedblocks)() = memtrack_getallocatedblocks_preinit

  Functor to get the number of allocated blocks.
- uint64_t(∗ memtrack_getallocatedRAM)() = memtrack_getallocatedRAM_preinit

  Functor to get the total RAM size allocated.
- size_t(∗ memtrack_getblocksize)(const void ∗p_Ptr) = memtrack_getblocksize_preinit

  Functor to get size of a specific memory block.

5.13.1 Detailed Description

Memory block metadata tracking implementation.

Date

25/09/2006

Author

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Copyright

Originally inspired by "L'art du code", Steve Maguire, Microsoft Press

Definition in file memtrack.c.

5.13.2 Function Documentation

5.13.2.1 memtrack_reset()

```
void memtrack_reset ( )
```

Memory block metadata list reset.

This function is not defined in the header file because it should never be used. It is exported because it is used by the unit tests. NEVER USE IT, it will crash your code.

Definition at line 99 of file memtrack.c.

5.13.3 Variable Documentation

5.13.3.1 memtrack_addblock

```
unsigned int(* memtrack_addblock) (const void *p_Ptr, const size_t p_Size, const char *p_File,
const int p_Line, const char *p_CompilDate, const char *p_CompilTime, const char *p_Function) (
            const void * p_Ptr,
            const size_t p_Size,
            const char * p_File,
            const int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function )
```

Initial value:

```
=
                                        memtrack_addblock_preinit
```

Functor to register an allocated memory block metadata.

Create and adds a memory block metadata record in the tracking system to detect memory leaks. It performs some basic sanity checks. The filename, compilation date and compilation time can not be null or empty, the line number can not be 0, the memory pointer to store can not be NULL or already registered and its size needs to be greater than 0.

The function is called from memdbg.c functions used in the application code thru memory.h macros. The macro automatically fills the filename, line number, compilation date and time, and function name (using GCC's non-ansi __func_ extension).

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Parameters

in	*p_Ptr*	Allocated memory block pointer
in	*p_Size*	Allocated memory block size
in	*p_File*	: Source file
in	*p_Line*	: Source line number
in	*p_CompilDate*	: File compilation date
in	*p_CompilTime*	: File compilation time
in	*p_Function*	: Source function name

Returns

Registration status

Return values

0	if succeeded,
1	if not possible.

Definition at line 593 of file memtrack.c.

5.13.3.2 memtrack_delblock

```
unsigned int(* memtrack_delblock) (const void *p_Ptr, const char *p_File, const int p_Line,
const char *p_CompilDate, const char *p_CompilTime, const char *p_Function) (
             const void * p_Ptr,
             const char * p_File,
             const int p_Line,
             const char * p_CompilDate,
             const char * p_CompilTime,
             const char * p_Function )
```

Initial value:

```
=
                                    memtrack_delblock_preinit
```

Functor to unregister an allocated memory block metadata.

Find and delete a memory block metadata record in the tracking system. It performs some basic sanity checks. The filename, compilation date and compilation time can not be null or empty, the line number can not be 0, the memory pointer to remove can not be NULL, it needs to already be registered.

The function is called from memdbg.c functions used in the application code thru memory.h macros. The macro automatically fills the filename, line number, compilation date and time, and function name (using GCC's non-ansi __func_ extension).

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Parameters

in	*p_Ptr*	Allocated memory block pointer
in	*p_File*	: Source file
in	*p_Line*	: Source line number
in	*p_CompilDate*	: File compilation date
in	*p_CompilTime*	: File compilation time
in	*p_Function*	: Source function name

Returns

Registration status

Return values

0	if succeeded,
!0	if not possible.

Definition at line 603 of file memtrack.c.

5.13.3.3 memtrack_dumpblocks

```
uint64_t(* memtrack_dumpblocks) () ( ) = memtrack_dumpblocks_preinit
```

Functor to list allocated memory blocks metadata.

Dumps all the metadata of the registered memory blocks to stderr.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Returns

Number of registered blocks (counted)

Return values

0	if succeeded,
!0	if not possible.

Definition at line 612 of file memtrack.c.

5.13.3.4 memtrack_getallocatedblocks

```
uint64_t(* memtrack_getallocatedblocks) () ( ) = memtrack_getallocatedblocks_preinit
```

Functor to get the number of allocated blocks.

This function returns the value of the internal counter of allocated memory blocks metadata.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Returns

Number of registered blocks

Definition at line 615 of file memtrack.c.

5.13.3.5 memtrack_getallocatedRAM

```
uint64_t(* memtrack_getallocatedRAM) () ( ) = memtrack_getallocatedRAM_preinit
```

Functor to get the total RAM size allocated.

This function returns the internal summ of all the allocated memory blocks which are registered.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Returns

Total RAM size in bytes

Definition at line 618 of file memtrack.c.

5.13.3.6 memtrack_getblocksize

```
size_t(* memtrack_getblocksize) (const void *p_Ptr) (
            const void * p_Ptr ) = memtrack_getblocksize_preinit
```

Functor to get size of a specific memory block.

The function will search in the list for the specified pointer. If the pointer is not found, it will return 0, which is discriminent as the memtracker does not allow to track a zero sized block. The memtracker does not allow neither to track a NULL pointer, thus NULL will return 0. Otherwise, the function will return the memory block size.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Parameters

in	*p_Ptr*	Allocated and tracked memory block pointer

Returns

Memory block size in bytes

Definition at line 621 of file memtrack.c.

5.14 memtrack.c

Go to the documentation of this file.

```
00001
00019 #include "memtrack.h"
00020 #include <string.h>             /* strdup */
00021 #include <stdio.h>              /* fprintf */
00022
00023 static struct MemBlock *Head;
00024 static struct MemBlock *Tail;
00025 static uint64_t NbBlocks;
00026 static uint64_t RAMSize;
00028 /* Early definition, documented in the implementation below */
00029 static unsigned int memtrack_init();
00030
00031 /* Early definition, documented in the implementation below */
00032 static unsigned int memtrack_addblock_preinit(const void *p_Ptr,
00033         const size_t p_Size,
00034         const char *p_File,
00035         const int p_Line,
00036         const char *p_CompilDate,
00037         const char *p_CompilTime,
00038         const char *p_Function);
00039
00040 /* Early definition, documented in the implementation below */
00041 static unsigned int memtrack_delblock_preinit(const void *p_Ptr,
00042         const char *p_File,
00043         const int p_Line,
00044         const char *p_CompilDate,
00045         const char *p_CompilTime,
00046         const char *p_Function);
00047
00048 /* Early definition, documented in the implementation below */
00049 static uint64_t memtrack_dumpblocks_preinit();
00050
00051 /* Early definition, documented in the implementation below */
00052 static uint64_t memtrack_getallocatedblocks_preinit();
00053
00054 /* Early definition, documented in the implementation below */
00055 static uint64_t memtrack_getallocatedRAM_preinit();
00056
```

```
00057 /* Early definition, documented in the implementation below */
00058 static size_t memtrack_getblocksize_preinit(const void *p_Ptr);
00059
00060 /* Early definition, documented in the implementation below */
00061 static unsigned int memtrack_addblock_postinit(const void *p_Ptr,
00062         const size_t p_Size,
00063         const char *p_File,
00064         const int p_Line,
00065         const char *p_CompilDate,
00066         const char *p_CompilTime,
00067         const char *p_Function);
00068
00069 /* Early definition, documented in the implementation below */
00070 static unsigned int memtrack_delblock_postinit(const void *p_Ptr,
00071         const char *p_File,
00072         const int p_Line,
00073         const char *p_CompilDate,
00074         const char *p_CompilTime,
00075         const char *p_Function);
00076
00077 /* Early definition, documented in the implementation below */
00078 static uint64_t memtrack_dumpblocks_postinit();
00079
00080 /* Early definition, documented in the implementation below */
00081 static uint64_t memtrack_getallocatedblocks_postinit();
00082
00083 /* Early definition, documented in the implementation below */
00084 static uint64_t memtrack_getallocatedRAM_postinit();
00085
00086 /* Early definition, documented in the implementation below */
00087 static size_t memtrack_getblocksize_postinit(const void *p_Ptr);
00088
00089 /********************/
00090 /* Implementations */
00091 /********************/
00092
00099 void memtrack_reset()
00100 {
00101     /* Ne réinitialise que si nécessaire */
00102     if ( memtrack_addblock == memtrack_addblock_preinit)
00103         return;
00104
00105     /* Déconfiguration des foncteurs */
00106     memtrack_addblock = memtrack_addblock_preinit;
00107     memtrack_delblock = memtrack_delblock_preinit;
00108     memtrack_dumpblocks = memtrack_dumpblocks_preinit;
00109     memtrack_getallocatedblocks = memtrack_getallocatedblocks_preinit;
00110     memtrack_getallocatedRAM = memtrack_getallocatedRAM_preinit;
00111     memtrack_getblocksize = memtrack_getblocksize_preinit;
00112
00113     /* Purge de la liste */
00114     while (Tail!=Head->Next) {
00115         memtrack_delblock_postinit(Head->Next->Ptr,NULL,0,NULL,NULL,NULL);
00116     }
00117
00118     /* Réinitialization des pointeurs */
00119     free(Head);
00120     free(Tail);
00121     Head=NULL;
00122     Tail=NULL;
00123 }
00124
00141 static unsigned int memtrack_init()
00142 {
00143     Head = (TMemBlock *) malloc(sizeof(TMemBlock));
00144     Tail = (TMemBlock *) malloc(sizeof(TMemBlock));
00145
00146     if ((NULL==Head)||(NULL==Tail)) {
00147         fprintf(stderr,"%s:%d Not enough memory to initialize memtracker\n",
00148                 __FILE__,__LINE__);
00149         return 1;
00150     }
00151     Head->Prev = (TMemBlock *) NULL;
00152     Head->Next = Tail;
00153     Tail->Next = (TMemBlock *) NULL;
00154     Tail->Prev = Head;
00155     Tail->Ptr = Head->Ptr = (void *)NULL;
00156     Tail->Size = Head->Size = 0;
00157     Tail->File = Head->File = (char *)NULL;
00158     Tail->Line = Head->Line = 0;
00159     Tail->CompilDate = Head->CompilDate = (char *)NULL;
00160     Tail->CompilTime = Head->CompilTime = (char *)NULL;
00161     Tail->Function = Head->Function = (char *)NULL;
00162
00163     /* Initialisation des compteurs */
00164     NbBlocks=0;
00165     RAMSize=0;
```

```
00166
00167     /* Modification des foncteurs pour utiliser les fonctions définitives */
00168     memtrack_addblock = memtrack_addblock_postinit;
00169     memtrack_delblock = memtrack_delblock_postinit;
00170     memtrack_dumpblocks = memtrack_dumpblocks_postinit;
00171     memtrack_getallocatedblocks = memtrack_getallocatedblocks_postinit;
00172     memtrack_getallocatedRAM = memtrack_getallocatedRAM_postinit;
00173     memtrack_getblocksize = memtrack_getblocksize_postinit;
00174
00175     return 0;
00176 }
00177
00178
00190 static unsigned int memtrack_addblock_preinit(const void *p_Ptr,
00191         const size_t p_Size,
00192         const char *p_File,
00193         const int p_Line,
00194         const char *p_CompilDate,
00195         const char *p_CompilTime,
00196         const char *p_Function)
00197 {
00198     /* Initialisation de la liste */
00199     if (0!=memtrack_init()) {
00200         fprintf(stderr,"%s:%d Not enough memory to initialize memtracker\n",
00201                 __FILE__,__LINE__);
00202         /* OOM */
00203         return 1;
00204     }
00205
00206     /* Appel de la fonction réelle */
00207     return memtrack_addblock(p_Ptr, p_Size, p_File, p_Line, p_CompilDate,
00208                              p_CompilTime, p_Function);
00209 }
00210
00222 static unsigned int memtrack_delblock_preinit(const void *p_Ptr,
00223         const char *p_File,
00224         const int p_Line,
00225         const char *p_CompilDate,
00226         const char *p_CompilTime,
00227         const char *p_Function)
00228 {
00229     /* Initialisation de la liste */
00230     if (0!=memtrack_init()) {
00231         fprintf(stderr,"%s:%d Not enough memory to initialize memtracker\n",
00232                 __FILE__,__LINE__);
00233         /* OOM */
00234         return 1;
00235     }
00236
00237     /* Appel de la fonction réelle */
00238     return memtrack_delblock(p_Ptr, p_File, p_Line, p_CompilDate,
00239                              p_CompilTime, p_Function);
00240 }
00241
00253 static uint64_t memtrack_dumpblocks_preinit()
00254 {
00255     /* Initialisation de la liste */
00256     if (0!=memtrack_init()) {
00257         fprintf(stderr,"%s:%d Not enough memory to initialize memtracker\n",
00258                 __FILE__,__LINE__);
00259         /* OOM */
00260         return 0;
00261     }
00262
00263     /* Appel de la fonction réelle */
00264     return memtrack_dumpblocks();
00265 }
00266
00278 static uint64_t memtrack_getallocatedblocks_preinit()
00279 {
00280     /* Initialisation de la liste */
00281     if (0!=memtrack_init()) {
00282         fprintf(stderr,"%s:%d Not enough memory to initialize memtracker\n",
00283                 __FILE__,__LINE__);
00284         /* OOM */
00285         return 0;
00286     }
00287
00288     /* Appel de la fonction réelle */
00289     return memtrack_getallocatedblocks();
00290 }
00291
00303 static uint64_t memtrack_getallocatedRAM_preinit()
00304 {
00305     /* Initialisation de la liste */
00306     if (0!=memtrack_init()) {
00307         fprintf(stderr,"%s:%d Not enough memory to initialize memtracker\n",
```

```
00308                 __FILE__,__LINE__);
00309         /* OOM */
00310         return 0;
00311     }
00312
00313     /* Appel de la fonction réelle */
00314     return memtrack_getallocatedRAM();
00315 }
00316
00328 static size_t memtrack_getblocksize_preinit(const void *p_Ptr)
00329 {
00330     /* Initialisation de la liste */
00331     if (0!=memtrack_init()) {
00332         fprintf(stderr,"%s:%d Not enough memory to initialize memtracker\n",
00333                 __FILE__,__LINE__);
00334         /* OOM */
00335         return 0;
00336     }
00337
00338     /* Appel de la fonction réelle */
00339     return memtrack_getblocksize(p_Ptr);
00340 }
00341
00350 static unsigned int memtrack_addblock_postinit(const void *p_Ptr,
00351         const size_t p_Size,
00352         const char *p_File,
00353         const int p_Line,
00354         const char *p_CompilDate,
00355         const char *p_CompilTime,
00356         const char *p_Function)
00357 {
00358     TMemBlock *l_tmp;
00359
00360     /* Test de validité des données à enregistrer */
00361     /* Meme si malloc permet Size=0, ce n'est pas portable */
00362     if ((NULL==p_Ptr)||
00363         (0==p_Size)||
00364         (NULL==p_File)||
00365         (0==p_File[0])||
00366         (0==p_Line)||
00367         (NULL==p_CompilDate)||
00368         (0==p_CompilDate[0])||
00369         (NULL==p_CompilTime)||
00370         (0==p_CompilTime[0])||
00371         (NULL==p_Function)||
00372         (0==p_Function[0])) {
00373         fprintf(stderr,"%s:%d Null or empty parameters\n",__FILE__, __LINE__);
00374         return 1;
00375     }
00376
00377     /* On ne peut pas dupliquer un pointeur.  Pour le modifier, il faut le
00378 * supprimer et le recréer, ce n'est pas le rôle de ces fonctions  de
00379 * bas-niveau */
00380
00381     /* Recherche du pointeur */
00382     l_tmp = Head->Next;
00383     while ((l_tmp->Ptr != p_Ptr) && (l_tmp != Tail))
00384         l_tmp = l_tmp->Next;
00385
00386     /* Le bloc ne doit pas avoir été trouvé */
00387     if (l_tmp != Tail) {
00388         fprintf(stderr,"%s:%d Memory bloc already registered\n",__FILE__, __LINE__);
00389         return 1;
00390     }
00391
00392     /* Allocation d'un nouveau descripteur de bloc */
00393     l_tmp = (TMemBlock *) malloc(sizeof(TMemBlock));
00394
00395     /* Allocation réussie ?  */
00396     if (NULL == l_tmp) {
00397         return 1;
00398     }
00399
00400     /* Remplissage du descripteur */
00401     l_tmp->Ptr = (void *)p_Ptr;
00402     l_tmp->Size = p_Size;
00403     if (NULL==(l_tmp->File = strdup(p_File?p_File:""))) {
00404         free(l_tmp);
00405         return 1;
00406     };
00407     l_tmp->Line = p_Line;
00408     if (NULL==(l_tmp->CompilDate = strdup(p_CompilDate?p_CompilDate:""))) {
00409         free(l_tmp->File);
00410         free(l_tmp);
00411         return 1;
00412     };
00413     if (NULL==(l_tmp->CompilTime = strdup(p_CompilTime?p_CompilTime:""))) {
```

```
00414         free(l_tmp->CompilDate);
00415         free(l_tmp->File);
00416         free(l_tmp);
00417         return 1;
00418     };
00419     if (NULL==(l_tmp->Function = strdup(p_Function?p_Function:""))) {
00420         free(l_tmp->CompilTime);
00421         free(l_tmp->CompilDate);
00422         free(l_tmp->File);
00423         free(l_tmp);
00424         return 1;
00425     };
00426 
00427     /* Ajout de la description dans la liste (Section critique) */
00428     l_tmp->Prev = Tail->Prev;
00429     l_tmp->Next = Tail;
00430     l_tmp->Prev->Next = l_tmp->Next->Prev = l_tmp;
00431 
00432     /* Mise à jour des compteurs */
00433     NbBlocks++;
00434     RAMSize += p_Size;
00435 
00436     return 0;
00437 }
00438 
00447 static unsigned int memtrack_delblock_postinit(const void *p_Ptr,
00448         const char *p_File,
00449         const int p_Line,
00450         const char *p_CompilDate,
00451         const char *p_CompilTime,
00452         const char *p_Function)
00453 {
00454     TMemBlock *l_tmp;
00455     (void) p_File;
00456     (void) p_Line;
00457     (void) p_CompilDate;
00458     (void) p_CompilTime;
00459     (void) p_Function;
00460 
00461     /* Recherche de la description */
00462     l_tmp = Head->Next;
00463     while ((l_tmp->Ptr != p_Ptr) && (l_tmp != Tail))
00464         l_tmp = l_tmp->Next;
00465 
00466     /* Le bloc doit avoir été trouvé */
00467     if (l_tmp == Tail) {
00468         fprintf(stderr,"%s:%d Block not found for deletion\n",__FILE__, __LINE__);
00469         return 1;
00470     }
00471 
00472     /* Libération des ressources acquises */
00473     /* On ne libère pas le bloc mémoire lui-même */
00474     free(l_tmp->File);
00475     free(l_tmp->CompilDate);
00476     free(l_tmp->CompilTime);
00477     free(l_tmp->Function);
00478 
00479     /* Retrait de la description de la liste (Section critique) */
00480     l_tmp->Next->Prev = l_tmp->Prev;
00481     l_tmp->Prev->Next = l_tmp->Next;
00482 
00483     /* Mise à jour des compteurs */
00484     NbBlocks--;
00485     RAMSize -= l_tmp->Size;
00486 
00487     /* Libération de la description */
00488     free(l_tmp);
00489 
00490     return 0;
00491 }
00492 
00501 static uint64_t memtrack_dumpblocks_postinit()
00502 {
00503     TMemBlock *l_tmp;
00504     uint64_t l_NbBlocks = 0;;
00505 
00506     if (Head->Next != Tail) {
00507         size_t l_BlockSize;
00508         fprintf(stderr,
00509 
      "+-------------------------------------------------------------------------------------------------------------------------+\n");
00510         fprintf(stderr, "| %-104s |\n", "Memory Tracker Report");
00511         fprintf(stderr,
00512 
      "+----------------------+----------------------+------+----------------+----------+-----------------------+\n");
00513         fprintf(stderr,
00514                 "| %-20s | %-20s | %-4s | %-15s | %-8s | %-22s |\n",
```

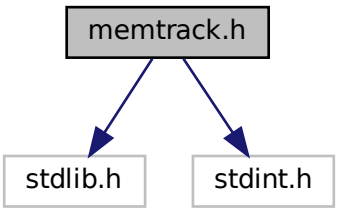
```
00515                 "Function", "File", "Line", "Address", "Bytes",
00516                 "Compiled");
00517         fprintf(stderr,
00518 "+----------------------+----------------------+------+----------------+----------+-----------------------+\n");
00519 
00520         l_tmp = Head->Next;
00521         l_BlockSize = 0;
00522         while (l_tmp != Tail) {
00523             fprintf(stderr,
00524                     "| %-20s | %-20s | %4d | %15p | %8lu | %11s @ %8s |\n",
00525                     l_tmp->Function, l_tmp->File, l_tmp->Line,
00526                     l_tmp->Ptr, (unsigned long)l_tmp->Size, l_tmp->CompilDate,
00527                     l_tmp->CompilTime);
00528             l_NbBlocks++;
00529             l_BlockSize += l_tmp->Size;
00530             l_tmp = l_tmp->Next;
00531         }
00532         fprintf(stderr,
00533 "+----------------------+----------------------+------+----------------+----------+-----------------------+\n");
00534         fprintf(stderr,
00535                 "| %9lu bytes in %6lu blocks.  %70s |\n", (unsigned long)l_BlockSize,
00536                 (unsigned long)l_NbBlocks, "");
00537         fprintf(stderr,
00538 "+-------------------------------------------------------------------------------------------------------------------+\n");
00539     }
00540     /* Add ASSERT or assert (l_NbBlocks==NbBlocks) */
00541     return l_NbBlocks;
00542 }
00543 
00552 static uint64_t memtrack_getallocatedblocks_postinit()
00553 {
00554     return NbBlocks;
00555 }
00556 
00565 static uint64_t memtrack_getallocatedRAM_postinit()
00566 {
00567     return RAMSize;
00568 }
00569 
00578 static size_t memtrack_getblocksize_postinit(const void *p_Ptr)
00579 {
00580     /* Recherche de la description */
00581     TMemBlock *l_tmp = Head->Next;
00582     while ((l_tmp->Ptr != p_Ptr) && (l_tmp != Tail))
00583         l_tmp = l_tmp->Next;
00584 
00585     /* Le bloc doit avoir été trouvé */
00586     if (l_tmp == Tail)
00587         return 0;
00588     else
00589         return l_tmp->Size;
00590 }
00591 
00592 /* Documented in header file */
00593 unsigned int (*memtrack_addblock) (const void *p_Ptr,
00594                                    const size_t p_Size,
00595                                    const char *p_File,
00596                                    const int p_Line,
00597                                    const char *p_CompilDate,
00598                                    const char *p_CompilTime,
00599                                    const char *p_Function) =
00600                                        memtrack_addblock_preinit;
00601 
00602 /* Documented in header file */
00603 unsigned int (*memtrack_delblock) (const void *p_Ptr,
00604                                    const char *p_File,
00605                                    const int p_Line,
00606                                    const char *p_CompilDate,
00607                                    const char *p_CompilTime,
00608                                    const char *p_Function) =
00609                                        memtrack_delblock_preinit;
00610 
00611 /* Documented in header file */
00612 uint64_t (*memtrack_dumpblocks) () = memtrack_dumpblocks_preinit;
00613 
00614 /* Documented in header file */
00615 uint64_t (*memtrack_getallocatedblocks) () = memtrack_getallocatedblocks_preinit;
00616 
00617 /* Documented in header file */
00618 uint64_t (*memtrack_getallocatedRAM) () = memtrack_getallocatedRAM_preinit;
00619 
00620 /* Documented in header file */
00621 size_t(*memtrack_getblocksize) (const void *p_Ptr) = memtrack_getblocksize_preinit;
```

5.15 memtrack.h File Reference

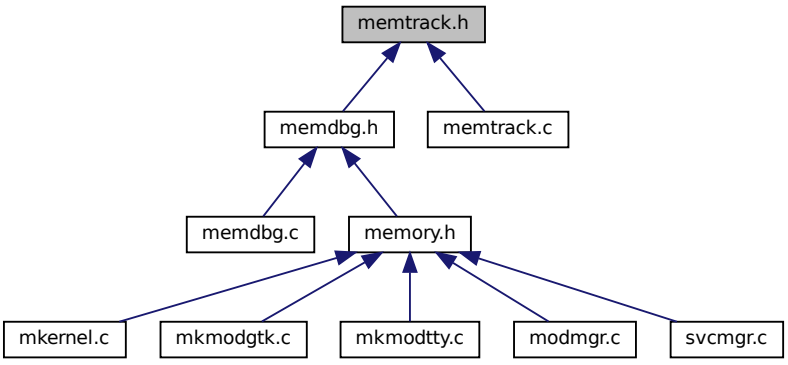
Memory block metadata tracking headers.

