

sftpserver

Generated by Doxygen 1.8.17



<b>1 sftpsrvr</b>	<b>1</b>
<b>2 Data Structure Index</b>	<b>3</b>
2.1 Data Structures	3
<b>3 File Index</b>	<b>5</b>
3.1 File List	5
<b>4 Data Structure Documentation</b>	<b>7</b>
4.1 handle_table_entry Struct Reference	7
4.1.1 Detailed Description	7
4.1.2 Field Documentation	7
4.1.2.1 handle	7
4.1.2.2 path	7
4.1.2.3 session_id	8
4.1.2.4 type	8
<b>5 File Documentation</b>	<b>9</b>
5.1 sftpsrvr.c File Reference	9
5.1.1 Detailed Description	11
5.1.2 Macro Definition Documentation	12
5.1.2.1 BINDPORT	12
5.1.2.2 HOME_DIR	12
5.1.2.3 MAX_HANDLES	12
5.1.2.4 MAX_LONG_NAME_LEN	12
5.1.2.5 MAX_THREADS	12
5.1.2.6 NUM_ENTRIES_PER_PACKET	12
5.1.2.7 SSH_KEYS_DIR	12
5.1.2.8 STR	13
5.1.2.9 WITH_SERVER	13
5.1.2.10 XSTR	13
5.1.3 Function Documentation	13
5.1.3.1 add_handle()	13
5.1.3.2 authenticate()	14
5.1.3.3 check_password()	14
5.1.3.4 clear_filexfer_attrib()	14
5.1.3.5 close_handle()	15
5.1.3.6 free_handles()	15
5.1.3.7 get_handle_path()	15
5.1.3.8 main()	16
5.1.3.9 open_channel()	16
5.1.3.10 process_close()	16
5.1.3.11 process_fstat()	17
5.1.3.12 process_lstat()	17

---

5.1.3.13 process_mkdir()	17
5.1.3.14 process_open()	18
5.1.3.15 process_opendir()	18
5.1.3.16 process_read()	18
5.1.3.17 process_readdir()	19
5.1.3.18 process_realpath()	19
5.1.3.19 process_remove()	19
5.1.3.20 process_rename()	20
5.1.3.21 process_rmdir()	20
5.1.3.22 process_setstat()	20
5.1.3.23 process_sftp_commands()	22
5.1.3.24 process_stat()	22
5.1.3.25 process_write()	22
5.1.3.26 readdir_long_name()	23
5.1.3.27 sftp_subsystem_request()	23
5.1.3.28 stat_to_filexfer_attrib()	24
5.1.3.29 unix_errno_to_ssh_status()	24
5.1.3.30 worker_thread()	24
5.1.4 Variable Documentation	24
5.1.4.1 num_threads	25
5.1.4.2 run	25
<b>Index</b>	<b>27</b>

# Chapter 1

## sftpserver

SFTP server based on libssh library using pthreads.

To build you may need to set the following cmake variables:-

CMAKE\_INCLUDE\_PATH for libssh

CMAKE\_LIBRARY\_PATH for libssh

CMAKE\_C\_FLAGS="-DSSH\_KEYS\_DIR=/etc/ssh -DHOME\_DIR=/home/user"



## Chapter 2

# Data Structure Index

### 2.1 Data Structures

Here are the data structures with brief descriptions:

<a href="#">handle_table_entry</a>	
Handle table entry . . . . .	7





## Chapter 3

# File Index

### 3.1 File List

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

<a href="#">sftpserver.c</a>	
SFTP server based on libssh and pthreads . . . . .	9



## Chapter 4

# Data Structure Documentation

### 4.1 `handle_table_entry` Struct Reference

Handle table entry.

#### Data Fields

- int `type`
- void \* `handle`
- void \* `session_id`
- char \* `path`

#### 4.1.1 Detailed Description

Handle table entry.

