

PEPITAS CRYPTOCURRENCY

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Chapter 1

PEPITAS

C cryptocurrency.

1.1 CODING STYLE

1.1.1 Coding case

- *Functions, variables and filenames* must be written in `snake_case`.
- *Structures* must be written in `PascalCase`.
- *Constants or MACRO* must be written in `UPPER_SNAKE_CASE`.

1.1.2 Tests

Each function must be tested before **marked as done**. To create a test function, you must write it in the `test/` directory and call the file `filename_test.c` and its functions `functionname_test`. Note that the test file must be at the same relative place than his real function

exemple : if you want to test `init_server()` in the file `network/client.c`, you must write the test in `test/network/client_test.c` and call the test function `init_server_test()`

Chapter 2

Data Structure Index

2.1 Data Structures

Here are the data structures with brief descriptions:

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Chapter 3

File Index

3.1 File List

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Chapter 4

Data Structure Documentation

4.1 Block Struct Reference

```
#include <block.h>
```

Collaboration diagram for Block:

Data Fields

- uint16_t [chunk_id](#)
- [BlockData](#) [block_data](#)
- size_t [signature_len](#)
- char * [block_signature](#)

4.1.1 Detailed Description

Definition at line 31 of file block.h.

4.1.2 Field Documentation

4.1.2.1 [block_data](#)

[BlockData](#) [block_data](#)

Definition at line 34 of file block.h.

4.1.2.2 block_signature

```
char* block_signature
```

Definition at line 37 of file block.h.

4.1.2.3 chunk_id

```
uint16_t chunk_id
```

Definition at line 33 of file block.h.

4.1.2.4 signature_len

```
size_t signature_len
```

Definition at line 36 of file block.h.

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

- </home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/block.h>

4.2 BlockData Struct Reference

```
#include <block.h>
```

Collaboration diagram for BlockData:

Data Fields

- char [magic](#)
- char [previous_block_hash](#) [SHA384_DIGEST_LENGTH *2+1]
- size_t [height](#)
- uint16_t [nb_transactions](#)
- [Transaction](#) ** [transactions](#)
- RSA * [validator_public_key](#)
- time_t [block_timestamp](#)

4.2.1 Detailed Description

Definition at line 17 of file block.h.

4.2.2 Field Documentation

4.2.2.1 block_timestamp

```
time_t block_timestamp
```

Definition at line 28 of file block.h.

4.2.2.2 height

```
size_t height
```

Definition at line 21 of file block.h.

4.2.2.3 magic

```
char magic
```

Definition at line 19 of file block.h.

4.2.2.4 nb_transactions

```
uint16_t nb_transactions
```

Definition at line 23 of file block.h.

4.2.2.5 previous_block_hash

```
char previous_block_hash[SHA384_DIGEST_LENGTH *2+1]
```

Definition at line 20 of file block.h.

4.2.2.6 transactions

```
Transaction** transactions
```

Definition at line 24 of file block.h.

4.2.2.7 validator_public_key

```
RSA* validator_public_key
```

Definition at line 27 of file block.h.

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

- /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/[block.h](#)

4.3 ChunkBlockchain Struct Reference

```
#include <block.h>
```

Collaboration diagram for ChunkBlockchain:

Data Fields

- size_t [chunk_nb](#)
- [Block](#)** [chunk](#)

4.3.1 Detailed Description

Definition at line 41 of file block.h.

4.3.2 Field Documentation

4.3.2.1 chunk

```
Block** chunk
```

Definition at line 44 of file block.h.

4.3.2.2 chunk_nb

```
size_t chunk_nb
```

Definition at line 43 of file block.h.

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

- /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/[block.h](#)

4.4 client_connection Struct Reference

```
#include <server.h>
```

Data Fields

- struct addrinfo [info](#)
- int [socket](#)

4.4.1 Detailed Description

Definition at line 8 of file server.h.

4.4.2 Field Documentation

4.4.2.1 info

```
struct addrinfo info
```

Definition at line 10 of file server.h.

4.4.2.2 socket

```
int socket
```

Definition at line 11 of file server.h.

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

- /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/[server.h](#)

4.5 Neighbour Struct Reference

```
#include <client.h>
```

Data Fields

- int [family](#)
- char * [hostname](#)
- int [server_sockfd](#)
- int [client_sockfd](#)

4.5.1 Detailed Description

Definition at line 8 of file client.h.

4.5.2 Field Documentation

4.5.2.1 [client_sockfd](#)

```
int client_sockfd
```

Definition at line 13 of file client.h.

4.5.2.2 [family](#)

```
int family
```

Definition at line 10 of file client.h.

4.5.2.3 [hostname](#)

```
char* hostname
```

Definition at line 11 of file client.h.

4.5.2.4 server_sockfd

```
int server_sockfd
```

Definition at line 12 of file client.h.

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

- /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/[client.h](#)

4.6 Node Struct Reference

```
#include <client.h>
```

Collaboration diagram for Node:

Data Fields

- [Neighbour](#) * [neighbours](#)

4.6.1 Detailed Description

Definition at line 16 of file client.h.

4.6.2 Field Documentation

4.6.2.1 neighbours

```
Neighbour* neighbours
```

Definition at line 18 of file client.h.

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

- /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/[client.h](#)

4.7 Transaction Struct Reference

```
#include <transaction.h>
```

Collaboration diagram for Transaction:

Data Fields

- [TransactionData](#) * [transaction_data](#)
- `size_t` [signature_len](#)
- `char` * [transaction_signature](#)

4.7.1 Detailed Description

Definition at line 28 of file `transaction.h`.

4.7.2 Field Documentation

4.7.2.1 `signature_len`

```
size_t signature_len
```

Definition at line 32 of file `transaction.h`.

4.7.2.2 `transaction_data`

```
TransactionData* transaction_data
```

Definition at line 30 of file `transaction.h`.

4.7.2.3 `transaction_signature`

```
char* transaction_signature
```

Definition at line 33 of file `transaction.h`.

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

- `/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/transaction.h`

4.8 TransactionData Struct Reference

```
#include <transaction.h>
```

Data Fields

- RSA * [sender_public_key](#)
- RSA * [receiver_public_key](#)
- RSA * [organisation_public_key](#)
- size_t [amount](#)
- size_t [sender_remaining_money](#)
- size_t [receiver_remaining_money](#)
- time_t [transaction_timestamp](#)
- char [cause](#) [512]
- char [asset](#) [512]

4.8.1 Detailed Description

Definition at line 11 of file transaction.h.

4.8.2 Field Documentation

4.8.2.1 amount

```
size_t amount
```

Definition at line 17 of file transaction.h.

4.8.2.2 asset

```
char asset[512]
```

Definition at line 25 of file transaction.h.

4.8.2.3 cause

```
char cause[512]
```

Definition at line 24 of file transaction.h.

4.8.2.4 organisation_public_key

```
RSA* organisation_public_key
```

Definition at line 16 of file transaction.h.

4.8.2.5 receiver_public_key

```
RSA* receiver_public_key
```

Definition at line 15 of file transaction.h.

4.8.2.6 receiver_remaining_money

```
size_t receiver_remaining_money
```

Definition at line 19 of file transaction.h.

4.8.2.7 sender_public_key

```
RSA* sender_public_key
```

Definition at line 14 of file transaction.h.

4.8.2.8 sender_remaining_money

```
size_t sender_remaining_money
```

Definition at line 18 of file transaction.h.

4.8.2.9 transaction_timestamp

```
time_t transaction_timestamp
```

Definition at line 20 of file transaction.h.

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

- /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/[transaction.h](#)

4.9 Wallet Struct Reference

```
#include <wallet.h>
```

Data Fields

- RSA * [priv_key](#)
- RSA * [pub_key](#)
- size_t [amount](#)
- char [is_validator](#)

4.9.1 Detailed Description

Definition at line 10 of file wallet.h.

4.9.2 Field Documentation

4.9.2.1 amount

```
size_t amount
```

Definition at line 15 of file wallet.h.

4.9.2.2 is_validator

```
char is_validator
```

Definition at line 16 of file wallet.h.

4.9.2.3 priv_key

```
RSA* priv_key
```

Definition at line 12 of file wallet.h.

4.9.2.4 pub_key

```
RSA* pub_key
```

Definition at line 13 of file wallet.h.

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

- [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/wallet.h](#)

Chapter 5

File Documentation

5.1 [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/block.h](#) File Reference

```
#include <stdlib.h>
#include <openssl/sha.h>
#include "transaction.h"
```

Include dependency graph for block.h:

5.2 [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/transaction.h](#) File Reference

```
#include <stdlib.h>
#include <openssl/rsa.h>
#include <openssl/sha.h>
#include <time.h>
```

Include dependency graph for transaction.h: This graph shows which files directly or indirectly include this file:

Data Structures

- struct [TransactionData](#)
- struct [Transaction](#)

Macros

- #define [TRANSACTION_DATA_SIZE](#) sizeof(size_t) * 3 + sizeof(time_t) + (512 * 2)
- #define [TRANSACTION_SIZE](#) sizeof(size_t) + 2048 + [TRANSACTION_DATA_SIZE](#)

Typedefs

- typedef struct [TransactionData](#) [TransactionData](#)
- typedef struct [Transaction](#) [Transaction](#)

Functions

- int [send_money](#) (size_t amount, u_int64_t receiver_public_key)
Send 'amount' money to 'receiver_public_key'. This will broadcast a transaction to the network.

5.2.1 Macro Definition Documentation

5.2.1.1 TRANSACTION_DATA_SIZE

```
#define TRANSACTION_DATA_SIZE sizeof(size_t) * 3 + sizeof(time_t) + (512 * 2)
```

Definition at line 9 of file transaction.h.