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

Include dependency graph for memtrack.h:



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



Classes

- struct MemBlock

  Memory block metadata list item.

Typedefs

- typedef struct MemBlock TMemBlock

  Memory block metadata list item.

Variables

- unsigned int(∗ memtrack_addblock)(const void ∗p_Ptr, const size_t p_Size, const char ∗p_File, const int p_Line, const char ∗p_CompilDate, const char ∗p_CompilTime, const char ∗p_Function)

  Functor to register an allocated memory block metadata.
- unsigned int(∗ memtrack_delblock)(const void ∗p_Ptr, const char ∗p_File, const int p_Line, const char ∗p_CompilDate, const char ∗p_CompilTime, const char ∗p_Function)

  Functor to unregister an allocated memory block metadata.
- uint64_t(∗ memtrack_dumpblocks)()

  Functor to list allocated memory blocks metadata.
- uint64_t(∗ memtrack_getallocatedblocks)()

  Functor to get the number of allocated blocks.
- uint64_t(∗ memtrack_getallocatedRAM)()

  Functor to get the total RAM size allocated.
- size_t(∗ memtrack_getblocksize)(const void ∗p_Ptr)

  Functor to get size of a specific memory block.

5.15.1 Detailed Description

Memory block metadata tracking headers.

Date

25/09/2006

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Copyright (c) 1997-2024, François Cerbelle

Originally inspired by "L'art du code", Steve Maguire, Microsoft Press

Definition in file memtrack.h.

5.15.2 Typedef Documentation

5.15.2.1 TMemBlock

```
typedef struct MemBlock TMemBlock
```

Memory block metadata list item.

Double linked list item to store memory block metadata

5.15.3 Variable Documentation

5.15.3.1 memtrack_addblock

```
unsigned int(* memtrack_addblock) (const void *p_Ptr, const size_t p_Size, const char *p_File,
const int p_Line, const char *p_CompilDate, const char *p_CompilTime, const char *p_Function) (
            const void * p_Ptr,
            const size_t p_Size,
            const char * p_File,
            const int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function )  [extern]
```

Functor to register an allocated memory block metadata.

Create and adds a memory block metadata record in the tracking system to detect memory leaks. It performs some basic sanity checks. The filename, compilation date and compilation time can not be null or empty, the line number can not be 0, the memory pointer to store can not be NULL or already registered and its size needs to be greater than 0.

The function is called from memdbg.c functions used in the application code thru memory.h macros. The macro automatically fills the filename, line number, compilation date and time, and function name (using GCC's non-ansi __func_ extension).

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Parameters

in	*p_Ptr*	Allocated memory block pointer
in	*p_Size*	Allocated memory block size
in	*p_File*	: Source file
in	*p_Line*	: Source line number
in	*p_CompilDate*	: File compilation date
in	*p_CompilTime*	: File compilation time
in	*p_Function*	: Source function name

Returns

Registration status

Return values

0	if succeeded,
1	if not possible.

Definition at line 593 of file memtrack.c.

5.15.3.2 memtrack_delblock

```
unsigned int(* memtrack_delblock) (const void *p_Ptr, const char *p_File, const int p_Line,
const char *p_CompilDate, const char *p_CompilTime, const char *p_Function) (
            const void * p_Ptr,
            const char * p_File,
            const int p_Line,
            const char * p_CompilDate,
            const char * p_CompilTime,
            const char * p_Function )  [extern]
```

Functor to unregister an allocated memory block metadata.

Find and delete a memory block metadata record in the tracking system. It performs some basic sanity checks. The filename, compilation date and compilation time can not be null or empty, the line number can not be 0, the memory pointer to remove can not be NULL, it needs to already be registered.

The function is called from memdbg.c functions used in the application code thru memory.h macros. The macro automatically fills the filename, line number, compilation date and time, and function name (using GCC's non-ansi __func_ extension).

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Parameters

in	*p_Ptr*	Allocated memory block pointer
in	*p_File*	: Source file
in	*p_Line*	: Source line number
in	*p_CompilDate*	: File compilation date
in	*p_CompilTime*	: File compilation time
in	*p_Function*	: Source function name

Returns

Registration status

Return values

0	if succeeded,
!0	if not possible.

Definition at line 603 of file memtrack.c.

5.15.3.3 memtrack_dumpblocks

```
uint64_t(* memtrack_dumpblocks) () ( )  [extern]
```

Functor to list allocated memory blocks metadata.

Dumps all the metadata of the registered memory blocks to stderr.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Returns

Number of registered blocks (counted)

Return values

0	if succeeded,
!0	if not possible.

Definition at line 612 of file memtrack.c.

5.15.3.4 memtrack_getallocatedblocks

```
uint64_t(* memtrack_getallocatedblocks) () ( )  [extern]
```

Functor to get the number of allocated blocks.

This function returns the value of the internal counter of allocated memory blocks metadata.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Returns

Number of registered blocks

Definition at line 615 of file memtrack.c.

5.15.3.5 memtrack_getallocatedRAM

```
uint64_t(* memtrack_getallocatedRAM) () ( )  [extern]
```

Functor to get the total RAM size allocated.

This function returns the internal summ of all the allocated memory blocks which are registered.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Returns

Total RAM size in bytes

Definition at line 618 of file memtrack.c.

5.15.3.6 memtrack_getblocksize

```
size_t(* memtrack_getblocksize) (const void *p_Ptr) (
            const void * p_Ptr )  [extern]
```

Functor to get size of a specific memory block.

The function will search in the list for the specified pointer. If the pointer is not found, it will return 0, which is discriminent as the memtracker does not allow to track a zero sized block. The memtracker does not allow neither to track a NULL pointer, thus NULL will return 0. Otherwise, the function will return the memory block size.

This functor is used to implement a lazy initialization. It initialy reference a temporary function to trigger memtrack initialization before calling the actual function. Then, it references the actual function directly to avoid any useless tests.

Parameters

in	*p_Ptr*	Allocated and tracked memory block pointer

Returns

Memory block size in bytes

Definition at line 621 of file memtrack.c.

5.16 memtrack.h

Go to the documentation of this file.

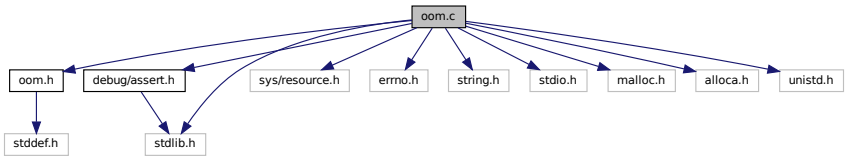
```
00001
00019 #ifndef __MEMTRACK_H__
00020 #define __MEMTRACK_H__
00021
00022 #ifdef HAVE_CONFIG_H
00023 #  include "config.h"
00024 #endif
00025
00026 #include <stdlib.h>             /* size_t */
00027 #include <stdint.h>             /* uint64_t */
00028
00029 #ifdef __cplusplus
00030 extern "C" {
00031 #endif
00032
00037 typedef struct MemBlock {
00038     struct MemBlock *Prev;
00039     struct MemBlock *Next;
00040     void *Ptr;
00041     size_t Size;
00042     char *File;
00043     int Line;
00044     char *CompilDate;
00045     char *CompilTime;
00046     char *Function;
00047 } TMemBlock;
00048
00079 extern unsigned int (*memtrack_addblock) (const void *p_Ptr,
00080         const size_t p_Size,
00081         const char *p_File,
00082         const int p_Line,
00083         const char *p_CompilDate,
00084         const char *p_CompilTime,
00085         const char *p_Function);
00086
00115 extern unsigned int (*memtrack_delblock) (const void *p_Ptr,
00116         const char *p_File,
00117         const int p_Line,
```

```
00118         const char *p_CompilDate,
00119         const char *p_CompilTime,
00120         const char *p_Function);
00121
00135 extern uint64_t (*memtrack_dumpblocks) ();
00136
00149 extern uint64_t (*memtrack_getallocatedblocks) ();
00150
00163 extern uint64_t (*memtrack_getallocatedRAM) ();
00164
00182 extern size_t(*memtrack_getblocksize) (const void *p_Ptr);
00183
00184 #ifdef __cplusplus
00185 }
00186 #endif
00187
00188 #endif                          /* __MEMTRACK_H__ */
00189
```

5.17 oom.c File Reference

```
#include "oom.h"
#include "debug/assert.h"
#include <sys/resource.h>
#include <errno.h>
#include <string.h>
#include <stdio.h>
#include <malloc.h>
#include <stdlib.h>
#include <alloca.h>
#include <unistd.h>
```

Include dependency graph for oom.c:



Macros

- #define __asm__ asm
- #define __sync_synchronize void
- #define _GNU_SOURCE
- #define RAMBLOCKS_MAX 1000

  Maximum number of fragmented blocks to allocate.

Functions

- size_t oomtest_config (const size_t hardlimit)

  Sets the oomtest helpers hard rlimit and enables the oomtest helper features.
- unsigned char oomtest_enabled ()

Variables

- size_t(∗ oomtest_fill)(const size_t minHeap, const size_t minStack) =oomtest_fill_preinit

  Starts an almost OOM single and simple test.
- void(∗ oomtest_free)() =oomtest_free_preinit

  Ends a single simple OOM test.
- size_t(∗ oomtest_enable)(const size_t softlimit) =oomtest_enable_preinit

  Starts a new oomtest environment or reconfigure the soft limit.
- size_t(∗ oomtest_disable)() =oomtest_disable_preinit

  Stops the current oomtest.

5.17.1 Detailed Description

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Definition in file oom.c.

5.17.2 Macro Definition Documentation

5.17.2.1 __asm__

```
#define __asm__ asm
```

Definition at line 21 of file oom.c.

5.17.2.2 __sync_synchronize

```
#define __sync_synchronize void
```

Definition at line 24 of file oom.c.

5.17.2.3 _GNU_SOURCE

```
#define _GNU_SOURCE
```

Definition at line 38 of file oom.c.

5.17.2.4 RAMBLOCKS_MAX

```
#define RAMBLOCKS_MAX 1000
```

Maximum number of fragmented blocks to allocate.

I never reached more than 350 on my systems. The value needs to be less than UINT_MAX

Definition at line 47 of file oom.c.

5.17.3 Function Documentation

5.17.3.1 oomtest_config()

```
size_t oomtest_config (
            const size_t hardlimit )
```

Sets the oomtest helpers hard rlimit and enables the oomtest helper features.

This function needs to be invoqued BEFORE any other helper from the framework. It will configure an hard RAM limit for the current process and each of his children. Then, it will enable the other oomtest helper functions.

It refuses to set a limit over the actually installed physical RAM to limit pushing RAM pages to the swap. If the requested value is zero, it will default to the actually installed physical RAM.

If anything goes wrong or did not behaves as expected, it abort the process to avoid RAM bombing and swapping.

Despite it was designed to be invoked only once, from the main parent process, it can be invoked several times as long as the hardlimit parameter is always less than the previous call, otherwise it will fail and abort the process.

Parameters

in	*hardlimit*	the size in bytes to limit the process to.

Returns

Returns the actual configured size. It should be the same value as the hardlimit parameter, otherwise something went wrong, it was not detected and the process was not aborted (which is a bug to report)

See also

oomtest_enable
oomtest_disable
oomtest_fill
oomtest_free

Definition at line 367 of file oom.c.

5.17.3.2 oomtest_enabled()

```
unsigned char oomtest_enabled ( )
```

Definition at line 422 of file oom.c.

5.17.4 Variable Documentation

5.17.4.1 oomtest_disable

```
size_t(* oomtest_disable) () ( ) =oomtest_disable_preinit
```

Stops the current oomtest.

This function can be invoked any time after the oomtest_config initialized the environment. If invocated before, it will abort the current process to help detecting mistakes in the test code.

This function disables the fill/free oomtest functions and free the allocated RAM before reverting the soft limit to the hard limit value.

It is designed to be invoked t the end of a test case.

Despite it could be invoked twice or without a prior call to oomtest_enable, it is illegal and not allowed to help detecting mistakes in the test code.

Returns

Returns the applied soft limit, which should be the same as the hard limit.

See also

oomtest_enable

oomtest_disable

oomtest_fill

oomtest_free

Definition at line 138 of file oom.c.

5.17.4.2 oomtest_enable

```
size_t(* oomtest_enable) (const size_t softlimit) (
            const size_t softlimit ) =oomtest_enable_preinit
```

Starts a new oomtest environment or reconfigure the soft limit.

This function can only be invoked after at least a first call to oomtest_config to initialize the oomtest helpers environment. If invocated before, it will abort the current process to help detecting mistakes in the test code.

It will (soft)limit the current process and his children to the provided value in bytes. Then, it will enable the fill/free oomtest helper functions which are disabled otherwise.

It is designed to be invoked at the begining of a test case to apply for all tests in this testcase.

In case of any unexpected behavior, it should abort the current process.

Parameters

in	*softlimit*	Soft limit to set in bytes. It has to be less than the hardlimit otherwise it will fail and abort. If set to 0, it will apply the same value as the hardlimit.

Returns

Returns the actually set value as a softlimit, either the requested value or the hardlimit in case of 0 requested.

See also

oomtest_enable

oomtest_disable

oomtest_fill

oomtest_free

Definition at line 120 of file oom.c.

5.17.4.3 oomtest_fill

```
size_t(* oomtest_fill) (const size_t minHeap, const size_t minStack) (
            const size_t minHeap,
            const size_t minStack ) =oomtest_fill_preinit
```

Starts an almost OOM single and simple test.

This function is only enabled after a call to oomtest_enable and will have no effect otherwise. Its goal is to completely fill the RAM until the very last bytes, to keep only between minHeap and maxHeap bytes available in the heap and minStack bytes in the stack.

If oomtest_enable was not invoked beforehand, this function will simply return without any RAM consumption.

It should be called immediately before the test and should be reverted with oomtest_free immediately after. It can create so much pressure on the available memory that a simple printf could fail.

It is designed to fail if invoked twice as this is very probably a mistake in the test code. Should you need to change the RAM filling values, first call oomtest_free and reapply oomtest_fill. This ensure a really wanted behavior and not a mistake in your test code.

Parameters

in	*minHeap*	
in	*minStack*	

Returns

Returns the allocated size to fill the memory

See also

oomtest_enable

oomtest_disable

oomtest_fill

oomtest_free

Definition at line 84 of file oom.c.

5.17.4.4 oomtest_free

```
void(* oomtest_free) () ( ) =oomtest_free_preinit
```

Ends a single simple OOM test.

If this function is invoked between an oomtest_enable and an oomtest_disable invocations, it deallocates the RAM allocated by the oomtest_fill function. It should be called immediately after the single and simple test because the RAM pressure can even make a printf to fail.

If called without a prior oomtest_enable invocation, this function simply returns without any action.

This function is designed to fail and abort the process if invocated whereas there is no current RAM allocated, when called twice, for example. This helps to avoid mistakes in the test scenario.

Definition at line 100 of file oom.c.

5.18 oom.c

Go to the documentation of this file.

```
00001
00017 #include "oom.h"                                /* OOM simulation */
00018
00019 #ifndef __GNUC__
00020 # ifndef __asm__
00021 #  define __asm__ asm
00022 # endif
00023 # ifndef __sync_synchronize
00024 #  define __sync_synchronize void
00025 # endif
00026 #endif
00027
00028 #include "debug/assert.h"                       /* libdebug's Assertions */
00029 #include <sys/resource.h>                       /* setrlimit */
00030 #include <errno.h>                              /* errno */
00031 #include <string.h>                             /* strerror() */
00032 #include <stdio.h>                              /* printf */
00033 #include <malloc.h>                             /* malloc_trim() */
00034 #include <stdlib.h>                             /* abort() */
00035 #include <alloca.h>                             /* alloca() */
00036
00037 #ifndef _GNU_SOURCE
00038 #define _GNU_SOURCE
00039 #endif
00040 #include <unistd.h>                             /* sysconf() */
00041
00047 #define RAMBLOCKS_MAX 1000
00048
00052 static void* _oomblocks[RAMBLOCKS_MAX] = {0};
00053
00055 static int checked_getrlimit(int resource, struct rlimit *rlim)
00056 {
00057     /* Get current limit values */
00058     if (getrlimit(resource, rlim) != 0) {
```

```
00059         /* Can occur, thus not ignored, but impossible to trigger for gcov/lcov */
00060         fprintf (stderr,"%s:%d getrlimit() failed with errno=%d %s\n",
00061                  __FILE__,__LINE__, errno,strerror(errno));
00062         abort();
00063     }
00064     return 0;
00065 }
00066
00075 static size_t oomtest_fill_preinit(const size_t minHeap, const size_t minStack)
00076 {
00077     (void)minHeap;
00078     (void)minStack;
00079     ASSERT(NULL==_oomblocks[0]);
00080     return 0;
00081 }
00082
00083 /* Documented in header file */
00084 size_t (*oomtest_fill)(const size_t minHeap, const size_t minStack)=oomtest_fill_preinit;
00085
00094 static void oomtest_free_preinit()
00095 {
00096     ASSERT(NULL==_oomblocks[0]);
00097 }
00098
00099 /* Documented in header file */
00100 void (*oomtest_free)()=oomtest_free_preinit;
00101
00110 static size_t oomtest_enable_preinit(const size_t softlimit)
00111 {
00112     (void)softlimit;
00113
00114     /* Should not be called without configuration */
00115     fprintf(stderr,"%s:%d oomtest_enable called without oomtest_config before\n",__FILE__,__LINE__);
00116     abort();
00117 }
00118
00119 /* Documented in header file */
00120 size_t (*oomtest_enable)(const size_t softlimit)=oomtest_enable_preinit;
00121
00130 static size_t oomtest_disable_preinit()
00131 {
00132     /* Should not be called before configuration */
00133     fprintf(stderr,"%s:%d oomtest_disable called without oomtest_config before\n",__FILE__,__LINE__);
00134     abort();
00135 }
00136
00137 /* Documented in header file */
00138 size_t (*oomtest_disable)()=oomtest_disable_preinit;
00139
00151 static size_t oomtest_getbiggestblock(void** p_ramblock)
00152 {
00153     /* This function could receive an optimized "max" value and return the final
00154 * "max" value to the caller.  So, it could be used as the next invocation
00155 * starting "max" value.  This would save few loop iterations, at the cost of
00156 * extra stack usage, I chose to not pass this value as a parameter to avoid
00157 * consuming stack.
00158 * The function starts to search between 0..rlim_cur which has very little
00159 * impact given the Olog2 complexity.  It could be optimized and start to
00160 * search between 0..sysconf(AVPHYSPAGE*PAGESIZE), assuming that sysconf is
00161 * faster than few loop iterations.  */
00162
00163     /* Use static to avoid stack allocation/free */
00164     static size_t max,cur;
00165     static struct rlimit limit;
00166
00167     ASSERT(NULL!=p_ramblock);
00168     ASSERT(NULL==*p_ramblock);
00169
00170     /* Get the current limits */
00171     checked_getrlimit(RLIMIT_AS, &limit);
00172     max = limit.rlim_cur;
00173
00174     /* Restart the whole process if cur can not be allocated at the end */
00175     while ((max>0)&&(NULL==*p_ramblock)) {
00176         static size_t min;
00177         /* Iterate quickly (Olog2) to converge to the biggest available RAM block */
00178         min = 0;
00179         while (max>min) {
00180             cur = min+(max-min)/2; /* To avoid overflow */
00181             if (NULL==(*p_ramblock = malloc(cur))) {
00182                 max = cur;
00183             } else {
00184                 min = cur+1;
00185                 free(*p_ramblock);
00186             }
00187         }
00188         cur -= 1;
```

```
00189         *p_ramblock=malloc(cur);
00190     }
00191
00192     return cur;
00193 }
00194
00202 static size_t oomtest_fill_postinit(const size_t minHeap, const size_t minStack)
00203 {
00204     unsigned int l_numblock;
00205     size_t l_sum;
00206     void* volatile l_reservedheap;
00207     void* l_reservedstack;
00208
00209     /* Probably a mistake in the test code, do not accept despite we could */
00210     if (NULL!=_oomblocks[0]) {
00211         /* Dirty hack to free some RAM and allow abort to SIGABRT */
00212         free(_oomblocks[0]);
00213         fprintf (stderr,"%s:%d oomblocks are already allocated\n", __FILE__,__LINE__);
00214         abort();
00215     }
00216
00217     /* Reserve/Protect stack bytes which will be auto freed at return */
00218     /* A failure means a stackoverflow, which is not recoverable and will abort
00219 * the process anyway.  */
00220     if (0<minStack)
00221         l_reservedstack=alloca(minStack);
00222     (void)l_reservedstack;
00223
00224     /* Reserve/Protect heap bytes which will be released before return */
00225     l_reservedheap=NULL;
00226     if (0<minHeap)
00227         if (NULL==(l_reservedheap=malloc(minHeap))) {
00228             /* This will fail if minHeap is higher than rlimit */
00229             fprintf(stderr,"%s:%d Failed to reserve minheap bytes\n",__FILE__,__LINE__);
00230             abort();
00231         }
00232
00233     /* Find and allocate the biggest available RAM blocks until no mre RAM
00234 * available or all _oomblocks are allocated */
00235     l_numblock=0;
00236     l_sum = 0;
00237     l_sum += oomtest_getbiggestblock(&(_oomblocks[l_numblock++]));
00238     while ((NULL!=_oomblocks[l_numblock-1])&&((RAMBLOCKS_MAX-1)>l_numblock))
00239         l_sum += oomtest_getbiggestblock(&(_oomblocks[l_numblock++]));
00240     /* Either already NULL, which stopped the while loop or reached the last
00241 * slot in the table, which stopped the while loop and the slot has to be
00242 * set to NULL */
00243     _oomblocks[l_numblock]=NULL;
00244
00245     /* There can be less than 4 bytes available at this point !!!  */
00246
00247     /* Make the protected heap bytes available again */
00248     if (NULL!=l_reservedheap)
00249         free(l_reservedheap);
00250
00251     return l_sum;
00252 }
00253
00261 static void oomtest_free_postinit()
00262 {
00263     unsigned int l_i;
00264
00265     /* Despite we could manage, abort to help detecting mistakes in test code */
00266     if (NULL==_oomblocks[0]) {
00267         fprintf(stderr,"%s:%d no blocks to free in oomtest_free.\n",__FILE__,__LINE__);
00268         abort();
00269     }
00270
00271     /* Actually free allocated blocks and set their pointer to NULL */
00272     l_i = 0;
00273     while ((l_i<(RAMBLOCKS_MAX-1))&&(_oomblocks[l_i])) {
00274         free(_oomblocks[l_i]);
00275         _oomblocks[l_i] = NULL;
00276         l_i+=1;
00277     }
00278     /* These barrier protections are probably useless */
00279     malloc_trim(0);
00280     /* SW barrier (compiler only) */
00281     __asm__ volatile(""::  :  :"memory");
00282     /* HW barrier (CPU instruction) */
00283     __sync_synchronize();
00284 }
00285
00293 static size_t oomtest_enable_postinit(const size_t softlimit)
00294 {
00295     struct rlimit limit;
00296     size_t l_softlimit = softlimit;
```

