# PotatOS

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# **Chapter 1**

# **Data Structure Index**

# 1.1 Data Structures

Here are the data structures with brief descriptions:

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2 Data Structure Index

# Chapter 2

# File Index

# 2.1 File List

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

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File Index

# **Chapter 3**

# **Data Structure Documentation**

#### 3.1 BOOTSECTORSTRUCT Struct Reference

#### **Data Fields**

- uint16\_t bytesPerSector
- uint16\_t sectorsPerCluster
- uint16 t numReservedSectors
- uint16\_t numFATCopies
- uint16\_t maxNumRoot
- uint16\_t numOfSectors
- uint16\_t numSECTORSPERFAT
- uint16\_t sectorsPerTrack
- uint16\_t numberHeads
- uint16\_t sectorCountFAT32
- uint16\_t bootSig
- uint32\_t volumeID
- char \* volumeLabel
- char \* fileSystemType

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

• file\_wrangler.h

#### 3.2 command Struct Reference

A struct to hold command information.

```
#include <command_utils.h>
```

#### **Data Fields**

- char \* command\_name
- CommandFunction function
- char \* command\_usage
- char \* command\_description
- char \* command\_examples

### 3.2.1 Detailed Description

A struct to hold command information.

command_name	The command's name
function	A pointer to the command's function
command_usage	Syntax for executing the command
command_description	A description of the command
command_examples	Example uses of the command

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

· command\_utils.h

## 3.3 ENTRY Struct Reference

A struct to hold an directory entry.

#include <command\_utils.h>

#### **Data Fields**

- BYTE empty
- char fileName [9]
- char extension [4]
- BYTE attributes
- uint16\_t reserved
- uint16\_t creationTime
- uint8 t creationHour
- uint8\_t creationMin
- uint8\_t creationSec
- uint16\_t creationDate
- uint16\_t creationYear
- uint8\_t creationMonth
- uint8\_t creationDay
- uint16\_t lastAccessDate
- uint16\_t lastAccessYear
- uint8 t lastAccessMonth
- uint8\_t lastAccessDay
- uint16\_t lastWriteTime
- uint8\_t lastWriteHouruint8\_t lastWriteMin
- uint8\_t lastWriteSec
- uint16\_t lastWriteDate
- uint16 t lastWriteYear
- uint8\_t lastWriteMonth
- uint8\_t lastWriteDay
- uint16\_t firstLogicalCluster
- uint32\_t fileSize

#### 3.3.1 Detailed Description

A struct to hold an directory entry.

empty	If the entry is empty
fileName	The name of the entry
extension	The extension, type, of the entry
attributes	The attributes of the entry
reserved	If the entry is resereved
creationTime	Entry creation time
creationHour	Entry creation hour
creationMin	Entry creation min
creationSec	Entry creation sec
creationDate	Entry creation date
creationYear	Entry creation year
creationMonth	Entry creation month
creationDay	Entry creation day
lastAccessDate	Entry access date
lastAccessYear	Entry access year
lastAccessMonth	Entry access month
lastAccessDay	Entry access day
lastWriteTime	Entry last write time
lastWriteHour	Entry last write hour
lastWriteMin	Entry last write min
lastWriteSec	Entry last write sec
lastWriteDate	Entry last write date
lastWriteYear	Entry last write year
lastWriteMonth	Entry last write month
lastWriteDay	Entry last write day
firstLogicalCluster	First logical cluster
fileSize	Entry filesize

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

• command\_utils.h

## 3.4 PREVDIR Struct Reference

## **Data Fields**

- char \* dirName
- uint32\_t sectorStart

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

· command\_utils.h

# **Chapter 4**

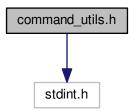
# **File Documentation**

# 4.1 command\_utils.h File Reference

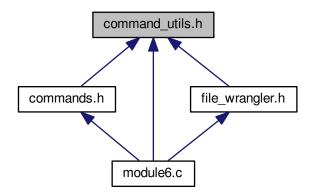
Holds standard typedefs and utility function headers for certain commands.