5.2.1.2 TRANSACTION_SIZE

```
#define TRANSACTION_SIZE sizeof(size_t) + 2048 + TRANSACTION\_DATA\_SIZE
```

Definition at line 10 of file transaction.h.

5.2.2 Typedef Documentation

5.2.2.1 Transaction

```
typedef struct Transaction Transaction
```

5.2.2.2 TransactionData

```
typedef struct TransactionData TransactionData
```

5.2.3 Function Documentation

5.2.3.1 send_money()

```
int send_money (  
    size_t amount,  
    u_int64_t receiver_public_key )
```

Send 'amount' money to 'receiver_public_key'. This will broadcast a transaction to the network.

5.3

/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/wallet.h

File Reference

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Parameters

<i>amount</i>	The amount to send
<i>receiver_public_key</i>	The receiver public key

Returns

returns 0 if the broadcast succeeds, -1 otherwise

5.3 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/blockchain/wallet.h File Reference

```
#include <openssl/rsa.h>
#include <stdlib.h>
#include <stdbool.h>
#include <time.h>
```

Include dependency graph for wallet.h: This graph shows which files directly or indirectly include this file:

Data Structures

- struct [Wallet](#)

Typedefs

- typedef struct [Wallet](#) [Wallet](#)

Functions

- [Wallet](#) * [get_my_wallet](#) ()
Get my wallet object.
- int [create_account](#) ()
Creates an account in local and broadcasts the creation to the network.

5.3.1 Typedef Documentation

5.3.1.1 Wallet

```
typedef struct Wallet Wallet
```

5.3.2 Function Documentation

5.3.2.1 create_account()

```
int create_account ( )
```

Creates an account in local and broadcasts the creation to the network.

Returns

0 if the broadcast succeeds, otherwise 1

Definition at line 19 of file wallet.c.

Here is the call graph for this function:

5.3.2.2 get_my_wallet()

```
Wallet* get_my_wallet ( )
```

Get my wallet object.

Returns

Wallet

Definition at line 7 of file wallet.c.

Here is the caller graph for this function:

5.4 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/validation/stake.h File Reference

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

Include dependency graph for stake.h:

Functions

- int [push_stake](#) (size_t amount)
Push an amount on the stake.
- int [pop_stake](#) (size_t amount)
Pops an amount on the stake.

5.4.1 Function Documentation

5.4.1.1 pop_stake()

```
int pop_stake (
    size_t amount )
```

Pops an amount on the stake.

This will broadcast a stake pop on the network.

See also

The stake account public key is '1'

Parameters

<i>amount</i>	The amount to pop
---------------	-------------------

Returns

0 if the broadcast succeeds, else returns -1

5.4.1.2 push_stake()

```
int push_stake (
    size_t amount )
```

Push an amount on the stake.

This will broadcast a stake push on the network.

See also

The stake account public key is '1'

Parameters

<i>amount</i>	The amount to push
---------------	--------------------

Returns

0 if the broadcast succeeds, else returns -1

5.5 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/core/validation/validations.h File Reference

```
#include <stdlib.h>
#include <openssl/rsa.h>
```

Include dependency graph for validations.h: This graph shows which files directly or indirectly include this file:

Functions

- RSA ** [get_next_committee](#) (size_t *nb_validators)
Get the 'next block' validators RSA public keys.
- ssize_t [get_amount](#) (RSA *public_key)
Searches how much money 'public_key' has.

5.5.1 Function Documentation

5.5.1.1 [get_amount\(\)](#)

```
ssize_t get_amount (
    RSA * public_key )
```

Searches how much money 'public_key' has.

Parameters

<i>public_key</i>	The RSA public key
-------------------	--------------------

Returns

The amount, or -1 in case of an error

5.5.1.2 [get_next_committee\(\)](#)

```
RSA** get_next_committee (
    size_t * nb_validators )
```

Get the 'next block' validators RSA public keys.

Parameters

<i>nb_validators</i>	return value, the number of selected validators
----------------------	---

See also

The 'next block' is referring to block after the last block available OFFLINE

Returns

[*RSA]

Definition at line 31 of file validations.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.6 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/cryptosystem/hash.h File Reference

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

```
#include "core/blockchain/block.h"
```

Include dependency graph for hash.h: This graph shows which files directly or indirectly include this file:

Functions

- char * [sha384_data](#) (void *data, size_t len_data)
Apply the SHA384 algorithm on a 'data' of size 'len_data'.
- char * [hash_block_transactions](#) ([Block](#) *block)
Apply the SHA384 to all block transactions.

5.6.1 Function Documentation

5.6.1.1 hash_block_transactions()

```
char* hash_block_transactions (
    Block * block )
```

Apply the SHA384 to all block transactions.

Parameters

<i>block</i>	The block to deal with
--------------	------------------------

Returns

sha384[SHA384_DIGEST_LENGTH]

Definition at line 24 of file hash.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.6.1.2 sha384_data()

```
char* sha384_data (
    void * data,
    size_t len_data )
```

Apply the SHA384 algorithm on a 'data' of size 'len_data'.

Parameters

<i>data</i>	The buffer to hash
<i>len_data</i>	The length of the buffer

Returns

char[97] (on heap)

Definition at line 6 of file hash.c.

Here is the caller graph for this function:

5.7 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/cryptosystem/rsa.h File Reference

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

Macros

- #define [RSA_KEY_SIZE](#) 366
- #define [RSA_FILE_TOTAL_SIZE](#) 426
- #define [RSA_BEGIN_SIZE](#) 31
- #define [RSA_END_SIZE](#) 29

Functions

- void [get_keys](#) ()
Get the keys object.

5.7.1 Macro Definition Documentation

5.7.1.1 RSA_BEGIN_SIZE

```
#define RSA_BEGIN_SIZE 31
```

Definition at line 6 of file rsa.h.

5.7.1.2 RSA_END_SIZE

```
#define RSA_END_SIZE 29
```

Definition at line 7 of file rsa.h.

5.7.1.3 RSA_FILE_TOTAL_SIZE

```
#define RSA_FILE_TOTAL_SIZE 426
```

Definition at line 5 of file rsa.h.

5.7.1.4 RSA_KEY_SIZE

```
#define RSA_KEY_SIZE 366
```

Definition at line 4 of file rsa.h.

5.7.2 Function Documentation

5.7.2.1 get_keys()

```
void get_keys ( )
```

Get the keys object.

Definition at line 21 of file rsa.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.8 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/cryptosystem/signature.h File Reference

```
#include <stdlib.h>
#include <err.h>
#include <string.h>
#include <openssl/crypto.h>
#include <openssl/ssl3.h>
#include <openssl/rsa.h>
#include <openssl/err.h>
#include "core/blockchain/wallet.h"
#include "core/blockchain/block.h"
```

Include dependency graph for signature.h: This graph shows which files directly or indirectly include this file:

Functions

- char * [sign_message](#) (char *data, size_t len_data, size_t *signature_len)
encrypt(SHA284(msg,len_data),priv_key)
- int [verify_signature](#) (void *data, size_t data_len, char *signature, size_t signature_len, RSA *pub_key)
Apply the SHA384 algorithm on a 'data' of size 'len_data' and verifies if SHA384(data, len_data) == 'signature'.
- int [verify_block_signature](#) (Block block)
Verifies if a block signature is valid.
- int [verify_transaction_signature](#) (Transaction transaction)
Verifies if a transaction signature is valid.
- void [get_transaction_data](#) (Transaction *trans, char **buff, size_t *size)
*Convert transactions to char * buffer.*
- char * [get_blockdata_data](#) (Block *block, size_t *size)
Get the blockdata data object.
- void [write_blockdata](#) (BlockData blockdata, int fd)
Writes blockdata in a file.
- void [write_block](#) (Block block, int fd)
Writes a block in a file.
- void [sign_block](#) (Block *block)
Signs a block.
- void [sign_transaction](#) (Transaction *transaction)
Sign a transaction.
- void [sign_block_transactions](#) (Block *block)
Signs transactions of a block.

5.8.1 Function Documentation

5.8.1.1 [get_blockdata_data\(\)](#)

```
char* get_blockdata_data (
    Block * block,
    size_t * size )
```

Get the blockdata data object.

Parameters

<i>block</i>	The block
<i>size</i>	The size of the block

Returns

char*

Definition at line 144 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.8.1.2 get_transaction_data()

```
void get_transaction_data (
    Transaction * trans,
    char ** buff,
    size_t * size )
```

Convert transactions to char * buffer.

Parameters

<i>transactions</i>	The transaction array
<i>buff</i>	The buffer that receives the transactions
<i>size</i>	The number of transactions in the array

Returns

The buffer allocated (Must be freed)

Definition at line 93 of file signature.c.

Here is the caller graph for this function:

5.8.1.3 sign_block()

```
void sign_block (
    Block * block )
```

Signs a block.

Parameters

<i>block</i>	The block to sign
--------------	-------------------

Definition at line 233 of file signature.c.

Here is the call graph for this function:

5.8.1.4 sign_block_transactions()

```
void sign_block_transactions (
    Block * block )
```

Signs transactions of a block.

Parameters

<i>block</i>	The block to sign
--------------	-------------------

Definition at line 258 of file signature.c.