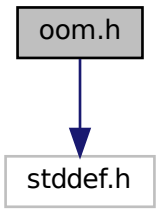
```
00297
00298     /* Probably a bug in oomtest */
00299     ASSERT(NULL==_oomblocks[0]);
00300
00301     /* Get current limit values */
00302     checked_getrlimit(RLIMIT_AS, &limit);
00303
00304     /* Check the requested value */
00305     if (0==l_softlimit) {
00306         /* Defaults to available physical RAM if requested 0 */
00307         l_softlimit = limit.rlim_max;
00308     };
00309
00310     /* Soft limit available RAM */
00311     limit.rlim_cur = l_softlimit;
00312
00313     /* Abort if setrlimit fails to avoid RAM bombing */
00314     if (setrlimit(RLIMIT_AS, &limit) != 0) {
00315         fprintf (stderr,"%s:%d setrlimit(cur=%lu, max=%lu) with errno=%d %s\n",
00316                  __FILE__,__LINE__,
00317                  (unsigned long)limit.rlim_cur, (unsigned long)limit.rlim_max,
00318                  errno,strerror(errno));
00319         abort();
00320     }
00321
00322     /* Activate fill/free functions */
00323     oomtest_fill = oomtest_fill_postinit;
00324     oomtest_free = oomtest_free_postinit;
00325
00326     /* Return the actual current soft limit */
00327     return limit.rlim_cur;
00328 }
00329
00337 static size_t oomtest_disable_postinit()
00338 {
00339     struct rlimit limit;
00340
00341     if (NULL!=_oomblocks[0]) {
00342         fprintf(stderr,"%s:%d RAM still allocated while calling oomtest_disable\n",__FILE__,__LINE__);
00343         abort();
00344     }
00345
00346     /* Do not allow calling disable if not enabled to detect test mistakes */
00347     if ((oomtest_fill!=oomtest_fill_postinit)||(oomtest_free!=oomtest_free_postinit)) {
00348         fprintf(stderr,"%s:%d Impossible to disable oomtest if not previously
      enabled\n",__FILE__,__LINE__);
00349         abort();
00350     }
00351
00352     /* Reset the soft limit to hard limit */
00353     oomtest_enable_postinit(0);
00354
00355     /* Get current limit values */
00356     checked_getrlimit(RLIMIT_AS, &limit);
00357
00358     /* Restore disabled functors */
00359     oomtest_fill = oomtest_fill_preinit;
00360     oomtest_free = oomtest_free_preinit;
00361
00362     /* Return the actual current soft limit, which is equal to hard limit */
00363     return limit.rlim_cur;
00364 }
00365
00366 /* Documented in header file */
00367 size_t oomtest_config(const size_t hardlimit)
00368 {
00369     struct rlimit limit;
00370     size_t l_avail;
00371     size_t l_hardlimit = hardlimit;
00372
00373     /* Probably a test implementation mistake */
00374     if (NULL!=_oomblocks[0]) {
00375         fprintf(stderr,"%s:%d Calling oomtest_config with allocated RAM blocks is not allowed.\n",
00376                 __FILE__,__LINE__);
00377         abort();
00378     }
00379
00380     /* Find *installed* physical RAM, 0 in case of failure */
00381     l_avail = (sysconf(_SC_PHYS_PAGES) * sysconf(_SC_PAGESIZE));
00382
00383     /* Get current limit values */
00384     checked_getrlimit(RLIMIT_AS, &limit);
00385     if (0==l_hardlimit) {
00386         /* Defaults to available physical RAM or already set rlimit
00387 * if 0 requested */
00388         l_hardlimit=(limit.rlim_max<l_avail?limit.rlim_max:l_avail);
00389     } else if (l_hardlimit>l_avail) {
```

```
00390         /* Fails if request is over available physical RAM to avoir swapping */
00391         fprintf(stderr,"%s:%d Requesing a limit %lu bigger than *installed* RAM %lu is not
    allowed.\n",
00392                 __FILE__,__LINE__,
00393                 (unsigned long)l_hardlimit,(unsigned long)l_avail);
00394         abort();
00395     }
00396
00397     /* Hard limit available RAM to hardlimit globally with no way back */
00398     limit.rlim_cur = l_hardlimit;
00399     limit.rlim_max = l_hardlimit;
00400
00401     /* Abort if setrlimit fails to avoid RAM bombing */
00402     if (setrlimit(RLIMIT_AS, &limit) != 0) {
00403         fprintf (stderr,"%s:%d setrlimit(cur=%lu, max=%lu) with errno=%d %s\n",
00404                  __FILE__,__LINE__, (unsigned long)limit.rlim_cur,
00405                  (unsigned long)limit.rlim_max, errno,strerror(errno));
00406         /* Get current limit values */
00407         checked_getrlimit(RLIMIT_AS, &limit);
00408         fprintf (stderr,"%s:%d getrlimit() is cur=%lu, max=%lu\n",
00409                  __FILE__,__LINE__, (unsigned long)limit.rlim_cur,
00410                  (unsigned long)limit.rlim_max);
00411         abort();
00412     }
00413
00414     /* Activate enable/disable functions */
00415     oomtest_enable = oomtest_enable_postinit;
00416     oomtest_disable = oomtest_disable_postinit;
00417
00418     /* Return the configured limit hard=soft */
00419     return limit.rlim_max;
00420 }
00421
00422 unsigned char oomtest_enabled()
00423 {
00424     return (oomtest_fill==oomtest_fill_postinit?1:0);
00425 }
```

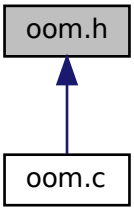
5.19 oom.h File Reference

`#include <stddef.h>`

Include dependency graph for oom.h:



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



Macros

- #define RAMLIMIT_HARD (7∗1024∗1024)
- #define RAMLIMIT_SOFT (5∗1024∗1024)

Functions

- size_t oomtest_config (const size_t hardlimit)

  Sets the oomtest helpers hard rlimit and enables the oomtest helper features.
- unsigned char oomtest_enabled ()

Variables

- size_t(∗ oomtest_enable)(const size_t softlimit)

  Starts a new oomtest environment or reconfigure the soft limit.
- size_t(∗ oomtest_disable)()

  Stops the current oomtest.
- size_t(∗ oomtest_fill)(const size_t minHeap, const size_t minStack)

  Starts an almost OOM single and simple test.
- void(∗ oomtest_free)()

  Ends a single simple OOM test.

5.19.1 Detailed Description

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Definition in file oom.h.

5.19.2 Macro Definition Documentation

5.19.2.1 RAMLIMIT_HARD

```
#define RAMLIMIT_HARD (7*1024*1024)
```

Definition at line 25 of file oom.h.

5.19.2.2 RAMLIMIT_SOFT

```
#define RAMLIMIT_SOFT (5*1024*1024)
```

Definition at line 28 of file oom.h.

5.19.3 Function Documentation

5.19.3.1 oomtest_config()

```
size_t oomtest_config (
            const size_t hardlimit )
```

Sets the oomtest helpers hard rlimit and enables the oomtest helper features.

This function needs to be invoqued BEFORE any other helper from the framework. It will configure an hard RAM limit for the current process and each of his children. Then, it will enable the other oomtest helper functions.

It refuses to set a limit over the actually installed physical RAM to limit pushing RAM pages to the swap. If the requested value is zero, it will default to the actually installed physical RAM.

If anything goes wrong or did not behaves as expected, it abort the process to avoid RAM bombing and swapping.

Despite it was designed to be invoked only once, from the main parent process, it can be invoked several times as long as the hardlimit parameter is always less than the previous call, otherwise it will fail and abort the process.

Parameters

in	*hardlimit*	the size in bytes to limit the process to.

Returns

Returns the actual configured size. It should be the same value as the hardlimit parameter, otherwise something went wrong, it was not detected and the process was not aborted (which is a bug to report)

See also

oomtest_enable

oomtest_disable

oomtest_fill

oomtest_free

Definition at line 367 of file oom.c.

5.19.3.2 oomtest_enabled()

```
unsigned char oomtest_enabled ( )
```

Definition at line 422 of file oom.c.

5.19.4 Variable Documentation

5.19.4.1 oomtest_disable

```
size_t(* oomtest_disable) () ( )  [extern]
```

Stops the current oomtest.

This function can be invoked any time after the oomtest_config initialized the environment. If invocated before, it will abort the current process to help detecting mistakes in the test code.

This function disables the fill/free oomtest functions and free the allocated RAM before reverting the soft limit to the hard limit value.

It is designed to be invoked t the end of a test case.

Despite it could be invoked twice or without a prior call to oomtest_enable, it is illegal and not allowed to help detecting mistakes in the test code.

Returns

Returns the applied soft limit, which should be the same as the hard limit.

See also

oomtest_enable

oomtest_disable

oomtest_fill

oomtest_free

Definition at line 138 of file oom.c.

5.19.4.2 oomtest_enable

```
size_t(* oomtest_enable) (const size_t softlimit) (
            const size_t softlimit )  [extern]
```

Starts a new oomtest environment or reconfigure the soft limit.

This function can only be invoked after at least a first call to oomtest_config to initialize the oomtest helpers environment. If invocated before, it will abort the current process to help detecting mistakes in the test code.

It will (soft)limit the current process and his children to the provided value in bytes. Then, it will enable the fill/free oomtest helper functions which are disabled otherwise.

It is designed to be invoked at the begining of a test case to apply for all tests in this testcase.

In case of any unexpected behavior, it should abort the current process.

Parameters

in	*softlimit*	Soft limit to set in bytes. It has to be less than the hardlimit otherwise it will fail and abort. If set to 0, it will apply the same value as the hardlimit.

Returns

Returns the actually set value as a softlimit, either the requested value or the hardlimit in case of 0 requested.

See also

oomtest_enable
oomtest_disable
oomtest_fill
oomtest_free

Definition at line 120 of file oom.c.

5.19.4.3 oomtest_fill

```
size_t(* oomtest_fill) (const size_t minHeap, const size_t minStack) (
            const size_t minHeap,
            const size_t minStack )  [extern]
```

Starts an almost OOM single and simple test.

This function is only enabled after a call to oomtest_enable and will have no effect otherwise. Its goal is to completely fill the RAM until the very last bytes, to keep only between minHeap and maxHeap bytes available in the heap and minStack bytes in the stack.

If oomtest_enable was not invoked beforehand, this function will simply return without any RAM consumption.

It should be called immediately before the test and should be reverted with oomtest_free immediately after. It can create so much pressure on the available memory that a simple printf could fail.

It is designed to fail if invoked twice as this is very probably a mistake in the test code. Should you need to change the RAM filling values, first call oomtest_free and reapply oomtest_fill. This ensure a really wanted behavior and not a mistake in your test code.

Parameters

in	*minHeap*	
in	*minStack*	

Returns

Returns the allocated size to fill the memory

See also

oomtest_enable

oomtest_disable

oomtest_fill

oomtest_free

Definition at line 84 of file oom.c.

5.19.4.4 oomtest_free

```
void(* oomtest_free) () ( )  [extern]
```

Ends a single simple OOM test.

If this function is invoked between an oomtest_enable and an oomtest_disable invocations, it deallocates the RAM allocated by the oomtest_fill function. It should be called immediately after the single and simple test because the RAM pressure can even make a printf to fail.

If called without a prior oomtest_enable invocation, this function simply returns without any action.

This function is designed to fail and abort the process if invocated whereas there is no current RAM allocated, when called twice, for example. This helps to avoid mistakes in the test scenario.

Definition at line 100 of file oom.c.

5.20 oom.h

Go to the documentation of this file.

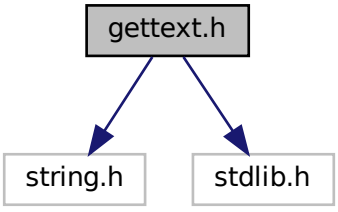
```
00001
00017 #ifndef __OOM_H__
00018 #define __OOM_H__
00019
00020 #ifdef HAVE_CONFIG_H
00021 #include "config.h"
00022 #endif
00023
00024 #ifndef RAMLIMIT_HARD
00025 #define RAMLIMIT_HARD (7*1024*1024)
00026 #endif
00027 #ifndef RAMLIMIT_SOFT
00028 #define RAMLIMIT_SOFT (5*1024*1024)
00029 #endif
00030
00031 #include <stddef.h>                          /* size_t */
```

```
00032
00033 /*     void myfunction() {
00034 *         void* ptr;
00035 *         ptr = NULL;
00036 *         // Keep at most 100 bytes available
00037 *         OOM_BEGIN(0.1);
00038 *         ptr=malloc(2000);
00039 *         OOM_END;
00040 *         if (NULL == ptr)
00041 *             fprintf(stderr,"malloc failed\n");
00042 *         else
00043 *             free(ptr);
00044 *     }
00045 *
00046 *     size_t ramlimit;
00047 *     ramlimit=64*1024*1024;
00048 *     printf ("Limit memory usage to %uMB : ",ramlimit/1024/1024);
00049 *     ramlimit = oomtest_setup(ramlimit);
00050 *     printf ("%uB (%uMB)\n",ramlimit,ramlimit/1024/1024);
00051 *
00052 *     // not constrained (only by the 64MB ramlimit)
00053 *     myfunction();
00054 *
00055 *     // OOM activation to eat all memory
00056 *     oomtest_enable(64*1024*1024);
00057 *     myfunction();
00058 */
00059
00090 size_t oomtest_config(const size_t hardlimit);
00091
00120 extern size_t (*oomtest_enable)(const size_t softlimit);
00121
00145 extern size_t (*oomtest_disable)();
00146
00176 extern size_t (*oomtest_fill)(const size_t minHeap, const size_t minStack);
00177
00193 extern void (*oomtest_free)();
00194
00195 extern unsigned char oomtest_enabled();
00196
00197 #endif  /*__OOM_H__ */
```

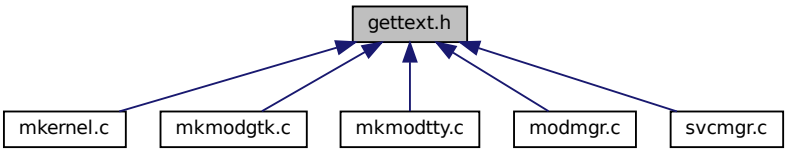
5.21 gettext.h File Reference

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

Include dependency graph for gettext.h:



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



Macros

- #define gettext(Msgid) ((const char ∗) (Msgid))
- #define dgettext(Domainname, Msgid) ((void) (Domainname), gettext (Msgid))
- #define dcgettext(Domainname, Msgid, Category) ((void) (Category), dgettext (Domainname, Msgid))
- #define ngettext(Msgid1, Msgid2, N)
- #define dngettext(Domainname, Msgid1, Msgid2, N) ((void) (Domainname), ngettext (Msgid1, Msgid2, N))
- #define dcngettext(Domainname, Msgid1, Msgid2, N, Category) ((void) (Category), dngettext (Domainname, Msgid1, Msgid2, N))
- #define textdomain(Domainname) ((const char ∗) (Domainname))
- #define bindtextdomain(Domainname, Dirname) ((void) (Domainname), (const char ∗) (Dirname))
- #define bind_textdomain_codeset(Domainname, Codeset) ((void) (Domainname), (const char ∗) (Codeset))
- #define gettext_noop(String) String
- #define GETTEXT_CONTEXT_GLUE "\004"
- #define pgettext(Msgctxt, Msgid) pgettext_aux (NULL, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, LC_MESSAGES)
- #define dpgettext(Domainname, Msgctxt, Msgid) pgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, LC_MESSAGES)
- #define dcpgettext(Domainname, Msgctxt, Msgid, Category) pgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, Category)
- #define npgettext(Msgctxt, Msgid, MsgidPlural, N) npgettext_aux (NULL, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, MsgidPlural, N, LC_MESSAGES)
- #define dnpgettext(Domainname, Msgctxt, Msgid, MsgidPlural, N) npgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, MsgidPlural, N, LC_MESSAGES)
- #define dcnpgettext(Domainname, Msgctxt, Msgid, MsgidPlural, N, Category) npgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, MsgidPlural, N, Category)
- #define _LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS 0
- #define pgettext_expr(Msgctxt, Msgid) dcpgettext_expr (NULL, Msgctxt, Msgid, LC_MESSAGES)
- #define dpgettext_expr(Domainname, Msgctxt, Msgid) dcpgettext_expr (Domainname, Msgctxt, Msgid, LC↩ _MESSAGES)
- #define npgettext_expr(Msgctxt, Msgid, MsgidPlural, N) dcnpgettext_expr (NULL, Msgctxt, Msgid, Msgid↩ Plural, N, LC_MESSAGES)
- #define dnpgettext_expr(Domainname, Msgctxt, Msgid, MsgidPlural, N) dcnpgettext_expr (Domainname, Msgctxt, Msgid, MsgidPlural, N, LC_MESSAGES)

5.21.1 Macro Definition Documentation

5.21.1.1 _LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS

```
#define _LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS 0
```

Definition at line 190 of file gettext.h.

5.21.1.2 bind_textdomain_codeset

```
#define bind_textdomain_codeset(
              Domainname,
              Codeset )  ((void) (Domainname), (const char *) (Codeset))
```

Definition at line 90 of file gettext.h.

5.21.1.3 bindtextdomain

```
#define bindtextdomain(
              Domainname,
              Dirname )  ((void) (Domainname), (const char *) (Dirname))
```

Definition at line 87 of file gettext.h.

5.21.1.4 dcgettext

```
#define dcgettext(
              Domainname,
              Msgid,
              Category )  ((void) (Category), dgettext (Domainname, Msgid))
```

Definition at line 71 of file gettext.h.

5.21.1.5 dcngettext

```
#define dcngettext(
              Domainname,
              Msgid1,
              Msgid2,
              N,
              Category )  ((void) (Category), dngettext (Domainname, Msgid1, Msgid2, N))
```

Definition at line 82 of file gettext.h.

5.21.1.6 dcnpgettext

```
#define dcnpgettext(
              Domainname,
              Msgctxt,
              Msgid,
              MsgidPlural,
              N,
              Category )  npgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid,
MsgidPlural, N, Category)
```

Definition at line 137 of file gettext.h.

5.21.1.7 dcpgettext

```
#define dcpgettext(
              Domainname,
              Msgctxt,
              Msgid,
              Category )  pgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid,
Category)
```

Definition at line 126 of file gettext.h.

5.21.1.8 dgettext

```
#define dgettext(
              Domainname,
              Msgid ) ((void) (Domainname), gettext (Msgid))
```

Definition at line 69 of file gettext.h.

5.21.1.9 dngettext

```
#define dngettext(
              Domainname,
              Msgid1,
              Msgid2,
              N )  ((void) (Domainname), ngettext (Msgid1, Msgid2, N))
```

Definition at line 79 of file gettext.h.

5.21.1.10 dnpgettext

```
#define dnpgettext(
              Domainname,
              Msgctxt,
              Msgid,
              MsgidPlural,
              N )  npgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, Msgid↩
Plural, N, LC_MESSAGES)
```

Definition at line 135 of file gettext.h.

5.21.1.11 dnpgettext_expr

```
#define dnpgettext_expr(
              Domainname,
              Msgctxt,
              Msgid,
              MsgidPlural,
              N )  dcnpgettext_expr (Domainname, Msgctxt, Msgid, MsgidPlural, N, LC_MESSAGES)
```

Definition at line 246 of file gettext.h.

5.21.1.12 dpgettext

```
#define dpgettext(
              Domainname,
              Msgctxt,
              Msgid )  pgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid,
LC_MESSAGES)
```

Definition at line 124 of file gettext.h.

5.21.1.13 dpgettext_expr

```
#define dpgettext_expr(
              Domainname,
              Msgctxt,
              Msgid )  dcpgettext_expr (Domainname, Msgctxt, Msgid, LC_MESSAGES)
```

Definition at line 199 of file gettext.h.

5.21.1.14 gettext

```
#define gettext(
              Msgid ) ((const char *) (Msgid))
```

Definition at line 67 of file gettext.h.

5.21.1.15 GETTEXT_CONTEXT_GLUE

```
#define GETTEXT_CONTEXT_GLUE "\004"
```

Definition at line 111 of file gettext.h.

5.21.1.16 gettext_noop

```
#define gettext_noop(
              String ) String
```

Definition at line 108 of file gettext.h.

5.21.1.17 ngettext

```
#define ngettext(
              Msgid1,
              Msgid2,
              N )
```

Value:

```
    ((N) == 1 \
     ?  ((void) (Msgid2), (const char *) (Msgid1)) \
     :  ((void) (Msgid1), (const char *) (Msgid2)))
```

Definition at line 74 of file gettext.h.

5.21.1.18 npgettext

```
#define npgettext(
              Msgctxt,
              Msgid,
              MsgidPlural,
              N )  npgettext_aux (NULL, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, Msgid↩
Plural, N, LC_MESSAGES)
```

Definition at line 132 of file gettext.h.

5.21.1.19 npgettext_expr

```
#define npgettext_expr(
              Msgctxt,
              Msgid,
              MsgidPlural,
              N )  dcnpgettext_expr (NULL, Msgctxt, Msgid, MsgidPlural, N, LC_MESSAGES)
```

Definition at line 244 of file gettext.h.

5.21.1.20 pgettext

```
#define pgettext(
              Msgctxt,
              Msgid )  pgettext_aux (NULL, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, LC_↩
MESSAGES)
```

Definition at line 121 of file gettext.h.

5.21.1.21 pgettext_expr

```
#define pgettext_expr(
              Msgctxt,
              Msgid )  dcpgettext_expr (NULL, Msgctxt, Msgid, LC_MESSAGES)
```

Definition at line 197 of file gettext.h.

5.21.1.22 textdomain

```
#define textdomain(
              Domainname ) ((const char *) (Domainname))
```

Definition at line 85 of file gettext.h.

5.22 gettext.h

Go to the documentation of this file.

```
00001 /* Convenience header for conditional use of GNU <libintl.h>.
00002 Copyright (C) 1995-1998, 2000-2002, 2004-2006, 2009-2016 Free Software
00003 Foundation, Inc.
00004
00005 This program is free software:  you can redistribute it and/or modify
00006 it under the terms of the GNU General Public License as published by
00007 the Free Software Foundation; either version 3 of the License, or
00008 (at your option) any later version.
00009
00010 This program is distributed in the hope that it will be useful,
00011 but WITHOUT ANY WARRANTY; without even the implied warranty of
00012 MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
00013 GNU General Public License for more details.
00014
00015 You should have received a copy of the GNU General Public License
00016 along with this program.    If not, see <http://www.gnu.org/licenses/>.    */
00017
00018 #ifndef _LIBGETTEXT_H
00019 #define _LIBGETTEXT_H 1
00020
00021 /* NLS can be disabled through the configure --disable-nls option.    */
00022 #if ENABLE_NLS
00023
00024 /* Get declarations of GNU message catalog functions.    */
00025 # include <libintl.h>
00026
00027 /* You can set the DEFAULT_TEXT_DOMAIN macro to specify the domain used by
00028 the gettext() and ngettext() macros.    This is an alternative to calling
00029 textdomain(), and is useful for libraries.    */
00030 # ifdef DEFAULT_TEXT_DOMAIN
00031 #  undef gettext
00032 #  define gettext(Msgid) \
00033 dgettext (DEFAULT_TEXT_DOMAIN, Msgid)
00034 #  undef ngettext
00035 #  define ngettext(Msgid1, Msgid2, N) \
00036 dngettext (DEFAULT_TEXT_DOMAIN, Msgid1, Msgid2, N)
00037 # endif
00038
00039 #else
00040
00041 /* Solaris /usr/include/locale.h includes /usr/include/libintl.h, which
00042 chokes if dcgettext is defined as a macro.    So include it now, to make
00043 later inclusions of <locale.h> a NOP.  We don't include <libintl.h>
00044 as well because people using "gettext.h" will not include <libintl.h>,
00045 and also including <libintl.h> would fail on SunOS 4, whereas <locale.h>
00046 is OK.  */
00047 #if defined(__sun)
00048 # include <locale.h>
00049 #endif
00050
00051 /* Many header files from the libstdc++ coming with g++ 3.3 or newer include
00052 <libintl.h>, which chokes if dcgettext is defined as a macro.    So include
00053 it now, to make later inclusions of <libintl.h> a NOP.  */
00054 #if defined(__cplusplus) && defined(__GNUG__) && (__GNUC__ >= 3)
00055 # include <cstdlib>
00056 # if (__GLIBC__ >= 2 && !defined __UCLIBC__) || _GLIBCXX_HAVE_LIBINTL_H
00057 #  include <libintl.h>
00058 # endif
00059 #endif
00060
00061 /* Disabled NLS.
00062 The casts to 'const char *' serve the purpose of producing warnings
00063 for invalid uses of the value returned from these functions.
00064 On pre-ANSI systems without 'const', the config.h file is supposed to
00065 contain "#define const".    */
00066 # undef gettext
00067 # define gettext(Msgid) ((const char *) (Msgid))
00068 # undef dgettext
00069 # define dgettext(Domainname, Msgid) ((void) (Domainname), gettext (Msgid))
00070 # undef dcgettext
00071 # define dcgettext(Domainname, Msgid, Category) \
00072 ((void) (Category), dgettext (Domainname, Msgid))
00073 # undef ngettext
00074 # define ngettext(Msgid1, Msgid2, N) \
00075 ((N) == 1 \
00076 ?  ((void) (Msgid2), (const char *) (Msgid1)) \
00077 :  ((void) (Msgid1), (const char *) (Msgid2)))
00078 # undef dngettext
00079 # define dngettext(Domainname, Msgid1, Msgid2, N) \
00080 ((void) (Domainname), ngettext (Msgid1, Msgid2, N))
00081 # undef dcngettext
00082 # define dcngettext(Domainname, Msgid1, Msgid2, N, Category) \
```

```
00083 ((void) (Category), dngettext (Domainname, Msgid1, Msgid2, N))
00084 # undef textdomain
00085 # define textdomain(Domainname) ((const char *) (Domainname))
00086 # undef bindtextdomain
00087 # define bindtextdomain(Domainname, Dirname) \
00088 ((void) (Domainname), (const char *) (Dirname))
00089 # undef bind_textdomain_codeset
00090 # define bind_textdomain_codeset(Domainname, Codeset) \
00091 ((void) (Domainname), (const char *) (Codeset))
00092
00093 #endif
00094
00095 /* Prefer gnulib's setlocale override over libintl's setlocale override.  */
00096 #ifdef GNULIB_defined_setlocale
00097 # undef setlocale
00098 # define setlocale rpl_setlocale
00099 #endif
00100
00101 /* A pseudo function call that serves as a marker for the automated
00102 extraction of messages, but does not call gettext().  The run-time
00103 translation is done at a different place in the code.
00104 The argument, String, should be a literal string.  Concatenated strings
00105 and other string expressions won't work.
00106 The macro's expansion is not parenthesized, so that it is suitable as
00107 initializer for static 'char[]' or 'const char[]' variables.  */
00108 #define gettext_noop(String) String
00109
00110 /* The separator between msgctxt and msgid in a .mo file.  */
00111 #define GETTEXT_CONTEXT_GLUE "\004"
00112
00113 /* Pseudo function calls, taking a MSGCTXT and a MSGID instead of just a
00114 MSGID.  MSGCTXT and MSGID must be string literals.  MSGCTXT should be
00115 short and rarely need to change.
00116 The letter 'p' stands for 'particular' or 'special'.  */
00117 #ifdef DEFAULT_TEXT_DOMAIN
00118 # define pgettext(Msgctxt, Msgid) \
00119 pgettext_aux (DEFAULT_TEXT_DOMAIN, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, LC_MESSAGES)
00120 #else
00121 # define pgettext(Msgctxt, Msgid) \
00122 pgettext_aux (NULL, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, LC_MESSAGES)
00123 #endif
00124 #define dpgettext(Domainname, Msgctxt, Msgid) \
00125 pgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, LC_MESSAGES)
00126 #define dcpgettext(Domainname, Msgctxt, Msgid, Category) \
00127 pgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, Category)
00128 #ifdef DEFAULT_TEXT_DOMAIN
00129 # define npgettext(Msgctxt, Msgid, MsgidPlural, N) \
00130 npgettext_aux (DEFAULT_TEXT_DOMAIN, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, MsgidPlural, N,
      LC_MESSAGES)
00131 #else
00132 # define npgettext(Msgctxt, Msgid, MsgidPlural, N) \
00133 npgettext_aux (NULL, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, MsgidPlural, N, LC_MESSAGES)
00134 #endif
00135 #define dnpgettext(Domainname, Msgctxt, Msgid, MsgidPlural, N) \
00136 npgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, MsgidPlural, N, LC_MESSAGES)
00137 #define dcnpgettext(Domainname, Msgctxt, Msgid, MsgidPlural, N, Category) \
00138 npgettext_aux (Domainname, Msgctxt GETTEXT_CONTEXT_GLUE Msgid, Msgid, MsgidPlural, N, Category)
00139
00140 #ifdef __GNUC__
00141 __inline
00142 #else
00143 #ifdef __cplusplus
00144 inline
00145 #endif
00146 #endif
00147 static const char *
00148 pgettext_aux (const char *domain,
00149               const char *msg_ctxt_id, const char *msgid,
00150               int category)
00151 {
00152     const char *translation = dcgettext (domain, msg_ctxt_id, category);
00153     if (translation == msg_ctxt_id)
00154         return msgid;
00155     else
00156         return translation;
00157 }
00158
00159 #ifdef __GNUC__
00160 __inline
00161 #else
00162 #ifdef __cplusplus
00163 inline
00164 #endif
00165 #endif
00166 static const char *
00167 npgettext_aux (const char *domain,
00168                const char *msg_ctxt_id, const char *msgid,
```