#include <stdint.h>

Include dependency graph for command\_utils.h:



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



#### **Data Structures**

· struct command

A struct to hold command information.

struct ENTRY

A struct to hold an directory entry.

struct PREVDIR

#### **Macros**

- #define SECTORSIZE 512
- #define SECTORSPERFAT 9
- #define FATTABLESIZE ((SECTORSPERFAT \* SECTORSIZE \* 8) / 12)
- #define MAXDIRENTRY 16
- #define MAXENTRIESPERDIR 16
- #define **DEBLOC**() printf("\033[33;1m%s(%d)\033[0m\n",\_\_FILE\_\_,\_\_LINE\_\_)

## **Typedefs**

- · typedef unsigned char BYTE
- typedef int(\* CommandFunction) (int, char \*\*)
- · typedef struct ENTRY ENTRY

A struct to hold an directory entry.

- typedef struct PREVDIR PREVDIR
- typedef struct command command\_t

#### **Functions**

• char \* trim whitespace (char \*str)

A function to trim strings.

• uint32\_t split\_args (char \*command, char \*\*argv)

A function to split up a input string into arguments for command functions.

void memcpyUpper (char \*, const char \*, int)

A memcpy function that takes all characters to their uppercase equivalent.

- int strcimp (char const \*a, char const \*b)
- uint32\_t starsearch (const char \*starryboi, const char \*fileboi)

Star search for Is.

uint16 t findDotPosition (const char \*)

#### 4.1.1 Detailed Description

Holds standard typedefs and utility function headers for certain commands.

#### 4.1.2 Typedef Documentation

#### 4.1.2.1 typedef struct ENTRY ENTRY

A struct to hold an directory entry.

empty	If the entry is empty
fileName	The name of the entry
extension	The extension, type, of the entry
attributes	The attributes of the entry
reserved	If the entry is resereved
creationTime	Entry creation time
creationHour	Entry creation hour
creationMin	Entry creation min
creationSec	Entry creation sec
creationDate	Entry creation date
creationYear	Entry creation year
creationMonth	Entry creation month
creationDay	Entry creation day
lastAccessDate	Entry access date
lastAccessYear	Entry access year
lastAccessMonth	Entry access month
lastAccessDay	Entry access day
lastWriteTime	Entry last write time
lastWriteHour	Entry last write hour
lastWriteMin	Entry last write min
lastWriteSec	Entry last write sec
lastWriteDate	Entry last write date
lastWriteYear	Entry last write year
lastWriteMonth	Entry last write month
lastWriteDay	Entry last write day
firstLogicalCluster	First logical cluster
fileSize	Entry filesize

#### 4.1.3 Function Documentation

4.1.3.1 void memcpyUpper ( char \* , const char \* , int )

A memcpy function that takes all characters to their uppercase equivalent.

#### **Parameters**

dest	The destination char pointer
source	The source char pointer
nchars	The number of chars to copy, and toUpper, from source to dest

#### Returns

void method, copies in place

```
4.1.3.2 uint32_t split_args ( char * command, char ** argv )
```

A function to split up a input string into arguments for command functions.

#### **Parameters**

The	command input to split up
Α	pointer to the destination of the argument slices, argv

#### Returns

The amount of arguments split up, argc

4.1.3.3 uint32\_t starsearch ( const char \* starryboi, const char \* fileboi )

Star search for Is.

#### **Parameters**

	starryboi	The char pointer that contians a star search
--	-----------	--

4.1.3.4 char\* trim\_whitespace ( char \* str )

A function to trim strings.

#### **Parameters**

str   The string to tr
------------------------

#### Returns

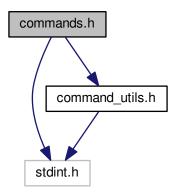
A pointer to the beginning of the trimmed string

## 4.2 commands.h File Reference

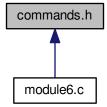
Holds all of the command prototypes.

```
#include <stdint.h>
#include "command_utils.h"
```

Include dependency graph for commands.h:



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



#### **Functions**

- command\_t \* search\_commands (char \*command)
  - Search commands for a given command.
- int help\_command (int argc, char \*\*argv)
  - Command to get help about other commands.
- int pbsi\_command (int argc, char \*\*argv)
  - print boot sector information
- int prd\_command (int argc, char \*\*argv)
  - print root directory
- int root\_command (int argc, char \*\*argv)
  - change directory to root directory
- int cd\_command (int argc, char \*\*argv)
  - change directory to requested directory
- int ls\_command (int argc, char \*\*argv)

list directory

• int type\_command (int argc, char \*\*argv)

prints out contents of file

int rename\_command (int argc, char \*\*argv)

renames a file or directory

• int move\_command (int argc, char \*\*argv)

move a file to an adjacent directory

• int exit\_command (int argc, char \*\*argv)

exit the m6 environement

## 4.2.1 Detailed Description

Holds all of the command prototypes.