Here is the call graph for this function:

5.8.1.5 sign_message()

```
char* sign_message (
    char * data,
    size_t len_data,
    size_t * signature_len )
```

encrypt(SHA284(msg,len_data),priv_key)

Parameters

<i>data</i>	The data to sign
<i>len_data</i>	The length of the data
<i>signature_len</i>	The length of the data signature

Returns

char*

Definition at line 10 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.8.1.6 sign_transaction()

```
void sign_transaction (
    Transaction * transaction )
```

Sign a transaction.

Parameters

<i>transaction</i>	The transaction to sign
--------------------	-------------------------

Definition at line 245 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.8.1.7 verify_block_signature()

```
int verify_block_signature (
    Block block )
```

Verifies if a block signature is valid.

Parameters

<i>block</i>	The block to verify
--------------	---------------------

Returns

1 if valid, 0 otherwise

Definition at line 206 of file signature.c.

Here is the call graph for this function:

5.8.1.8 verify_signature()

```
int verify_signature (
    void * data,
    size_t data_len,
    char * signature,
    size_t signature_len,
    RSA * pub_key )
```

Apply the SHA384 algorithm on a 'data' of size 'len_data' and verifies if SHA384(data, len_data) == 'signature'.

Parameters

<i>data</i>	The buffer to verify
<i>data_len</i>	The length of the buffer
<i>signature</i>	The signature to compare with SHA384(data, len_data)
<i>signature_len</i>	The length of the signature
<i>pub_key</i>	The RSA public key used for the decryption

Returns

int

Definition at line 31 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.8.1.9 verify_transaction_signature()

```
int verify_transaction_signature (
    Transaction transaction )
```

Verifies if a transaction signature is valid.

Parameters

<i>transaction</i>	The transaction to verify
--------------------	---------------------------

Returns

1 if valid, 0 otherwise

Definition at line 219 of file signature.c.

Here is the call graph for this function:

5.8.1.10 write_block()

```
void write_block (
    Block block,
    int fd )
```

Writes a block in a file.

Parameters

<i>block</i>	The block to write
<i>fd</i>	the file descriptor of the file in which the block is written

Definition at line 199 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.8.1.11 write_blockdata()

```
void write_blockdata (
    BlockData blockdata,
    int fd )
```

Writes blockdata in a file.

Parameters

<i>blockdata</i>	The blockdata to write
<i>fd</i>	The file descriptor of the file in which the blockdata is written

Definition at line 174 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.9 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/misc/files.h File Reference

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

Functions

- char * [last_file_in_folder](#) (char folder_path[])
Return the last file (reverse alphabetical order) of a folder path.

5.9.1 Function Documentation

5.9.1.1 last_file_in_folder()

```
char* last_file_in_folder (  
    char folder_path[] )
```

Return the last file (reverse alphabetical order) of a folder path.

Parameters

<i>folder_path</i>	The path of the folder
--------------------	------------------------

Returns

char*, return NULL if any error, must be freed !

Definition at line 7 of file files.c.

Here is the caller graph for this function:

5.10 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/misc/math.h File Reference

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

Macros

- `#define MIN(a, b) ((a) < (b)) ? (a) : (b)`
- `#define MAX(a, b) ((a) > (b)) ? (a) : (b)`

5.10.1 Macro Definition Documentation

5.10.1.1 MAX

```
#define MAX(  
    a,  
    b ) ((a) > (b)) ? (a) : (b)
```

Definition at line 2 of file math.h.

5.10.1.2 MIN

```
#define MIN(  
    a,  
    b ) ((a) < (b)) ? (a) : (b)
```

Definition at line 1 of file math.h.

5.11 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/misc/safe.h File Reference

```
#include <stdlib.h>  
#include <err.h>  
#include <unistd.h>  
#include <string.h>  
#include <errno.h>
```

Include dependency graph for safe.h: This graph shows which files directly or indirectly include this file:

Functions

- int [safe_write](#) (int fd, const void *buf, ssize_t count)
Writes safely to a file descriptor.
- ssize_t [safe_read](#) (int fd, const void **buf, size_t *bufsize)
Reads safely in a file descriptor until '\r\n\r\n'.
- ssize_t [safe_fread](#) (void *buffer, const size_t size, const size_t n, FILE *file)
Calls 'fread' but safely !

5.11.1 Function Documentation

5.11.1.1 [safe_fread\(\)](#)

```

ssize_t safe_fread (
    void * buffer,
    const size_t size,
    const size_t n,
    FILE * file )

```

Calls 'fread' but safely !

Parameters

<i>buffer</i>	The buffer to write on
<i>size</i>	The size of 1 read element
<i>n</i>	The number of elements to read
<i>file</i>	The IO FILE

Returns

ssize_t, -1 if error or the number of read items

Definition at line 40 of file safe.c.

Here is the caller graph for this function:

5.11.1.2 [safe_read\(\)](#)

```

ssize_t safe_read (
    int fd,
    const void ** buf,
    size_t * bufsize )

```

Reads safely in a file descriptor until '\r\n\r\n'.

Parameters

<i>fd</i>	The file descriptor
<i>buf</i>	The buffer which contains the message

Returns

The number of byte the file 'fd', if -1 error

Definition at line 18 of file safe.c.

Here is the caller graph for this function:

5.11.1.3 safe_write()

```
int safe_write (
    int fd,
    const void * buf,
    ssize_t count )
```

Writes safely to a file descriptor.

Parameters

<i>fd</i>	The file descriptor
<i>buf</i>	The buffer to write
<i>count</i>	The number of byte to write in fd

Returns

Error code

Definition at line 4 of file safe.c.

Here is the caller graph for this function:

5.12 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/client.h File Reference

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

Include dependency graph for client.h: This graph shows which files directly or indirectly include this file:

Data Structures

- struct [Neighbour](#)
- struct [Node](#)

Macros

- `#define MAX_NEIGHBOURS 64`

Typedefs

- `typedef struct Neighbour Neighbour`
- `typedef struct Node Node`

Functions

- `Node * get_my_node ()`
Get the my node object.
- `int set_neighbour (char *hostname, int family)`
Sets a neighbour in the client.neighbours section.
- `int listen_to (size_t neighbour_id)`
Tries to connect to the peer-to-peer network via a node in the Node structure.
- `int ping_client (size_t neighbour_id)`
Pings the client side of 'neighbour_id' and deletes it from struct Node if there is no response.

5.12.1 Macro Definition Documentation

5.12.1.1 MAX_NEIGHBOURS

```
#define MAX_NEIGHBOURS 64
```

Definition at line 6 of file client.h.

5.12.2 Typedef Documentation

5.12.2.1 Neighbour

```
typedef struct Neighbour Neighbour
```

5.12.2.2 Node

```
typedef struct Node Node
```

5.12.3 Function Documentation

5.12.3.1 `get_my_node()`

```
Node* get_my_node ( )
```

Get the my node object.

Returns

Node*

Definition at line 5 of file client.c.

Here is the caller graph for this function:

5.12.3.2 `listen_to()`

```
int listen_to (
    size_t neighbour_id )
```

Tries to connect to the peer-to-peer network via a node in the [Node](#) structure.

Parameters

<i>neighbour_id</i>	The neighbour's index (in struct Node) to connect with
---------------------	---

Returns

socket FD or -1 if an error occurs

Definition at line 57 of file client.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.12.3.3 `ping_client()`

```
int ping_client (
    size_t neighbour_id )
```

Pings the client side of 'neighbour_id' and deletes it from struct [Node](#) if there is no response.

Parameters

<i>neighbour_id</i>	
---------------------	--

Returns

0 if success, -1 otherwise

5.12.3.4 set_neighbour()

```
int set_neighbour (
    char * hostname,
    int family )
```

Sets a neighbour in the client.neighbours section.

Returns

0 if success, -1 otherwise

Definition at line 14 of file client.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.13 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/get_data.h File Reference

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

Functions

- int [read_header](#) (int sockfd)
Waits a header in 'sockfd', reads it and processes it.
- int [fetch_client_list](#) (int neighbour_id)
Merges my neighbours list with the one sent by 'neighbour_id'.

5.13.1 Function Documentation**5.13.1.1 fetch_client_list()**

```
int fetch_client_list (
    int neighbour_id )
```

Merges my neighbours list with the one sent by 'neighbour_id'.

Parameters

<i>neighbour</i> ↔ _id	The id of the neighbour list to merge
---------------------------	---------------------------------------

Returns

0 if sucess, -1 otherwise

Definition at line 32 of file get_data.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.13.1.2 read_header()

```
int read_header (  
    int sockfd )
```

Waits a header in 'sockfd', reads it and processes it.

Parameters

<i>sockfd</i>	The sock FD
---------------	-------------

Returns

0 if sucess, -1 otherwise

Definition at line 86 of file get_data.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.14 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/network.h File Reference

```
#include <stdio.h>  
#include <stdlib.h>  
#include <unistd.h>  
#include <sys/un.h>  
#include <sys/types.h>  
#include <sys/socket.h>  
#include <netdb.h>  
#include <err.h>  
#include <string.h>  
#include <pthread.h>  
#include <arpa/inet.h>  
#include "misc/safe.h"  
#include "client.h"
```

Include dependency graph for network.h: This graph shows which files directly or indirectly include this file:

Macros

- `#define NB_HARD_CODED_ADDR 2`
- `#define STATIC_PORT "4242"`
- `#define HD_GET_CLIENT_LIST "GET CLIENT LIST\r\n\r\n"`
- `#define HD_SEND_CLIENT_LIST "SEND CLIENT LIST\n"`
- `#define HD_GET_BLOCKCHAIN "GET BLOCKCHAIN\r\n\r\n"`
- `#define HD_SEND_BLOCKCHAIN "SEND BLOCKCHAIN\n"`

Variables

- `const Neighbour HARD_CODED_ADDR []`

5.14.1 Macro Definition Documentation

5.14.1.1 HD_GET_BLOCKCHAIN

```
#define HD_GET_BLOCKCHAIN "GET BLOCKCHAIN\r\n\r\n"
```

Definition at line 25 of file network.h.