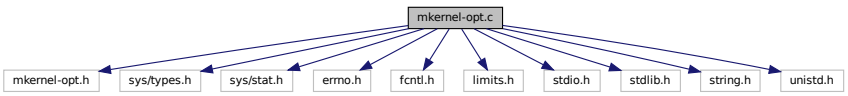
```
00169                const char *msgid_plural, unsigned long int n,
00170                int category)
00171 {
00172     const char *translation =
00173         dcngettext (domain, msg_ctxt_id, msgid_plural, n, category);
00174     if (translation == msg_ctxt_id || translation == msgid_plural)
00175         return (n == 1 ?  msgid :  msgid_plural);
00176     else
00177         return translation;
00178 }
00179
00180 /* The same thing extended for non-constant arguments.    Here MSGCTXT and MSGID
00181 can be arbitrary expressions.    But for string literals these macros are
00182 less efficient than those above.    */
00183
00184 #include <string.h>
00185
00186 #if (((__GNUC__ >= 3 || __GNUG__ >= 2) && !defined __STRICT_ANSI__) \
00187 /* || __STDC_VERSION__ >= 199901L */)
00188 # define _LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS 1
00189 #else
00190 # define _LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS 0
00191 #endif
00192
00193 #if !_LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS
00194 #include <stdlib.h>
00195 #endif
00196
00197 #define pgettext_expr(Msgctxt, Msgid) \
00198 dcpgettext_expr (NULL, Msgctxt, Msgid, LC_MESSAGES)
00199 #define dpgettext_expr(Domainname, Msgctxt, Msgid) \
00200 dcpgettext_expr (Domainname, Msgctxt, Msgid, LC_MESSAGES)
00201
00202 #ifdef __GNUC__
00203 __inline
00204 #else
00205 #ifdef __cplusplus
00206 inline
00207 #endif
00208 #endif
00209 static const char *
00210 dcpgettext_expr (const char *domain,
00211                  const char *msgctxt, const char *msgid,
00212                  int category)
00213 {
00214     size_t msgctxt_len = strlen (msgctxt) + 1;
00215     size_t msgid_len = strlen (msgid) + 1;
00216     const char *translation;
00217 #if _LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS
00218     char msg_ctxt_id[msgctxt_len + msgid_len];
00219 #else
00220     char buf[1024];
00221     char *msg_ctxt_id =
00222         (msgctxt_len + msgid_len <= sizeof (buf)
00223          ?  buf
00224          :  (char *) malloc (msgctxt_len + msgid_len));
00225     if (msg_ctxt_id != NULL)
00226 #endif
00227     {
00228         int found_translation;
00229         memcpy (msg_ctxt_id, msgctxt, msgctxt_len - 1);
00230         msg_ctxt_id[msgctxt_len - 1] = '\004';
00231         memcpy (msg_ctxt_id + msgctxt_len, msgid, msgid_len);
00232         translation = dcgettext (domain, msg_ctxt_id, category);
00233         found_translation = (translation != msg_ctxt_id);
00234 #if !_LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS
00235         if (msg_ctxt_id != buf)
00236             free (msg_ctxt_id);
00237 #endif
00238         if (found_translation)
00239             return translation;
00240     }
00241     return msgid;
00242 }
00243
00244 #define npgettext_expr(Msgctxt, Msgid, MsgidPlural, N) \
00245 dcnpgettext_expr (NULL, Msgctxt, Msgid, MsgidPlural, N, LC_MESSAGES)
00246 #define dnpgettext_expr(Domainname, Msgctxt, Msgid, MsgidPlural, N) \
00247 dcnpgettext_expr (Domainname, Msgctxt, Msgid, MsgidPlural, N, LC_MESSAGES)
00248
00249 #ifdef __GNUC__
00250 __inline
00251 #else
00252 #ifdef __cplusplus
00253 inline
00254 #endif
00255 #endif
```

```
00256 static const char *
00257 dcnpgettext_expr (const char *domain,
00258                   const char *msgctxt, const char *msgid,
00259                   const char *msgid_plural, unsigned long int n,
00260                   int category)
00261 {
00262     size_t msgctxt_len = strlen (msgctxt) + 1;
00263     size_t msgid_len = strlen (msgid) + 1;
00264     const char *translation;
00265 #if _LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS
00266     char msg_ctxt_id[msgctxt_len + msgid_len];
00267 #else
00268     char buf[1024];
00269     char *msg_ctxt_id =
00270         (msgctxt_len + msgid_len <= sizeof (buf)
00271          ?  buf
00272          :  (char *) malloc (msgctxt_len + msgid_len));
00273     if (msg_ctxt_id != NULL)
00274 #endif
00275     {
00276         int found_translation;
00277         memcpy (msg_ctxt_id, msgctxt, msgctxt_len - 1);
00278         msg_ctxt_id[msgctxt_len - 1] = '\004';
00279         memcpy (msg_ctxt_id + msgctxt_len, msgid, msgid_len);
00280         translation = dcngettext (domain, msg_ctxt_id, msgid_plural, n, category);
00281         found_translation = !(translation == msg_ctxt_id || translation == msgid_plural);
00282 #if !_LIBGETTEXT_HAVE_VARIABLE_SIZE_ARRAYS
00283         if (msg_ctxt_id != buf)
00284             free (msg_ctxt_id);
00285 #endif
00286         if (found_translation)
00287             return translation;
00288     }
00289     return (n == 1 ?  msgid :  msgid_plural);
00290 }
00291
00292 #endif /* _LIBGETTEXT_H */
```

5.23 mkernel-opt.c File Reference

```
#include "mkernel-opt.h"
#include <sys/types.h>
#include <sys/stat.h>
#include <errno.h>
#include <fcntl.h>
#include <limits.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
```

Include dependency graph for mkernel-opt.c:



Macros

- #define OPTION_CODE_COMPILE 1
- #define zCopyright (mkernel_opt_strs+0)
- #define zLicenseDescrip (mkernel_opt_strs+266)
- #define NULL 0

- #define MODULE_PATH_DESC (mkernel_opt_strs+892)

  module-path option description:
- #define MODULE_PATH_NAME (mkernel_opt_strs+918)

  Upper-cased name for the module-path option.
- #define MODULE_PATH_name (mkernel_opt_strs+930)

  Name string for the module-path option.
- #define MODULE_PATH_FLAGS

  Compiled in flag settings for the module-path option.
- #define HELP_DESC (mkernel_opt_strs+942)
- #define HELP_name (mkernel_opt_strs+986)
- #define MORE_HELP_DESC HELP_DESC
- #define MORE_HELP_name HELP_name
- #define MORE_HELP_FLAGS (OPTST_OMITTED | OPTST_NO_INIT)
- #define VER_FLAGS
- #define VER_DESC (mkernel_opt_strs+1046)
- #define VER_name (mkernel_opt_strs+1082)
- #define SAVE_OPTS_DESC (mkernel_opt_strs+1090)
- #define SAVE_OPTS_name (mkernel_opt_strs+1129)
- #define LOAD_OPTS_DESC (mkernel_opt_strs+1139)
- #define LOAD_OPTS_NAME (mkernel_opt_strs+1171)
- #define NO_LOAD_OPTS_name (mkernel_opt_strs+1181)
- #define LOAD_OPTS_pfx (mkernel_opt_strs+1194)
- #define LOAD_OPTS_name (NO_LOAD_OPTS_name + 3)
- #define VER_PROC optionPrintVersion
- #define zPROGNAME (mkernel_opt_strs+1197)

  Reference to the upper cased version of mkernel.
- #define zUsageTitle (mkernel_opt_strs+1205)

  Reference to the title line for mkernel usage.
- #define zRcName (mkernel_opt_strs+1321)

  mkernel configuration file name.
- #define zBugsAddr (mkernel_opt_strs+1332)

  The mkernel program bug email address.
- #define zExplain (mkernel_opt_strs+1354)

  Clarification/explanation of what mkernel does.
- #define zDetail (mkernel_opt_strs+1423)

  Extra detail explaining what mkernel does.
- #define zFullVersion (mkernel_opt_strs+1610)

  The full version string for mkernel.
- #define OPTPROC_BASE OPTPROC_NONE
- #define translate_option_strings NULL
- #define mkernel_full_usage (NULL)
- #define mkernel_short_usage (NULL)
- #define PKGDATADIR ""

  The directory containing the data associated with mkernel.
- #define mkernel_packager_info NULL

  Information about the person or institution that packaged mkernel for the current distribution.

Variables

- FILE * option_usage_fp
- tOptProc optionBooleanVal

  Declare option callback procedures.
- tOptProc optionNestedVal
- tOptProc optionNumericVal
- tOptProc optionPagedUsage
- tOptProc optionPrintVersion
- tOptProc optionResetOpt
- tOptProc optionStackArg
- tOptProc optionTimeDate
- tOptProc optionTimeVal
- tOptProc optionUnstackArg
- tOptProc optionVendorOption
- tOptions mkernelOptions

  The option definitions for mkernel.

5.23.1 Macro Definition Documentation

5.23.1.1 HELP_DESC

```
#define HELP_DESC (mkernel_opt_strs+942)
```

Definition at line 129 of file mkernel-opt.c.

5.23.1.2 HELP_name

```
#define HELP_name (mkernel_opt_strs+986)
```

Definition at line 130 of file mkernel-opt.c.

5.23.1.3 LOAD_OPTS_DESC

```
#define LOAD_OPTS_DESC (mkernel_opt_strs+1139)
```

Definition at line 150 of file mkernel-opt.c.

5.23.1.4 LOAD_OPTS_NAME

```
#define LOAD_OPTS_NAME (mkernel_opt_strs+1171)
```

Definition at line 151 of file mkernel-opt.c.

5.23.1.5 LOAD_OPTS_name

```
#define LOAD_OPTS_name (NO_LOAD_OPTS_name + 3)
```

Definition at line 154 of file mkernel-opt.c.

5.23.1.6 LOAD_OPTS_pfx

```
#define LOAD_OPTS_pfx (mkernel_opt_strs+1194)
```

Definition at line 153 of file mkernel-opt.c.

5.23.1.7 mkernel_full_usage

```
#define mkernel_full_usage (NULL)
```

Definition at line 281 of file mkernel-opt.c.

5.23.1.8 mkernel_packager_info

```
#define mkernel_packager_info NULL
```

Information about the person or institution that packaged mkernel for the current distribution.

Definition at line 321 of file mkernel-opt.c.

5.23.1.9 mkernel_short_usage

```
#define mkernel_short_usage (NULL)
```

Definition at line 282 of file mkernel-opt.c.

5.23.1.10 MODULE_PATH_DESC

```
#define MODULE_PATH_DESC (mkernel_opt_strs+892)
```

module-path option description:

Descriptive text for the module-path option

Definition at line 117 of file mkernel-opt.c.

5.23.1.11 MODULE_PATH_FLAGS

```
#define MODULE_PATH_FLAGS
```

Value:

```
        (OPTST_DISABLED \
        | OPTST_SET_ARGTYPE(OPARG_TYPE_STRING))
```

Compiled in flag settings for the module-path option.

Definition at line 123 of file mkernel-opt.c.

5.23.1.12 MODULE_PATH_NAME

```
#define MODULE_PATH_NAME (mkernel_opt_strs+918)
```

Upper-cased name for the module-path option.

Definition at line 119 of file mkernel-opt.c.

5.23.1.13 MODULE_PATH_name

```
#define MODULE_PATH_name (mkernel_opt_strs+930)
```

Name string for the module-path option.

Definition at line 121 of file mkernel-opt.c.

5.23.1.14 MORE_HELP_DESC

```
#define MORE_HELP_DESC HELP_DESC
```

Definition at line 136 of file mkernel-opt.c.

5.23.1.15 MORE_HELP_FLAGS

```
#define MORE_HELP_FLAGS (OPTST_OMITTED | OPTST_NO_INIT)
```

Definition at line 138 of file mkernel-opt.c.

5.23.1.16 MORE_HELP_name

```
#define MORE_HELP_name HELP_name
```

Definition at line 137 of file mkernel-opt.c.

5.23.1.17 NO_LOAD_OPTS_name

```
#define NO_LOAD_OPTS_name (mkernel_opt_strs+1181)
```

Definition at line 152 of file mkernel-opt.c.

5.23.1.18 NULL

```
#define NULL 0
```

Definition at line 64 of file mkernel-opt.c.

5.23.1.19 OPTION_CODE_COMPILE

```
#define OPTION_CODE_COMPILE 1
```

Definition at line 42 of file mkernel-opt.c.

5.23.1.20 OPTPROC_BASE

```
#define OPTPROC_BASE OPTPROC_NONE
```

Definition at line 277 of file mkernel-opt.c.

5.23.1.21 PKGDATADIR

```
#define PKGDATADIR ""
```

The directory containing the data associated with mkernel.

Definition at line 313 of file mkernel-opt.c.

5.23.1.22 SAVE_OPTS_DESC

```
#define SAVE_OPTS_DESC (mkernel_opt_strs+1090)
```

Definition at line 148 of file mkernel-opt.c.

5.23.1.23 SAVE_OPTS_name

```
#define SAVE_OPTS_name (mkernel_opt_strs+1129)
```

Definition at line 149 of file mkernel-opt.c.

5.23.1.24 translate_option_strings

```
#define translate_option_strings NULL
```

Definition at line 278 of file mkernel-opt.c.

5.23.1.25 VER_DESC

```
#define VER_DESC (mkernel_opt_strs+1046)
```

Definition at line 146 of file mkernel-opt.c.

5.23.1.26 VER_FLAGS

```
#define VER_FLAGS
```

Value:

```
(OPTST_SET_ARGTYPE(OPARG_TYPE_STRING) | \
OPTST_ARG_OPTIONAL | OPTST_IMM | OPTST_NO_INIT)
```

Definition at line 143 of file mkernel-opt.c.

5.23.1.27 VER_name

```
#define VER_name (mkernel_opt_strs+1082)
```

Definition at line 147 of file mkernel-opt.c.

5.23.1.28 VER_PROC

```
#define VER_PROC optionPrintVersion
```

Definition at line 165 of file mkernel-opt.c.

5.23.1.29 zBugsAddr

```
#define zBugsAddr (mkernel_opt_strs+1332)
```

The mkernel program bug email address.

Definition at line 264 of file mkernel-opt.c.

5.23.1.30 zCopyright

```
#define zCopyright (mkernel_opt_strs+0)
```

Definition at line 59 of file mkernel-opt.c.

5.23.1.31 zDetail

```
#define zDetail (mkernel_opt_strs+1423)
```

Extra detail explaining what mkernel does.

Definition at line 268 of file mkernel-opt.c.

5.23.1.32 zExplain

```
#define zExplain (mkernel_opt_strs+1354)
```

Clarification/explanation of what mkernel does.

Definition at line 266 of file mkernel-opt.c.

5.23.1.33 zFullVersion

```
#define zFullVersion (mkernel_opt_strs+1610)
```

The full version string for mkernel.

Definition at line 270 of file mkernel-opt.c.

5.23.1.34 zLicenseDescrip

```
#define zLicenseDescrip (mkernel_opt_strs+266)
```

Definition at line 60 of file mkernel-opt.c.

5.23.1.35 zPROGNAME

```
#define zPROGNAME (mkernel_opt_strs+1197)
```

Reference to the upper cased version of mkernel.

Definition at line 254 of file mkernel-opt.c.

5.23.1.36 zRcName

```
#define zRcName (mkernel_opt_strs+1321)
```

mkernel configuration file name.

Definition at line 258 of file mkernel-opt.c.

5.23.1.37 zUsageTitle

```
#define zUsageTitle (mkernel_opt_strs+1205)
```

Reference to the title line for mkernel usage.

Definition at line 256 of file mkernel-opt.c.

5.23.2 Variable Documentation

5.23.2.1 mkernelOptions

```
tOptions mkernelOptions
```

The option definitions for mkernel.

The one structure that binds them all.

Definition at line 343 of file mkernel-opt.c.

5.23.2.2 option_usage_fp

```
FILE* option_usage_fp  [extern]
```

5.23.2.3 optionBooleanVal

```
tOptProc optionBooleanVal  [extern]
```

Declare option callback procedures.

5.23.2.4 optionNestedVal

```
tOptProc optionNestedVal
```

Definition at line 159 of file mkernel-opt.c.

5.23.2.5 optionNumericVal

```
tOptProc optionNumericVal
```

Definition at line 159 of file mkernel-opt.c.

5.23.2.6 optionPagedUsage

```
tOptProc optionPagedUsage
```

Definition at line 160 of file mkernel-opt.c.

5.23.2.7 optionPrintVersion

```
tOptProc optionPrintVersion
```

Definition at line 160 of file mkernel-opt.c.

5.23.2.8 optionResetOpt

```
tOptProc optionResetOpt
```

Definition at line 160 of file mkernel-opt.c.

5.23.2.9 optionStackArg

```
tOptProc optionStackArg
```

Definition at line 161 of file mkernel-opt.c.

5.23.2.10 optionTimeDate

```
tOptProc optionTimeDate
```

Definition at line 161 of file mkernel-opt.c.

5.23.2.11 optionTimeVal

```
tOptProc optionTimeVal
```

Definition at line 161 of file mkernel-opt.c.

5.23.2.12 optionUnstackArg

```
tOptProc optionUnstackArg
```

Definition at line 162 of file mkernel-opt.c.

5.23.2.13 optionVendorOption

```
tOptProc optionVendorOption
```

Definition at line 162 of file mkernel-opt.c.

