

C

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<b>1 table of contents</b>	<b>1</b>
1.1 basic types . . . . .	1
<b>2 Class Index</b>	<b>3</b>
2.1 Class List . . . . .	3
<b>3 File Index</b>	<b>5</b>
3.1 File List . . . . .	5
<b>4 Class Documentation</b>	<b>7</b>
4.1 file_handler Struct Reference . . . . .	7
4.2 list_handler Struct Reference . . . . .	7
4.3 memory_info_data Struct Reference . . . . .	8
4.4 pointer Struct Reference . . . . .	8
4.5 stack_element Struct Reference . . . . .	9
4.6 stack_handler Struct Reference . . . . .	9
4.7 string_reference Struct Reference . . . . .	10
4.8 vm Struct Reference . . . . .	10
4.9 vm_data Struct Reference . . . . .	11
4.10 vm_data_enumerator Struct Reference . . . . .	11
4.11 vm_pointer Struct Reference . . . . .	12
4.12 vm_state Struct Reference . . . . .	13
4.13 vm_type Struct Reference . . . . .	13
4.14 vm_types Struct Reference . . . . .	14
<b>5 File Documentation</b>	<b>15</b>
5.1 memory_v1.h . . . . .	15
5.2 src/list/list_v1.h File Reference . . . . .	16
5.2.1 Detailed Description . . . . .	16
5.3 list_v1.h . . . . .	16
5.4 api.h . . . . .	17
5.5 compile.h . . . . .	18
5.6 data.h . . . . .	19
5.7 errors.h . . . . .	19
5.8 headers.h . . . . .	20
5.9 macros.h . . . . .	21
5.10 time.h . . . . .	21
5.11 version.h . . . . .	22
5.12 options_v1.h . . . . .	22
5.13 src/vm/v1/os/os_v1.h File Reference . . . . .	23
5.13.1 Detailed Description . . . . .	23
5.14 os_v1.h . . . . .	23
5.15 src/vm/v1/pointer/pointer_v1.h File Reference . . . . .	24
5.15.1 Detailed Description . . . . .	25

---

5.16	<a href="#">pointer_v1.h</a>	25
5.17	<a href="#">info_v1.h</a>	26
5.18	<a href="#">src/vm/v1/types/data/data_v1.h</a> File Reference	26
5.18.1	Detailed Description	27
5.19	<a href="#">data_v1.h</a>	28
5.20	<a href="#">src/vm/v1/types/file/file_v1.h</a> File Reference	28
5.20.1	Detailed Description	29
5.21	<a href="#">file_v1.h</a>	30
5.22	<a href="#">src/vm/v1/types/object/object_v1.h</a> File Reference	31
5.22.1	Detailed Description	31
5.23	<a href="#">object_v1.h</a>	32
5.24	<a href="#">stack_v1.h</a>	32
5.25	<a href="#">src/vm/v1/types/string/string_v1.h</a> File Reference	33
5.25.1	Detailed Description	34
5.26	<a href="#">string_v1.h</a>	34
5.27	<a href="#">src/vm/v1/types/string_pointer/string_pointer_v1.h</a> File Reference	35
5.27.1	Detailed Description	36
5.28	<a href="#">string_pointer_v1.h</a>	36
5.29	<a href="#">src/vm/v1/types/user/user_v1.h</a> File Reference	37
5.29.1	Detailed Description	38
5.30	<a href="#">user_v1.h</a>	38
5.31	<a href="#">types_v1.h</a>	39
5.32	<a href="#">virtual_v1.h</a>	40
5.33	<a href="#">vm_type.h</a>	40
5.34	<a href="#">vm_type.h</a>	41
5.35	<a href="#">vm_v1.h</a>	42
<b>Index</b>		<b>43</b>

# Chapter 1

## table of contents

### 1.1 basic types

- os
- string



## Chapter 2

# Class Index

### 2.1 Class List

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

<a href="#">file_handler</a>	7
<a href="#">list_handler</a>	7
<a href="#">memory_info_data</a>	8
<a href="#">pointer</a>	8
<a href="#">stack_element</a>	9
<a href="#">stack_handler</a>	9
<a href="#">string_reference</a>	10
<a href="#">vm</a>	10
<a href="#">vm_data</a>	11
<a href="#">vm_data_enumerator</a>	11
<a href="#">vm_pointer</a>	12
<a href="#">vm_state</a>	13
<a href="#">vm_type</a>	13
<a href="#">vm_types</a>	14





## Chapter 3

# File Index

### 3.1 File List

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

src/generic/ <a href="#">memory_v1.h</a> . . . . .	15
src/list/ <a href="#">list_v1.h</a>	
C API / list . . . . .	16
src/std/ <a href="#">api.h</a> . . . . .	17
src/std/ <a href="#">compile.h</a> . . . . .	18
src/std/ <a href="#">data.h</a> . . . . .	19
src/std/ <a href="#">errors.h</a> . . . . .	19
src/std/ <a href="#">headers.h</a> . . . . .	20
src/std/ <a href="#">macros.h</a> . . . . .	21
src/std/ <a href="#">time.h</a> . . . . .	21
src/std/ <a href="#">version.h</a> . . . . .	22
src/vm/ <a href="#">vm_type.h</a> . . . . .	41
src/vm/v1/ <a href="#">types_v1.h</a> . . . . .	39
src/vm/v1/ <a href="#">vm_type.h</a> . . . . .	40
src/vm/v1/ <a href="#">vm_v1.h</a> . . . . .	42
src/vm/v1/options/ <a href="#">options_v1.h</a> . . . . .	22
src/vm/v1/os/ <a href="#">os_v1.h</a>	
C API / os . . . . .	23
src/vm/v1/pointer/ <a href="#">pointer_v1.h</a>	
C API / pointer . . . . .	24
src/vm/v1/system/ <a href="#">info_v1.h</a> . . . . .	26
src/vm/v1/types/data/ <a href="#">data_v1.h</a>	
C API / data . . . . .	26
src/vm/v1/types/file/ <a href="#">file_v1.h</a>	
C API / file . . . . .	28
src/vm/v1/types/object/ <a href="#">object_v1.h</a>	
C API / object . . . . .	31
src/vm/v1/types/stack/ <a href="#">stack_v1.h</a> . . . . .	32
src/vm/v1/types/string/ <a href="#">string_v1.h</a>	
C API / string . . . . .	33
src/vm/v1/types/string_pointer/ <a href="#">string_pointer_v1.h</a>	
C API / string pointer . . . . .	35
src/vm/v1/types/user/ <a href="#">user_v1.h</a>	
C API / user . . . . .	37
src/vm/v1/virtual/ <a href="#">virtual_v1.h</a> . . . . .	40



## Chapter 4

# Class Documentation

### 4.1 file\_handler Struct Reference

#### Public Attributes

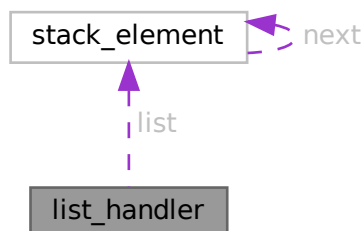
- FILE \* **file**

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

- src/vm/v1/pointer/pointer\_v1.c
- src/vm/v1/types/file/file\_v1.c

### 4.2 list\_handler Struct Reference

Collaboration diagram for list\_handler:



### Public Attributes

- [stack\\_pointer](#) list

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

- `src/vm/v1/pointer/pointer_v1.c`
- `src/vm/v1/types/string/string_v1.c`

## 4.3 memory\_info\_data Struct Reference

### Public Attributes

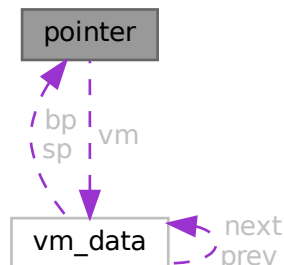
- u64 **alloc**
- u64 **used**
- u64 **free**

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

- `src/generic/memory_v1.c`

## 4.4 pointer Struct Reference

Collaboration diagram for pointer:



### Public Attributes

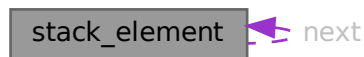
- struct [vm\\_data](#) \* **vm**
- void \* **data**
- u64 **size**
- u64 **address**
- u64 **id**

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

- `src/vm/v1/pointer/pointer_v1.c`

## 4.5 `stack_element` Struct Reference

Collaboration diagram for `stack_element`:



### Public Attributes

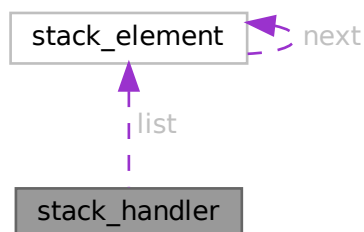
- [stack\\_pointer](#) `next`
- `void *` `data`

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

- `src/std/data.h`

## 4.6 `stack_handler` Struct Reference

Collaboration diagram for `stack_handler`:



### Public Attributes

- `u64` `size`
- [stack\\_pointer](#) `list`

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

- `src/vm/v1/types/stack/stack_v1.c`

## 4.7 string\_reference Struct Reference

### Public Attributes

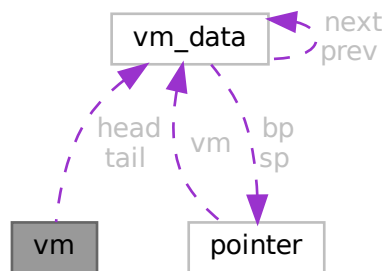
- u64 **address**
- u64 **offset**

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

- [src/vm/v1/types/string\\_pointer/string\\_pointer\\_v1.h](#)

## 4.8 vm Struct Reference

Collaboration diagram for vm:



### Public Attributes

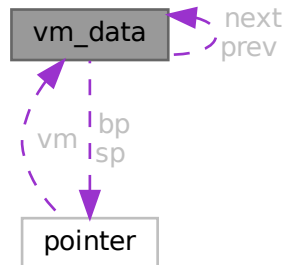
- struct [vm\\_data](#) \* **head**
- struct [vm\\_data](#) \* **tail**

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

- [src/vm/v1/virtual/virtual\\_v1.c](#)

## 4.9 vm\_data Struct Reference

Collaboration diagram for vm\_data:



### Public Attributes

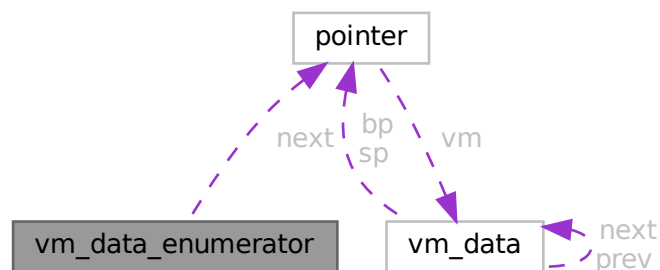
- struct `pointer` \*\* `sp`
- struct `pointer` \*\* `bp`
- struct `vm_data` \* `prev`
- struct `vm_data` \* `next`
- u64 `offset`
- u64 `size`

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

- `src/vm/v1/virtual/virtual_v1.c`

## 4.10 vm\_data\_enumerator Struct Reference

Collaboration diagram for vm\_data\_enumerator:



### Public Attributes

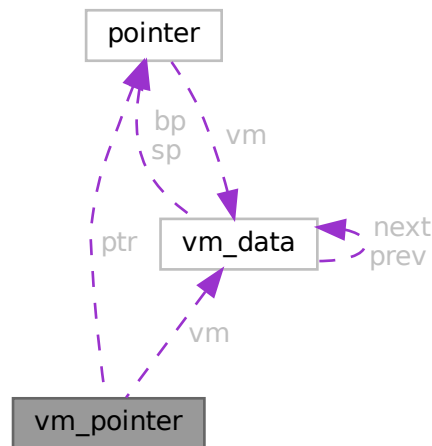
- struct [pointer](#) **next**(void)

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

- src/vm/v1/virtual/virtual\_v1.c

## 4.11 vm\_pointer Struct Reference

Collaboration diagram for vm\_pointer:



### Public Attributes

- struct [pointer](#) **ptr**
- struct [vm\\_data](#) **vm**

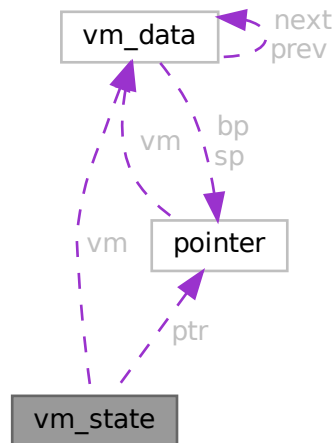
The documentation for this struct was generated from the following file:

- src/vm/v1/virtual/virtual\_v1.c



## 4.12 vm\_state Struct Reference

Collaboration diagram for vm\_state:



### Public Attributes

- struct `vm_data` \* `vm`
- struct `pointer` \*\* `ptr`

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

- `src/vm/v1/virtual/virtual_v1.c`

## 4.13 vm\_type Struct Reference

### Public Attributes

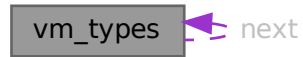
- void(\* `free` )(struct `pointer` \*ptr)

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

- `src/vm/vm_type.h`

## 4.14 vm\_types Struct Reference

Collaboration diagram for vm\_types:



### Public Attributes

- struct [vm\\_types](#) \* **next**
- u64 **id**
- void(\* **free** )(struct [pointer](#) \*ptr)

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

- src/vm/v1/pointer/pointer\_v1.c

# Chapter 5

## File Documentation

### 5.1 memory\_v1.h

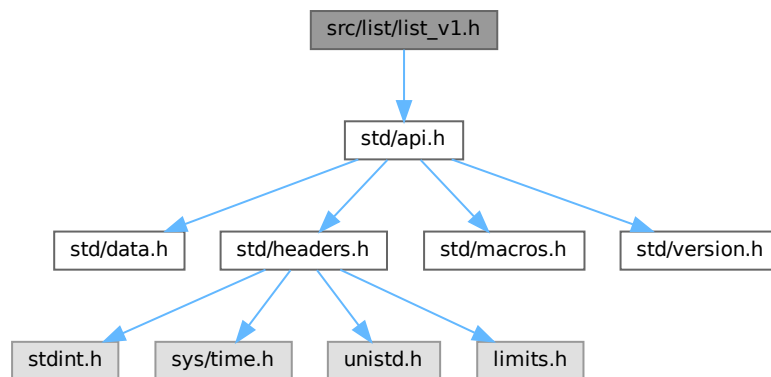
```
00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 5:33:37 PM GMT+3
00008  *
00009  */
00010 /*
00011  Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013  This program is free software: you can redistribute it and/or modify
00014  it under the terms of the GNU General Public License as published by
00015  the Free Software Foundation, either version 3 of the License, or
00016  (at your option) any later version.
00017
00018  This program is distributed in the hope that it will be useful,
00019  but WITHOUT ANY WARRANTY; without even the implied warranty of
00020  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _GENERIC_MEMORY_H_
00028 #define _GENERIC_MEMORY_H_
00029
00030 #include "std/api.h"
00031
00032 #ifdef USE_MEMORY_DEBUG_INFO
00033 extern void global_statistics(void);
00034 #endif
00035
00036 typedef struct PRIVATE_API(generic_memory) generic_memory;
00037
00038 struct PRIVATE_API(generic_memory) {
00039     void* (*alloc)(u64 size);
00040     void (*free)(void* ptr, u64 size);
00041     void* (*realloc)(void* old_ptr, u64 size, u64 new_size);
00042 #ifdef USE_MEMORY_DEBUG_INFO
00043     void (*set)(void* dest, u8 c, u64 count);
00044 #endif
00045 };
00046
00047 /* definition */
00048 extern const generic_memory PRIVATE_API(generic_memory_definition);
00049
00050 /* definition */
00051 #ifdef INLINE
00052 const generic_memory* generic_memory_v1 = &PRIVATE_API(generic_memory_definition);
00053 #else
00054 /* definition */
00055 static const generic_memory* generic_memory_v1 = &PRIVATE_API(generic_memory_definition);
00056 #endif
00057
00058 #endif /* _GENERIC_MEMORY_H_ */
```

## 5.2 src/list/list\_v1.h File Reference

C API / list.

```
#include "std/api.h"
```

Include dependency graph for list\_v1.h:



### Functions

- struct **PRIVATE\_API** (list)
- const list **PRIVATE\_API** (list\_definition)

### Variables

- list

### 5.2.1 Detailed Description

C API / list.