5.14.1.2 HD_GET_CLIENT_LIST

```
#define HD_GET_CLIENT_LIST "GET CLIENT LIST\r\n\r\n"
```

Definition at line 23 of file network.h.

5.14.1.3 HD_SEND_BLOCKCHAIN

```
#define HD_SEND_BLOCKCHAIN "SEND BLOCKCHAIN\n"
```

Definition at line 26 of file network.h.

5.14.1.4 HD_SEND_CLIENT_LIST

```
#define HD_SEND_CLIENT_LIST "SEND CLIENT LIST\n"
```

Definition at line 24 of file network.h.

5.14.1.5 NB_HARD_CODED_ADDR

```
#define NB_HARD_CODED_ADDR 2
```

Definition at line 17 of file network.h.

5.14.1.6 STATIC_PORT

```
#define STATIC_PORT "4242"
```

Definition at line 20 of file network.h.

5.14.2 Variable Documentation

5.14.2.1 HARD_CODED_ADDR

```
const Neighbour HARD_CODED_ADDR[ ]
```

Definition at line 4 of file network.c.

5.15 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/send_data.h File Reference

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

Functions

- int [send_client_list](#) (int sockfd)
Sends my client list to a node via 'sockfd'.

5.15.1 Function Documentation

5.15.1.1 send_client_list()

```
int send_client_list (  
    int sockfd )
```

Sends my client list to a node via 'sockfd'.

Parameters

<code>sockfd</code>	The sock FD
---------------------	-------------

Returns

0 if success, -1 otherwise

Definition at line 3 of file `send_data.c`.

Here is the call graph for this function: Here is the caller graph for this function:

5.16 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/server.h File Reference

```
#include <sys/socket.h>
#include "network.h"
#include "core/blockchain/block.h"
```

Include dependency graph for `server.h`: This graph shows which files directly or indirectly include this file:

Data Structures

- struct [client_connection](#)

Typedefs

- typedef struct [client_connection](#) [client_connection](#)

Functions

- int [init_server](#) ()
Launches a server instance, connected to the peer-to-peer network 'hostname'.
- int [send_block](#) ([Block](#) block, int sockfd)
Sends a block to a user via a socket FD.

5.16.1 Typedef Documentation**5.16.1.1 client_connection**

```
typedef struct client\_connection client\_connection
```

5.16.2 Function Documentation

5.16.2.1 init_server()

```
int init_server ( )
```

Launches a server instance, connected to the peer-to-peer network 'hostname'.

Returns

0 if success, -1 otherwise

Definition at line 30 of file server.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.16.2.2 send_block()

```
int send_block (
    Block block,
    int sockfd )
```

Sends a block to a user via a socket FD.

Parameters

<i>sockfd</i>	The socket FD
<i>block</i>	The block to send

Returns

int

5.17 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/ui/ui.h File Reference

```
#include <gtk/gtk.h>
#include <stdio.h>
#include <string.h>
#include <err.h>
#include <time.h>
#include "../cryptosystem/rsa.h"
#include "../cryptosystem/hash.h"
#include "../core/blockchain/wallet.h"
```

Include dependency graph for ui.h: This graph shows which files directly or indirectly include this file:

Functions

- int [setup](#) ()
Setups the gtk widgets for the GUI.
- gboolean [on_main_window_delete](#) (GtkWidget *widget, __attribute__((unused)) gpointer data)
Destroys the window when it is closed.
- void [on_main_window_destroy](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) gpointer data)
Quits GTK when the program ends.
- gboolean [on_transaction_button_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Will be used when the transaction function is ready.
- gboolean [on_pkey_button_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Hides the private key of the user, or shows it if it was already hidden.
- gboolean [on_invest_button1_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Opens the invest window.
- gboolean [on_invest_button2_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Resets the entry in the invest window and closes it, will later be used for the invest function.
- gboolean [on_recover_button1_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Opens the recover window.
- gboolean [on_recover_button2_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Resets the entry in the recover window and closes it, will later be used for the recover function.
- gboolean [on_add_contact_button1_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Opens the contact window.
- gboolean [add_contact](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
Adds a contact to the treeview if the entrys weren't empty, and closes the contact window.
- gboolean [on_create_key_but1_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
- gboolean [on_create_key_but2_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
- gboolean [on_connect_but_press](#) (GtkWidget *widget, GdkEventKey *event, gpointer user_data)
- void [add_contacts_from_file](#) (char *name, char *public_key)
- void [load_contacts_from_file](#) ()
- void [add_contact_to_combobox](#) (char *name)
- void [update_labels](#) ()
- void [add_transaction](#) (double amount, char *public_key, char *date)
- void [add_transaction_from_file](#) (double amount, char *public_key, char *date)
- void [load_transaction_from_file](#) ()
- char * [get_public_key_from_contacts](#) (const char *name)

5.17.1 Function Documentation

5.17.1.1 [add_contact\(\)](#)

```
gboolean add_contact (
    GtkWidget * widget,
    GdkEventKey * event,
    gpointer user_data )
```

Adds a contact to the treeview if the entrys weren't empty, and closes the contact window.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean Error code

5.17.1.2 add_contact_to_combobox()

```
void add_contact_to_combobox (  
    char * name )
```

Definition at line 366 of file ui.c.

Here is the caller graph for this function:

5.17.1.3 add_contacts_from_file()

```
void add_contacts_from_file (  
    char * name,  
    char * public_key )
```

Definition at line 374 of file ui.c.

Here is the caller graph for this function:

5.17.1.4 add_transaction()

```
void add_transaction (  
    double amount,  
    char * public_key,  
    char * date )
```

Definition at line 209 of file ui.c.

Here is the caller graph for this function:

5.17.1.5 add_transaction_from_file()

```
void add_transaction_from_file (  
    double amount,  
    char * public_key,  
    char * date )
```

Definition at line 228 of file ui.c.

Here is the caller graph for this function:

5.17.1.6 get_public_key_from_contacts()

```
char* get_public_key_from_contacts (
    const char * name )
```

Definition at line 405 of file ui.c.

Here is the caller graph for this function:

5.17.1.7 load_contacts_from_file()

```
void load_contacts_from_file ( )
```

Definition at line 383 of file ui.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.17.1.8 load_transaction_from_file()

```
void load_transaction_from_file ( )
```

5.17.1.9 on_add_contact_button1_press()

```
gboolean on_add_contact_button1_press (
    GtkWidget * widget,
    GdkEventKey * event,
    gpointer user_data )
```

Opens the contact window.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean Error code

5.17.1.10 on_connect_but_press()

```
gboolean on_connect_but_press (
    GtkWidget * widget,
```

```
GdkEventKey * event,  
gpointer user_data )
```

5.17.1.11 on_create_key_but1_press()

```
gboolean on_create_key_but1_press (  
    GtkWidget * widget,  
    GdkEventKey * event,  
    gpointer user_data )
```

5.17.1.12 on_create_key_but2_press()

```
gboolean on_create_key_but2_press (  
    GtkWidget * widget,  
    GdkEventKey * event,  
    gpointer user_data )
```

5.17.1.13 on_invest_button1_press()

```
gboolean on_invest_button1_press (  
    GtkWidget * widget,  
    GdkEventKey * event,  
    gpointer user_data )
```

Opens the invest window.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean

5.17.1.14 on_invest_button2_press()

```
gboolean on_invest_button2_press (  
    GtkWidget * widget,
```

```
GdkEventKey * event,  
gpointer user_data )
```

Resets the entry in the invest window and closes it, will later be used for the invest function.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean Error Code

5.17.1.15 on_main_window_delete()

```
gboolean on_main_window_delete (
    GtkWidget * widget,
    __attribute__((unused)) gpointer data )
```

Destroys the window when it is closed.

Parameters

<i>widget</i>	The main window of the GUI
---------------	----------------------------

Returns

gboolean Error code

Definition at line 159 of file ui.c.

5.17.1.16 on_main_window_destroy()

```
void on_main_window_destroy (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) gpointer data )
```

Quits GTK when the program ends.

5.17.1.17 on_pkey_button_press()

```
gboolean on_pkey_button_press (
    GtkWidget * widget,
    GdkEventKey * event,
    gpointer user_data )
```

Hides the private key of the user, or shows it if it was already hidden.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean Error code

5.17.1.18 on_recover_button1_press()

```
gboolean on_recover_button1_press (
    GtkWidget * widget,
    GdkEventKey * event,
    gpointer user_data )
```

Opens the recover window.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean Error code

5.17.1.19 on_recover_button2_press()

```
gboolean on_recover_button2_press (
    GtkWidget * widget,
    GdkEventKey * event,
    gpointer user_data )
```

Resets the entry in the recover window and closes it, will later be used for the recover function.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean Error code

5.17.1.20 on_transaction_button_press()

```
gboolean on_transaction_button_press (
    GtkWidget * widget,
    GdkEventKey * event,
    gpointer user_data )
```

Will be used when the transaction function is ready.

Parameters

<i>widget</i>	unused
<i>event</i>	unused
<i>user_data</i>	unused

Returns

gboolean Error code

5.17.1.21 setup()

```
int setup ( )
```

Setups the gtk widgets for the GUI.

Returns

int Returns 1 if there is an error, 0 otherwise

Definition at line 57 of file ui.c.