5.24 mkernel-opt.c

Go to the documentation of this file.

```
00001 /*   -*- buffer-read-only:  t -*- vi:  set ro:
00002 *
00003 *  DO NOT EDIT THIS FILE   (mkernel-opt.c)
00004 *
00005 *  It has been AutoGen-ed
00006 *  From the definitions    mkernel-opt.def
00007 *  and the template file   options
00008 *
00009 * Generated from AutoOpts 42:1:17 templates.
00010 *
00011 *  AutoOpts is a copyrighted work.    This source file is not encumbered
00012 *  by AutoOpts licensing, but is provided under the licensing terms chosen
00013 *  by the mkernel author or copyright holder.    AutoOpts is
00014 *  licensed under the terms of the LGPL.  The redistributable library
00015 *  ("libopts") is licensed under the terms of either the LGPL or, at the
00016 *  users discretion, the BSD license.    See the AutoOpts and/or libopts sources
00017 *  for details.
00018 *
00019 * The mkernel program is copyrighted and licensed
00020 * under the following terms:
00021 *
00022 *  Copyright (C) 2017 Francois Cerbelle, all rights reserved.
00023 *  This is free software.  It is licensed for use, modification and
00024 *  redistribution under the terms of the GNU Lesser General Public License,
00025 *  version 3 or later <http://gnu.org/licenses/lgpl.html>
00026 *
00027 *  mkernel is free software:  you can redistribute it and/or modify it
00028 *  under the terms of the GNU Lesser General Public License as published
00029 *  by the Free Software Foundation, either version 3 of the License, or
00030 *  (at your option) any later version.
00031 *
00032 *  mkernel is distributed in the hope that it will be useful, but
00033 *  WITHOUT ANY WARRANTY; without even the implied warranty of
00034 *  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
00035 *  See the GNU Lesser General Public License for more details.
00036 *
00037 *  You should have received a copy of the GNU Lesser General Public License
00038 *  along with this program.    If not, see <http://www.gnu.org/licenses/>.";
00039 */
00040
00041 #ifndef __doxygen__
00042 #define OPTION_CODE_COMPILE 1
00043 #include "mkernel-opt.h"
00044 #include <sys/types.h>
00045 #include <sys/stat.h>
00046
00047 #include <errno.h>
00048 #include <fcntl.h>
00049 #include <limits.h>
00050 #include <stdio.h>
00051 #include <stdlib.h>
00052 #include <string.h>
00053 #include <unistd.h>
00054
00055 #ifdef  __cplusplus
00056 extern "C" {
00057 #endif
00058 extern FILE * option_usage_fp;
00059 #define zCopyright      (mkernel_opt_strs+0)
00060 #define zLicenseDescrip (mkernel_opt_strs+266)
00061
00062
00063 #ifndef NULL
00064 #  define NULL 0
00065 #endif
00066
00070 static char const mkernel_opt_strs[1624] =
00071 /*     0 */ "mkernel 0.0.2\n"
00072             "Copyright (C) 2017 Francois Cerbelle, all rights reserved.\n"
```

```
00073             "This is free software.  It is licensed for use, modification and\n"
00074             "redistribution under the terms of the GNU Lesser General Public License,\n"
00075             "version 3 or later <http://gnu.org/licenses/lgpl.html>\n\0"
00076 /*   266 */ "mkernel is free software:  you can redistribute it and/or modify it under\n"
00077             "the terms of the GNU Lesser General Public License as published by the Free\n"
00078             "Software Foundation, either version 3 of the License, or (at your option)\n"
00079             "any later version.\n\n"
00080             "mkernel is distributed in the hope that it will be useful, but WITHOUT ANY\n"
00081             "WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS\n"
00082             "FOR A PARTICULAR PURPOSE.  See the GNU Lesser General Public License for\n"
00083             "more details.\n\n"
00084             "You should have received a copy of the GNU Lesser General Public License\n"
00085             "along with this program.    If not, see <http://www.gnu.org/licenses/>.\";\n\0"
00086 /*   892 */ "path to load modules from\0"
00087 /*   918 */ "MODULE_PATH\0"
00088 /*   930 */ "module-path\0"
00089 /*   942 */ "display extended usage information and exit\0"
00090 /*   986 */ "help\0"
00091 /*   991 */ "extended usage information passed thru pager\0"
00092 /*  1036 */ "more-help\0"
00093 /*  1046 */ "output version information and exit\0"
00094 /*  1082 */ "version\0"
00095 /*  1090 */ "save the option state to a config file\0"
00096 /*  1129 */ "save-opts\0"
00097 /*  1139 */ "load options from a config file\0"
00098 /*  1171 */ "LOAD_OPTS\0"
00099 /*  1181 */ "no-load-opts\0"
00100 /*  1194 */ "no\0"
00101 /*  1197 */ "MKERNEL\0"
00102 /*  1205 */ "mkernel - Generic micro-kernel application\n"
00103             "Usage:    %s [ -<flag> [<val>] | --<name>[{=| }<val>] ]...  <module>\n\0"
00104 /*  1315 */ "$HOME\0"
00105 /*  1321 */ ".mkernelrc\0"
00106 /*  1332 */ "francois@cerbelle.net\0"
00107 /*  1354 */ "additional information given whenever the usage routine is invoked.\n\0"
00108 /*  1423 */ "This string is added to the usage output when the HELP option is selected.\n"
00109             "The contents of the file 'mkernel.details' is added to the usage output\n"
00110             "when the MORE-HELP option is selected.\n\0"
00111 /*  1610 */ "mkernel 0.0.2";
00112
00117 #define MODULE_PATH_DESC      (mkernel_opt_strs+892)
00119 #define MODULE_PATH_NAME      (mkernel_opt_strs+918)
00121 #define MODULE_PATH_name      (mkernel_opt_strs+930)
00123 #define MODULE_PATH_FLAGS     (OPTST_DISABLED \
00124 | OPTST_SET_ARGTYPE(OPARG_TYPE_STRING))
00125
00126 /*
00127 *  Help/More_Help/Version option descriptions:
00128 */
00129 #define HELP_DESC       (mkernel_opt_strs+942)
00130 #define HELP_name       (mkernel_opt_strs+986)
00131 #ifdef HAVE_WORKING_FORK
00132 #define MORE_HELP_DESC  (mkernel_opt_strs+991)
00133 #define MORE_HELP_name  (mkernel_opt_strs+1036)
00134 #define MORE_HELP_FLAGS (OPTST_IMM | OPTST_NO_INIT)
00135 #else
00136 #define MORE_HELP_DESC  HELP_DESC
00137 #define MORE_HELP_name  HELP_name
00138 #define MORE_HELP_FLAGS (OPTST_OMITTED | OPTST_NO_INIT)
00139 #endif
00140 #ifdef NO_OPTIONAL_OPT_ARGS
00141 #  define VER_FLAGS     (OPTST_IMM | OPTST_NO_INIT)
00142 #else
00143 #  define VER_FLAGS     (OPTST_SET_ARGTYPE(OPARG_TYPE_STRING) | \
00144 OPTST_ARG_OPTIONAL | OPTST_IMM | OPTST_NO_INIT)
00145 #endif
00146 #define VER_DESC        (mkernel_opt_strs+1046)
00147 #define VER_name        (mkernel_opt_strs+1082)
00148 #define SAVE_OPTS_DESC  (mkernel_opt_strs+1090)
00149 #define SAVE_OPTS_name  (mkernel_opt_strs+1129)
00150 #define LOAD_OPTS_DESC     (mkernel_opt_strs+1139)
00151 #define LOAD_OPTS_NAME     (mkernel_opt_strs+1171)
00152 #define NO_LOAD_OPTS_name  (mkernel_opt_strs+1181)
00153 #define LOAD_OPTS_pfx      (mkernel_opt_strs+1194)
00154 #define LOAD_OPTS_name     (NO_LOAD_OPTS_name + 3)
00158 extern tOptProc
00159     optionBooleanVal,   optionNestedVal,    optionNumericVal,
00160     optionPagedUsage,   optionPrintVersion, optionResetOpt,
00161     optionStackArg,     optionTimeDate,     optionTimeVal,
00162     optionUnstackArg,   optionVendorOption;
00163 static tOptProc
00164     doUsageOpt;
00165 #define VER_PROC        optionPrintVersion
00166
00167 /* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * */
00173 static tOptDesc optDesc[OPTION_CT] = {
00174   {  /* entry idx, value */ 0, VALUE_OPT_MODULE_PATH,
```

```
00175      /* equiv idx, value */ 0, VALUE_OPT_MODULE_PATH,
00176      /* equivalenced to  */ NO_EQUIVALENT,
00177      /* min, max, act ct */ 0, 1, 0,
00178      /* opt state flags  */ MODULE_PATH_FLAGS, 0,
00179      /* last opt argumnt */ { NULL }, /* --module-path */
00180      /* arg list/cookie  */ NULL,
00181      /* must/cannot opts */ NULL, NULL,
00182      /* option proc      */ NULL,
00183      /* desc, NAME, name */ MODULE_PATH_DESC, MODULE_PATH_NAME, MODULE_PATH_name,
00184      /* disablement strs */ NULL, NULL },
00185
00186    {  /* entry idx, value */ INDEX_OPT_VERSION, VALUE_OPT_VERSION,
00187      /* equiv idx value  */ NO_EQUIVALENT, VALUE_OPT_VERSION,
00188      /* equivalenced to  */ NO_EQUIVALENT,
00189      /* min, max, act ct */ 0, 1, 0,
00190      /* opt state flags  */ VER_FLAGS, AOUSE_VERSION,
00191      /* last opt argumnt */ { NULL },
00192      /* arg list/cookie  */ NULL,
00193      /* must/cannot opts */ NULL, NULL,
00194      /* option proc      */ VER_PROC,
00195      /* desc, NAME, name */ VER_DESC, NULL, VER_name,
00196      /* disablement strs */ NULL, NULL },
00197
00198
00199
00200    {  /* entry idx, value */ INDEX_OPT_HELP, VALUE_OPT_HELP,
00201      /* equiv idx value  */ NO_EQUIVALENT, VALUE_OPT_HELP,
00202      /* equivalenced to  */ NO_EQUIVALENT,
00203      /* min, max, act ct */ 0, 1, 0,
00204      /* opt state flags  */ OPTST_IMM | OPTST_NO_INIT, AOUSE_HELP,
00205      /* last opt argumnt */ { NULL },
00206      /* arg list/cookie  */ NULL,
00207      /* must/cannot opts */ NULL, NULL,
00208      /* option proc      */ doUsageOpt,
00209      /* desc, NAME, name */ HELP_DESC, NULL, HELP_name,
00210      /* disablement strs */ NULL, NULL },
00211
00212    {  /* entry idx, value */ INDEX_OPT_MORE_HELP, VALUE_OPT_MORE_HELP,
00213      /* equiv idx value  */ NO_EQUIVALENT, VALUE_OPT_MORE_HELP,
00214      /* equivalenced to  */ NO_EQUIVALENT,
00215      /* min, max, act ct */ 0, 1, 0,
00216      /* opt state flags  */ MORE_HELP_FLAGS, AOUSE_MORE_HELP,
00217      /* last opt argumnt */ { NULL },
00218      /* arg list/cookie  */ NULL,
00219      /* must/cannot opts */ NULL,  NULL,
00220      /* option proc      */ optionPagedUsage,
00221      /* desc, NAME, name */ MORE_HELP_DESC, NULL, MORE_HELP_name,
00222      /* disablement strs */ NULL, NULL },
00223
00224    {  /* entry idx, value */ INDEX_OPT_SAVE_OPTS, VALUE_OPT_SAVE_OPTS,
00225      /* equiv idx value  */ NO_EQUIVALENT, VALUE_OPT_SAVE_OPTS,
00226      /* equivalenced to  */ NO_EQUIVALENT,
00227      /* min, max, act ct */ 0, 1, 0,
00228      /* opt state flags  */ OPTST_SET_ARGTYPE(OPARG_TYPE_STRING)
00229                            | OPTST_ARG_OPTIONAL | OPTST_NO_INIT, AOUSE_SAVE_OPTS,
00230      /* last opt argumnt */ { NULL },
00231      /* arg list/cookie  */ NULL,
00232      /* must/cannot opts */ NULL,  NULL,
00233      /* option proc      */ NULL,
00234      /* desc, NAME, name */ SAVE_OPTS_DESC, NULL, SAVE_OPTS_name,
00235      /* disablement strs */ NULL, NULL },
00236
00237    {  /* entry idx, value */ INDEX_OPT_LOAD_OPTS, VALUE_OPT_LOAD_OPTS,
00238      /* equiv idx value  */ NO_EQUIVALENT, VALUE_OPT_LOAD_OPTS,
00239      /* equivalenced to  */ NO_EQUIVALENT,
00240      /* min, max, act ct */ 0, NOLIMIT, 0,
00241      /* opt state flags  */ OPTST_SET_ARGTYPE(OPARG_TYPE_STRING)
00242               | OPTST_DISABLE_IMM, AOUSE_LOAD_OPTS,
00243      /* last opt argumnt */ { NULL },
00244      /* arg list/cookie  */ NULL,
00245      /* must/cannot opts */ NULL, NULL,
00246      /* option proc      */ optionLoadOpt,
00247      /* desc, NAME, name */ LOAD_OPTS_DESC, LOAD_OPTS_NAME, LOAD_OPTS_name,
00248      /* disablement strs */ NO_LOAD_OPTS_name, LOAD_OPTS_pfx }
00249 };
00250
00251
00252 /* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * */
00254 #define zPROGNAME       (mkernel_opt_strs+1197)
00256 #define zUsageTitle     (mkernel_opt_strs+1205)
00258 #define zRcName         (mkernel_opt_strs+1321)
00260 static char const * const apzHomeList[2] = {
00261     mkernel_opt_strs+1315,
00262     NULL };
00264 #define zBugsAddr       (mkernel_opt_strs+1332)
00266 #define zExplain        (mkernel_opt_strs+1354)
00268 #define zDetail         (mkernel_opt_strs+1423)
```

```
00270 #define zFullVersion    (mkernel_opt_strs+1610)
00271 /* extracted from optcode.tlib near line 342 */
00272
00273 #if defined(ENABLE_NLS)
00274 # define OPTPROC_BASE OPTPROC_TRANSLATE
00275   static tOptionXlateProc translate_option_strings;
00276 #else
00277 # define OPTPROC_BASE OPTPROC_NONE
00278 # define translate_option_strings NULL
00279 #endif /* ENABLE_NLS */
00280
00281 #define mkernel_full_usage (NULL)
00282 #define mkernel_short_usage (NULL)
00283
00284 #endif /* not defined __doxygen__ */
00285
00286 /*
00287 *  Create the static procedure(s) declared above.
00288 */
00296 static void
00297 doUsageOpt(tOptions * opts, tOptDesc * od)
00298 {
00299     int ex_code;
00300     ex_code = MKERNEL_EXIT_SUCCESS;
00301     optionUsage(&mkernelOptions, ex_code);
00302     /* NOTREACHED */
00303     exit(MKERNEL_EXIT_FAILURE);
00304     (void)opts;
00305     (void)od;
00306 }
00307 /* extracted from optmain.tlib near line 1250 */
00308
00312 #ifndef  PKGDATADIR
00313 # define PKGDATADIR ""
00314 #endif
00315
00320 #ifndef  WITH_PACKAGER
00321 # define mkernel_packager_info NULL
00322 #else
00324 static char const mkernel_packager_info[] =
00325     "Packaged by " WITH_PACKAGER
00326
00327 # ifdef WITH_PACKAGER_VERSION
00328         " ("WITH_PACKAGER_VERSION")"
00329 # endif
00330
00331 # ifdef WITH_PACKAGER_BUG_REPORTS
00332     "\nReport mkernel bugs to " WITH_PACKAGER_BUG_REPORTS
00333 # endif
00334     "\n";
00335 #endif
00336 #ifndef __doxygen__
00337
00338 #endif /* __doxygen__ */
00343 tOptions mkernelOptions = {
00344     OPTIONS_STRUCT_VERSION,
00345     0, NULL,                    /* original argc + argv    */
00346     ( OPTPROC_BASE
00347     + OPTPROC_ERRSTOP
00348     + OPTPROC_SHORTOPT
00349     + OPTPROC_LONGOPT
00350     + OPTPROC_NO_REQ_OPT
00351     + OPTPROC_ENVIRON
00352     + OPTPROC_ARGS_REQ
00353     + OPTPROC_GNUUSAGE ),
00354     0, NULL,                    /* current option index, current option */
00355     NULL,         NULL,         zPROGNAME,
00356     zRcName,      zCopyright,   zLicenseDescrip,
00357     zFullVersion, apzHomeList,  zUsageTitle,
00358     zExplain,     zDetail,      optDesc,
00359     zBugsAddr,                  /* address to send bugs to */
00360     NULL, NULL,                 /* extensions/saved state  */
00361     optionUsage, /* usage procedure */
00362     translate_option_strings,   /* translation procedure */
00363     /*
00364 *  Indexes to special options
00365 */
00366     { INDEX_OPT_MORE_HELP, /* more-help option index */
00367       INDEX_OPT_SAVE_OPTS, /* save option index */
00368       NO_EQUIVALENT, /* '-#' option index */
00369       NO_EQUIVALENT /* index of default opt */
00370     },
00371     6 /* full option count */, 1 /* user option count */,
00372     mkernel_full_usage, mkernel_short_usage,
00373     NULL, NULL,
00374     PKGDATADIR, mkernel_packager_info
00375 };
```

```
00376
00377 #if ENABLE_NLS
00383 #include <stdio.h>
00384 #include <stdlib.h>
00385 #include <string.h>
00386 #include <unistd.h>
00387 #ifdef HAVE_DCGETTEXT
00388 # include <gettext.h>
00389 #endif
00390 #include <autoopts/usage-txt.h>
00391
00392 static char * AO_gettext(char const * pz);
00393 static void   coerce_it(void ** s);
00394
00405 static char *
00406 AO_gettext(char const * pz)
00407 {
00408     char * res;
00409     if (pz == NULL)
00410         return NULL;
00411 #ifdef HAVE_DCGETTEXT
00412     /*
00413 * While processing the option_xlateable_txt data, try to use the
00414 * "libopts" domain.    Once we switch to the option descriptor data,
00415 * do *not* use that domain.
00416 */
00417     if (option_xlateable_txt.field_ct != 0) {
00418         res = dgettext("libopts", pz);
00419         if (res == pz)
00420             res = (char *)VOIDP(_(pz));
00421     } else
00422         res = (char *)VOIDP(_(pz));
00423 #else
00424     res = (char *)VOIDP(_(pz));
00425 #endif
00426     if (res == pz)
00427         return res;
00428     res = strdup(res);
00429     if (res == NULL) {
00430         fputs(_("No memory for duping translated strings\n"), stderr);
00431         exit(MKERNEL_EXIT_FAILURE);
00432     }
00433     return res;
00434 }
00435
00440 static void coerce_it(void ** s) { *s = AO_gettext(*s);
00441 }
00442
00447 static void
00448 translate_option_strings(void)
00449 {
00450     tOptions * const opts = &mkernelOptions;
00451
00452     /*
00453 *  Guard against re-translation.    It won't work.    The strings will have
00454 *  been changed by the first pass through this code.    One shot only.
00455 */
00456     if (option_xlateable_txt.field_ct != 0) {
00457         /*
00458 *  Do the translations.    The first pointer follows the field count
00459 *  field.    The field count field is the size of a pointer.
00460 */
00461         char ** ppz = (char**)VOIDP(&(option_xlateable_txt));
00462         int     ix  = option_xlateable_txt.field_ct;
00463
00464         do {
00465             ppz++; /* skip over field_ct */
00466             *ppz = AO_gettext(*ppz);
00467         } while (--ix > 0);
00468         /* prevent re-translation and disable "libopts" domain lookup */
00469         option_xlateable_txt.field_ct = 0;
00470
00471         coerce_it(VOIDP(&(opts->pzCopyright)));
00472         coerce_it(VOIDP(&(opts->pzCopyNotice)));
00473         coerce_it(VOIDP(&(opts->pzFullVersion)));
00474         coerce_it(VOIDP(&(opts->pzUsageTitle)));
00475         coerce_it(VOIDP(&(opts->pzExplain)));
00476         coerce_it(VOIDP(&(opts->pzDetail)));
00477         {
00478             tOptDesc * od = opts->pOptDesc;
00479             for (ix = opts->optCt; ix > 0; ix--, od++)
00480                 coerce_it(VOIDP(&(od->pzText)));
00481         }
00482     }
00483 }
00484 #endif /* ENABLE_NLS */
00485
```

```
00486 #ifdef DO_NOT_COMPILE_THIS_CODE_IT_IS_FOR_GETTEXT
00488 static void bogus_function(void) {
00489   /* TRANSLATORS:
00490
00491 The following dummy function was crated solely so that xgettext can
00492 extract the correct strings.    These strings are actually referenced
00493 by a field name in the mkernelOptions structure noted in the
00494 comments below.    The literal text is defined in mkernel_opt_strs.
00495
00496 NOTE: the strings below are segmented with respect to the source string
00497 mkernel_opt_strs.    The strings above are handed off for translation
00498 at run time a paragraph at a time.    Consequently, they are presented here
00499 for translation a paragraph at a time.
00500
00501 ALSO: often the description for an option will reference another option
00502 by name.    These are set off with apostrophe quotes (I hope).    Do not
00503 translate option names.
00504 */
00505   /* referenced via mkernelOptions.pzCopyright */
00506   puts(_("mkernel 0.0.2\n\
00507 Copyright (C) 2017 Francois Cerbelle, all rights reserved.\n\
00508 This is free software.  It is licensed for use, modification and\n\
00509 redistribution under the terms of the GNU Lesser General Public License,\n\
00510 version 3 or later <http://gnu.org/licenses/lgpl.html>\n"));
00511
00512   /* referenced via mkernelOptions.pzCopyNotice */
00513   puts(_("mkernel is free software:  you can redistribute it and/or modify it under\n\
00514 the terms of the GNU Lesser General Public License as published by the Free\n\
00515 Software Foundation, either version 3 of the License, or (at your option)\n\
00516 any later version.\n\n"));
00517   puts(_("mkernel is distributed in the hope that it will be useful, but WITHOUT ANY\n\
00518 WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS\n\
00519 FOR A PARTICULAR PURPOSE.  See the GNU Lesser General Public License for\n\
00520 more details.\n\n"));
00521   puts(_("You should have received a copy of the GNU Lesser General Public License\n\
00522 along with this program.    If not, see <http://www.gnu.org/licenses/>.\";\n"));
00523
00524   /* referenced via mkernelOptions.pOptDesc->pzText */
00525   puts(_("path to load modules from"));
00526
00527   /* referenced via mkernelOptions.pOptDesc->pzText */
00528   puts(_("display extended usage information and exit"));
00529
00530   /* referenced via mkernelOptions.pOptDesc->pzText */
00531   puts(_("extended usage information passed thru pager"));
00532
00533   /* referenced via mkernelOptions.pOptDesc->pzText */
00534   puts(_("output version information and exit"));
00535
00536   /* referenced via mkernelOptions.pOptDesc->pzText */
00537   puts(_("save the option state to a config file"));
00538
00539   /* referenced via mkernelOptions.pOptDesc->pzText */
00540   puts(_("load options from a config file"));
00541
00542   /* referenced via mkernelOptions.pzUsageTitle */
00543   puts(_("mkernel - Generic micro-kernel application\n\
00544 Usage:    %s [ -<flag> [<val>] | --<name>[{=| }<val>] ]...  <module>\n"));
00545
00546   /* referenced via mkernelOptions.pzExplain */
00547   puts(_("additional information given whenever the usage routine is invoked.\n"));
00548
00549   /* referenced via mkernelOptions.pzDetail */
00550   puts(_("This string is added to the usage output when the HELP option is selected.\n\
00551 The contents of the file 'mkernel.details' is added to the usage output\n\
00552 when the MORE-HELP option is selected.\n"));
00553
00554   /* referenced via mkernelOptions.pzFullVersion */
00555   puts(_("mkernel 0.0.2"));
00556
00557   /* referenced via mkernelOptions.pzFullUsage */
00558   puts(_("<<NOT-FOUND>>"));
00559
00560   /* referenced via mkernelOptions.pzShortUsage */
00561   puts(_("<<NOT-FOUND>>"));
00562   /* LIBOPTS-MESSAGES: */
00563 #line 67 "../autoopts.c"
00564   puts(_("allocation of %d bytes failed\n"));
00565 #line 89 "../autoopts.c"
00566   puts(_("allocation of %d bytes failed\n"));
00567 #line 48 "../init.c"
00568   puts(_("AutoOpts function called without option descriptor\n"));
00569 #line 81 "../init.c"
00570   puts(_("\tThis exceeds the compiled library version:    "));
00571 #line 79 "../init.c"
00572   puts(_("Automated Options Processing Error!\n"
00573         "\t%s called AutoOpts function with structure version %d:%d:%d.\n"));
```

```
00574 #line 78 "../autoopts.c"
00575   puts(_("realloc of %d bytes at 0x%p failed\n"));
00576 #line 83 "../init.c"
00577   puts(_("\tThis is less than the minimum library version:    "));
00578 #line 121 "../version.c"
00579   puts(_("Automated Options version %s\n"
00580         "\tCopyright (C) 1999-2017 by Bruce Korb - all rights reserved\n"));
00581 #line 49 "../makeshell.c"
00582   puts(_("(AutoOpts bug):    %s.\n"));
00583 #line 90 "../reset.c"
00584   puts(_("optionResetOpt() called, but reset-option not configured"));
00585 #line 241 "../usage.c"
00586   puts(_("could not locate the 'help' option"));
00587 #line 330 "../autoopts.c"
00588   puts(_("optionProcess() was called with invalid data"));
00589 #line 697 "../usage.c"
00590   puts(_("invalid argument type specified"));
00591 #line 568 "../find.c"
00592   puts(_("defaulted to option with optional arg"));
00593 #line 76 "../alias.c"
00594   puts(_("aliasing option is out of range."));
00595 #line 210 "../enum.c"
00596   puts(_("%s error:    the keyword '%s' is ambiguous for %s\n"));
00597 #line 78 "../find.c"
00598   puts(_("  The following options match:\n"));
00599 #line 263 "../find.c"
00600   puts(_("%s:  ambiguous option name:  %s (matches %d options)\n"));
00601 #line 161 "../check.c"
00602   puts(_("%s:  Command line arguments required\n"));
00603 #line 43 "../alias.c"
00604   puts(_("%d %s%s options allowed\n"));
00605 #line 56 "../makeshell.c"
00606   puts(_("%s error %d (%s) calling %s for '%s'\n"));
00607 #line 268 "../makeshell.c"
00608   puts(_("interprocess pipe"));
00609 #line 171 "../version.c"
00610   puts(_("error:  version option argument '%c' invalid.    Use:\n"
00611         "\t'v' - version only\n"
00612         "\t'c' - version and copyright\n"
00613         "\t'n' - version and full copyright notice\n"));
00614 #line 58 "../check.c"
00615   puts(_("%s error:    the '%s' and '%s' options conflict\n"));
00616 #line 187 "../find.c"
00617   puts(_("%s:  The '%s' option has been disabled."));
00618 #line 400 "../find.c"
00619   puts(_("%s:  The '%s' option has been disabled."));
00620 #line 38 "../alias.c"
00621   puts(_("-equivalence"));
00622 #line 439 "../find.c"
00623   puts(_("%s:  illegal option -- %c\n"));
00624 #line 110 "../reset.c"
00625   puts(_("%s:  illegal option -- %c\n"));
00626 #line 241 "../find.c"
00627   puts(_("%s:  illegal option -- %s\n"));
00628 #line 740 "../find.c"
00629   puts(_("%s:  illegal option -- %s\n"));
00630 #line 118 "../reset.c"
00631   puts(_("%s:  illegal option -- %s\n"));
00632 #line 305 "../find.c"
00633   puts(_("%s:  unknown vendor extension option -- %s\n"));
00634 #line 135 "../enum.c"
00635   puts(_("  or an integer from %d through %d\n"));
00636 #line 145 "../enum.c"
00637   puts(_("  or an integer from %d through %d\n"));
00638 #line 696 "../usage.c"
00639   puts(_("%s error:    invalid option descriptor for %s\n"));
00640 #line 1030 "../usage.c"
00641   puts(_("%s error:    invalid option descriptor for %s\n"));
00642 #line 355 "../find.c"
00643   puts(_("%s:  invalid option name:  %s\n"));
00644 #line 497 "../find.c"
00645   puts(_("%s:  The '%s' option requires an argument.\n"));
00646 #line 150 "../autoopts.c"
00647   puts(_("(AutoOpts bug):    Equivalenced option '%s' was equivalenced to both\n"
00648         "\t'%s' and '%s'."));
00649 #line 94 "../check.c"
00650   puts(_("%s error:    The %s option is required\n"));
00651 #line 602 "../find.c"
00652   puts(_("%s:  The '%s' option cannot have an argument.\n"));
00653 #line 151 "../check.c"
00654   puts(_("%s:  Command line arguments are not allowed.\n"));
00655 #line 568 "../save.c"
00656   puts(_("error %d (%s) creating %s\n"));
00657 #line 210 "../enum.c"
00658   puts(_("%s error:    '%s' does not match any %s keywords.\n"));
00659 #line 93 "../reset.c"
00660   puts(_("%s error:  The '%s' option requires an argument.\n"));
```

```
00661 #line 122 "../save.c"
00662   puts(_("error %d (%s) stat-ing %s\n"));
00663 #line 175 "../save.c"
00664   puts(_("error %d (%s) stat-ing %s\n"));
00665 #line 143 "../restore.c"
00666   puts(_("%s error:  no saved option state\n"));
00667 #line 225 "../autoopts.c"
00668   puts(_("'%s' is not a command line option.\n"));
00669 #line 113 "../time.c"
00670   puts(_("%s error:    '%s' is not a recognizable date/time.\n"));
00671 #line 50 "../time.c"
00672   puts(_("%s error:    '%s' is not a recognizable time duration.\n"));
00673 #line 92 "../check.c"
00674   puts(_("%s error:    The %s option must appear %d times.\n"));
00675 #line 165 "../numeric.c"
00676   puts(_("%s error:    '%s' is not a recognizable number.\n"));
00677 #line 176 "../enum.c"
00678   puts(_("%s error:    %s exceeds %s keyword count\n"));
00679 #line 279 "../usage.c"
00680   puts(_("Try '%s %s' for more information.\n"));
00681 #line 45 "../alias.c"
00682   puts(_("one %s%s option allowed\n"));
00683 #line 170 "../makeshell.c"
00684   puts(_("standard output"));
00685 #line 905 "../makeshell.c"
00686   puts(_("standard output"));
00687 #line 223 "../usage.c"
00688   puts(_("standard output"));
00689 #line 364 "../usage.c"
00690   puts(_("standard output"));
00691 #line 574 "../usage.c"
00692   puts(_("standard output"));
00693 #line 178 "../version.c"
00694   puts(_("standard output"));
00695 #line 223 "../usage.c"
00696   puts(_("standard error"));
00697 #line 364 "../usage.c"
00698   puts(_("standard error"));
00699 #line 574 "../usage.c"
00700   puts(_("standard error"));
00701 #line 178 "../version.c"
00702   puts(_("standard error"));
00703 #line 170 "../makeshell.c"
00704   puts(_("write"));
00705 #line 905 "../makeshell.c"
00706   puts(_("write"));
00707 #line 222 "../usage.c"
00708   puts(_("write"));
00709 #line 363 "../usage.c"
00710   puts(_("write"));
00711 #line 573 "../usage.c"
00712   puts(_("write"));
00713 #line 177 "../version.c"
00714   puts(_("write"));
00715 #line 60 "../numeric.c"
00716   puts(_("%s error:    %s option value %ld is out of range.\n"));
00717 #line 44 "../check.c"
00718   puts(_("%s error:    %s option requires the %s option\n"));
00719 #line 121 "../save.c"
00720   puts(_("%s warning:    cannot save options - %s not regular file\n"));
00721 #line 174 "../save.c"
00722   puts(_("%s warning:    cannot save options - %s not regular file\n"));
00723 #line 193 "../save.c"
00724   puts(_("%s warning:    cannot save options - %s not regular file\n"));
00725 #line 567 "../save.c"
00726   puts(_("%s warning:    cannot save options - %s not regular file\n"));
00727   /* END-LIBOPTS-MESSAGES */
00728
00729   /* USAGE-TEXT: */
00730 #line 822 "../usage.c"
00731   puts(_("\t\t\t- an alternate for '%s'\n"));
00732 #line 1097 "../usage.c"
00733   puts(_("Version, usage and configuration options:"));
00734 #line 873 "../usage.c"
00735   puts(_("\t\t\t- default option for unnamed options\n"));
00736 #line 786 "../usage.c"
00737   puts(_("\t\t\t- disabled as '--%s'\n"));
00738 #line 1066 "../usage.c"
00739   puts(_(" --- %-14s %s\n"));
00740 #line 1064 "../usage.c"
00741   puts(_("This option has been disabled"));
00742 #line 813 "../usage.c"
00743   puts(_("\t\t\t- enabled by default\n"));
00744 #line 40 "../alias.c"
00745   puts(_("%s error:    only "));
00746 #line 1143 "../usage.c"
00747   puts(_(" - examining environment variables named %s_*\n"));
```

```
00748 #line 168 "../file.c"
00749   puts(_("\t\t\t\t- file must not pre-exist\n"));
00750 #line 172 "../file.c"
00751   puts(_("\t\t\t\t- file must pre-exist\n"));
00752 #line 329 "../usage.c"
00753   puts(_("Options are specified by doubled hyphens and their name or by a single\n"
00754         "hyphen and the flag character.\n"));
00755 #line 882 "../makeshell.c"
00756   puts(_("\n"
00757         "= = = = = = = =\n\n"
00758         "This incarnation of genshell will produce\n"
00759         "a shell script to parse the options for %s:\n\n"));
00760 #line 142 "../enum.c"
00761   puts(_("  or an integer mask with any of the lower %d bits set\n"));
00762 #line 846 "../usage.c"
00763   puts(_("\t\t\t\t- is a set membership option\n"));
00764 #line 867 "../usage.c"
00765   puts(_("\t\t\t\t- must appear between %d and %d times\n"));
00766 #line 331 "../usage.c"
00767   puts(_("Options are specified by single or double hyphens and their name.\n"));
00768 #line 853 "../usage.c"
00769   puts(_("\t\t\t\t- may appear multiple times\n"));
00770 #line 840 "../usage.c"
00771   puts(_("\t\t\t\t- may not be preset\n"));
00772 #line 1258 "../usage.c"
00773   puts(_("   Arg Option-Name    Description\n"));
00774 #line 1194 "../usage.c"
00775   puts(_("  Flg Arg Option-Name    Description\n"));
00776 #line 1252 "../usage.c"
00777   puts(_("  Flg Arg Option-Name    Description\n"));
00778 #line 1253 "../usage.c"
00779   puts(_(" %3s %s"));
00780 #line 1259 "../usage.c"
00781   puts(_(" %3s %s"));
00782 #line 336 "../usage.c"
00783   puts(_("The '-#<number>' option may omit the hash char\n"));
00784 #line 332 "../usage.c"
00785   puts(_("All arguments are named options.\n"));
00786 #line 920 "../usage.c"
00787   puts(_(" - reading file %s"));
00788 #line 358 "../usage.c"
00789   puts(_("\n"
00790         "Please send bug reports to:    <%s>\n"));
00791 #line 100 "../version.c"
00792   puts(_("\n"
00793         "Please send bug reports to:    <%s>\n"));
00794 #line 129 "../version.c"
00795   puts(_("\n"
00796         "Please send bug reports to:    <%s>\n"));
00797 #line 852 "../usage.c"
00798   puts(_("\t\t\t\t- may NOT appear - preset only\n"));
00799 #line 893 "../usage.c"
00800   puts(_("\n"
00801         "The following option preset mechanisms are supported:\n"));
00802 #line 1141 "../usage.c"
00803   puts(_("\n"
00804         "The following option preset mechanisms are supported:\n"));
00805 #line 631 "../usage.c"
00806   puts(_("prohibits these options:\n"));
00807 #line 626 "../usage.c"
00808   puts(_("prohibits the option '%s'\n"));
00809 #line 81 "../numeric.c"
00810   puts(_("%s%ld to %ld"));
00811 #line 79 "../numeric.c"
00812   puts(_("%sgreater than or equal to %ld"));
00813 #line 75 "../numeric.c"
00814   puts(_("%s%ld exactly"));
00815 #line 68 "../numeric.c"
00816   puts(_("%sit must lie in one of the ranges:\n"));
00817 #line 68 "../numeric.c"
00818   puts(_("%sit must be in the range:\n"));
00819 #line 88 "../numeric.c"
00820   puts(_(", or\n"));
00821 #line 66 "../numeric.c"
00822   puts(_("%sis scalable with a suffix:  k/K/m/M/g/G/t/T\n"));
00823 #line 77 "../numeric.c"
00824   puts(_("%sless than or equal to %ld"));
00825 #line 339 "../usage.c"
00826   puts(_("Operands and options may be intermixed.    They will be reordered.\n"));
00827 #line 601 "../usage.c"
00828   puts(_("requires the option '%s'\n"));
00829 #line 604 "../usage.c"
00830   puts(_("requires these options:\n"));
00831 #line 1270 "../usage.c"
00832   puts(_("   Arg Option-Name   Req?    Description\n"));
00833 #line 1264 "../usage.c"
00834   puts(_("  Flg Arg Option-Name   Req?    Description\n"));
```