#### 4.2.2 Function Documentation

4.2.2.1 int cd\_command ( int argc, char \*\* argv )

change directory to requested directory

#### **Parameters**

	argc	count of arguments passed in
ĺ	argv	list of strings separated by space characters passed in

#### Returns

0

#### 4.2.2.2 int exit\_command ( int argc, char \*\* argv )

exit the m6 environement

#### **Parameters**

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

#### Returns

0

exit the m6 environement

Confirms user wants to exit, and saves the state of the image.

argc	Number of arguments
argv	List of arguments. (None are applicable).

#### Returns

int Success condition.

4.2.2.3 int help\_command ( int argc, char \*\* argv )

Command to get help about other commands.

#### **Parameters**

argc	Number of arguments
argv	Pointer to arguments

#### Returns

exit status code

4.2.2.4 int ls\_command ( int argc, char \*\* argv )

list directory

#### **Parameters**

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

#### Returns

0

4.2.2.5 int move\_command ( int argc, char \*\* argv )

move a file to an adjacent directory

#### **Parameters**

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

#### Returns

0

move a file to an adjacent directory

Takes the name of a file and directory within the same directory, and moves the file entry into the specified directory.

#### **Parameters**

arg	Number of arguments.	
arg	List of arguments argv[1] is the file to move, argv[2] is the destination directory.	

#### Returns

int Success condition.

4.2.2.6 int pbsi\_command ( int argc, char \*\* argv )

print boot sector information

#### **Parameters**

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

#### Returns

0

4.2.2.7 int prd\_command ( int argc, char \*\* argv )

print root directory

#### **Parameters**

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

#### Returns

0

4.2.2.8 int rename\_command ( int argc, char \*\* argv )

renames a file or directory

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

#### Returns

0

4.2.2.9 int root\_command ( int argc, char \*\* argv )

change directory to root directory

#### **Parameters**

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

#### Returns

0

change directory to root directory

Sends user's current working directory to the root.

### **Parameters**

argc	Number of arguments
argv	List of string arguments.

#### Returns

int Success condition.

4.2.2.10  $command_t* search_commands ( char * command )$ 

Search commands for a given command.

#### **Parameters**

command	A command name to search for
---------	------------------------------

#### Returns

Pointer to command if found, else NULL

4.2.2.11 int type\_command ( int argc, char \*\* argv )

prints out contents of file

#### **Parameters**

argc	count of arguments passed in
argv	list of strings separated by space characters passed in

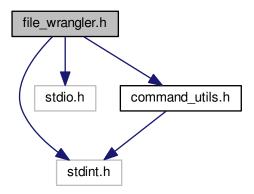
#### Returns

0

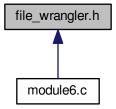
# 4.3 file\_wrangler.h File Reference

 $Holds \ all \ of \ the \ prototypes \ for \ file\_wrangler.c \ and \ has \ BOOTSECTOR \ struct.$ 

```
#include <stdint.h>
#include <stdio.h>
#include "command_utils.h"
Include dependency graph for file_wrangler.h:
```