structure for organizing stack functions

## 5.3 list\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 10:04:39 PM GMT+3
00008  *
00009  */
00010 /*

```

```

00011     Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013     This program is free software: you can redistribute it and/or modify
00014     it under the terms of the GNU General Public License as published by
00015     the Free Software Foundation, either version 3 of the License, or
00016     (at your option) any later version.
00017
00018     This program is distributed in the hope that it will be useful,
00019     but WITHOUT ANY WARRANTY; without even the implied warranty of
00020     MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _LIST_MICRO_DATA_H_
00028 #define _LIST_MICRO_DATA_H_
00029
00030 #include "std/api.h"
00031
00032 typedef struct PRIVATE_API(list) {
00033     /* initialize context */
00034     void (*init)(stack_pointer* current);
00035     /* destroy context */
00036     void (*destroy)(stack_pointer* current);
00037     /* push item on current context (stack) */
00038     void (*push)(stack_pointer* current, void* item);
00039     /* pop item on current context (stack) */
00040     void* (*pop)(stack_pointer* current);
00041     /* peek item on current context (stack) */
00042     void* (*peek)(stack_pointer* current);
00043 #ifdef USE_MEMORY_DEBUG_INFO
00044     /* print head */
00045     void (*print_head)(stack_pointer* current);
00046     /* print */
00047     void (*print)(stack_pointer* current);
00048 #endif
00049 } list;
00050
00051 /* definition */
00052 extern const list PRIVATE_API(list_definition);
00053
00054 /* definition */
00055 #ifdef INLINE
00056 const list_v1* list_v1 = &PRIVATE_API(list_definition);
00057 #else
00058 /* definition */
00059 static const list* list_v1 = &PRIVATE_API(list_definition);
00060 #endif
00061
00062 #endif /* _LIST_MICRO_DATA_H_ */

```

## 5.4 api.h

```

00001 /*--coding:utf-8 --
00002 * Auto updated?
00003 * Yes
00004 * Created:
00005 * 11 December 2023 at 9:06:14 GMT+3
00006 * Modified:
00007 * February 3, 2025 at 6:17:28 PM GMT+3
00008 *
00009 */
00010 /*
00011     Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013     This program is free software: you can redistribute it and/or modify
00014     it under the terms of the GNU General Public License as published by
00015     the Free Software Foundation, either version 3 of the License, or
00016     (at your option) any later version.
00017
00018     This program is distributed in the hope that it will be useful,
00019     but WITHOUT ANY WARRANTY; without even the implied warranty of
00020     MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _STD_API_H_
00028 #define _STD_API_H_

```

```

00029
00030 #define USING_API
00031
00032 #define USING_DATA
00033 #define USING_HEADERS
00034 #define USING_MACROS
00035
00036 #include "std/data.h"
00037 #include "std/headers.h"
00038 #include "std/macros.h"
00039 #include "std/version.h"
00040
00041 #define VERSION 1
00042 #define MAJOR 0
00043 #define MINOR 0
00044 #define REVISION 0
00045
00046 #define VM_EXPAND(X) X
00047 #define VM_CONCAT_(A, B) A##B
00048 #define VM_CONCAT(A, B) VM_CONCAT_(A, B)
00049 #define VM_STRINGIFY_(X) #X
00050 #define VM_STRINGIFY(X) VM_STRINGIFY_(X)
00051
00052 #define PRIVATE_API(x) VM_CONCAT(API(x), VM_CONCAT(_, GIT_COMMIT_HASH_VALUE))
00053 #define API_VERSION VM_EXPAND(VM_CONCAT(, VM_STRINGIFY(VM_CONCAT(VERSION, VM_CONCAT(.,
VM_CONCAT(MAJOR, VM_CONCAT(., VM_CONCAT(MINOR, VM_CONCAT(., REVISION)))))))
00054 #define API(x) VM_CONCAT(x, VM_CONCAT(_, VM_CONCAT(v, VM_CONCAT(VERSION, VM_CONCAT(_, VM_CONCAT(MAJOR,
VM_CONCAT(_, VM_CONCAT(MINOR, VM_CONCAT(_, REVISION)))))))
00055
00056 #endif /* _STD_API_H_ */

```

## 5.5 compile.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  * Yes
00004  * Created:
00005  * 11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  * January 29, 2025 at 8:02:24 AM GMT+3
00008  *
00009  */
00010 /*
00011 Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013 This program is free software: you can redistribute it and/or modify
00014 it under the terms of the GNU General Public License as published by
00015 the Free Software Foundation, either version 3 of the License, or
00016 (at your option) any later version.
00017
00018 This program is distributed in the hope that it will be useful,
00019 but WITHOUT ANY WARRANTY; without even the implied warranty of
00020 MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021 GNU General Public License for more details.
00022
00023 You should have received a copy of the GNU General Public License
00024 along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _STD_COMPILE_H_
00028 #define _STD_COMPILE_H_
00029
00030 #ifdef CONFIG_MEMORY_DEBUG_INFO
00031 #if CONFIG_MEMORY_DEBUG_INFO == 1
00032 #define USE_MEMORY_DEBUG_INFO
00033 #endif
00034 #endif
00035
00036 #ifdef CONFIG_MEMORY_CLEANUP
00037 #if CONFIG_MEMORY_CLEANUP == 1
00038 #define USE_MEMORY_CLEANUP
00039 #endif
00040 #endif
00041
00042 #ifdef CONFIG_MEMORY_ALLOC
00043 #if CONFIG_MEMORY_ALLOC == 1
00044 #define USE_MEMORY_ALLOC
00045 #endif
00046 #endif
00047
00048 #ifdef CONFIG_GC
00049 #if CONFIG_GC == 1
00050 #define USE_GC

```

```

00051 #endif
00052 #endif
00053
00054 #ifdef CONFIG MOCKS
00055 #if CONFIG MOCKS == 1
00056 #define USE MOCKS
00057 #endif
00058 #endif
00059
00060 #ifdef CONFIG MEMCPY
00061 #if CONFIG MEMCPY == 1
00062 #define USE MEMCPY
00063 #endif
00064 #endif
00065
00066 #endif /* _STD_COMPILE_H_ */

```

## 5.6 data.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 10:09:04 PM GMT+3
00008  *
00009  */
00010 /*
00011  Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013  This program is free software: you can redistribute it and/or modify
00014  it under the terms of the GNU General Public License as published by
00015  the Free Software Foundation, either version 3 of the License, or
00016  (at your option) any later version.
00017
00018  This program is distributed in the hope that it will be useful,
00019  but WITHOUT ANY WARRANTY; without even the implied warranty of
00020  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _STD_DATA_H_
00028 #define _STD_DATA_H_
00029
00030 #define USING_DATA
00031
00032 typedef unsigned long long u64;
00033 typedef unsigned long int u32;
00034 typedef unsigned short int u16;
00035 typedef unsigned char u8;
00036
00037 typedef signed long long s64;
00038 typedef signed long int s32;
00039 typedef signed short int s16;
00040 typedef signed char s8;
00041
00042 typedef struct stack_element stack_element, *stack_pointer;
00043
00044 struct stack_element {
00045     /* points to next node */
00046     stack_pointer next;
00047     /* data */
00048     void* data;
00049 };
00050
00051 #endif /* _STD_DATA_H_ */

```

## 5.7 errors.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:

```

```

00007 *    11 December 2023 at 9:16:31 GMT+3
00008 *
00009 */
00010 /*
00011     Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013     This program is free software: you can redistribute it and/or modify
00014     it under the terms of the GNU General Public License as published by
00015     the Free Software Foundation, either version 3 of the License, or
00016     (at your option) any later version.
00017
00018     This program is distributed in the hope that it will be useful,
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00020     MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _STD_ERRORS_H_
00028 #define _STD_ERRORS_H_
00029
00030 #define ERROR_MSG_INDEX(n) (-n)
00031
00032 #define ERROR_MSG_ID_INVALID_ARGUMENT ERROR_MSG_INDEX((u64)1)
00033
00034 #define ERROR(x) ERROR_MSG_ID_##x
00035 #define ERROR_INVALID_ARGUMENT ERROR(INVALID_ARGUMENT)
00036
00037 #endif /* _STD_ERRORS_H_ */

```

## 5.8 headers.h

```

00001 /*--coding:utf-8 --
00002 * Auto updated?
00003 * Yes
00004 * Created:
00005 *    11 December 2023 at 9:06:14 GMT+3
00006 * Modified:
00007 *    February 3, 2025 at 10:27:17 PM GMT+3
00008 *
00009 */
00010 /*
00011     Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013     This program is free software: you can redistribute it and/or modify
00014     it under the terms of the GNU General Public License as published by
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00016     (at your option) any later version.
00017
00018     This program is distributed in the hope that it will be useful,
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00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _STD_HEADERS_H_
00028 #define _STD_HEADERS_H_
00029
00030 #define USING_HEADERS
00031
00032 #include <stdint.h>
00033
00034 #ifdef _WIN32
00035 #include <windows.h>
00036 #define PATH_MAX MAX_PATH
00037 #else
00038 #include <sys/time.h>
00039 #include <unistd.h>
00040 #endif
00041
00042 #include <limits.h>
00043
00044 #endif /* _STD_HEADERS_H_ */