#### 4.1.2 Field Documentation

##### 4.1.2.1 `handle`

```
void* handle
```

Handle

##### 4.1.2.2 `path`

```
char* path
```

Path

#### 4.1.2.3 session\_id

`void* session_id`

Session ID

#### 4.1.2.4 type

`int type`

Handle type

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

- [sftpserver.c](#)

## Chapter 5

# File Documentation

### 5.1 sftpserver.c File Reference

SFTP server based on libssh and pthreads.

```
#include <sys/types.h>
#include <sys/stat.h>
#include <stdlib.h>
#include <string.h>
#include <pthread.h>
#include <stdio.h>
#include <dirent.h>
#include <semaphore.h>
#include <errno.h>
#include <utime.h>
#include <signal.h>
#include <libssh/libssh.h>
#include <libssh/server.h>
#include <libssh/sftp.h>
#include <libssh/callbacks.h>
```

#### Data Structures

- struct [handle\\_table\\_entry](#)

*Handle table entry.*

#### Macros

- #define [WITH\\_SERVER](#) 1
- #define [STR\(s\) XSTR\(s\)](#)
- #define [XSTR\(s\) #s](#)
- #define [SSH\\_KEYS\\_DIR](#) /etc/ssh
- #define [HOME\\_DIR](#) /home/user
- #define [BINDPORT](#) "2222"
- #define [MAX\\_HANDLES](#) 20
- #define [NUM\\_ENTRIES\\_PER\\_PACKET](#) 50
- #define [MAX\\_LONG\\_NAME\\_LEN](#) (NAME\_MAX + 100)
- #define [MAX\\_THREADS](#) 10

## Enumerations

- enum { **DIR\_HANDLE**, **FILE\_HANDLE** }  
*Handle type enum.*

## Functions

- static void **init\_handle\_table** (void)  
*Initialise handle table.*
- static int **add\_handle** (int z\_type, void \*z\_handle, const char \*z\_path, void \*z\_session\_id)  
*Add handle to table.*
- static char \* **get\_handle\_path** (void \*z\_handle)  
*Get handle path from table.*
- static int **close\_handle** (void \*z\_handle)  
*Close handle in table.*
- static void **free\_handles** (void \*z\_session\_id)  
*Free handles in table for given session.*
- static int **unix\_errno\_to\_ssh\_status** (int z\_errno)  
*unix errno to SSH status*
- static void **clear\_flexfer\_attr** (struct sftp\_attributes\_struct \*z\_attr)  
*Clear flexfer attrib.*
- static void **stat\_to\_flexfer\_attr** (const struct stat \*z\_st, struct sftp\_attributes\_struct \*z\_attr)  
*stat to flexfer attrib*
- char \* **readdir\_long\_name** (char \*z\_file\_name, struct stat \*z\_st, char \*z\_long\_name)  
*readdir long name*
- static int **check\_password** (const char \*z\_user, const char \*z\_password)  
*Check password.*
- static int **authenticate** (ssh\_session z\_session)  
*Authenticate session.*
- static ssh\_channel **open\_channel** (ssh\_session z\_session)  
*Open channel.*
- static int **sftp\_subsystem\_request** (ssh\_session z\_session)  
*SFTP subsystem request.*
- static int **process\_close** (sftp\_client\_message z\_client\_message)  
*Process close command.*
- static int **process\_fstat** (sftp\_client\_message z\_client\_message)  
*Process fstat command.*
- static int **process\_lstat** (sftp\_client\_message z\_client\_message)  
*Process lstat command.*
- static int **process\_mkdir** (sftp\_client\_message z\_client\_message)  
*Process mkdir command.*
- static int **process\_open** (sftp\_client\_message z\_client\_message)  
*Process open command.*
- static int **process\_opendir** (sftp\_client\_message z\_client\_message)  
*Process opendir command.*
- static int **process\_read** (sftp\_client\_message z\_client\_message)  
*Process read command.*
- static int **process\_readdir** (sftp\_client\_message z\_client\_message)  
*Process readdir command.*
- static int **process\_realpath** (sftp\_client\_message z\_client\_message)

- Process realpath command.*
  - static int `process_remove` (sftp\_client\_message z\_client\_message)
- Process remove command.*
  - static int `process_rename` (sftp\_client\_message z\_client\_message)
- Process rename command.*
  - static int `process_rmdir` (sftp\_client\_message z\_client\_message)
- Process rmdir command.*
  - static int `process_setstat` (sftp\_client\_message z\_client\_message)
- Process setstat command.*
  - static int `process_stat` (sftp\_client\_message z\_client\_message)
- Process stat command.*
  - static int `process_write` (sftp\_client\_message z\_client\_message)
- Process write command.*
  - static void `process_sftp_commands` (sftp\_session z\_sftp\_sn)
- Process SFTP commands.*
  - static void \* `worker_thread` (void \*z\_session)
- Worker thread.*
  - void `sigterm_handler` (int signal)
- sigterm handler*
  - int `main` ()
- Main function.*

## Variables

- static sem\_t `s_handle_table_mutex`
- Handle table semaphore.*
- static struct `handle_table_entry` `s_handle_table` [MAX\_HANDLES]
- Handle table.*
- volatile sig\_atomic\_t `run` = 1
- volatile sig\_atomic\_t `num_threads` = 0

### 5.1.1 Detailed Description

SFTP server based on libssh and pthreads.