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



#### **Data Structures**

struct BOOTSECTORSTRUCT

#### **Typedefs**

• typedef struct BOOTSECTORSTRUCT BOOTSECTORSTRUCT

#### **Functions**

```
    void loadBootSector (FILE *fpIn)

• uint16_t * loadFAT (BYTE *fpIn, uint32_t startingSector)
     loads the FAT

    void loadDir (BYTE **dirp, BYTE *sys, uint32_t startingSec)

     loads a directory

    void loadCWD (BYTE *whole, uint32_t startingSec)

     loads the current working directory into global BYTE* cwd

    void loadROOT (BYTE *sys)

     loads the root into global BYTE* root

    void loadEntireSystem (char *filename)

     loads the entire system

    BOOTSECTORSTRUCT * getBootSectorIn ()

     gets boot sector in
• BYTE * getSystem ()
     gets entire system pointer
• uint32_t getSystemSize ()
     gets entire system size
• uint16_t * getDiabetes1 ()
     gets fat table 1
uint16_t * getDiabetes2 ()
     gets fat table 2

    BYTE * getCWD ()

     gets current working directory BYTE*

    BYTE * getRoot ()
```

```
gets the root directory
    char * getCwdPath ()
          gets current working directory path
    • char * getImagePath ()
          gets root directory

    void setCwdPath (const char *jerry)

          sets cwd path
4.3.1 Detailed Description
Holds all of the prototypes for file_wrangler.c and has BOOTSECTOR struct.
4.3.2 Function Documentation
4.3.2.1 BOOTSECTORSTRUCT* getBootSectorIn ( )
gets boot sector in
Returns
      pointer to boot sector in
4.3.2.2 BYTE* getCWD ( )
gets current working directory BYTE*
Returns
      pointer to current working directory
4.3.2.3 char* getCwdPath ( )
gets current working directory path
Returns
      char pointer that contains current working directory path
4.3.2.4 uint16_t* getDiabetes1 ( )
gets fat table 1
Returns
      pointer to fat table 1
```

```
4.3.2.5 uint16_t* getDiabetes2 ( )
gets fat table 2
Returns
      pointer to fat table 2
4.3.2.6 char* getImagePath ( )
gets root directory
Returns
      pointer to root directory
4.3.2.7 BYTE* getRoot ( )
gets the root directory
Returns
      pointer to the root directory
4.3.2.8 BYTE* getSystem ( )
gets entire system pointer
Returns
      pointer to entire system
4.3.2.9 uint32_t getSystemSize ( )
gets entire system size
Returns
      u32 int that is system size
4.3.2.10 void loadCWD ( BYTE * whole, uint32_t startingSec )
loads the current working directory into global BYTE* cwd
```

#### **Parameters**

sys	raw byte array of entire file system	
startingSector	number of the sector to start loading the cwd from	

4.3.2.11 void loadDir ( BYTE \*\* dirp, BYTE \* sys, uint32\_t startingSec )

loads a directory

#### **Parameters**

sys	raw byte array of entire file system
startingSector	number of the sector to start loading the fat from

#### Returns

pointer to FAT

4.3.2.12 void loadEntireSystem ( char \* filename )

loads the entire system

#### **Parameters**

filename	filename of the correct FAT12 Image
----------	-------------------------------------

4.3.2.13 uint16\_t\* loadFAT ( BYTE \* fpln, uint32\_t startingSector )

loads the FAT

#### **Parameters**

fpIn	raw byte array of entire file system	
startingSector	number of the sector to start loading the fat from	

#### Returns

pointer to FAT

4.3.2.14 void loadROOT ( BYTE \* sys )

loads the root into global BYTE\* root

sys	raw byte array of entire file system
-----	--------------------------------------

4.3.2.15 void setCwdPath ( const char \* jerry )

sets cwd path

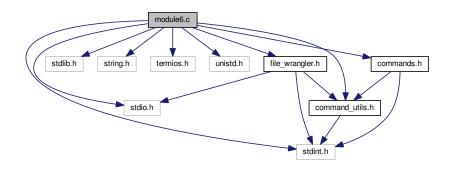
#### **Parameters**

jerry	string to make cwdPath
-------	------------------------

## 4.4 module6.c File Reference

#### Entry point for file system.

```
#include <stdint.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <termios.h>
#include <unistd.h>
#include "command_utils.h"
#include "commands.h"
#include "file_wrangler.h"
Include dependency graph for module6.c:
```



#### **Functions**

- ENTRY \* file\_recurse (BYTE \*dir, BYTE \*whole, const char \*key)

  Searches through an entire file system for a file.
- int main (int argc, char \*\*argv)

## 4.4.1 Detailed Description

Entry point for file system.

## 4.4.2 Function Documentation

4.4.2.1 ENTRY \* file\_recurse ( BYTE \* dir, BYTE \* whole, const char \* key )

Searches through an entire file system for a file.

Using a recursive search, this function will search through an entire image to find a specified file. This then returns an entry for this file.

#### **Parameters**

dir	Current searching directory
whole	Pointer to the system.
key	Name of the file to search for, including extension.

#### Returns

ENTRY\* Entry of the file that was being searched for. NULL if the file is not found.

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