```



## 5.9 macros.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 5:06:59 PM GMT+3
00008  *
00009  */
00010 /*
00011  Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013  This program is free software: you can redistribute it and/or modify
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00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _STD_MACROS_H_
00028 #define _STD_MACROS_H_
00029
00030 #define USING_MACROS
00031
00032 #define CLEAN(ptr) \
00033     if (ptr != 0) { \
00034         ptr = 0; \
00035     }
00036
00037 #ifdef __GNUC__
00038 #define FALL_THROUGH __attribute__((fallthrough))
00039 #define ATTRIBUTE
00040 #define INIT __attribute__((constructor))
00041 #define DESTROY __attribute__((destructor))
00042 #else
00043 #define INIT
00044 #define DESTROY
00045 #define FALL_THROUGH ((void)0)
00046 #endif /* __GNUC__ >= 7 */
00047
00048 #define RXP_DEBUG_TESTS
00049
00050 #endif /* _STD_MACROS_H_ */

```

## 5.10 time.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   12 December 2023 at 9:49:00 GMT+3
00008  *
00009  */
00010 /*
00011  Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013  This program is free software: you can redistribute it and/or modify
00014  it under the terms of the GNU General Public License as published by
00015  the Free Software Foundation, either version 3 of the License, or
00016  (at your option) any later version.
00017
00018  This program is distributed in the hope that it will be useful,
00019  but WITHOUT ANY WARRANTY; without even the implied warranty of
00020  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _STD_TIME_H_
00028 #define _STD_TIME_H_

```

```

00029
00030 #define TIME_INIT(s) \
00031     struct timeval s##t1; \
00032     struct timeval s##t2; \
00033     struct timeval s##diff;
00034
00035 #define TIME_START(s) \
00036     gettimeofday(&s##t1, NULL);
00037
00038 #define TIME_END(s) \
00039     gettimeofday(&s##t2, NULL); \
00040     TIME_CALC(s);
00041
00042 #define TIME_CALC(s) \
00043     s##diff.tv_sec = s##t2.tv_sec - s##t1.tv_sec; \
00044     s##diff.tv_usec = s##t2.tv_usec - s##t1.tv_usec;
00045
00046 #define TIME_VALUE(s) \
00047     (u64)(s##diff.tv_sec * 1000000 + s##diff.tv_usec)
00048
00049 #define TIME_PRINT(s) printf("%0.3Lf\n", (long double)(TIME_VALUE(s)) / 1000.0);
00050
00051 #endif /* _STD_TIME_H_ */

```

## 5.11 version.h

```

00001 #define GIT_COMMIT_HASH_VALUE 8f7fb7f1339b157488e98d97d5d448848a6d46b7
00002 #define GIT_COMMIT_HASH "8f7fb7f1339b157488e98d97d5d448848a6d46b7"
00003 #define UNIX_TIMESTAMP 1738525356

```

## 5.12 options\_v1.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 3:55:46 PM GMT+3
00008  *
00009  */
00010 /*
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00015     the Free Software Foundation, either version 3 of the License, or
00016     (at your option) any later version.
00017
00018     This program is distributed in the hope that it will be useful,
00019     but WITHOUT ANY WARRANTY; without even the implied warranty of
00020     MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _VM_V1_OPTIONS_H_
00028 #define _VM_V1_OPTIONS_H_
00029
00030 #include "std/api.h"
00031
00032 typedef struct PRIVATE_API(vm_options) vm_options;
00033
00034 struct PRIVATE_API(vm_options) {
00035     const u64 size;
00036 };
00037
00038 /* definition */
00039 extern const vm_options PRIVATE_API(vm_options_definition);
00040
00041 /* definition */
00042 #ifdef INLINE
00043 const vm_options* vm_options_v1 = &PRIVATE_API(vm_options_definition);
00044 #else
00045 /* definition */
00046 static const vm_options* vm_options_v1 = &PRIVATE_API(vm_options_definition);
00047 #endif
00048
00049 #endif /* _VM_V1_OPTIONS_H_ */

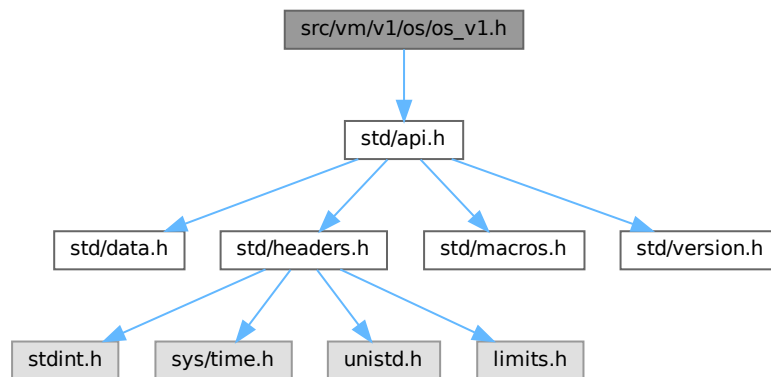
```

## 5.13 src/vm/v1/os/os\_v1.h File Reference

C API / os.

```
#include "std/api.h"
```

Include dependency graph for os\_v1.h:



### Functions

- struct **PRIVATE\_API** (os\_methods) os\_methods
- const os\_methods **PRIVATE\_API** (os\_methods\_definition)

### 5.13.1 Detailed Description

C API / os.

## 5.14 os\_v1.h

[Go to the documentation of this file.](#)

```

00001  /**--coding:utf-8 --
00002  * Auto updated?
00003  * Yes
00004  * Created:
00005  * 11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  * February 3, 2025 at 7:56:43 PM GMT+3
00008  *
00009  */
00010  /*
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00014  it under the terms of the GNU General Public License as published by
00015  the Free Software Foundation, either version 3 of the License, or
00016  (at your option) any later version.
00017
00018  This program is distributed in the hope that it will be useful,
00019  but WITHOUT ANY WARRANTY; without even the implied warranty of
00020  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021  GNU General Public License for more details.
  
```

```

00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program.  If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _POINTER_TYPES_OS_H_
00028 #define _POINTER_TYPES_OS_H_
00029
00030 #include "std/api.h"
00031
00032 typedef struct PRIVATE_API(os_methods) os_methods;
00033
00034 struct PRIVATE_API(os_methods) {
00035     u64 (*getenv)(u64 name);
00036     u64 (*getcwd)(void);
00037     void (*putc)(u64 ptr);
00038 };
00039
00040 /* definition */
00041 extern const os_methods PRIVATE_API(os_methods_definition);
00042
00043 /* definition */
00044 #ifndef INLINE
00045 const os_methods* os_v1 = &PRIVATE_API(os_methods_definition);
00046 #else
00047 /* definition */
00048 static const os_methods* os_v1 = &PRIVATE_API(os_methods_definition);
00049 #endif
00050 #endif /* _POINTER_TYPES_OS_H_ */

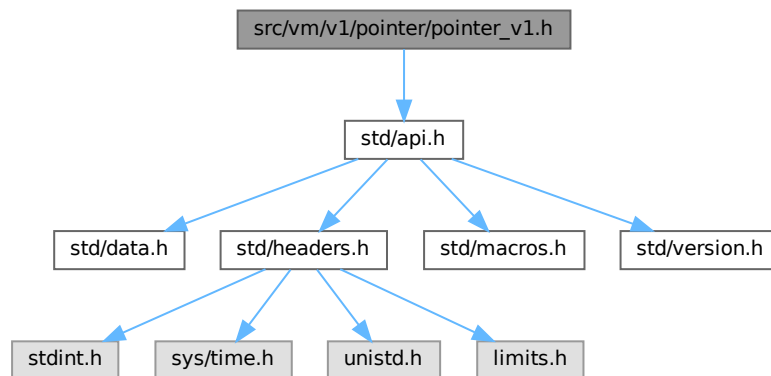
```

## 5.15 src/vm/v1/pointer/pointer\_v1.h File Reference

C API / pointer.