#### Author

Steve Pickford

#### Date

5 Dec 2020 Typo \*

#### See also

<https://github.com/sjp27/sftpserver>

## 5.1.2 Macro Definition Documentation

### 5.1.2.1 BINDPORT

```
#define BINDPORT "2222"
```

Port to bind to

### 5.1.2.2 HOME\_DIR

```
#define HOME_DIR /home/user
```

Home directory

### 5.1.2.3 MAX\_HANDLES

```
#define MAX_HANDLES 20
```

Maximum handles

### 5.1.2.4 MAX\_LONG\_NAME\_LEN

```
#define MAX_LONG_NAME_LEN (NAME_MAX + 100)
```

Maximum long name length for readdir

### 5.1.2.5 MAX\_THREADS

```
#define MAX_THREADS 10
```

Maximum number of threads

### 5.1.2.6 NUM\_ENTRIES\_PER\_PACKET

```
#define NUM_ENTRIES_PER_PACKET 50
```

Maximum entries per packet for readdir

### 5.1.2.7 SSH\_KEYS\_DIR

```
#define SSH_KEYS_DIR /etc/ssh
```

SSH keys directory



### 5.1.2.8 STR

```
#define STR(  
    s ) XSTR(s)
```

Stringification support

### 5.1.2.9 WITH\_SERVER

```
#define WITH_SERVER 1
```

Compile with SFTP server support

### 5.1.2.10 XSTR

```
#define XSTR(  
    s ) #s
```

Stringification support

## 5.1.3 Function Documentation

### 5.1.3.1 add\_handle()

```
static int add_handle (  
    int z_type,  
    void * z_handle,  
    const char * z_path,  
    void * z_session_id ) [static]
```

Add handle to table.

#### Parameters

<i>z_type</i>	Handle type
<i>z_handle</i>	Handle
<i>z_path</i>	Path
<i>z_session↔ _id</i>	Session ID

#### Returns

SSH\_OK or SSH\_ERROR

### 5.1.3.2 authenticate()

```
static int authenticate (
    ssh_session z_session ) [static]
```

Authenticate session.

#### Parameters

<i>z_session</i>	Pointer to ssh session
------------------	------------------------

#### Returns

SSH\_OK or SSH\_ERROR

### 5.1.3.3 check\_password()

```
static int check_password (
    const char * z_user,
    const char * z_password ) [static]
```

Check password.

#### Parameters

<i>z_user</i>	User
<i>z_password</i>	Password

#### Returns

SSH\_OK or SSH\_ERROR

### 5.1.3.4 clear\_filexfer\_attr()

```
static void clear_filexfer_attr (
    struct sftp_attributes_struct * z_attr ) [static]
```

Clear filexfer attrib.

#### Parameters

<i>z_attr</i>	Pointer to attributes struct
---------------	------------------------------

### 5.1.3.5 close\_handle()

```
static int close_handle (
    void * z_handle ) [static]
```

Close handle in table.

#### Parameters

<i>z_handle</i>	Handle
-----------------	--------

#### Returns

SSH\_OK or SSH\_ERROR

### 5.1.3.6 free\_handles()

```
static void free_handles (
    void * z_session_id ) [static]
```

Free handles in table for given session.

#### Parameters

<i>z_session_id</i>	Session ID
---------------------	------------

### 5.1.3.7 get\_handle\_path()

```
static char* get_handle_path (
    void * z_handle ) [static]
```

Get handle path from table.

#### Parameters

<i>z_handle</i>	Handle
-----------------	--------

#### Returns

handle path

#### 5.1.3.8 main()

```
int main ( )
```

Main function.

##### Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.9 open\_channel()

```
static ssh_channel open_channel (
    ssh_session z_session ) [static]
```

Open channel.

##### Parameters

<i>z_session</i>	Pointer to ssh session
------------------	------------------------

##### Returns

ssh channel

#### 5.1.3.10 process\_close()

```
static int process_close (
    sftp_client_message z_client_message ) [static]
```

Process close command.

##### Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

##### Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.11 process\_fstat()

```
static int process_fstat (
    sftp_client_message z_client_message ) [static]
```

Process fstat command.

##### Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

##### Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.12 process\_lstat()

```
static int process_lstat (
    sftp_client_message z_client_message ) [static]
```

Process lstat command.

##### Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

##### Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.13 process\_mkdir()

```
static int process_mkdir (
    sftp_client_message z_client_message ) [static]
```

Process mkdir command.

##### Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

##### Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.14 process\_open()

```
static int process_open (  
    sftp_client_message z_client_message ) [static]
```

Process open command.

##### Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

##### Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.15 process\_opendir()

```
static int process_opendir (  
    sftp_client_message z_client_message ) [static]
```

Process opendir command.

##### Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

##### Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.16 process\_read()

```
static int process_read (  
    sftp_client_message z_client_message ) [static]
```

Process read command.

##### Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.17 process\_readdir()**

```
static int process_readdir (  
    sftp_client_message z_client_message ) [static]
```

Process readdir command.

**Parameters**

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.18 process\_realpath()**

```
static int process_realpath (  
    sftp_client_message z_client_message ) [static]
```

Process realpath command.

**Parameters**

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.19 process\_remove()**

```
static int process_remove (  
    sftp_client_message z_client_message ) [static]
```

Process remove command.

**Parameters**

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.20 process\_rename()**

```
static int process_rename (  
    sftp_client_message z_client_message ) [static]
```

Process rename command.

**Parameters**

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.21 process\_rmdir()**

```
static int process_rmdir (  
    sftp_client_message z_client_message ) [static]
```

Process rmdir command.

**Parameters**

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.22 process\_setstat()**

```
static int process_setstat (  
    sftp_client_message z_client_message ) [static]
```



Process setstat command.

**Parameters**

<code>z_client_message</code>	Pointer to client message
-------------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.23 process\_sftp\_commands()**

```
static void process_sftp_commands (
    sftp_session z_sftp_sn ) [static]
```

Process SFTP commands.

**Parameters**

<code>z_sftp_sn</code>	- Pointer to sftp session
------------------------	---------------------------

**5.1.3.24 process\_stat()**

```
static int process_stat (
    sftp_client_message z_client_message ) [static]
```

Process stat command.

**Parameters**

<code>z_client_message</code>	Pointer to client message
-------------------------------	---------------------------

**Returns**

SSH\_OK or SSH\_ERROR

**5.1.3.25 process\_write()**

```
static int process_write (
    sftp_client_message z_client_message ) [static]
```

Process write command.

## Parameters

<i>z_client_message</i>	Pointer to client message
-------------------------	---------------------------

## Returns

SSH\_OK or SSH\_ERROR

**5.1.3.26 readdir\_long\_name()**

```
char* readdir_long_name (
    char * z_file_name,
    struct stat * z_st,
    char * z_long_name )
```

readdir long name

## Parameters

<i>z_file_name</i>	Pointer to file_name
<i>z_st</i>	Pointer to stat structure
<i>z_long_name</i>	Pointer to long_name

## Returns

Pointer to long\_name

**5.1.3.27 sftp\_subsystem\_request()**

```
static int sftp_subsystem_request (
    ssh_session z_session ) [static]
```

SFTP subsystem request.

## Parameters

<i>z_session</i>	Pointer to ssh session
------------------	------------------------

## Returns

SSH\_OK or SSH\_ERROR

#### 5.1.3.28 stat\_to\_filexfer\_attr()

```
static void stat_to_filexfer_attr (
    const struct stat * z_st,
    struct sftp_attributes_struct * z_attr ) [static]
```

stat to filexfer attrib

##### Parameters

<i>z_st</i>	Pointer to stat struct
<i>z_attr</i>	Pointer to attributes struct

#### 5.1.3.29 unix\_errno\_to\_ssh\_status()

```
static int unix_errno_to_ssh_status (
    int z_errno ) [static]
```

unix errno to SSH status

##### Parameters

<i>z_errno</i>	Error number
----------------	--------------

##### Returns

SSH status

#### 5.1.3.30 worker\_thread()

```
static void* worker_thread (
    void * z_session ) [static]
```

Worker thread.