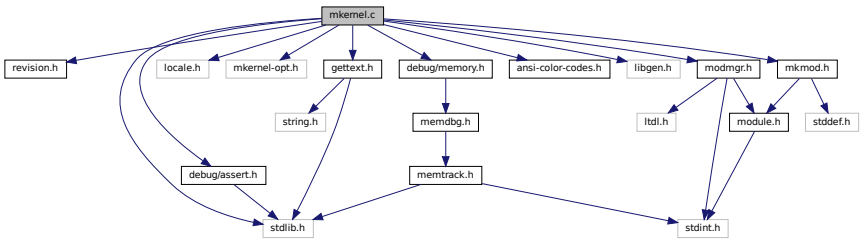
```
00835 #line 143 "../enum.c"
00836   puts(_("or you may use a numeric representation.    Preceding these with a '!'\n"
00837        "will clear the bits, specifying 'none' will clear all bits, and 'all'\n"
00838        "will set them all.    Multiple entries may be passed as an option\n"
00839        "argument list.\n"));
00840 #line 859 "../usage.c"
00841   puts(_("\t\t\t\t- may appear up to %d times\n"));
00842 #line 52 "../enum.c"
00843   puts(_("The valid \"%s\" option keywords are:\n"));
00844 #line 1101 "../usage.c"
00845   puts(_("The next option supports vendor supported extra options:"));
00846 #line 722 "../usage.c"
00847   puts(_("These additional options are:"));
00848   /* END-USAGE-TEXT */
00849 }
00850 #endif /* uncompilable code */
00851 #ifdef  __cplusplus
00852 }
00853 #endif
00854 /* mkernel-opt.c ends here */
```

5.25 mkernel.c File Reference

Micro-kernel core main source.

```
#include "revision.h"
#include "gettext.h"
#include <locale.h>
#include "mkernel-opt.h"
#include "modmgr.h"
#include "mkmod.h"
#include "ansi-color-codes.h"
#include <stdlib.h>
#include <libgen.h>
#include "debug/assert.h"
#include "debug/memory.h"
```

Include dependency graph for mkernel.c:



Macros

- #define _(String) gettext (String)

  GetText helper.
- #define PATH_MAX 255
- #define MODULE_PATH_ENV "MODULE_PATH"

  Default environment variable name to get module patch from.
- #define MODULE_PATH_DEFAULT "."

  Default path to search modules in, if not defined by autotools (should be)

Functions

- int main (int argc, char **argv, char **env)

5.25.1 Detailed Description

Micro-kernel core main source.

Date

10/11/2017

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

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Definition in file mkernel.c.

5.25.2 Macro Definition Documentation

5.25.2.1 _

```
#define _(
              String ) gettext (String)
```

GetText helper.

Definition at line 24 of file mkernel.c.

5.25.2.2 MODULE_PATH_DEFAULT

```
#define MODULE_PATH_DEFAULT "."
```

Default path to search modules in, if not defined by autotools (should be)

Definition at line 54 of file mkernel.c.

5.25.2.3 MODULE_PATH_ENV

```
#define MODULE_PATH_ENV "MODULE_PATH"
```

Default environment variable name to get module patch from.

Todo Define in configure.ac with default value

Definition at line 49 of file mkernel.c.

5.25.2.4 PATH_MAX

```
#define PATH_MAX 255
```

Definition at line 40 of file mkernel.c.

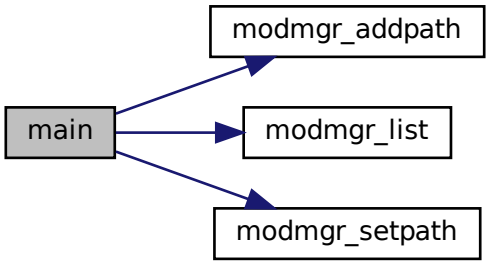
5.25.3 Function Documentation

5.25.3.1 main()

```
int main (
            int argc,
            char ** argv,
            char ** env )
```

Definition at line 57 of file mkernel.c.

Here is the call graph for this function:



5.26 mkernel.c

Go to the documentation of this file.

```
00001
00017 #ifdef HAVE_CONFIG_H
00018 #include "config.h"
00019 #endif
00020
00021 #include "revision.h"
00022 #include "gettext.h"
00024 #define _(String) gettext (String)
00025 #include <locale.h>
00026
00027 /* Exclude inclusion for static code analysis with cppcheck */
00028 #ifndef NOCPPCHECK
00029 #include "mkernel-opt.h"
00030 #endif
00031
00032 #include "modmgr.h"
00033 #include "mkmod.h"
00034 #include "ansi-color-codes.h"
00035
00036 #include <stdlib.h> /* EXIT_SUCCESS / EXIT_FAILURE */
00037 #include <libgen.h> /* dirname */
00038
00039 #ifndef PATH_MAX
00040 #  define PATH_MAX 255
00041 #endif
00042
00043 #include "debug/assert.h"
00044 #include "debug/memory.h"
00045
00047 #ifndef MODULE_PATH_ENV
00049 #  define MODULE_PATH_ENV        "MODULE_PATH"
00050 #endif
00051
00052 #ifndef MODULE_PATH_DEFAULT
00054 #  define MODULE_PATH_DEFAULT        "."
00055 #endif
00056
00057 int main(int argc, char** argv, char**env)
00058 {
00059     char *appDir;
00060
00061     (void)env;
00062
00063     /* Get executable relative invocation path from argv0 BEFORE AutoOpts */
00064     {
00065         char* execCmdCopy = strdup(argv[0]);
00066         appDir = strdup(dirname(execCmdCopy));
00067     }
00068
00069     /* LibIntl/GetText setup for Internationalization i18n */
00070     setlocale (LC_ALL, "");
00071     bindtextdomain (PACKAGE, LOCALEDIR);
00072     textdomain (PACKAGE);
00073
00074     /* Application banner */
00075     printf(BCYN PACKAGE_NAME " " PACKAGE_VERSION RESET);
00076 #ifdef REVISION
00077     printf("." BBLU REVISION RESET);
00078 #endif
00079 #ifdef BBID
00080     printf("." BBID);
00081 #endif
00082     printf("\n");
00083
00084 #pragma GCC diagnostic push                             /* save the actual diag context */
00085 #pragma GCC diagnostic ignored "-Wdate-time"         /* locally disable warnings because of non
      reproductible build triggered by pbuild */
00086     printf(_("Compiled %s at %s\n"),__DATE__, __TIME__);
00087 #pragma GCC diagnostic pop                              /* restore previous diag context */
00088     /* TRANSLATORS: This is a French proper name.  "fraa-swa sEr\-bEl" "François Cerbelle" */
00089     printf("Copyright 2024 François Cerbelle\n");
00090     printf(_("Report bugs to %s\n\n"), BYEL PACKAGE_BUGREPORT RESET);
00091
00092     /* AutoGen option parsing and consumming */
00093     {
00094         int arg_ct = optionProcess( &mkernelOptions, argc, argv );
00095         argc -= arg_ct;
00096         argv += arg_ct;
00097         /* Avoid assignement without usage warnings from cppcheck */
00098         (void)argc;
00099     }
00100
```

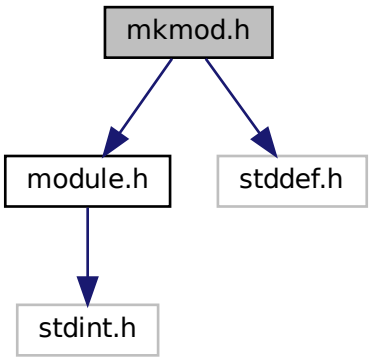
```
00101     /* Default (least significant) module search path */
00102     if (0!=modmgr_addpath(MODULE_PATH_DEFAULT))
00103         fprintf(stderr,_("The module search path can not add MODULE_PATH_DEFAULT
      (%s)\n"),MODULE_PATH_DEFAULT);
00104 
00105     /* Add Application root and plugins subdir to module path */
00106     {
00107         char *modulePath;
00108         modulePath = (char*)malloc(strlen(appDir)+strlen("/plugins")+1);
00109         strcpy(modulePath,appDir);
00110         strcat(modulePath,"/plugins");
00111         if (0!=modmgr_addpath(appDir))
00112             fprintf(stderr,_("The module search path can not add the application folder
      (%s)\n"),appDir);
00113         if (0!=modmgr_addpath(modulePath))
00114             fprintf(stderr,_("The module search path can not add the application plugin folder
      (%s)\n"),modulePath);
00115         free(modulePath);
00116     }
00117 
00118     /* Override whole module path if environment defined */
00119     if ((getenv(MODULE_PATH_ENV)) && (strlen(getenv(MODULE_PATH_ENV))>0))
00120         if (0!=modmgr_setpath(getenv (MODULE_PATH_ENV)))
00121             fprintf(stderr,_("The module path can not be reset from MODULE_PATH_ENV (%s)\n"),getenv
      (MODULE_PATH_ENV));
00122 
00123     /* Override whole module path if options passed in CLI */
00124     if (HAVE_OPT(MODULE_PATH))
00125         if (0!=modmgr_setpath(OPT_ARG(MODULE_PATH)))
00126             fprintf(stderr,_("The module path can not be reset from CLI parameter
      (%s)\n"),OPT_ARG(MODULE_PATH));
00127 
00128     /* Main payload */
00129     printf (_("Hello from main\n"));
00130 
00131     /* AutoGen/AutoOpts shifted left argv */
00132     /* Try to load the provided module list */
00133     {
00134         modmgr_module_t* modhandle=NULL;
00135         mkmod_api_t* *modapi=NULL;
00136         int l_i;
00137 
00138         modhandle = malloc(argc*sizeof(modmgr_module_t*));
00139         memset(modhandle, 0, argc);
00140 
00141         modapi = malloc(argc*sizeof(mkmod_api_t*));
00142         memset(modapi, 0, argc);
00143 
00144         DBG_ITRACE(modmgr_list());
00145 
00146         l_i = 0;
00147         while (l_i < argc) {
00148             DBG_PRINTF("Loading module #%d:  %s", l_i, argv[l_i]);
00149             MODMGR_LOAD(modhandle[l_i], modapi[l_i], argv[l_i]);
00150             if (NULL!=modhandle[l_i]) {
00151                 if ((NULL!=modapi[l_i])&&(NULL!=modapi[l_i]->mkmod_function))
00152                     modapi[l_i]->mkmod_function();
00153                 else
00154                     fprintf(stderr,_("mkmod_function not found\n"));
00155             }
00156             l_i++;
00157         }
00158 
00159         DBG_ITRACE(modmgr_list());
00160 
00161         l_i = 0;
00162         while (l_i < argc) {
00163             DBG_PRINTF("Unloading module #%d (%s)", l_i, argv[l_i]);
00164             if (NULL!=modhandle[l_i]) {
00165                 modmgr_unload(modhandle[l_i]);
00166             }
00167             l_i++;
00168         }
00169 
00170         DBG_ITRACE(modmgr_list());
00171     }
00172 
00173     free(appDir);
00174     memreport();
00175 
00176 #ifdef _WIN32
00177     system("PAUSE");  /* Pour la console Windows.  */
00178 #endif
00179 
00180     return EXIT_SUCCESS;
00181 }
```

5.27 mkmod.h File Reference

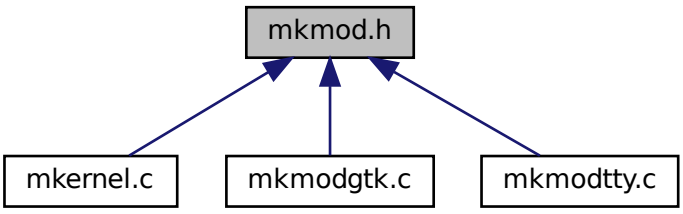
ABI interface shared between module class and application.

```
#include "module.h"
#include <stddef.h>
```

Include dependency graph for mkmod.h:



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



Classes

- struct mkmod_api_s

Typedefs

- typedef struct mkmod_api_s mkmod_api_t

5.27.1 Detailed Description

ABI interface shared between module class and application.

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Definition in file mkmod.h.

5.27.2 Typedef Documentation

5.27.2.1 mkmod_api_t

```
typedef struct mkmod_api_s mkmod_api_t
```

5.28 mkmod.h

Go to the documentation of this file.

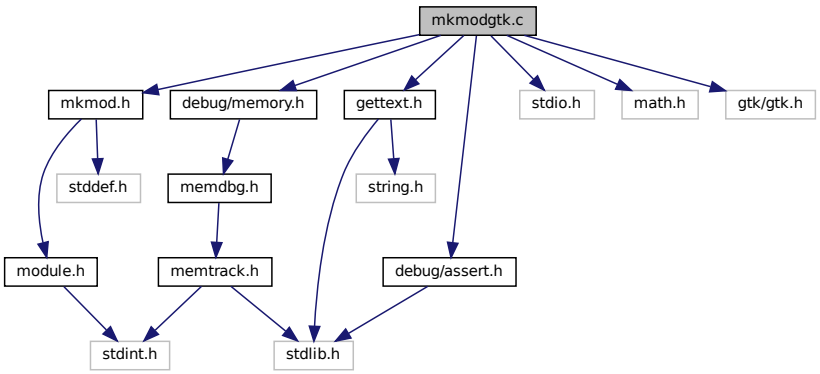
```
00001
00018 #ifndef __MKMOD_H__
00019 #define __MKMOD_H__
00020
00021 #include "module.h"
00022 # include <stddef.h> /* NULL */
00023
00024 typedef struct mkmod_api_s {
00025     void (*mkmod_function)();
00026 } mkmod_api_t;
00027
00028 #endif /* __MKMOD_H__ */
```

5.29 mkmodgtk.c File Reference

```
#include "mkmod.h"
#include "gettext.h"
#include <stdio.h>
#include "debug/assert.h"
#include "debug/memory.h"
#include <math.h>
```

```
#include <gtk/gtk.h>
```

Include dependency graph for mkmodgtk.c:



Macros

- #define _(String) gettext (String)

Functions

- moduleinfo_t * onLoad ()
- uint8_t onUnload ()

Variables

- mkmod_api_t module_api

5.29.1 Detailed Description

Date

17/11/2017

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

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Definition in file mkmodgtk.c.

5.29.2 Macro Definition Documentation

5.29.2.1 _

```
#define _(
              String ) gettext (String)
```

Definition at line 19 of file mkmodgtk.c.

5.29.3 Function Documentation

5.29.3.1 onLoad()

```
moduleinfo_t * onLoad ( )
```

Definition at line 90 of file mkmodgtk.c.

5.29.3.2 onUnload()

```
uint8_t onUnload ( )
```

Definition at line 96 of file mkmodgtk.c.

5.29.4 Variable Documentation

5.29.4.1 module_api

```
mkmod_api_t module_api
```

Initial value:

```
= {
    mkmod_function
}
```

Definition at line 34 of file mkmodgtk.c.

5.30 mkmodgtk.c

Go to the documentation of this file.