Here is the caller graph for this function:

5.17.1.22 update_labels()

```
void update_labels ( )
```

Definition at line 501 of file ui.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.18 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-[Cryptocurrency/README.md](#) File Reference

5.19 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-[Cryptocurrency/src/client.c](#) File Reference

```
#include <signal.h>
#include <stdlib.h>
#include "network/network.h"
#include "network/client.h"
#include "network/server.h"
#include "network/send_data.h"
#include "network/get_data.h"
Include dependency graph for client.c:
```

Functions

- int [main](#) ()

5.19.1 Function Documentation

5.19.1.1 main()

```
int main ( )
```

Definition at line 10 of file client.c.

Here is the call graph for this function:

5.20 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-[Cryptocurrency/src/network/client.c](#) File Reference

```
#include "network/client.h"
#include "network/server.h"
#include "network/network.h"
Include dependency graph for client.c:
```

Functions

- `Node * get_my_node ()`
Get the my node object.
- `int set_neighbour (char *hostname, int family)`
Sets a neighbour in the client.neighbours section.
- `int listen_to (size_t neighbour_id)`
Tries to connect to the peer-to-peer network via a node in the [Node](#) structure.

5.20.1 Function Documentation

5.20.1.1 `get_my_node()`

```
Node* get_my_node ( )
```

Get the my node object.

Returns

Node*

Definition at line 5 of file client.c.

Here is the caller graph for this function:

5.20.1.2 `listen_to()`

```
int listen_to (
    size_t neighbour_id )
```

Tries to connect to the peer-to-peer network via a node in the [Node](#) structure.

Parameters

<code>neighbour↔ _id</code>	The neighbour's index (in struct Node) to connect with
---------------------------------	---

Returns

socket FD or -1 if an error occurs

Definition at line 57 of file client.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.20.1.3 set_neighbour()

```
int set_neighbour (
    char * hostname,
    int family )
```

Sets a neighbour in the client.neighbours section.

Returns

0 if success, -1 otherwise

Definition at line 14 of file client.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/blockchain/block.c File Reference

```
#include "core/blockchain/block.h"
#include "cryptosystem/signature.h"
#include <sys/stat.h>
#include <unistd.h>
#include <err.h>
#include <errno.h>
#include <openssl/rsa.h>
#include <openssl/crypto.h>
#include <fcntl.h>
#include <sys/types.h>
```

Include dependency graph for block.c:

Functions

- [ChunkBlockchain](#) * [get_blockchain](#) (size_t nb_chunk)
Loads a blockchain object with a padding of 'nb_chunk'.
- void [write_block_file](#) ([Block](#) block)
Writes a block struct in a file.
- void [convert_data_to_transactiondata](#) ([TransactionData](#) *transactiondata, FILE *blockfile)
- void [convert_data_to_transaction](#) ([Transaction](#) *transaction, FILE *blockfile)
- void [convert_data_to_blockdata](#) ([BlockData](#) *blockdata, FILE *blockfile)
- void [convert_data_to_block](#) ([Block](#) *block, FILE *blockfile)
- [Block](#) * [get_block](#) (size_t block_height)
- void [free_block](#) ([Block](#) *block)
Free a block struct.
- [Block](#) * [get_next_block](#) ([Block](#) *block)
For a block of height h, returns the block of height h+1
- [Block](#) * [get_prev_block](#) ([Block](#) *block)
For a block of height h, return the block of height h-1

5.21.1 Function Documentation

5.21.1.1 convert_data_to_block()

```
void convert_data_to_block (
    Block * block,
    FILE * blockfile )
```

Definition at line 142 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21.1.2 convert_data_to_blockdata()

```
void convert_data_to_blockdata (
    BlockData * blockdata,
    FILE * blockfile )
```

Definition at line 116 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21.1.3 convert_data_to_transaction()

```
void convert_data_to_transaction (
    Transaction * transaction,
    FILE * blockfile )
```

Definition at line 106 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21.1.4 convert_data_to_transactiondata()

```
void convert_data_to_transactiondata (
    TransactionData * transactiondata,
    FILE * blockfile )
```

Definition at line 69 of file block.c.

Here is the caller graph for this function:

5.21.1.5 free_block()

```
void free_block (
    Block * block )
```

Free a block struct.

Parameters

<i>block</i>	The block to free
--------------	-------------------

Definition at line 168 of file block.c.

Here is the caller graph for this function:

5.21.1.6 `get_block()`

```
Block* get_block (
    size_t block_height )
```

Definition at line 150 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21.1.7 `get_blockchain()`

```
ChunkBlockchain* get_blockchain (
    size_t nb_chunk )
```

Loads a blockchain object with a padding of 'nb_chunk'.

Parameters

<i>nb_chunk</i>	The chunk nb, if 0 : return the current blockchain object without modification
-----------------	--

Returns

ChunkBlockchain*, NULL if the [ChunkBlockchain](#) is empty after switching

Definition at line 12 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21.1.8 `get_next_block()`

```
Block* get_next_block (
    Block * block )
```

For a block of height h , returns the block of height $h+1$

Parameters

<i>block</i>	The base block
--------------	----------------

Returns

The next Block*

Definition at line 184 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21.1.9 get_prev_block()

```
Block* get_prev_block (  
    Block * block )
```

For a block of height h , return the block of height $h-1$

Parameters

<i>block</i>	The base block
--------------	----------------

Returns

The next Block*

Definition at line 194 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.21.1.10 write_block_file()

```
void write_block_file (  
    Block block )
```

Writes a block struct in a file.

Parameters

<i>block</i>	The block to write
--------------	--------------------

Definition at line 51 of file block.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.22 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/blockchain/wallet.c File Reference

```
#include <time.h>  
#include "core/blockchain/wallet.h"
```

```
#include "cryptosystem/rsa.h"
#include "core/blockchain/transaction.h"
Include dependency graph for wallet.c:
```

Functions

- [Wallet](#) * [get_my_wallet](#) ()
Get my wallet object.
- int [create_account](#) ()
Creates an account in local and broadcasts the creation to the network.

5.22.1 Function Documentation

5.22.1.1 [create_account\(\)](#)

```
int create_account ( )
```

Creates an account in local and broadcasts the creation to the network.

Returns

0 if the broadcast succeeds, otherwise 1

Definition at line 19 of file wallet.c.

Here is the call graph for this function:

5.22.1.2 [get_my_wallet\(\)](#)

```
Wallet* get_my_wallet ( )
```

Get my wallet object.

Returns

[Wallet](#)

Definition at line 7 of file wallet.c.

Here is the caller graph for this function:

5.23 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/validation/validations.c File Reference

```
#include "core/validation/validations.h"
#include "core/blockchain/block.h"
#include "cryptosystem/signature.h"
#include "cryptosystem/rsa.h"
#include "cryptosystem/hash.h"
#include "misc/math.h"
#include "misc/files.h"
#include "misc/safe.h"
#include <string.h>
#include <openssl/bio.h>
Include dependency graph for validations.c:
```

Macros

- #define [NB_RSA_CHUNK](#) 2048 / 64
- #define [MAX_VALIDATORS_PER_BLOCK](#) 10000

Functions

- uint16_t [define_nb_validators](#) (size_t n)
- RSA ** [get_next_committee](#) (size_t *nb_validators)
Get the 'next block' validators RSA public keys.

5.23.1 Macro Definition Documentation

5.23.1.1 MAX_VALIDATORS_PER_BLOCK

```
#define MAX_VALIDATORS_PER_BLOCK 10000
```

Definition at line 14 of file validations.c.

5.23.1.2 NB_RSA_CHUNK

```
#define NB_RSA_CHUNK 2048 / 64
```

Definition at line 13 of file validations.c.

5.23.2 Function Documentation

5.23.2.1 define_nb_validators()

```
uint16_t define_nb_validators (
    size_t n )
```

Definition at line 16 of file validations.c.

Here is the caller graph for this function:

5.23.2.2 get_next_committee()

```
RSA** get_next_committee (
    size_t * nb_validators )
```

Get the 'next block' validators RSA public keys.

Parameters

<i>nb_validators</i>	return value, the number of selected validators
----------------------	---

See also

The 'next block' is referring to block after the last block available OFFLINE

Returns

[*RSA]

Definition at line 31 of file validations.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.24 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/src/cryptosystem/hash.c File Reference

```
#include <openssl/sha.h>
#include "cryptosystem/hash.h"
#include "core/blockchain/block.h"
#include "cryptosystem/signature.h"
Include dependency graph for hash.c:
```

Functions

- char * [sha384_data](#) (void *data, size_t len_data)
Apply the SHA384 algorithm on a 'data' of size 'len_data'.
- char * [hash_block_transactions](#) ([Block](#) *block)
Apply the SHA384 to all block transactions.

5.24.1 Function Documentation

5.24.1.1 [hash_block_transactions\(\)](#)

```
char* hash_block_transactions (  
    Block * block )
```

Apply the SHA384 to all block transactions.

Parameters

<i>block</i>	The block to deal with
--------------	------------------------

Returns

sha384[SHA384_DIGEST_LENGTH]

Definition at line 24 of file hash.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.24.1.2 [sha384_data\(\)](#)

```
char* sha384_data (  
    void * data,  
    size_t len_data )
```

Apply the SHA384 algorithm on a 'data' of size 'len_data'.

Parameters

<i>data</i>	The buffer to hash
<i>len_data</i>	The length of the buffer

Returns

char[97] (on heap)

Definition at line 6 of file hash.c.