```
#include "std/api.h"
```

Include dependency graph for pointer\_v1.h:



### Functions

- struct **PRIVATE\_API** (pointer\_methods)
- const pointer\_methods **PRIVATE\_API** (pointer\_methods\_definition)

### Variables

- **pointer\_methods**

### 5.15.1 Detailed Description

C API / pointer.

## 5.16 pointer\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  * Yes
00004  * Created:
00005  * 11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  * February 3, 2025 at 5:50:58 PM GMT+3
00008  *
00009  */
00010 /*
00011  Copyright (C) 2022-2047 Artur Mustafin (artur.mustafin@gmail.com)
00012
00013  This program is free software: you can redistribute it and/or modify
00014  it under the terms of the GNU General Public License as published by
00015  the Free Software Foundation, either version 3 of the License, or
00016  (at your option) any later version.
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00019  but WITHOUT ANY WARRANTY; without even the implied warranty of
00020  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _POINTER_V1_H_
00028 #define _POINTER_V1_H_
00029
00030 #include "std/api.h"
00031
00032 struct pointer;
00033 struct vm_data;
00034 struct vm_type;
00035
00036 typedef struct PRIVATE_API(pointer_methods) {
00037     void (*init)(u64 size);
00038     void (*destroy)(void);
00039     void (*gc)(void);
00040     struct pointer* (*alloc)(u64 size, u64 id);
00041     void (*realloc)(struct pointer* ptr, u64 size);
00042     u64 (*register_type)(u64 id, const struct vm_type* data_type);
00043     void (*free)(u64 ptr);
00044     u64 (*address)(const struct pointer* ptr);
00045     struct vm_data* (*vm)(const struct pointer* ptr);
00046     void (*release)(struct pointer* ptr);
00047     u64 (*size)(const struct pointer* ptr);
00048     void* (*read)(const struct pointer* ptr);
00049     u64 (*read_type)(const struct pointer* ptr, u64 id);
00050     void (*write)(struct pointer* ptr, struct vm_data* vm, u64 address);
00051 #ifdef USE_MEMORY_DEBUG_INFO
00052     void (*dump)(struct pointer* ptr);
00053     void (*dump_ref)(void** ptr);
00054 #endif
00055 } pointer_methods;
00056
00057 /* definition */
00058 extern const pointer_methods PRIVATE_API(pointer_methods_definition);
00059
00060 /* definition */
00061 #ifdef INLINE
00062 const spointer_methods* pointer_v1 = &PRIVATE_API(pointer_methods_definition);
00063 #else
00064 /* definition */
00065 static const pointer_methods* pointer_v1 = &PRIVATE_API(pointer_methods_definition);
00066 #endif
00067
00068 #endif /* _POINTER_V1_H_ */

```

## 5.17 info\_v1.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 5:54:48 PM GMT+3
00008  *
00009  */
00010 /*
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00016  (at your option) any later version.
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00019  but WITHOUT ANY WARRANTY; without even the implied warranty of
00020  MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026 #ifndef _POINTER_INFO_V1_H_
00027 #define _POINTER_INFO_V1_H_
00028
00029 #include "std/api.h"
00030
00031 typedef struct PRIVATE_API(info_methods) info_methods;
00032
00033 struct PRIVATE_API(info_methods) {
00034     const u64 timestamp;
00035     const char* commit;
00036     const char* version;
00037 };
00038
00039 /* definition */
00040 extern const info_methods PRIVATE_API(info_methods_definition);
00041
00042 /* definition */
00043 #ifdef INLINE
00044 const info_methods* info_v1 = &PRIVATE_API(info_methods_definition);
00045 #else
00046 /* definition */
00047 static const info_methods* info_v1 = &PRIVATE_API(info_methods_definition);
00048 #endif
00049
00050 #endif /* _POINTER_INFO_V1_H_ */

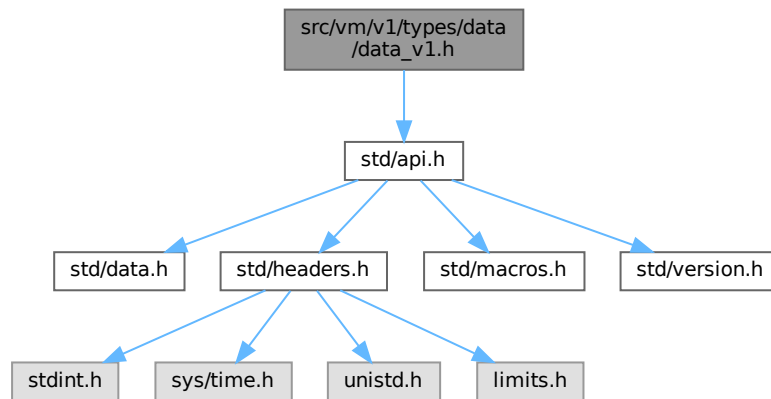
```

## 5.18 src/vm/v1/types/data/data\_v1.h File Reference

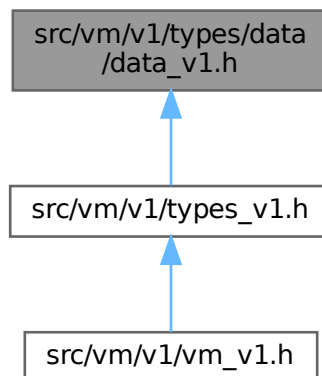
C API / data.

```
#include "std/api.h"
```

Include dependency graph for data\_v1.h:



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



## Functions

- struct **PRIVATE\_API** (data\_methods) data\_methods
- const data\_methods **PRIVATE\_API** (data\_methods\_definition)

### 5.18.1 Detailed Description

C API / data.

## 5.19 data\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 7:44:06 PM GMT+3
00008  *
00009  */
00010 /*
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00016     (at your option) any later version.
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00019     but WITHOUT ANY WARRANTY; without even the implied warranty of
00020     MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #define USING_API
00028
00029 #ifndef _POINTER_TYPES_DATA_H_
00030 #define _POINTER_TYPES_DATA_H_
00031
00032 #include "std/api.h"
00033
00034 typedef struct PRIVATE_API(data_methods) data_methods;
00035
00036 struct PRIVATE_API(data_methods) {
00037     u64 (*alloc)(u64 size);
00038     void (*free)(u64 ptr);
00039     void* (*unsafe)(u64 ptr);
00040     u64 (*size)(u64 ptr);
00041 };
00042
00043 /* definition */
00044 extern const data_methods PRIVATE_API(data_methods_definition);
00045
00046 /* definition */
00047 #ifdef INLINE
00048 const struct data_methods* type_data_v1 = &PRIVATE_API(data_methods_definition);
00049 #else
00050 /* definition */
00051 static const data_methods* type_data_v1 = &PRIVATE_API(data_methods_definition);
00052 #endif
00053
00054 #endif /* _POINTER_TYPES_DATA_H_ */

```

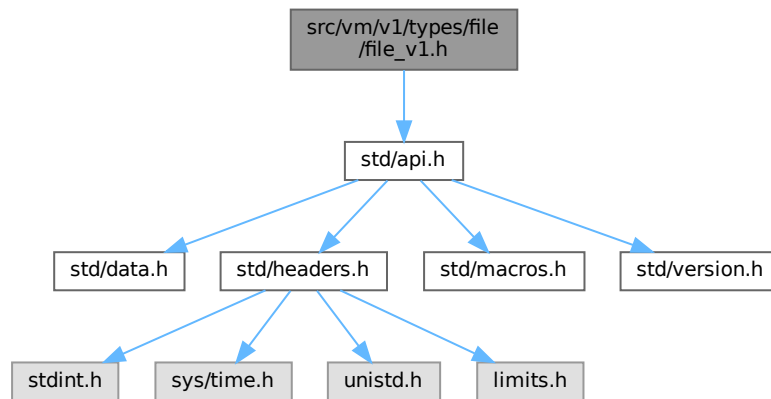
## 5.20 src/vm/v1/types/file/file\_v1.h File Reference

C API / file.