##### Parameters

<i>z_session</i>	- Pointer to ssh session
------------------	--------------------------

##### Returns

NULL

### 5.1.4 Variable Documentation

#### 5.1.4.1 num\_threads

```
volatile sig_atomic_t num_threads = 0
```

Number of threads

#### 5.1.4.2 run

```
volatile sig_atomic_t run = 1
```

Run flag



# Index

- add\_handle
  - sftpserver.c, [13](#)
- authenticate
  - sftpserver.c, [13](#)
- BINDPORT
  - sftpserver.c, [12](#)
- check\_password
  - sftpserver.c, [14](#)
- clear\_filexfer\_attrib
  - sftpserver.c, [14](#)
- close\_handle
  - sftpserver.c, [14](#)
- free\_handles
  - sftpserver.c, [15](#)
- get\_handle\_path
  - sftpserver.c, [15](#)
- handle
  - handle\_table\_entry, [7](#)
- handle\_table\_entry, [7](#)
  - handle, [7](#)
  - path, [7](#)
  - session\_id, [7](#)
  - type, [8](#)
- HOME\_DIR
  - sftpserver.c, [12](#)
- main
  - sftpserver.c, [15](#)
- MAX\_HANDLES
  - sftpserver.c, [12](#)
- MAX\_LONG\_NAME\_LEN
  - sftpserver.c, [12](#)
- MAX\_THREADS
  - sftpserver.c, [12](#)
- NUM\_ENTRIES\_PER\_PACKET
  - sftpserver.c, [12](#)
- num\_threads
  - sftpserver.c, [24](#)
- open\_channel
  - sftpserver.c, [16](#)
- path
  - handle\_table\_entry, [7](#)
- process\_close
  - sftpserver.c, [16](#)
- process\_fstat
  - sftpserver.c, [16](#)
- process\_lstat
  - sftpserver.c, [17](#)
- process\_mkdir
  - sftpserver.c, [17](#)
- process\_open
  - sftpserver.c, [18](#)
- process\_opendir
  - sftpserver.c, [18](#)
- process\_read
  - sftpserver.c, [18](#)
- process\_readdir
  - sftpserver.c, [19](#)
- process\_realpath
  - sftpserver.c, [19](#)
- process\_remove
  - sftpserver.c, [19](#)
- process\_rename
  - sftpserver.c, [20](#)
- process\_rmdir
  - sftpserver.c, [20](#)
- process\_setstat
  - sftpserver.c, [20](#)
- process\_sftp\_commands
  - sftpserver.c, [22](#)
- process\_stat
  - sftpserver.c, [22](#)
- process\_write
  - sftpserver.c, [22](#)
- readdir\_long\_name
  - sftpserver.c, [23](#)
- run
  - sftpserver.c, [25](#)
- session\_id
  - handle\_table\_entry, [7](#)
- sftp\_subsystem\_request
  - sftpserver.c, [23](#)
- sftpserver.c, [9](#)
  - add\_handle, [13](#)
  - authenticate, [13](#)
  - BINDPORT, [12](#)
  - check\_password, [14](#)
  - clear\_filexfer\_attrib, [14](#)
  - close\_handle, [14](#)
  - free\_handles, [15](#)
  - get\_handle\_path, [15](#)

- HOME\_DIR, [12](#)
- main, [15](#)
- MAX\_HANDLES, [12](#)
- MAX\_LONG\_NAME\_LEN, [12](#)
- MAX\_THREADS, [12](#)
- NUM\_ENTRIES\_PER\_PACKET, [12](#)
- num\_threads, [24](#)
- open\_channel, [16](#)
- process\_close, [16](#)
- process\_fstat, [16](#)
- process\_lstat, [17](#)
- process\_mkdir, [17](#)
- process\_open, [18](#)
- process\_opendir, [18](#)
- process\_read, [18](#)
- process\_readdir, [19](#)
- process\_realpath, [19](#)
- process\_remove, [19](#)
- process\_rename, [20](#)
- process\_rmdir, [20](#)
- process\_setstat, [20](#)
- process\_sftp\_commands, [22](#)
- process\_stat, [22](#)
- process\_write, [22](#)
- readdir\_long\_name, [23](#)
- run, [25](#)
- sftp\_subsystem\_request, [23](#)
- SSH\_KEYS\_DIR, [12](#)
- stat\_to\_filexfer\_attr, [23](#)
- STR, [12](#)
- unix\_errno\_to\_ssh\_status, [24](#)
- WITH\_SERVER, [13](#)
- worker\_thread, [24](#)
- XSTR, [13](#)
- SSH\_KEYS\_DIR
  - sftpserver.c, [12](#)
- stat\_to\_filexfer\_attr
  - sftpserver.c, [23](#)
- STR
  - sftpserver.c, [12](#)
- type
  - handle\_table\_entry, [8](#)
- unix\_errno\_to\_ssh\_status
  - sftpserver.c, [24](#)
- WITH\_SERVER
  - sftpserver.c, [13](#)
- worker\_thread
  - sftpserver.c, [24](#)
- XSTR
  - sftpserver.c, [13](#)