Here is the caller graph for this function:

5.25 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/cryptosystem/rsa.c File Reference

```
#include "cryptosystem/rsa.h"
#include "core/blockchain/wallet.h"
#include <stdio.h>
#include <stdlib.h>
#include <openssl/rsa.h>
#include <openssl/pem.h>
#include <time.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <unistd.h>
#include <err.h>
#include <errno.h>
#include <openssl/bn.h>
#include <openssl/crypto.h>
#include <string.h>
Include dependency graph for rsa.c:
```

Macros

- #define [RSA_NUM_E](#) 3

Functions

- void [get_keys](#) ()
Get the keys object.

5.25.1 Macro Definition Documentation

5.25.1.1 [RSA_NUM_E](#)

```
#define RSA_NUM_E 3
```

Definition at line 16 of file rsa.c.

5.25.2 Function Documentation

5.25.2.1 get_keys()

```
void get_keys ( )
```

Get the keys object.

Definition at line 21 of file rsa.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/cryptosystem/signature.c File Reference

```
#include "core/blockchain/block.h"
#include "cryptosystem/signature.h"
#include "cryptosystem/hash.h"
#include <openssl/bio.h>
#include <openssl/rsa.h>
#include <string.h>
#include <stdio.h>
#include <unistd.h>
```

Include dependency graph for signature.c:

Functions

- char * [sign_message](#) (char *data, size_t len_data, size_t *signature_len)
encrypt(SHA284(msg,len_data),priv_key)
- int [verify_signature](#) (void *data, size_t data_len, char *signature, size_t signature_len, RSA *pub_key)
Apply the SHA384 algorithm on a 'data' of size 'len_data' and verifies if SHA384(data, len_data) == 'signature'.
- void [write_transactiondata](#) (TransactionData *transaction, int fd)
- void [write_transaction](#) (Transaction *transaction, int fd)
- void [get_transaction_data](#) (Transaction *trans, char **buff, size_t *index)
*Convert transactions to char * buffer.*
- char * [get_blockdata_data](#) (Block *block, size_t *size)
Get the blockdata data object.
- void [write_blockdata](#) (BlockData blockdata, int fd)
Writes blockdata in a file.
- void [write_block](#) (Block block, int fd)
Writes a block in a file.
- int [verify_block_signature](#) (Block block)
Verifies if a block signature is valid.
- int [verify_transaction_signature](#) (Transaction transaction)
Verifies if a transaction signature is valid.
- void [sign_block](#) (Block *block)
Signs a block.
- void [sign_transaction](#) (Transaction *transaction)
Sign a transaction.
- void [sign_block_transactions](#) (Block *block)
Signs transactions of a block.

5.26.1 Function Documentation

5.26.1.1 `get_blockdata_data()`

```
char* get_blockdata_data (
    Block * block,
    size_t * size )
```

Get the blockdata data object.

Parameters

<i>block</i>	The block
<i>size</i>	The size of the block

Returns

char*

Definition at line 144 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26.1.2 `get_transaction_data()`

```
void get_transaction_data (
    Transaction * trans,
    char ** buff,
    size_t * size )
```

Convert transactions to char * buffer.

Parameters

<i>transactions</i>	The transaction array
<i>buff</i>	The buffer that receives the transactions
<i>size</i>	The number of transactions in the array

Returns

The buffer allocated (Must be freed)

Definition at line 93 of file signature.c.

Here is the caller graph for this function:

5.26.1.3 sign_block()

```
void sign_block (
    Block * block )
```

Signs a block.

Parameters

<i>block</i>	The block to sign
--------------	-------------------

Definition at line 233 of file signature.c.

Here is the call graph for this function:

5.26.1.4 sign_block_transactions()

```
void sign_block_transactions (
    Block * block )
```

Signs transactions of a block.

Parameters

<i>block</i>	The block to sign
--------------	-------------------

Definition at line 258 of file signature.c.

Here is the call graph for this function:

5.26.1.5 sign_message()

```
char* sign_message (
    char * data,
    size_t len_data,
    size_t * signature_len )
```

encrypt(SHA284(msg,len_data),priv_key)

Parameters

<i>data</i>	The data to sign
<i>len_data</i>	The length of the data
<i>signature_len</i>	The length of the data signature

Returns

char*

Definition at line 10 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26.1.6 sign_transaction()

```
void sign_transaction (
    Transaction * transaction )
```

Sign a transaction.

Parameters

<i>transaction</i>	The transaction to sign
--------------------	-------------------------

Definition at line 245 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26.1.7 verify_block_signature()

```
int verify_block_signature (
    Block block )
```

Verifies if a block signature is valid.

Parameters

<i>block</i>	The block to verify
--------------	---------------------

Returns

1 if valid, 0 otherwise

Definition at line 206 of file signature.c.

Here is the call graph for this function:

5.26.1.8 verify_signature()

```
int verify_signature (
    void * data,
    size_t data_len,
    char * signature,
    size_t signature_len,
    RSA * pub_key )
```

Apply the SHA384 algorithm on a 'data' of size 'len_data' and verifies if SHA384(data, len_data) == 'signature'.

Parameters

<i>data</i>	The buffer to verify
<i>data_len</i>	The length of the buffer
<i>signature</i>	The signature to compare with SHA384(data, len_data)
<i>signature_len</i>	The length of the signature
<i>pub_key</i>	The RSA public key used for the decryption

Returns

int

Definition at line 31 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26.1.9 verify_transaction_signature()

```
int verify_transaction_signature (  
    Transaction transaction )
```

Verifies if a transaction signature is valid.

Parameters

<i>transaction</i>	The transaction to verify
--------------------	---------------------------

Returns

1 if valid, 0 otherwise

Definition at line 219 of file signature.c.

Here is the call graph for this function:

5.26.1.10 write_block()

```
void write_block (  
    Block block,  
    int fd )
```

Writes a block in a file.

Parameters

<i>block</i>	The block to write
<i>fd</i>	the file descriptor of the file in which the block is written

Definition at line 199 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26.1.11 write_blockdata()

```
void write_blockdata (
    BlockData blockdata,
    int fd )
```

Writes blockdata in a file.

Parameters

<i>blockdata</i>	The blockdata to write
<i>fd</i>	The file descriptor of the file in which the blockdata is written

Definition at line 174 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26.1.12 write_transaction()

```
void write_transaction (
    Transaction * transaction,
    int fd )
```

Definition at line 86 of file signature.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.26.1.13 write_transactiondata()

```
void write_transactiondata (
    TransactionData * transaction,
    int fd )
```

Definition at line 50 of file signature.c.

Here is the caller graph for this function:

5.27 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/gui.c File Reference

```
#include "ui/ui.h"
```

Include dependency graph for gui.c:

Functions

- int [main](#) (int argc, char **argv)

5.27.1 Function Documentation

5.27.1.1 main()

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

Definition at line 3 of file gui.c.

Here is the call graph for this function:

5.28 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/misc/files.c File Reference

```
#include "misc/files.h"
#include <dirent.h>
#include <string.h>
#include <stdlib.h>
Include dependency graph for files.c:
```

Macros

- [#define _GNU_SOURCE](#)

Functions

- char * [last_file_in_folder](#) (char folder_path[])
Return the last file (reverse alphabetical order) of a folder path.

5.28.1 Macro Definition Documentation

5.28.1.1 _GNU_SOURCE

```
#define _GNU_SOURCE
```

Definition at line 1 of file files.c.

5.28.2 Function Documentation

5.28.2.1 last_file_in_folder()

```
char* last_file_in_folder (
    char folder_path[] )
```

Return the last file (reverse alphabetical order) of a folder path.

Parameters

<i>folder_path</i>	The path of the folder
--------------------	------------------------

Returns

char*, return NULL if any error, must be freed !

Definition at line 7 of file files.c.

Here is the caller graph for this function:

5.29 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/src/misc/safe.c File Reference

```
#include <stdio.h>
#include "misc/safe.h"
Include dependency graph for safe.c:
```

Functions

- int [safe_write](#) (int fd, const void *buf, ssize_t count)
Writes safely to a file descriptor.
- ssize_t [safe_read](#) (int fd, const void **buf, size_t *bufsize)
Reads safely in a file descriptor until '\r\n\r\n'.
- ssize_t [safe_fread](#) (void *buffer, const size_t size, const size_t n, FILE *file)
Calls 'fread' but safely !

5.29.1 Function Documentation

5.29.1.1 `safe_fread()`

```
ssize_t safe_fread (
    void * buffer,
    const size_t size,
    const size_t n,
    FILE * file )
```

Calls 'fread' but safely !

Parameters

<i>buffer</i>	The buffer to write on
<i>size</i>	The size of 1 read element
<i>n</i>	The number of elements to read
<i>file</i>	The IO FILE

Returns

ssize_t, -1 if error or the number of read items

Definition at line 40 of file safe.c.

Here is the caller graph for this function:

5.29.1.2 safe_read()

```
ssize_t safe_read (  
    int fd,  
    const void ** buf,  
    size_t * bufsize )
```

Reads safely in a file descriptor until '\r\n\r\n'.

Parameters

<i>fd</i>	The file descriptor
<i>buf</i>	The buffer which contains the message

Returns

The number of byte the file 'fd', if -1 error

Definition at line 18 of file safe.c.

Here is the caller graph for this function:

5.29.1.3 safe_write()

```
int safe_write (  
    int fd,  
    const void * buf,  
    ssize_t count )
```

Writes safely to a file descriptor.

Parameters

<i>fd</i>	The file descriptor
<i>buf</i>	The buffer to write
<i>count</i>	The number of byte to write in fd

Returns

Error code

Definition at line 4 of file safe.c.