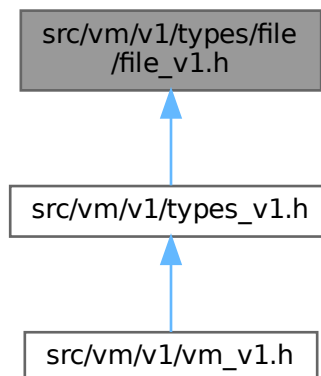


```
#include "std/api.h"
```

Include dependency graph for file\_v1.h:



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



## Functions

- struct **PRIVATE\_API** (file\_methods) file\_methods
- const file\_methods **PRIVATE\_API** (file\_methods\_definition)

### 5.20.1 Detailed Description

C API / file.



```

struct file_methods {
    u64 (*alloc)(u64 file_path_ptr, u64 mode_ptr);
    void (*free)(u64 ptr);
    u64 (*data)(u64 ptr);
};

```

## 5.21 file\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 7:44:11 PM GMT+3
00008  *
00009  */
00010 /*
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00016     (at your option) any later version.
00017
00018     This program is distributed in the hope that it will be useful,
00019     but WITHOUT ANY WARRANTY; without even the implied warranty of
00020     MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _POINTER_TYPES_FILE_H_
00028 #define _POINTER_TYPES_FILE_H_
00029
00030 #define USING_API
00031
00032 #include "std/api.h"
00033
00034 typedef struct PRIVATE_API(file_methods) file_methods;
00035
00036 struct PRIVATE_API(file_methods) {
00037     u64 (*alloc)(u64 file_path_ptr, u64 mode_ptr);
00038     void (*free)(u64 ptr);
00039     u64 (*data)(u64 ptr);
00040 };
00041
00042 /* definition */
00043 extern const file_methods PRIVATE_API(file_methods_definition);
00044
00045 /* definition */
00046 #ifdef INLINE
00047 const file_methods* type_file_v1 = &PRIVATE_API(file_methods_definition);
00048 #else
00049 /* definition */
00050 static const file_methods* type_file_v1 = &PRIVATE_API(file_methods_definition);
00051 #endif
00052 #endif /* _POINTER_TYPES_FILE_H_ */

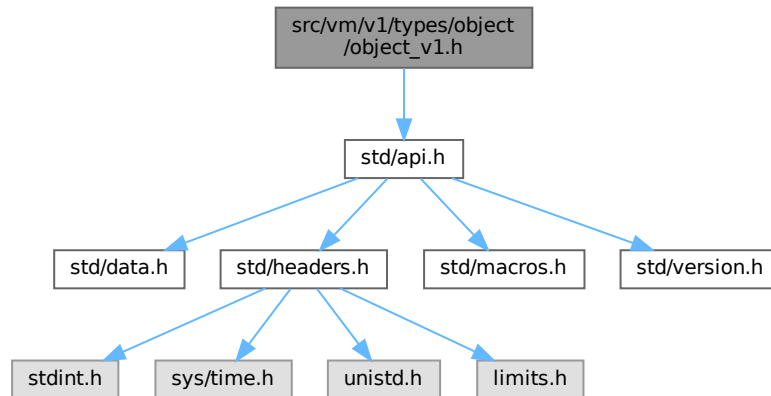
```

## 5.22 src/vm/v1/types/object/object\_v1.h File Reference

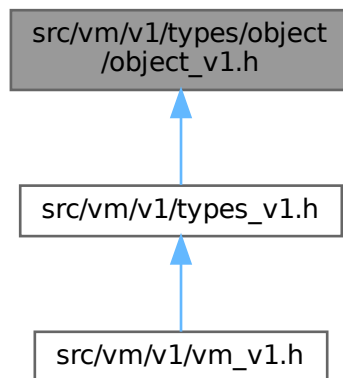
C API / object.

```
#include "std/api.h"
```

Include dependency graph for object\_v1.h:



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



### Functions

- struct **API** (object\_methods) object\_methods

### 5.22.1 Detailed Description

C API / object.

## 5.23 object\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 4:00:14 PM GMT+3
00008  *
00009  */
00010 /*
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00016  (at your option) any later version.
00017
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00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _POINTER_TYPES_OBJECT_H_
00028 #define _POINTER_TYPES_OBJECT_H_
00029
00030 #include "std/api.h"
00031
00032 typedef struct API(object_methods) object_methods;
00033
00034 struct API(object_methods) {
00035     u64 (*alloc)(u64 size);
00036     void (*free)(u64 ptr);
00037     void* (*unsafe)(u64 ptr);
00038     u64 (*load)(const void* data, u64 size);
00039     u64 (*size)(u64 ptr);
00040 };
00041
00042 #endif /* _POINTER_TYPES_OBJECT_H_ */

```

## 5.24 stack\_v1.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 9:27:06 PM GMT+3
00008  *
00009  */
00010 /*
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00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _POINTER_TYPES_LIST_H_
00028 #define _POINTER_TYPES_LIST_H_
00029
00030 #define USING_VM_V1
00031
00032 #include "std/api.h"
00033

```

```

00041 typedef struct PRIVATE_API(stack) stack;
00042
00043 struct PRIVATE_API(stack) {
00044     u64 (*alloc)(void);
00045     void (*free)(u64 ptr);
00046     u64 (*peek)(u64 list_ptr);
00052     u64 (*peekn)(u64 list_ptr, u64 nelements);
00053     u64 (*pop)(u64 list_ptr);
00054     u64 (*popn)(u64 list_ptr, u64 nelements);
00055     void (*push)(u64 list_ptr, u64 ptr);
00056     u64 (*size)(u64 ptr);
00057     void (*release)(u64 ptr);
00058 };
00059
00060 /* definition */
00061 extern const stack PRIVATE_API(stack_definition);
00062
00063 /* definition */
00064 #ifdef INLINE
00065 const stack* stack_v1 = &PRIVATE_API(stack_definition);
00066 #else
00067 /* definition */
00068 static const stack* stack_v1 = &PRIVATE_API(stack_definition);
00069 #endif
00070
00071 #endif /* _POINTER_TYPES_LIST_H_ */

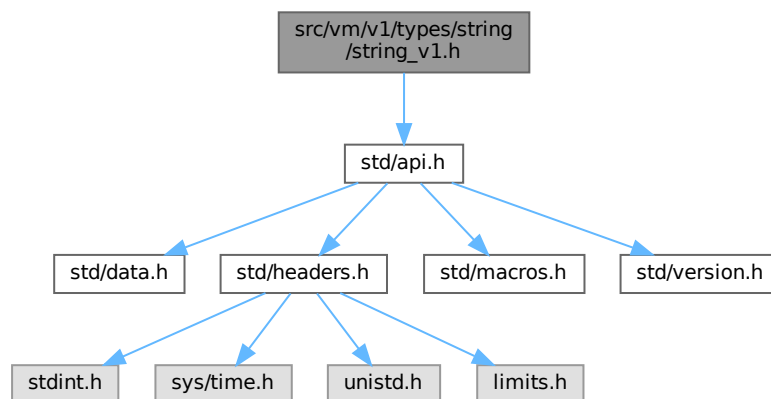
```

## 5.25 src/vm/v1/types/string/string\_v1.h File Reference

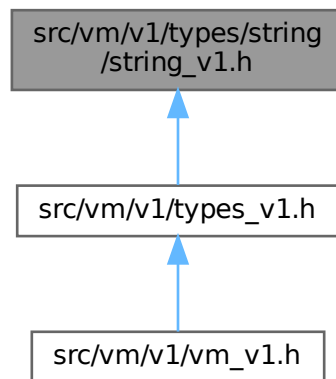
C API / string.

```
#include "std/api.h"
```

Include dependency graph for string\_v1.h:



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



## Functions

- struct **API** (string\_methods) string\_methods

### 5.25.1 Detailed Description

C API / string.

## 5.26 string\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 4:01:14 PM GMT+3
00008  *
00009  */
00010 /*
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00021  GNU General Public License for more details.
00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _POINTER_TYPES_STRING_H_
00028 #define _POINTER_TYPES_STRING_H_
00029