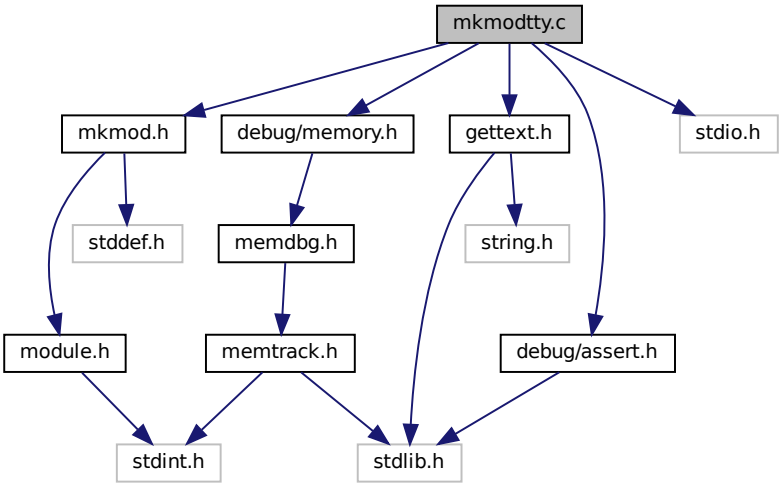
```
00001
00017 #include "mkmod.h"
00018 #include "gettext.h"
00019 #define _(String) gettext (String)
00020
00021 #include <stdio.h>
00022
00023 #include "debug/assert.h"
00024 #include "debug/memory.h"
00025
00026 #include <math.h>
00027 #pragma GCC diagnostic push                             /* save the actual diag context */
00028 #pragma GCC diagnostic ignored "-Wpedantic"             /* locally disable maybe warnings */
00029 #include <gtk/gtk.h>
00030 #pragma GCC diagnostic pop                              /* restore previous diag context */
00031
00032 /* List exposed module functions */
00033 static void mkmod_function();
00034 mkmod_api_t module_api = {
00035     mkmod_function
00036 };
00037
00038 static moduleinfo_t moduleinfo = {
00039     "MyGTKModule",
00040     "MyGTKModule description",
00041     0,
00042     1,
00043     0,
00044     "First and Lastname",
00045     "email@address.tld",
00046     "http://www.mygtkmodule.com",
00047     "GPLv3"
00048 };
00049
00050 static void
00051 print_hello (GtkWidget *widget,
00052              gpointer   data)
00053 {
00054     (void)widget;
00055     (void)data;
00056     g_print (_("Hello world from GTK !!!"));
00057     g_print ("\n");
00058 }
00059
00060 static void
00061 activate (GtkApplication* app,
00062           gpointer        user_data)
00063 {
00064     GtkWidget *window;
00065     GtkWidget *button;
00066     GtkWidget *box;
00067
00068     (void)user_data;
00069     window = gtk_application_window_new (app);
00070     gtk_window_set_title (GTK_WINDOW (window), "Window");
00071     gtk_window_set_default_size (GTK_WINDOW (window), 200, 200);
00072
00073     box = gtk_box_new (GTK_ORIENTATION_VERTICAL, 0);
00074     gtk_widget_set_halign (box, GTK_ALIGN_CENTER);
00075     gtk_widget_set_valign (box, GTK_ALIGN_CENTER);
00076
00077     gtk_window_set_child (GTK_WINDOW (window), box);
00078
00079     button = gtk_button_new_with_label (_("Hello world from GTK !!!"));
00080
00081     g_signal_connect (button, "clicked", G_CALLBACK (print_hello), NULL);
00082     g_signal_connect_swapped (button, "clicked", G_CALLBACK (gtk_window_destroy), window);
00083
00084     gtk_box_append (GTK_BOX (box), button);
00085
00086     gtk_window_present (GTK_WINDOW (window));
00087
00088 }
00089
00090 moduleinfo_t* onLoad ()
00091 {
00092     DBG_MSG("params()");
00093     return &moduleinfo;
00094 }
00095
00096 uint8_t onUnload()
00097 {
```

```
00098     DBG_MSG("params()");
00099     return 0;
00100 }
00101
00102 static void mkmod_function()
00103 {
00104     GtkApplication *app;
00105     DBG_MSG("params()");
00106
00107     printf(_("Hello from mkmod_function\n"));
00108     app = gtk_application_new ("org.gtk.example", G_APPLICATION_DEFAULT_FLAGS);
00109     g_signal_connect (app, "activate", G_CALLBACK (activate), NULL);
00110     /* g_application_run (G_APPLICATION (app), argc, argv); */
00111     g_application_run (G_APPLICATION (app), 0,NULL);
00112     g_object_unref (app);
00113
00114 }
00115
```

5.31 mkmodtty.c File Reference

```
#include "mkmod.h"
#include "gettext.h"
#include <stdio.h>
#include "debug/assert.h"
#include "debug/memory.h"
```

Include dependency graph for mkmodtty.c:



Macros

- #define _(String) gettext (String)

Functions

- moduleinfo_t * onLoad ()
- uint8_t onUnload ()

Variables

- mkmod_api_t module_api

5.31.1 Detailed Description

Date

17/11/2017

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Definition in file mkmodtty.c.

5.31.2 Macro Definition Documentation

5.31.2.1 _

```
#define _(
              String ) gettext (String)
```

Definition at line 19 of file mkmodtty.c.

5.31.3 Function Documentation

5.31.3.1 onLoad()

```
moduleinfo_t * onLoad ( )
```

Definition at line 43 of file mkmodtty.c.

5.31.3.2 onUnload()

```
uint8_t onUnload ( )
```

Definition at line 49 of file mkmodtty.c.

5.31.4 Variable Documentation

5.31.4.1 module_api

```
mkmod_api_t module_api
```

Initial value:

```
= {
    mkmod_function
}
```

Definition at line 27 of file mkmodtty.c.

5.32 mkmodtty.c

Go to the documentation of this file.

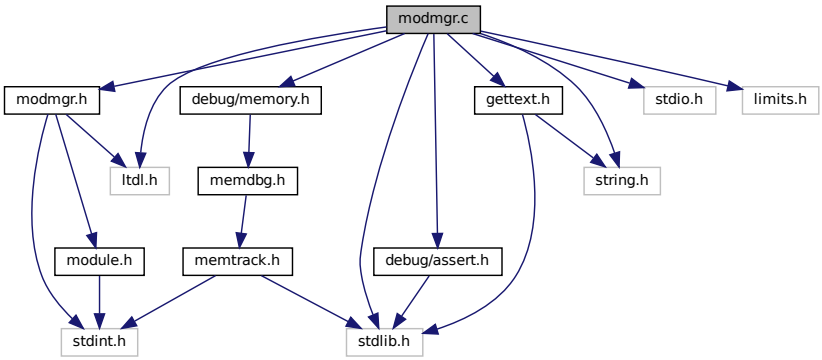
```
00001
00017 #include "mkmod.h"
00018 #include "gettext.h"
00019 #define _(String) gettext (String)
00020
00021 #include <stdio.h>
00022
00023 #include "debug/assert.h"
00024 #include "debug/memory.h"
00025
00026 /* List exposed module functions */static void mkmod_function();
00027 mkmod_api_t module_api = {
00028     mkmod_function
00029 };
00030
00031 static moduleinfo_t moduleinfo = {
00032     "MyModule",
00033     "MyModule description",
00034     0,
00035     1,
00036     0,
00037     "First and Lastname",
00038     "email@address.tld",
00039     "http://www.mymodule.com",
00040     "GPLv3"
00041 };
00042
00043 moduleinfo_t* onLoad ()
00044 {
00045     DBG_TRACE;
00046     return &moduleinfo;
00047 }
00048
00049 uint8_t onUnload()
00050 {
00051     DBG_TRACE;
00052     return 0;
00053 }
00054
00055 static void mkmod_function()
00056 {
00057     DBG_TRACE;
00058
00059     printf(_("Hello from mkmod_function\n"));
00060 }
00061
```

5.33 modmgr.c File Reference

Module manager implementation.

```
#include "modmgr.h"
#include "gettext.h"
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <limits.h>
#include <ltdl.h>
#include "debug/assert.h"
#include "debug/memory.h"
```

Include dependency graph for modmgr.c:



Classes

- struct modules_s

  Module list item structure.

Macros

- #define _(String) gettext (String)
- #define PATH_MAX 255

Typedefs

- typedef struct modules_s modules_t

  Module list item structure.

Functions

- int modmgr_setpath (const char *path)

  Reset and initialize the modules search path.
- int modmgr_addpath (const char *path)

  Add a path at the end (lowest prio) of the search path.
- int modmgr_insertpath (const char *before, const char *path)

  Insert (with higher prio) a path before the specified one (from the current search path)
- const char * modmgr_getpath ()

  Get a read-only pointer on the current search path.
- modmgr_module_t modmgr_load (const char *modfile)

  Load a module, initialize it, add it to the list and return an opaque handle.
- void modmgr_unload (modmgr_module_t module)

  Decrement the usage counter, if last usage, remove from the module list and call onUnload.
- void modmgr_list ()

  Output the list of modules.
- void * modmgr_getsymbol (const modmgr_module_t module, const char *szSymbol)

  Resolve a module symbol pointer.

5.33.1 Detailed Description

Module manager implementation.

Date

25/11/2017

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

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Definition in file modmgr.c.

5.33.2 Macro Definition Documentation

5.33.2.1 _

```
#define _(
              String ) gettext (String)
```

Definition at line 20 of file modmgr.c.

5.33.2.2 PATH_MAX

```
#define PATH_MAX 255
```

Definition at line 28 of file modmgr.c.

5.33.3 Typedef Documentation

5.33.3.1 modules_t

```
typedef struct modules_s modules_t
```

Module list item structure.

5.33.4 Function Documentation

5.33.4.1 modmgr_addpath()

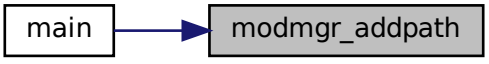
```
int modmgr_addpath (
            const char * path )
```

Add a path at the end (lowest prio) of the search path.

Add a path to the end of the module search path.

Definition at line 141 of file modmgr.c.

Here is the caller graph for this function:



5.33.4.2 modmgr_getpath()

```
const char * modmgr_getpath ( )
```

Get a read-only pointer on the current search path.

Get the current search path list.

Definition at line 181 of file modmgr.c.

5.33.4.3 modmgr_getsymbol()

```
void * modmgr_getsymbol (
            const modmgr_module_t module,
            const char * szSymbol )
```

Resolve a module symbol pointer.

Resolve a module symbol, can be a function or a variable.

Definition at line 419 of file modmgr.c.

5.33.4.4 modmgr_insertpath()

```
int modmgr_insertpath (
            const char * before,
            const char * path )
```

Insert (with higher prio) a path before the specified one (from the current search path)

Insert an higher priority search path before another one.

Definition at line 161 of file modmgr.c.

5.33.4.5 modmgr_list()

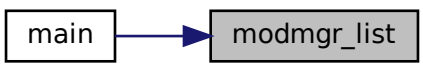
```
void modmgr_list ( )
```

Output the list of modules.

Print the currently loaded modules list for debug and tracing.

Definition at line 379 of file modmgr.c.

Here is the caller graph for this function:



5.33.4.6 modmgr_load()

```
modmgr_module_t modmgr_load (
            const char * modfile )
```

Load a module, initialize it, add it to the list and return an opaque handle.

Load a module and call the initialization with a parameter if first usage.

Todo critical section

Definition at line 191 of file modmgr.c.

5.33.4.7 modmgr_setpath()

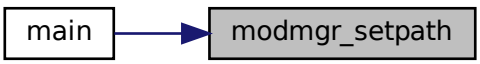
```
int modmgr_setpath (
            const char * path )
```

Reset and initialize the modules search path.

Initialize or reset module search path.

Definition at line 125 of file modmgr.c.

Here is the caller graph for this function:



5.33.4.8 modmgr_unload()

```
void modmgr_unload (
            modmgr_module_t module )
```

Decrement the usage counter, if last usage, remove from the module list and call onUnload.

Call the unload function if last usage and tries to unload the module.

Definition at line 306 of file modmgr.c.

5.34 modmgr.c

Go to the documentation of this file.

```
00001
00018 #include "modmgr.h"
00019 #include "gettext.h"
00020 #define _(String) gettext (String)
00021
00022 #include <stdio.h>
00023 #include <stdlib.h>
00024 #include <string.h>
00025
00026 #include <limits.h>
00027 #ifndef PATH_MAX
00028 #  define PATH_MAX 255
00029 #endif
00030
00031 #include <string.h>
00032 #include <ltdl.h>
00033
00034 #if LIBPTHREAD
00035 # include <pthread.h>
00036 #endif
00037
00038 #include "debug/assert.h"
00039 #include "debug/memory.h"
00040
00042 typedef struct modules_s {
00043     lt_dlhandle handle;
00044     moduleinfo_t* modinfo;
00045     struct modules_s *next;
00046 } modules_t;
00047
00049 static modules_t* modules = NULL;
00050
00051 static char * dlerrordup (char *errormsg)
00052 {
00053     char *error = (char *) lt_dlerror ();
00054     if (error && !errormsg)
00055         errormsg = strdup (error);
00056     return errormsg;
00057 }
00058
00059 static uint8_t modmgr_error(const char* contextname)
00060 {
00061     char* errormsg=NULL;
00062
00063     errormsg = dlerrordup (errormsg);
00064     if (NULL != errormsg) {
00065         fprintf(stderr,"%s:  %s\n",contextname,errormsg);
00066         free(errormsg);
00067         return 1;
00068     }
00069     DBG_PRINTF("%s:  OK",contextname);
00070     return 0;
00071 }
00072
00073 static void modmgr_init_real();
00075 static void modmgr_init_noop()
00076 {
00077     DBG_MSG("modmgr already initialized.");
00078     return;
00079 }
00081 static void (*modmgr_init_ptr)() = modmgr_init_real;
00082
00084 static void modmgr_atexit()
00085 {
00086     DBG_MSG("Validate that module list is empty.");
00087     /* Checks that all modules were unloaded before exit */
00088     /* Module list should be either not initialized or with sentinel only */
00089     ASSERT((modules==NULL)||(modules->handle==NULL));
00090     /* Finished with ltdl now.  */
00091     if (0!=lt_dlexit ()) {
00092         modmgr_error("lt_dlexit");
00093         /* We should abort here, but aborting in atexit() would be stupid */
00094     }
00095 }
00096
00098 static void modmgr_init_real()
00099 {
00100     /* Needs to be called once and only once */
00101     ASSERT(modules == NULL);
00102
00103     DBG_MSG("LTDL initialization");
00104     if (0 != lt_dlinit ())
```

```
00105         modmgr_error("lt_dlinit");
00106
00107     /* Initialize the module list with a sentinel */
00108     DBG_MSG("Module list initialization");
00109     modules = (modules_t*)malloc(sizeof(modules_t));
00110     if ( NULL == modules ) {
00111         fprintf(stderr,_("Critical:  Module manager lacks RAM (OOM) to initialize.\n"));
00112         abort();
00113     }
00114     modules->handle = NULL;
00115     modules->modinfo = NULL;
00116     modules->next = NULL;
00117     DBG_MSG("Register an atexit healthcheck and cleanup fonction");
00118     atexit(modmgr_atexit);
00119
00120     /* Avoid double calls */
00121     modmgr_init_ptr = modmgr_init_noop;
00122 }
00123
00125 int modmgr_setpath (const char* path)
00126 {
00127     int result;
00128     DBG_PRINTF("path=%s",path);
00129     modmgr_init_ptr();
00130     ASSERT(modules != NULL);
00131
00132     /* Set the module search path.  */
00133     result = lt_dlsetsearchpath (path);
00134     if (0!=result)
00135         modmgr_error("lt_dlsetsearchpath");
00136     DBG_PRINTF("search path = %s",lt_dlgetsearchpath());
00137     return result;
00138 }
00139
00141 int modmgr_addpath (const char* path)
00142 {
00143     int result=0;
00144     DBG_PRINTF("path=%s",path);
00145     modmgr_init_ptr();
00146     ASSERT(modules != NULL);
00147
00148     /* Add a module search path.  */
00149     if ((NULL==path)||(0==path[0])) {
00150         fprintf(stderr,_("Module manager can not add a null or empty path.\n"));
00151     } else {
00152         result = lt_dladdsearchdir (path);
00153         if (0!=result)
00154             modmgr_error("lt_dladdsearchdir");
00155     }
00156     DBG_PRINTF("search path = %s",lt_dlgetsearchpath());
00157     return result;
00158 }
00159
00161 int modmgr_insertpath (const char* before, const char* path)
00162 {
00163     int result=0;
00164     DBG_PRINTF("before=%s, path=%s",before,path);
00165     modmgr_init_ptr();
00166     ASSERT(modules != NULL);
00167
00168     /* Insert a module search path.  */
00169     if ((NULL==path)||(0==path[0])) {
00170         fprintf(stderr,_("Module manager can not insert a null or empty path.\n"));
00171     } else {
00172         result = lt_dlinsertsearchdir (before,path);
00173         if (0!=result)
00174             modmgr_error("lt_dlinsertsearchdir");
00175     }
00176     DBG_PRINTF("search path = %s",lt_dlgetsearchpath());
00177     return result;
00178 }
00179
00181 const char* modmgr_getpath ()
00182 {
00183     DBG_TRACE;
00184     modmgr_init_ptr();
00185     ASSERT(modules != NULL);
00186
00187     return lt_dlgetsearchpath();
00188 }
00189
00191 modmgr_module_t modmgr_load(const char* modfile)
00192 {
00193     modules_t* module;
00194     moduleinfo_t* (*l_onLoad)();
00195     modules_t* it;
00196
```

```
00197     DBG_PRINTF("modfile=%s",modfile);
00198     modmgr_init_ptr();
00199     ASSERT(modules != NULL);
00200 
00201     if ((NULL==modfile)||(0==modfile[0])) {
00202         fprintf(stderr,_("Module manager can not load a null or empty modfile.\n"));
00203         return NULL;
00204     }
00205 
00206     module = (modules_t*)malloc(sizeof(modules_t));
00207     if ( NULL == module ) {
00208         /* TRANSLATORS: module filename */
00209         fprintf(stderr,_("Module manager lacks RAM (OOM) to create a module structure for
      %s.\n"),modfile);
00210         return NULL;
00211     }
00212 
00213     DBG_PRINTF("Loading module file %s",modfile);
00214     module->handle = lt_dlopenext (modfile);
00215     if (NULL==module->handle) {
00216         modmgr_error("lt_dlopenext");
00217         fprintf(stderr,_("Module manager can not load %s.\n"),modfile);
00218         free(module);
00219         return NULL;
00220     }
00221 
00222 #ifndef NDEBUG
00223     {
00224         const lt_dlinfo *li = lt_dlgetinfo(module->handle);
00225         if (0!=modmgr_error("lt_dlgetinfo")) {
00226             DBG_MSG("lt_dlgetinfo failed");
00227             abort();
00228         }
00229         DBG_PRINTF ("ltinfo:  filename = %s ", li->filename);
00230         DBG_PRINTF ("ltinfo:  name(ref_count) = %s(%d)", li->name, li->ref_count);
00231     }
00232 #endif
00233 
00234     DBG_PRINTF("Search loaded module (%p) in the module list",module->handle);
00235     it = modules;
00236     while ((it)&&(it->handle!=module->handle))
00237         it = it->next;
00238 
00239     /* Module already loaded and initialized, free structure and return module */
00240     if (NULL != it) {
00241         DBG_PRINTF("Module (%p) already loaded, no initialization",module->handle);
00242         free(module);
00243         return it;
00244     }
00245 #ifndef NDEBUG
00246     else
00247         DBG_PRINTF("Module (%p) not yet loaded, keep and initialize",module->handle);
00248 #endif
00249 
00250     /* Find the entry points.  */
00251     *(void**)(&l_onLoad) = lt_dlsym (module->handle, "onLoad");
00252 
00253     /* Mandatory entry point not found, cancel the load */
00254     if (0!=modmgr_error("lt_dlsym")) {
00255         /* TRANSLATORS: module filename */
00256         fprintf(stderr,_("Module manager can not find the entry point (onLoad) not found
      (%s).\n"),modfile);
00257         /* Unload to decrement the ref counter */
00258         if (0!=lt_dlclose(module->handle)) {
00259             modmgr_error("lt_dlclose");
00260             /* TRANSLATORS: module filename */
00261             fprintf(stderr,_("Critical:  Module manager can not unload partially loaded invalid module
      (%s).\n"),modfile);
00262             /* Do not cleanup, immediate abort to help debugging */
00263             abort();
00264         }
00265         free(module);
00266         return NULL;
00267     }
00268 
00269     /* Execute entry point to initialize, if found */
00270     DBG_PRINTF("Module (%p) entry point found (%p), initializing",module->handle, l_onLoad);
00271     module->modinfo = l_onLoad();
00272     if (module->modinfo == NULL) {
00273         fprintf(stderr,_("Invalid module(%s):  entry point (onLoad) did not return module
      info.\n"),modfile);
00274         free(module);
00275         return NULL;
00276     }
00277 
00278 #ifndef NDEBUG
00279     DBG_PRINTF ("modinfo:  name (version) = %s (v%d.%d.%d)",
```

```
00280                 module->modinfo->moduleName,
00281                 module->modinfo->moduleMajor,
00282                 module->modinfo->moduleMinor,
00283                 module->modinfo->modulePatch);
00284     DBG_PRINTF ("modinfo:  description = %s",
00285                 module->modinfo->moduleDesc);
00286     DBG_PRINTF ("modinfo:  URL = %s",
00287                 module->modinfo->moduleURL);
00288     DBG_PRINTF ("modinfo:  author (email) = %s (%s)",
00289                 module->modinfo->moduleAuthor,
00290                 module->modinfo->moduleEmail);
00291     DBG_PRINTF ("modinfo:  license = %s",
00292                 module->modinfo->moduleLicense);
00293 #endif
00294
00295     /* Add module structure to module list */
00296     DBG_PRINTF("Module (%p) registration in the list",module->handle);
00298     module->next = modules;
00299     modules = module;
00300
00301     DBG_PRINTF("Return the module(%p) handle(%p)",module->handle, module);
00302     return module;
00303 }
00304
00306 void modmgr_unload(modmgr_module_t module)
00307 {
00308     modules_t *it;
00309     modules_t *prevmodule;
00310     uint8_t (*l_onUnload)();
00311
00312     DBG_PRINTF("module(%p)",module);
00313     modmgr_init_ptr();
00314     ASSERT(modules != NULL);
00315
00316     if (NULL==module) {
00317         fprintf(stderr,_("Module manager can not unload a null module.\n"));
00318         return;
00319     }
00320
00321     /* Find the module if loaded */
00322     it = modules;
00323     prevmodule = NULL;
00324     while ((it)&&(module!=it)) {
00325         prevmodule = it;
00326         it = it->next;
00327     }
00328     ASSERT(module==it); /* Module not found */
00329
00330     {
00331         /* Get the reference (loading) counter */
00332         const lt_dlinfo *li;
00333         ASSERT(NULL!=module->handle);
00334         li = lt_dlgetinfo(module->handle);
00335         if (0!=modmgr_error("lt_dlgetinfo")) {
00336             DBG_MSG("lt_dlgetinfo failed");
00337             fprintf(stderr,_("Critical:  Module manager can not get module counter before
    unload.\n"));
00338             abort();
00339         }
00340         DBG_PRINTF ("ltinfo = %s (%s:%d)",
00341                     li->filename, li->name,
00342                     li->ref_count);
00343         /* Execute onUnLoad only if really unloading the very last occurence */
00344         if (1==li->ref_count) {
00345             DBG_MSG("Last module usage :  call onUnLoad");
00346             *(void**)(&l_onUnload) = lt_dlsym (it->handle, "onUnload");
00347             if (0!=modmgr_error("lt_dlsym")) {
00348                 fprintf(stderr,_("Module manager can not find the module exit point (onUnload).\n"));
00349             } else {
00350                 uint8_t result;
00351                 result = 0;
00352                 /* Call the exit point function.  */
00353                 result = l_onUnload();
00354                 if (result != 0)
00355                     /* TRANSLATORS: result code, return value */
00356                     fprintf(stderr,_("Module manager received an error i(%d) from the module exit
    point (onUnload).\n"),result);
00357                 DBG_PRINTF ("onUnLoad retCode :  %d", result);
00358             }
00359
00360             /*  Remove module record from module list */
00361             if (NULL!=prevmodule)
00362                 prevmodule->next = it->next;
00363             else
00364                 modules = it->next;
00365             /* Actually Unload because this was the last usage */
00366             if (0!=lt_dlclose(module->handle))
```

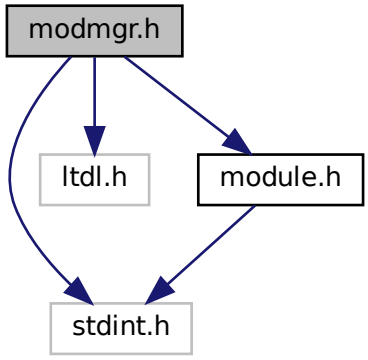
```
00367                 modmgr_error("lt_dlclose");
00368             free(it);
00369         } else {
00370             DBG_MSG("Module still used, do not call onUnLoad");
00371             /* Unload :  Only to decrement the ref counter */
00372             if (0!=lt_dlclose(module->handle))
00373                 modmgr_error("lt_dlclose");
00374         }
00375     }
00376 }
00377
00379 void modmgr_list()
00380 {
00381     modules_t* it;
00382
00383     DBG_TRACE;
00384     modmgr_init_ptr();
00385     ASSERT(modules != NULL);
00386
00387     it = modules;
00388     printf(_("--- Module list :\n"));
00389     while (it) {
00390         /* If not on the sentinel */
00391         if (it->handle) {
00392             fprintf ( stderr,
00393                       "ltinfo = %s (%s:%d), "
00394                       "name (version) = %s (v%d.%d.%d), "
00395                       "description = %s, "
00396                       "URL = %s, "
00397                       "author (email) = %s (%s), "
00398                       "license = %s\n",
00399                       lt_dlgetinfo(it->handle)->filename,
00400                       lt_dlgetinfo(it->handle)->name,
00401                       lt_dlgetinfo(it->handle)->ref_count,
00402                       it->modinfo->moduleName,
00403                       it->modinfo->moduleMajor,
00404                       it->modinfo->moduleMinor,
00405                       it->modinfo->modulePatch,
00406                       it->modinfo->moduleDesc,
00407                       it->modinfo->moduleURL,
00408                       it->modinfo->moduleAuthor,
00409                       it->modinfo->moduleEmail,
00410                       it->modinfo->moduleLicense
00411                     );
00412         }
00413         it = it->next;
00414     }
00415     return;
00416 }
00417
00419 void* modmgr_getsymbol(const modmgr_module_t module, const char* szSymbol)
00420 {
00421     modules_t* it;
00422     void* pSymbol;
00423
00424     DBG_PRINTF("module=%p, Symbol=%s",module,szSymbol);
00425
00426     if (NULL==module) {
00427         fprintf(stderr,_("Module manager can not resolve a symbol from a null module.\n"));
00428         return NULL;
00429     }
00430
00431     if ((NULL==szSymbol)||(0==szSymbol[0])) {
00432         fprintf(stderr,_("Module manager can not resolve a null or empty symbol name.\n"));
00433         return NULL;
00434     }
00435
00436     /* Search the module */
00437     it = modules;
00438     while ((it)&&(it!=module))
00439         it = it->next;
00440     ASSERT(NULL!=it);
00441     ASSERT(module==it);
00442
00443     pSymbol = lt_dlsym (it->handle, szSymbol);
00444     if (0!=modmgr_error("lt_dlsym")) {
00445         return NULL;
00446     }
00447
00448     return pSymbol;
00449 }
```

5.35 modmgr.h File Reference

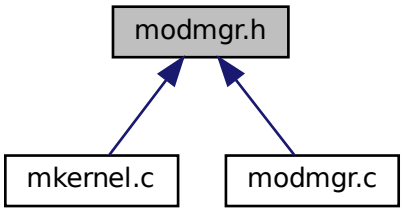
Module manager headers.

```
#include <stdint.h>
#include <ltdl.h>
#include "module.h"
```

Include dependency graph for modmgr.h:



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



Macros

- #define MODMGR_GETFUNCTION(m, f) ∗(void∗∗)(&f)=modmgr_getsymbol(m,#f);
- #define MODMGR_LOAD(module, api, filename)

Typedefs

- typedef struct modules_s ∗ modmgr_module_t

  Pointer type on private structure.