Here is the caller graph for this function:

5.30 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/network/get_data.c File Reference

```
#include "network/client.h"
#include "network/server.h"
#include "network/network.h"
#include "network/send_data.h"
#include "network/get_data.h"
Include dependency graph for get_data.c:
```

Functions

- int [process_header](#) (char *header, int sockfd)
- int [fetch_client_list](#) (int neighbour_id)
Merges my neighbours list with the one sent by 'neighbour_id'.
- int [read_header](#) (int sockfd)
Waits a header in 'sockfd', reads it and processes it.

5.30.1 Function Documentation

5.30.1.1 [fetch_client_list](#)()

```
int fetch_client_list (
    int neighbour_id )
```

Merges my neighbours list with the one sent by 'neighbour_id'.

Parameters

<i>neighbour_id</i>	The id of the neighbour list to merge
---------------------	---------------------------------------

Returns

0 if success, -1 otherwise

Definition at line 32 of file `get_data.c`.

Here is the call graph for this function: Here is the caller graph for this function:

5.30.1.2 `process_header()`

```
int process_header (
    char * header,
    int sockfd )
```

Definition at line 7 of file `get_data.c`.

Here is the call graph for this function: Here is the caller graph for this function:

5.30.1.3 `read_header()`

```
int read_header (
    int sockfd )
```

Waits a header in 'sockfd', reads it and processes it.

Parameters

<code>sockfd</code>	The sock FD
---------------------	-------------

Returns

0 if success, -1 otherwise

Definition at line 86 of file `get_data.c`.

Here is the call graph for this function: Here is the caller graph for this function:

5.31 `/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/network/network.c` File Reference

```
#include "network/client.h"
#include <arpa/inet.h>
Include dependency graph for network.c:
```

Variables

- const `Neighbour HARD_CODED_ADDR []`

5.31.1 Variable Documentation

5.31.1.1 HARD_CODED_ADDR

```
const Neighbour HARD_CODED_ADDR[ ]
```

Initial value:

```
=  
{  
    {AF_INET, "34.72.117.116", 0, 0},  
    {AF_INET, "127.0.0.1", 0, 0}  
}
```

Definition at line 4 of file network.c.

5.32 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/network/send_data.c File Reference

```
#include "network/network.h"  
Include dependency graph for send_data.c:
```

Functions

- int [send_client_list](#) (int sockfd)
Sends my client list to a node via 'sockfd'.

5.32.1 Function Documentation

5.32.1.1 send_client_list()

```
int send_client_list (  
    int sockfd )
```

Sends my client list to a node via 'sockfd'.

Parameters

<i>sockfd</i>	The sock FD
---------------	-------------

Returns

0 if success, -1 otherwise

Definition at line 3 of file send_data.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.33 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/network/server.c File Reference

```
#include "network/server.h"
#include "network/client.h"
#include "network/get_data.h"
#include "network/network.h"
#include "misc/safe.h"
Include dependency graph for server.c:
```

Functions

- void * [accept_connection](#) (void *arg)
- int [init_server](#) ()

Launches a server instance, connected to the peer-to-peer network 'hostname'.

5.33.1 Function Documentation**5.33.1.1 accept_connection()**

```
void* accept_connection (
    void * arg )
```

Definition at line 7 of file server.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.33.1.2 init_server()

```
int init_server ( )
```

Launches a server instance, connected to the peer-to-peer network 'hostname'.

Returns

0 if success, -1 otherwise

Definition at line 30 of file server.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.34 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/server.c File Reference

```
#include "network/server.h"
#include "network/client.h"
#include "cryptosystem/signature.h"
#include "core/blockchain/block.h"
#include <time.h>
Include dependency graph for server.c:
```

Functions

- int [main](#) ()

5.34.1 Function Documentation

5.34.1.1 main()

```
int main ( )
```

Definition at line 7 of file server.c.

Here is the call graph for this function:

5.35 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/sign.c File Reference

```
#include "network/network.h"
#include "network/client.h"
#include "network/server.h"
#include "network/send_data.h"
#include "network/get_data.h"
#include "cryptosystem/signature.h"
#include "cryptosystem/rsa.h"
#include "cryptosystem/hash.h"
Include dependency graph for sign.c:
```

Functions

- int [main](#) ()

5.35.1 Function Documentation

5.35.1.1 main()

```
int main ( )
```

Definition at line 10 of file sign.c.

Here is the call graph for this function:

5.36 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/ui/ui.c File Reference

```
#include "ui/ui.h"
```

Include dependency graph for ui.c:

Functions

- int [setup](#) ()
Setups the gtk widgets for the GUI.
- gboolean [on_main_window_delete](#) (GtkWidget *widget, __attribute__((unused)) gpointer data)
Destroys the window when it is closed.
- void [on_main_window_destroy](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) gpointer data)
- gboolean [on_transaction_button_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- void [add_transaction](#) (double amount, char *public_key, char *date)
- void [add_transaction_from_file](#) (double amount, char *public_key, char *date)
- void [load_transactions_from_file](#) ()
- gboolean [on_pkey_button_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [on_invest_button1_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [on_invest_button2_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [on_recover_button1_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [on_recover_button2_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [on_add_contact_button1_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [add_contact](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- void [add_contact_to_combobox](#) (char *name)
- void [add_contacts_from_file](#) (char *name, char *public_key)
- void [load_contacts_from_file](#) ()

- char * [get_public_key_from_contacts](#) (const char *name)
- gboolean [on_create_key_but1_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [on_create_key_but2_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- gboolean [on_connect_but_press](#) (__attribute__((unused)) GtkWidget *widget, __attribute__((unused)) GdkEventKey *event, __attribute__((unused)) gpointer user_data)
- void [update_labels](#) ()

Variables

- GtkWidget * [balance_1](#)
- GtkWidget * [balance_2](#)
- GtkWidget * [private_key_label](#)
- GtkWidget * [stake_label1](#)
- GtkWidget * [stake_label2](#)
- GtkWidget * [stake_label3](#)
- GtkWidget * [password_error_label](#)
- GtkWidget * [transa_amount](#)
- GtkWidget * [recipient_key](#)
- GtkWidget * [invest_entry](#)
- GtkWidget * [recover_entry](#)
- GtkWidget * [name_entry_con](#)
- GtkWidget * [public_key_entry_con](#)
- GtkWidget * [password_entry1](#)
- GtkWidget * [password_entry2](#)
- GtkWidget * [tv_con](#)
- GtkWidget * [ts_con](#)
- GtkWidget * [cx1_con](#)
- GtkWidget * [cx2_con](#)
- GtkWidget * [cr1_con](#)
- GtkWidget * [cr2_con](#)
- GtkWidget * [tv_th](#)
- GtkWidget * [ts_th](#)
- GtkWidget * [cx1_th](#)
- GtkWidget * [cx2_th](#)
- GtkWidget * [cx3_th](#)
- GtkWidget * [cr1_th](#)
- GtkWidget * [cr2_th](#)
- GtkWidget * [cr3_th](#)
- GtkWidget * [contacts_combo](#)
- GtkWidget * [ls_combo](#)
- GtkWidget * [cr1_combo](#)

5.36.1 Function Documentation

5.36.1.1 `add_contact()`

```
gboolean add_contact (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 337 of file `ui.c`.

5.36.1.2 `add_contact_to_combobox()`

```
void add_contact_to_combobox (
    char * name )
```

Definition at line 366 of file `ui.c`.

Here is the caller graph for this function:

5.36.1.3 `add_contacts_from_file()`

```
void add_contacts_from_file (
    char * name,
    char * public_key )
```

Definition at line 374 of file `ui.c`.

Here is the caller graph for this function:

5.36.1.4 `add_transaction()`

```
void add_transaction (
    double amount,
    char * public_key,
    char * date )
```

Definition at line 209 of file `ui.c`.

Here is the caller graph for this function:

5.36.1.5 `add_transaction_from_file()`

```
void add_transaction_from_file (
    double amount,
    char * public_key,
    char * date )
```

Definition at line 228 of file `ui.c`.

Here is the caller graph for this function:

5.36.1.6 get_public_key_from_contacts()

```
char* get_public_key_from_contacts (
    const char * name )
```

Definition at line 405 of file ui.c.

Here is the caller graph for this function:

5.36.1.7 load_contacts_from_file()

```
void load_contacts_from_file ( )
```

Definition at line 383 of file ui.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.36.1.8 load_transactions_from_file()

```
void load_transactions_from_file ( )
```

Definition at line 238 of file ui.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.36.1.9 on_add_contact_button1_press()

```
gboolean on_add_contact_button1_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 328 of file ui.c.

5.36.1.10 on_connect_but_press()

```
gboolean on_connect_but_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 466 of file ui.c.

Here is the call graph for this function:

5.36.1.11 on_create_key_but1_press()

```
gboolean on_create_key_but1_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 436 of file ui.c.

5.36.1.12 on_create_key_but2_press()

```
gboolean on_create_key_but2_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 445 of file ui.c.

Here is the call graph for this function:

5.36.1.13 on_invest_button1_press()

```
gboolean on_invest_button1_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 289 of file ui.c.

5.36.1.14 on_invest_button2_press()

```
gboolean on_invest_button2_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 298 of file ui.c.

5.36.1.15 on_main_window_delete()

```
gboolean on_main_window_delete (
    GtkWidget * widget,
    __attribute__((unused)) gpointer data )
```

Destroys the window when it is closed.

Parameters

<i>widget</i>	The main window of the GUI
---------------	----------------------------

Returns

gboolean Error code

Definition at line 159 of file ui.c.

5.36.1.16 on_main_window_destroy()

```
void on_main_window_destroy (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) gpointer data )
```

Definition at line 168 of file ui.c.

5.36.1.17 on_pkey_button_press()

```
gboolean on_pkey_button_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 271 of file ui.c.