```

```

00030 #include "std/api.h"
00031
00036 typedef struct API(string_methods) string_methods;
00037
00038 struct API(string_methods) {
00039     void (*free)(u64 ptr);
00040     u64 (*copy)(u64 ptr);
00041     void (*strcpy)(u64 dest, u64 src);
00042     void (*strcat)(u64 dest, u64 src);
00043     u64 (*strrchr)(u64 src_ptr, u64 match_ptr);
00044     u64 (*strchr)(u64 src_ptr, u64 match_ptr);
00045     u64 (*match)(u64 src_ptr, u64 match_ptr);
00046     u64 (*offset)(u64 src_ptr, u64 match_ptr);
00047     u64 (*load)(const char* data);
00048     void (*put_char)(u64 ptr, char value);
00049     char* (*unsafe)(u64 ptr);
00050     u64 (*size)(u64 ptr);
00051     u64 (*lessthan)(u64 src, u64 dest);
00052     u64 (*greaterthan)(u64 src, u64 dest);
00053     u64 (*equals)(u64 src, u64 dest);
00054     u64 (*compare)(u64 src, u64 dest);
00055     u64 (*left)(u64 src, u64 offset);
00056     u64 (*strncpy)(u64 src, u64 nbytes);
00057     u64 (*left_strncpy)(u64 src, u64 offset);
00058     u64 (*right)(u64 src, u64 offset);
00059     u64 (*move_left)(u64 src, u64 nbytes);
00060     u64 (*move_right)(u64 src, u64 nbytes);
00061     u64 (*strcmp)(u64 src, u64 dest);
00062 };
00063
00064 #endif /* _POINTER_TYPES_STRING_H_ */

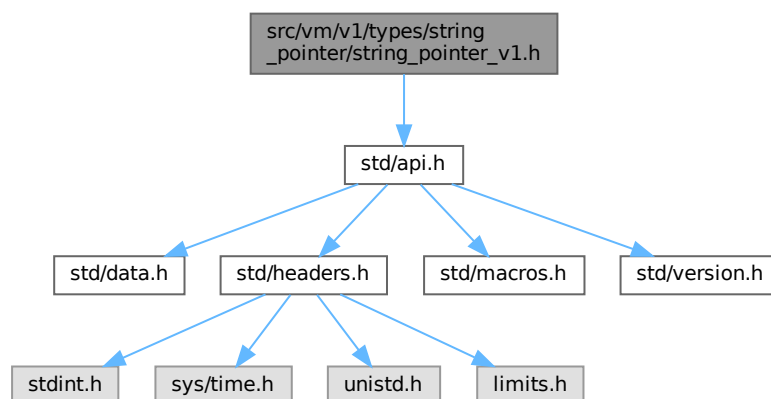
```

## 5.27 src/vm/v1/types/string\_pointer/string\_pointer\_v1.h File Reference

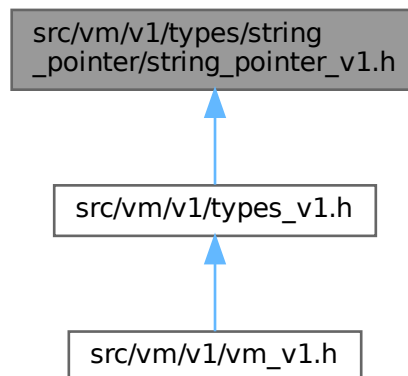
C API / string pointer.

```
#include "std/api.h"
```

Include dependency graph for string\_pointer\_v1.h:



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



## Classes

- struct [string\\_reference](#)

## Functions

- struct **PRIVATE\_API** (string\_pointer\_methods) string\_pointer\_methods
- const string\_pointer\_methods **PRIVATE\_API** (string\_pointer\_methods\_definition)

### 5.27.1 Detailed Description

C API / string pointer.

## 5.28 string\_pointer\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 8:01:43 PM GMT+3
00008  *
00009  */
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```



```

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00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program.  If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _POINTER_TYPES_STRING_POINTER_H_
00028 #define _POINTER_TYPES_STRING_POINTER_H_
00029
00030 #define USING_API
00031
00032 #include "std/api.h"
00033
00034 typedef struct PRIVATE_API(string_pointer_methods) string_pointer_methods;
00035
00036 struct PRIVATE_API(string_pointer_methods) {
00037     void (*free)(u64 ptr);
00038 };
00039
00040 struct string_reference {
00041     u64 address;
00042     u64 offset;
00043 };
00044
00045 /* definition */
00046 extern const string_pointer_methods PRIVATE_API(string_pointer_methods_definition);
00047
00048 /* definition */
00049 #ifdef INLINE
00050 const string_pointer_methods* string_pointer_v1 = &PRIVATE_API(string_pointer_methods_definition);
00051 #else
00052 /* definition */
00053 static const string_pointer_methods* string_pointer_v1 =
00054     &PRIVATE_API(string_pointer_methods_definition);
00055 #endif
00056
00057 #endif /* _POINTER_TYPES_STRING_POINTER_H_ */

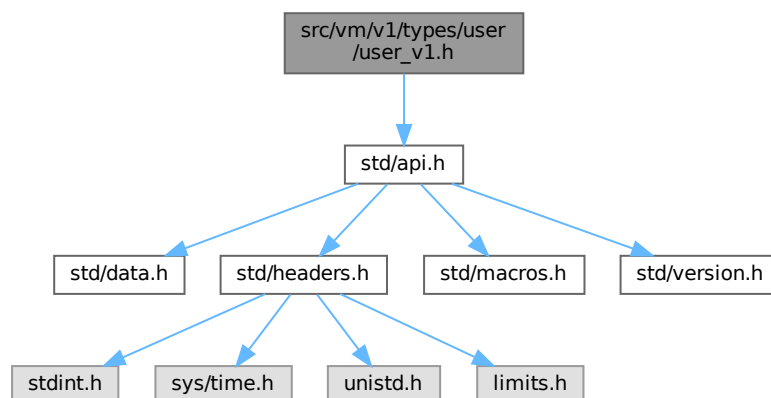
```

## 5.29 src/vm/v1/types/user/user\_v1.h File Reference

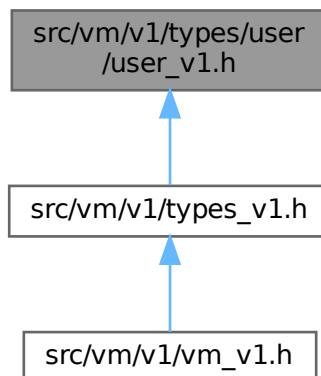
C API / user.

```
#include "std/api.h"
```

Include dependency graph for user\_v1.h:



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



## Functions

- struct **PRIVATE\_API** (user\_methods) user\_methods
- const user\_methods **PRIVATE\_API** (user\_methods\_definition)

### 5.29.1 Detailed Description

C API / user.

## 5.30 user\_v1.h

[Go to the documentation of this file.](#)

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 7:54:40 PM GMT+3
00008  *
00009  */
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00021     GNU General Public License for more details.
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00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _POINTER_TYPES_USER_TYPE_H_

```

```

00028 #define _POINTER_TYPES_USER_TYPE_H_
00029
00030 #define USING_API
00031
00032 #include "std/api.h"
00033
00038 typedef struct PRIVATE_API(user_methods) user_methods;
00039
00040 struct PRIVATE_API(user_methods) {
00041     u64 (*alloc)(void);
00042     void (*free)(u64 ptr);
00043 };
00044
00045 /* definition */
00046 extern const user_methods PRIVATE_API(user_methods_definition);
00047
00048 /* definition */
00049 #ifndef INLINE
00050 const user_methods* user_v1 = &PRIVATE_API(user_methods_definition);
00051 #else
00052 /* definition */
00053 static const user_methods* user_v1 = &PRIVATE_API(user_methods_definition);
00054 #endif
00055
00056 #endif /* _POINTER_TYPES_USER_TYPE_H_ */

```

## 5.31 types\_v1.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 9:06:38 PM GMT+3
00008  *
00009  */
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00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026 #ifndef _POINTER_TYPES_V1_H_
00027 #define _POINTER_TYPES_V1_H_
00028
00029 #define USING_TYPES_V1
00030
00031 #include "std/api.h"
00032
00033 #include "vm/v1/types/data/data_v1.h"
00034 #include "vm/v1/types/file/file_v1.h"
00035 #include "vm/v1/types/object/object_v1.h"
00036 #include "vm/v1/types/string/string_v1.h"
00037 #include "vm/v1/types/string_pointer/string_pointer_v1.h"
00038 #include "vm/v1/types/user/user_v1.h"
00039
00040 typedef struct PRIVATE_API(type_methods) type_methods;
00041
00042 struct PRIVATE_API(type_methods) {
00043     const data_methods* data;
00044     const file_methods* file;
00045     const object_methods* object;
00046     const string_methods* string;
00047     const string_pointer_methods* string_pointer;
00048     const user_methods* user;
00049 };
00050
00051 /* definition */
00052 extern const type_methods PRIVATE_API(type_methods_definition);
00053
00054 /* definition */
00055 #ifndef INLINE

```

```

00056 const type_methods* type_v1 = &PRIVATE_API(type_methods_definition);
00057 #else
00058 /* definition */
00059 static const type_methods* type_v1 = &PRIVATE_API(type_methods_definition);
00060 #endif
00061
00062 #endif /* _POINTER_TYPES_V1_H_ */