Functions

- int modmgr_setpath (const char *path)
  Initialize or reset module search path.
- int modmgr_addpath (const char *path)
  Add a path to the end of the module search path.
- int modmgr_insertpath (const char *before, const char *path)
  Insert an higher priority search path before another one.
- const char * modmgr_getpath ()
  Get the current search path list.
- modmgr_module_t modmgr_load (const char *modfile)
  Load a module and call the initialization with a parameter if first usage.
- void modmgr_unload (modmgr_module_t module)
  Call the unload function if last usage and tries to unload the module.
- void modmgr_list ()
  Print the currently loaded modules list for debug and tracing.
- void * modmgr_getsymbol (const modmgr_module_t module, const char *szSymbol)
  Resolve a module symbol, can be a function or a variable.

5.35.1 Detailed Description

Module manager headers.

Date

25/11/2017

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Copyright (c) 2017, François Cerbelle

Manage module loading with parametrized initialization, module unloading, fetching modules ABI...

Definition in file modmgr.h.

5.35.2 Macro Definition Documentation

5.35.2.1 MODMGR_GETFUNCTION

```
#define MODMGR_GETFUNCTION(
            m,
            f ) *(void**)(&f)=modmgr_getsymbol(m,#f);
```

Definition at line 32 of file modmgr.h.

5.35.2.2 MODMGR_LOAD

```
#define MODMGR_LOAD(
                module,
                api,
                filename )
```

Value:

```
module=modmgr_load(filename); \
api=modmgr_getsymbol(module,"module_api");
```

Definition at line 33 of file modmgr.h.

5.35.3 Typedef Documentation

5.35.3.1 modmgr_module_t

```
typedef struct modules_s* modmgr_module_t
```

Pointer type on private structure.

Definition at line 42 of file modmgr.h.

5.35.4 Function Documentation

5.35.4.1 modmgr_addpath()

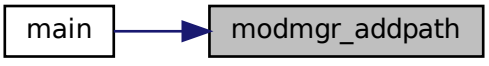
```
int modmgr_addpath (
              const char * path )
```

Add a path to the end of the module search path.

Add a path to the end of the module search path.

Definition at line 141 of file modmgr.c.

Here is the caller graph for this function:



5.35.4.2 modmgr_getpath()

```
const char * modmgr_getpath ( )
```

Get the current search path list.

Get the current search path list.

Definition at line 181 of file modmgr.c.

5.35.4.3 modmgr_getsymbol()

```
void * modmgr_getsymbol (
            const modmgr_module_t module,
            const char * szSymbol )
```

Resolve a module symbol, can be a function or a variable.

Resolve a module symbol, can be a function or a variable.

Definition at line 419 of file modmgr.c.

5.35.4.4 modmgr_insertpath()

```
int modmgr_insertpath (
            const char * before,
            const char * path )
```

Insert an higher priority search path before another one.

Insert an higher priority search path before another one.

Definition at line 161 of file modmgr.c.

5.35.4.5 modmgr_list()

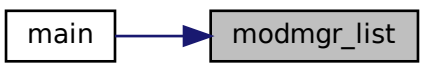
```
void modmgr_list ( )
```

Print the currently loaded modules list for debug and tracing.

Print the currently loaded modules list for debug and tracing.

Definition at line 379 of file modmgr.c.

Here is the caller graph for this function:



5.35.4.6 modmgr_load()

```
modmgr_module_t modmgr_load (
            const char * modfile )
```

Load a module and call the initialization with a parameter if first usage.

Load a module and call the initialization with a parameter if first usage.

Todo critical section

Definition at line 191 of file modmgr.c.

5.35.4.7 modmgr_setpath()

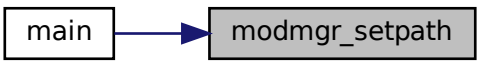
```
int modmgr_setpath (
            const char * path )
```

Initialize or reset module search path.

Initialize or reset module search path.

Definition at line 125 of file modmgr.c.

Here is the caller graph for this function:



5.35.4.8 modmgr_unload()

```
void modmgr_unload (
            modmgr_module_t module )
```

Call the unload function if last usage and tries to unload the module.

Call the unload function if last usage and tries to unload the module.

Definition at line 306 of file modmgr.c.

5.36 modmgr.h

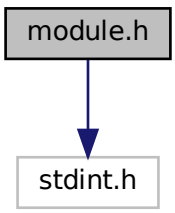
Go to the documentation of this file.

```
00001
00020 #ifndef __MODMGR_H__
00021 #define __MODMGR_H__
00022
00023 #ifdef HAVE_CONFIG_H
00024 #include "config.h"
00025 #endif
00026
00027 #include <stdint.h>
00028 #include <ltdl.h>
00029
00030 #include "module.h"
00031
00032 #define MODMGR_GETFUNCTION(m,f) *(void**)(&f)=modmgr_getsymbol(m,#f);
00033 #define MODMGR_LOAD(module,api,filename) \
00034 module=modmgr_load(filename); \
00035 api=modmgr_getsymbol(module,"module_api");
00036
00037 #ifdef __cplusplus
00038 extern "C" {
00039 #endif
00040
00042 typedef struct modules_s *modmgr_module_t;
00043
00045 int modmgr_setpath (const char* path);
00046
00048 int modmgr_addpath (const char* path);
00049
00051 int modmgr_insertpath (const char* before, const char* path);
00052
00054 const char* modmgr_getpath ();
00055
00057 modmgr_module_t modmgr_load(const char* modfile);
00058
00060 void modmgr_unload(modmgr_module_t module);
00061
00063 void modmgr_list();
00064
00066 void* modmgr_getsymbol(const modmgr_module_t module, const char* szSymbol);
00067
00068 #ifdef __cplusplus
00069 }
00070 #endif
00071
00072 #endif /* __MODMGR_H__ */
```

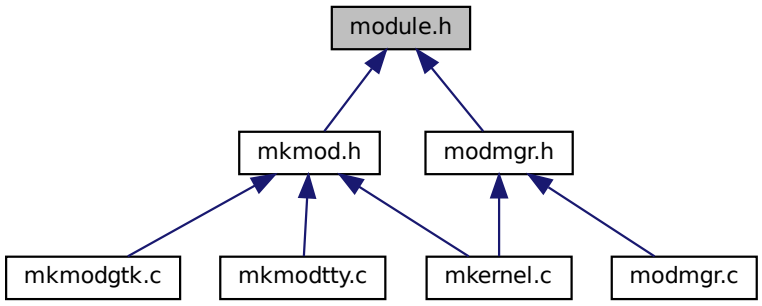
5.37 module.h File Reference

Internal ABI shared by all modules with modmgr.

`#include <stdint.h>`
Include dependency graph for module.h:



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



Classes

- struct moduleinfo_s

Typedefs

- typedef struct moduleinfo_s moduleinfo_t

5.37.1 Detailed Description

Internal ABI shared by all modules with modmgr.

Date

17/11/2017

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Definition in file module.h.

5.37.2 Typedef Documentation

5.37.2.1 moduleinfo_t

```
typedef struct moduleinfo_s moduleinfo_t
```

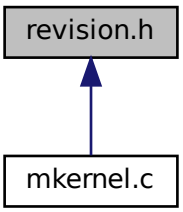
5.38 module.h

Go to the documentation of this file.

```
00001
00018 #ifndef __MODULE_H__
00019 #define __MODULE_H__
00020
00021 #include <stdint.h>
00022
00023 #ifdef __cplusplus
00024 extern "C" {
00025 #endif
00026
00027 typedef struct moduleinfo_s {
00028     const char* moduleName;
00029     const char* moduleDesc;
00030     const uint8_t moduleMajor;
00031     const uint8_t moduleMinor;
00032     const uint8_t modulePatch;
00033     const char* moduleAuthor;
00034     const char* moduleEmail;
00035     const char* moduleURL;
00036     const char* moduleLicense;
00037 } moduleinfo_t;
00038
00039 #ifdef __cplusplus
00040 }
00041 #endif
00042
00043 #endif /* __MODULE_H__ */
```

5.39 revision.h File Reference

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



Macros

- #define REVISION "e538cd7d962a"

5.39.1 Macro Definition Documentation

5.39.1.1 REVISION

```
#define REVISION "e538cd7d962a"
```

Definition at line 3 of file revision.h.

5.40 revision.h

Go to the documentation of this file.

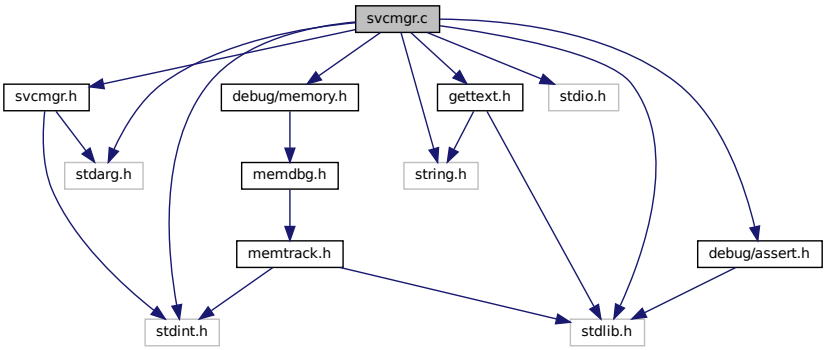
```
00001 /* This file is updated in the distdir before creating the dist archive */
00002 #ifndef REVISION
00003 #define REVISION "e538cd7d962a"
00004 #endif
```

5.41 svcmgr.c File Reference

Service manager implementation.

```
#include "svcmgr.h"
#include "gettext.h"
#include <stdarg.h>
#include <stdint.h>
#include <string.h>
#include <stdlib.h>
#include <stdio.h>
#include "debug/assert.h"
#include "debug/memory.h"
```

Include dependency graph for svcmgr.c:



Classes

- struct service_s

Macros

- #define _(String) gettext (String)

Typedefs

- typedef struct service_s service_t

Functions

- void svcmgr_dump (const char *p_prefix, service_t *p_list)
- void svcmgr_register (const char *p_endpoint, svcfunc_t *p_svcfunc)
- uint8_t svcmgr_call (const char *p_endpoint,...)
- void svcmgr_unregister (const char *p_endpoint)

5.41.1 Detailed Description

Service manager implementation.

Date

27/11/2017

Author

François Cerbelle (Fanfan), francois@cerbelle.net

Copyright

Copyright (c) 2017, François Cerbelle

Todo make threadsafe

investigate prefix or b+* trees

Implements the services dictionnary in an n-tree structure.

Definition in file svcmgr.c.

5.41.2 Macro Definition Documentation

5.41.2.1 _

```
#define _(
              String ) gettext (String)
```

Definition at line 24 of file svcmgr.c.

5.41.3 Typedef Documentation

5.41.3.1 service_t

```
typedef struct service_s service_t
```

5.41.4 Function Documentation

5.41.4.1 svcmgr_call()

```
uint8_t svcmgr_call (
            const char * p_endpoint,
             ...  )
```

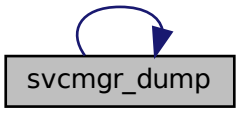
Definition at line 235 of file svcmgr.c.

5.41.4.2 svcmgr_dump()

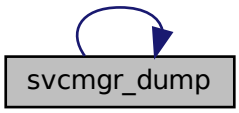
```
void svcmgr_dump (
            const char * p_prefix,
            service_t * p_list )
```

Definition at line 163 of file svcmgr.c.

Here is the call graph for this function:



Here is the caller graph for this function:



5.41.4.3 svcmgr_register()

```
void svcmgr_register (
            const char * p_endpoint,
            svcfunc_t * p_svcfunc )
```

Definition at line 182 of file svcmgr.c.

5.41.4.4 svcmgr_unregister()

```
void svcmgr_unregister (
            const char * p_endpoint )
```

Definition at line 259 of file svcmgr.c.

5.42 svcmgr.c

Go to the documentation of this file.

```
00001
00022 #include "svcmgr.h"
00023 #include "gettext.h"
00024 #define _(String) gettext (String)
00025
00026 #include <stdarg.h> /* va_list, va_start, va_arg, va_end */
00027 #include <stdint.h>
00028 #include <string.h>
00029 #include <stdlib.h> /* free */
00030 #include <stdio.h> /* printf */
00031
00032 #include "debug/assert.h"
00033 #include "debug/memory.h"
00034
00035 typedef struct service_s {
00036     struct service_s *next;
00037     struct service_s *children;
00038     uint8_t nbArgs;
00039     char *name;
00040     svcfunc_t *function;
00041 } service_t;
00042
00044 static service_t* services=NULL;
00045
00052 static service_t* svcmgr_find(service_t* p_list, const char* p_name)
00053 {
00054     int l_cmp; /*< string comparison */
00055
00056     ASSERT(p_name);
00057     DBG_PRINTF("p_list=%p, p_name=%s",p_list,p_name);
00058
00059
00060     l_cmp=0;
00061     /* Search for the service name in the service list */
00062     while ((p_list!=NULL)&&((l_cmp=strcmp(p_list->name,p_name))<0)) {
00063         DBG_PRINTF("p_list=%p, p_list->next=%p",p_list,p_list->next);
00064         DBG_PRINTF("p_list=%p, p_list->name=%s",p_list,p_list->name);
00065         DBG_PRINTF("p_list=%p, l_cmp=%d",p_list,l_cmp);
00066         if (l_cmp!=0)
00067             p_list = p_list->next;
00068     }
00069
00070     return (l_cmp==0?p_list:NULL);
00071 }
00072
00083 static service_t* svcmgr_insert(service_t** p_list, service_t* p_service)
00084 {
00085     int l_cmp; /*< string comparison */
00086
00087     ASSERT(p_list);
```

```
00088     ASSERT(p_service);
00089     DBG_PRINTF("p_list=%p, p_service=%p",p_list,p_service);
00090
00091     l_cmp=0;
00092
00093     /* Search for the service name in the service list */
00094     while ((*p_list)&&((l_cmp=strcmp((*p_list)->name,p_service->name))<0))
00095         p_list = &(*p_list)->next;
00096
00097     if ((*p_list==NULL)||(l_cmp>0)) {
00099         p_service->next = *p_list;
00100         *p_list = p_service;
00101         /* End of critical section */
00102     }
00103
00104     return *p_list;
00105 }
00106
00111 static void svcmgr_rdelete(service_t* p_service)
00112 {
00113     service_t* l_svc;
00114
00115     ASSERT(p_service);
00116     DBG_PRINTF("p_service=%p",p_service);
00117
00118     l_svc = NULL;
00119
00120     /* Delete childrens */
00121     while (p_service->children) {
00122         l_svc = p_service->children;
00123         p_service->children = p_service->next;
00124         svcmgr_rdelete(l_svc);
00125     }
00126     /* Delete name */
00127     free(p_service->name);
00128     /* Delete record */
00129     free(p_service);
00130 }
00131
00141 static service_t* svcmgr_delete(service_t** p_list, const char* p_name)
00142 {
00143     int l_cmp; /*< string comparison */
00144
00145     ASSERT(p_list);
00146     ASSERT(p_name);
00147     DBG_PRINTF("p_list=%p, p_name=%s",p_list,p_name);
00148
00149     l_cmp=0;
00150
00151     /* Search for the service name in the service list */
00152     while ((*p_list)&&((l_cmp=strcmp((*p_list)->name,p_name))<0))
00153         p_list = &(*p_list)->next;
00154
00155     if ((*p_list!=NULL)&&(l_cmp==0)) {
00156         service_t* l_svc = *p_list;
00157         *p_list = (*p_list)->next;
00158         svcmgr_rdelete(l_svc);
00159     }
00160     return *p_list;
00161 }
00162
00163 void svcmgr_dump(const char* p_prefix, service_t* p_list)
00164 {
00165 #ifndef NDEBUG
00166     while (p_list) {
00167         printf("%s%s\n",p_prefix, p_list->name);
00168         if (p_list->children) {
00169             char l_fullname[256];
00170             snprintf(l_fullname,255,"%s%s/",p_prefix,p_list->name);
00171             svcmgr_dump(l_fullname,p_list->children);
00172         }
00173         p_list = p_list->next;
00174     }
00175 #else
00176     /* Avoid unused parameters compilation warning for release builds */
00177     ((void)p_prefix);
00178     ((void)p_list);
00179 #endif
00180 }
00181
00182 void svcmgr_register(const char* p_endpoint, svcfunc_t* p_svcfunc)
00183 {
00184     char* l_token;
00185     char* l_endpoint; /* Get rid of const qualifier */
00186     service_t** l_head;
00187     service_t* l_svc;
00188     service_t* l_retsvc;
```

```
00189
00190     ASSERT(p_endpoint);
00191     ASSERT(p_svcfunc);
00192     DBG_PRINTF("p_endpoint=%s, p_svcfunc=%p",p_endpoint,p_svcfunc);
00193
00194     l_endpoint = strdup(p_endpoint);
00195     DBG_PRINTF("l_endpoint=%s",l_endpoint);
00196     l_head=&services;
00197     DBG_PRINTF("l_head=%p, *l_head=%p",l_head,*l_head);
00198     l_svc=NULL;
00199     l_retsvc=NULL;
00200
00201     while ((l_token = strtok_r(l_endpoint,"/",&l_endpoint))) {
00202         DBG_PRINTF("l_token=%s",l_token);
00203         DBG_PRINTF("l_svc=%p",l_svc);
00204         l_svc = (service_t*)malloc(sizeof(service_t));
00205         DBG_PRINTF("l_svc=%p",l_svc);
00206         l_svc->next=NULL;
00207         l_svc->children=NULL;
00208         l_svc->name=strdup(l_token);
00209         if (strlen(l_endpoint)) {
00210             /* Create a intermediate node */
00211             l_svc->nbArgs=0;
00212             l_svc->function=NULL;
00213         } else {
00214             /* Create an endpoint */
00215             l_svc->nbArgs=0;
00216             l_svc->function=p_svcfunc;
00217         }
00218         DBG_MSG("---------");
00219         DBG_PRINTF("l_svc=%p",l_svc);
00220         DBG_PRINTF("l_svc->next=%p",l_svc->next);
00221         DBG_PRINTF("l_svc->children=%p",l_svc->children);
00222         DBG_PRINTF("l_svc->nbArgs=%d",l_svc->nbArgs);
00223         DBG_PRINTF("l_svc->name=%s",l_svc->name);
00224         DBG_PRINTF("l_svc->function=%p",l_svc->function);
00225         DBG_MSG("---------");
00226         if (l_svc!=(l_retsvc=svcmgr_insert(l_head, l_svc)))
00227             free(l_svc);
00228         DBG_PRINTF("l_retsvc=%p",l_retsvc);
00229         l_head=&(l_retsvc->children);
00230         DBG_PRINTF("l_head=%p, *l_head=%p",l_head,*l_head);
00231     };
00232     svcmgr_dump("/",services);
00233 }
00234
00235 uint8_t svcmgr_call(const char* p_endpoint,...)
00236 {
00237     service_t* l_svc;
00238
00239     ASSERT(p_endpoint);
00240     DBG_PRINTF("p_endpoint=%s",p_endpoint);
00241
00242     l_svc=svcmgr_find(services, p_endpoint);
00243     DBG_PRINTF("l_svc=%p",l_svc);
00244
00245     if (l_svc) {
00246         DBG_PRINTF("l_svc->function=%p",l_svc->function);
00247         if (l_svc->function) {
00248             va_list l_ap;
00249             va_start(l_ap, p_endpoint);
00250             l_svc->function(l_ap);
00251             va_end(l_ap);
00252         }
00253     }
00254
00255     DBG_TRACE;
00256     return 0;
00257 }
00258
00259 void svcmgr_unregister(const char* p_endpoint)
00260 {
00261     svcmgr_delete(&services, p_endpoint);
00262 }
00263
00264 /*
00265 sem_init
00266 sem_wait
00267 sem_post
00268 sem_destroy
00269 sem_overview
00270
00271
00272 int pthread_mutex_init(pthread_mutex_t *restrict mutex, const pthread_mutexattr_t *restrict attr);
00273 int pthread_mutex_lock(pthread_mutex_t *mutex);
00274 int pthread_mutex_unlock(pthread_mutex_t *mutex);
00275 int pthread_mutex_destroy(pthread_mutex_t *mutex);
```

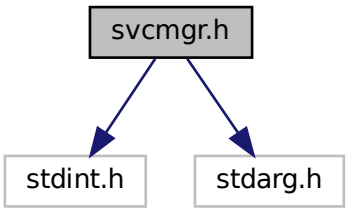
```
00276 */
```

5.43 svcmgr.h File Reference

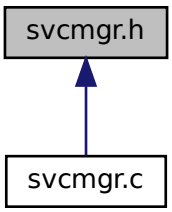
Service manager header.

```
#include <stdint.h>
#include <stdarg.h>
```

Include dependency graph for svcmgr.h:



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



Typedefs

- typedef uint8_t svcfunc_t(va_list p_ap)

Functions

- void svcmgr_register (const char *p_endpoint, svcfunc_t *p_service)
- uint8_t svcmgr_call (const char *p_endpoint,...)
- void svcmgr_unregister (const char *p_endpoint)

5.43.1 Detailed Description

Service manager header.

Date

27/11/2017

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Copyright

Defines a service dictionnary or registry in which a module can register and call a new service, with an endpoint, a callback function and an arbitrary number of arguments.

Definition in file svcmgr.h.

5.43.2 Typedef Documentation

5.43.2.1 svcfunc_t

```
typedef uint8_t svcfunc_t(va_list p_ap)
```

Definition at line 34 of file svcmgr.h.

5.43.3 Function Documentation

5.43.3.1 svcmgr_call()

```
uint8_t svcmgr_call (
            const char * p_endpoint,
             ...  )
```

Definition at line 235 of file svcmgr.c.

5.43.3.2 svcmgr_register()

```
void svcmgr_register (
            const char * p_endpoint,
            svcfunc_t * p_service )
```

Definition at line 182 of file svcmgr.c.

5.43.3.3 svcmgr_unregister()

```
void svcmgr_unregister (
            const char * p_endpoint )
```

Definition at line 259 of file svcmgr.c.

5.44 svcmgr.h

Go to the documentation of this file.

```
00001
00020 #ifndef __SVCMGR_H__
00021 #define __SVCMGR_H__
00022
00023 #ifdef HAVE_CONFIG_H
00024 #include "config.h"
00025 #endif
00026
00027 #include <stdint.h>
00028 #include <stdarg.h> /* va_list, va_start, va_arg, va_end */
00029
00030 #ifdef __cplusplus
00031 extern "C" {
00032 #endif
00033
00034 typedef uint8_t svcfunc_t (va_list p_ap);
00035
00036 void svcmgr_register(const char* p_endpoint, svcfunc_t* p_service);
00037 uint8_t svcmgr_call(const char* p_endpoint,...);
00038 void svcmgr_unregister(const char* p_endpoint);
00039
00040 #ifdef __cplusplus
00041 }
00042 #endif
00043
00044 #endif /* __SVCMGR_H__ */
```

Index