```

## 5.32 virtual\_v1.h

```

00001 /**--coding:utf-8 --
00002  * Auto updated?
00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 7:56:43 PM GMT+3
00008  *
00009  */
00010 /*
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00021  GNU General Public License for more details.
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00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _VIRTUAL_H_
00028 #define _VIRTUAL_H_
00029
00030 #include "std/api.h"
00031
00032 struct vm;
00033 struct pointer;
00034
00035 typedef struct PRIVATE_API(virtual_methods) virtual_methods;
00036
00037 struct PRIVATE_API(virtual_methods) {
00038     void (*init)(struct vm**, u64 size);
00039     void (*destroy)(struct vm**);
00040     u64 (*alloc)(struct pointer* ptr);
00041     void (*free)(const struct pointer* ptr);
00042     struct pointer* (*read)(u64 address);
00043     struct pointer* (*read_type)(u64 address, u64 id);
00044     void (*enumerator_init)(void);
00045     void (*enumerator_destroy)(void);
00046     u64 (*enumerator_next)(void);
00047 #ifdef USE_MEMORY_DEBUG_INFO
00048     void (*dump)(void);
00049     void (*dump_ref)(void);
00050 #endif
00051 };
00052
00053 /* definition */
00054 extern const virtual_methods PRIVATE_API(virtual_methods_definition);
00055
00056 /* definition */
00057 #ifdef INLINE
00058 const virtual_methods* virtual_v1 = &PRIVATE_API(virtual_methods_definition);
00059 #else
00060 /* definition */
00061 static const virtual_methods* virtual_v1 = &PRIVATE_API(virtual_methods_definition);
00062 #endif
00063
00064 #endif /* _VIRTUAL_H_ */

```

## 5.33 vm\_type.h

```

00001 /**--coding:utf-8 --
00002  * Auto updated?

```

```

00003  *   Yes
00004  * Created:
00005  *   11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  *   February 3, 2025 at 10:14:44 PM GMT+3
00008  *
00009  */
00010 /*
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00021     GNU General Public License for more details.
00022
00023     You should have received a copy of the GNU General Public License
00024     along with this program. If not, see <https://www.gnu.org/licenses/>.
00025 */
00026
00027 #ifndef _VM_V1_VM_TYPE_H_
00028 #define _VM_V1_VM_TYPE_H_
00029
00030 enum type {
00031     /* value used for ephemeral type - null */
00032     TYPE_NULL = 0,
00033     /* value used for pointer type - ref */
00034     TYPE_DATA = 1,
00035     /* value used for string type - string */
00036     TYPE_STRING = 2,
00037     /* value used for string ref type - string ref */
00038     TYPE_STRING_POINTER = 3,
00039     /* value used for file type - file */
00040     TYPE_FILE = 4,
00041     /* value used for list type - list */
00042     TYPE_LIST = 5,
00043     /* value used for object type - object */
00044     TYPE_OBJECT = 6,
00045     /* value used for user type - user (id: +0, +1, +2, +3, ...) */
00046     TYPE_USER = 7,
00047     /* value used for list type - list */
00048     TYPE_STACK = 8,
00049 };
00050
00051 #endif /* _VM_V1_VM_TYPE_H_ */

```

## 5.34 vm\_type.h

```

00001
00002 /**-coding:utf-8 -*-
00003  * Auto updated?
00004  *   Yes
00005  * Created:
00006  *   11 December 2023 at 9:06:14 GMT+3
00007  * Modified:
00008  *   February 3, 2025 at 8:34:23 PM GMT+3
00009  *
00010  */
00011 /*
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00017     (at your option) any later version.
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00020     but WITHOUT ANY WARRANTY; without even the implied warranty of
00021     MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
00022     GNU General Public License for more details.
00023
00024     You should have received a copy of the GNU General Public License
00025     along with this program. If not, see <https://www.gnu.org/licenses/>.
00026 */
00027
00028 #ifndef _VM_TYPE_H_
00029 #define _VM_TYPE_H_
00030
00031 struct pointer;

```

```

00032
00033 struct vm_type {
00034     void (*free)(struct pointer* ptr);
00035 };
00036
00037 struct stack_data;
00038
00039 #endif /* _VM_TYPE_H_ */

```

## 5.35 vm\_v1.h

```

00001 /*--coding:utf-8 --
00002  * Auto updated?
00003  * Yes
00004  * Created:
00005  * 11 December 2023 at 9:06:14 GMT+3
00006  * Modified:
00007  * February 3, 2025 at 9:06:49 PM GMT+3
00008  *
00009  */
00010 /*
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00022
00023  You should have received a copy of the GNU General Public License
00024  along with this program. If not, see <https://www.gnu.org/licenses/>.
00025  */
00026
00027 #ifndef _VM_V1_H_
00028 #define _VM_V1_H_
00029
00030 #define USING_VM_V1
00031 #define USING_TYPES_V1
00032
00033 #include "std/api.h"
00034
00035 #include "vm/v1/types_v1.h"
00036
00037 /* definition */
00038 extern const object_methods PRIVATE_API(object_methods_definition);
00039 extern const string_methods PRIVATE_API(string_methods_definition);
00040 extern const string_pointer_methods PRIVATE_API(string_pointer_methods_definition);
00041 extern const user_methods PRIVATE_API(user_methods_definition);
00042
00043 /* definition */
00044 #ifdef INLINE
00045 const object_methods* type_object_v1 = &PRIVATE_API(object_methods_definition);
00046 const string_methods* type_string_v1 = &PRIVATE_API(string_methods_definition);
00047 const string_pointer_methods* type_string_pointer_v1 =
00048     &PRIVATE_API(string_pointer_methods_definition);
00049 const user_methods* type_user_v1 = &PRIVATE_API(user_methods_definition);
00050 #else
00051 /* definition */
00052 static const object_methods* type_object_v1 = &PRIVATE_API(object_methods_definition);
00053 static const string_methods* type_string_v1 = &PRIVATE_API(string_methods_definition);
00054 static const string_pointer_methods* type_string_pointer_v1 =
00055     &PRIVATE_API(string_pointer_methods_definition);
00056 static const user_methods* type_user_v1 = &PRIVATE_API(user_methods_definition);
00057 #endif
00058 #endif /* _VM_V1_H_ */

```

# Index

[file\\_handler](#), [7](#)

[list\\_handler](#), [7](#)

[memory\\_info\\_data](#), [8](#)

[pointer](#), [8](#)

[src/generic/memory\\_v1.h](#), [15](#)

[src/list/list\\_v1.h](#), [16](#)

[src/std/api.h](#), [17](#)

[src/std/compile.h](#), [18](#)

[src/std/data.h](#), [19](#)

[src/std/errors.h](#), [19](#)

[src/std/headers.h](#), [20](#)

[src/std/macros.h](#), [21](#)

[src/std/time.h](#), [21](#)

[src/std/version.h](#), [22](#)

[src/vm/v1/options/options\\_v1.h](#), [22](#)

[src/vm/v1/os/os\\_v1.h](#), [23](#)

[src/vm/v1/pointer/pointer\\_v1.h](#), [24](#), [25](#)

[src/vm/v1/system/info\\_v1.h](#), [26](#)

[src/vm/v1/types/data/data\\_v1.h](#), [26](#), [28](#)

[src/vm/v1/types/file/file\\_v1.h](#), [28](#), [30](#)

[src/vm/v1/types/object/object\\_v1.h](#), [31](#), [32](#)

[src/vm/v1/types/stack/stack\\_v1.h](#), [32](#)

[src/vm/v1/types/string/string\\_v1.h](#), [33](#), [34](#)

[src/vm/v1/types/string\\_pointer/string\\_pointer\\_v1.h](#), [35](#),  
[36](#)

[src/vm/v1/types/user/user\\_v1.h](#), [37](#), [38](#)

[src/vm/v1/types\\_v1.h](#), [39](#)

[src/vm/v1/virtual/virtual\\_v1.h](#), [40](#)

[src/vm/v1/vm\\_type.h](#), [40](#)

[src/vm/v1/vm\\_v1.h](#), [42](#)

[src/vm/vm\\_type.h](#), [41](#)

[stack\\_element](#), [9](#)

[stack\\_handler](#), [9](#)

[string\\_reference](#), [10](#)

[table of contents](#), [1](#)

[vm](#), [10](#)

[vm\\_data](#), [11](#)

[vm\\_data\\_enumerator](#), [11](#)

[vm\\_pointer](#), [12](#)

[vm\\_state](#), [13](#)

[vm\\_type](#), [13](#)

[vm\\_types](#), [14](#)