5.36.1.18 on_recover_button1_press()

```
gboolean on_recover_button1_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 308 of file ui.c.

5.36.1.19 on_recover_button2_press()

```
gboolean on_recover_button2_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 317 of file ui.c.

5.36.1.20 on_transaction_button_press()

```
gboolean on_transaction_button_press (
    __attribute__((unused)) GtkWidget * widget,
    __attribute__((unused)) GdkEventKey * event,
    __attribute__((unused)) gpointer user_data )
```

Definition at line 175 of file ui.c.

Here is the call graph for this function:

5.36.1.21 setup()

```
int setup ( )
```

Setups the gtk widgets for the GUI.

Returns

int Returns 1 if there is an error, 0 otherwise

Definition at line 57 of file ui.c.

Here is the caller graph for this function:

5.36.1.22 update_labels()

```
void update_labels ( )
```

Definition at line 501 of file ui.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.36.2 Variable Documentation

5.36.2.1 balance_1

```
GtkLabel* balance_1
```

Definition at line 23 of file ui.c.

5.36.2.2 balance_2

`GtkLabel* balance_2`

Definition at line 24 of file ui.c.

5.36.2.3 contacts_combo

`GtkComboBox* contacts_combo`

Definition at line 52 of file ui.c.

5.36.2.4 cr1_combo

`GtkCellRenderer* cr1_combo`

Definition at line 54 of file ui.c.

5.36.2.5 cr1_con

`GtkCellRenderer* cr1_con`

Definition at line 42 of file ui.c.

5.36.2.6 cr1_th

`GtkCellRenderer* cr1_th`

Definition at line 49 of file ui.c.

5.36.2.7 cr2_con

`GtkCellRenderer* cr2_con`

Definition at line 43 of file ui.c.

5.36.2.8 cr2_th

```
GtkCellRenderer* cr2_th
```

Definition at line 50 of file ui.c.

5.36.2.9 cr3_th

```
GtkCellRenderer* cr3_th
```

Definition at line 51 of file ui.c.

5.36.2.10 cx1_con

```
GtkTreeViewColumn* cx1_con
```

Definition at line 40 of file ui.c.

5.36.2.11 cx1_th

```
GtkTreeViewColumn* cx1_th
```

Definition at line 46 of file ui.c.

5.36.2.12 cx2_con

```
GtkTreeViewColumn* cx2_con
```

Definition at line 41 of file ui.c.

5.36.2.13 cx2_th

```
GtkTreeViewColumn* cx2_th
```

Definition at line 47 of file ui.c.

5.36.2.14 cx3_th

`GtkTreeViewColumn* cx3_th`

Definition at line 48 of file ui.c.

5.36.2.15 invest_entry

`GtkEntry* invest_entry`

Definition at line 32 of file ui.c.

5.36.2.16 ls_combo

`GtkListStore* ls_combo`

Definition at line 53 of file ui.c.

5.36.2.17 name_entry_con

`GtkEntry* name_entry_con`

Definition at line 34 of file ui.c.

5.36.2.18 password_entry1

`GtkEntry* password_entry1`

Definition at line 36 of file ui.c.

5.36.2.19 password_entry2

`GtkEntry* password_entry2`

Definition at line 37 of file ui.c.

5.36.2.20 password_error_label

```
GtkLabel* password_error_label
```

Definition at line 29 of file ui.c.

5.36.2.21 private_key_label

```
GtkLabel* private_key_label
```

Definition at line 25 of file ui.c.

5.36.2.22 public_key_entry_con

```
GtkEntry* public_key_entry_con
```

Definition at line 35 of file ui.c.

5.36.2.23 recipient_key

```
GtkEntry* recipient_key
```

Definition at line 31 of file ui.c.

5.36.2.24 recover_entry

```
GtkEntry* recover_entry
```

Definition at line 33 of file ui.c.

5.36.2.25 stake_label1

```
GtkLabel* stake_label1
```

Definition at line 26 of file ui.c.

5.36.2.26 stake_label2

```
GtkLabel* stake_label2
```

Definition at line 27 of file ui.c.

5.36.2.27 stake_label3

```
GtkLabel* stake_label3
```

Definition at line 28 of file ui.c.

5.36.2.28 transa_amount

```
GtkEntry* transa_amount
```

Definition at line 30 of file ui.c.

5.36.2.29 ts_con

```
GtkTreeStore* ts_con
```

Definition at line 39 of file ui.c.

5.36.2.30 ts_th

```
GtkTreeStore* ts_th
```

Definition at line 45 of file ui.c.

5.36.2.31 tv_con

```
GtkTreeView* tv_con
```

Definition at line 38 of file ui.c.

5.36.2.32 tv_th

```
GtkTreeView* tv_th
```

Definition at line 44 of file ui.c.

5.37 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/gen/GEN_blockchain_files.c File Reference

```
#include "tests_macros.h"
#include "core/blockchain/block.h"
#include "core/blockchain/transaction.h"
```

Include dependency graph for GEN_blockchain_files.c: This graph shows which files directly or indirectly include this file:

Functions

- void * [rand_data](#) (size_t size)
- void [gen_blockchain](#) (size_t nb_blocks)

5.37.1 Function Documentation

5.37.1.1 gen_blockchain()

```
void gen_blockchain (
    size_t nb_blocks )
```

Definition at line 20 of file GEN_blockchain_files.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.37.1.2 rand_data()

```
void* rand_data (
    size_t size )
```

Definition at line 5 of file GEN_blockchain_files.c.

Here is the caller graph for this function:

5.38 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/gen/GEN_validators_file.c File Reference

```
#include <stdio.h>
#include <openssl/rsa.h>
#include <openssl/pem.h>
#include <string.h>
#include <time.h>
#include <stdlib.h>
#include <math.h>
#include "cryptosystem/rsa.h"
```

Include dependency graph for GEN_validators_file.c: This graph shows which files directly or indirectly include this file:

Macros

- #define [NB_FAKE_VALIDATORS](#) 10
- #define [str](#)(x) #x

Functions

- void [gen_validators_file](#) (char path[])
Generate a mock validators states file.

5.38.1 Macro Definition Documentation

5.38.1.1 NB_FAKE_VALIDATORS

```
#define NB_FAKE_VALIDATORS 10
```

Definition at line 11 of file GEN_validators_file.c.

5.38.1.2 str

```
#define str(
    x ) #x
```

Definition at line 12 of file GEN_validators_file.c.

5.38.2 Function Documentation

5.38.2.1 gen_validators_file()

```
void gen_validators_file (
    char path[] )
```

Generate a mock validators states file.

Parameters

<i>path</i>	The path of the output file
-------------	-----------------------------

See also

For one stake transaction, power += amount / block_height + amount
 Foreach stake withdraw, power -= power * withdraw_stake / user_total_stake

validators states file description Header : nb_validators[sizeof(size_t)], total_stake[sizeof(size_t)], block_height_↵
 validity[sizeof(size_t)] '
 '[sizeof(char)] For each 'nb_validators' : validator_pkey[RSA_KEY_SIZE], user_stake[sizeof(size_t)] ,validator_↵
 power[sizeof(size_t)], '
 '[sizeof(char)]

Definition at line 28 of file GEN_validators_file.c.

Here is the caller graph for this function:

5.39 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-↵ Cryptocurrency/tests/main_test.c File Reference

```
#include "gen/GEN_validators_file.c"
Include dependency graph for main_test.c:
```

Functions

- int [main](#) ()

5.39.1 Function Documentation

5.39.1.1 main()

```
int main ( )
```

Definition at line 3 of file main_test.c.

Here is the call graph for this function:

5.40 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/src/core/blockchain/block_test.c File Reference

```
#include "tests_macros.h"
#include "core/blockchain/block.h"
#include "core/blockchain/transaction.h"
#include "gen/GEN_blockchain_files.c"
Include dependency graph for block_test.c:
```

Macros

- #define [NB_BLOCK_PER_CHUNK](#) 10
- #define [NB MOCK_BLOCKS](#) 13

Functions

- void [block_test](#) (void)

5.40.1 Macro Definition Documentation

5.40.1.1 NB_BLOCK_PER_CHUNK

```
#define NB_BLOCK_PER_CHUNK 10
```

Definition at line 7 of file block_test.c.

5.40.1.2 NB MOCK_BLOCKS

```
#define NB MOCK_BLOCKS 13
```

Definition at line 9 of file block_test.c.

5.40.2 Function Documentation

5.40.2.1 block_test()

```
void block_test (
    void )
```

Definition at line 11 of file block_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.41 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/src/core/blockchain/block_test.h File Reference

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

Functions

- void [block_test](#) (void)

5.41.1 Function Documentation

5.41.1.1 block_test()

```
void block_test (
    void )
```

Definition at line 11 of file block_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.42 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/src/core/validation/validations_test.c File Reference

```
#include "gen/GEN_validators_file.c"
#include "core/validation/validations.h"
#include "tests_macros.h"
```

Include dependency graph for validations_test.c: This graph shows which files directly or indirectly include this file:

Functions

- void [validations_test](#) ()

5.42.1 Function Documentation

5.42.1.1 validations_test()

```
void validations_test ( )
```

Definition at line 5 of file validations_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.43 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/src/cryptosystem/rsa_test.c File Reference

```
#include "tests_macros.h"
#include "cryptosystem/signature.h"
#include "cryptosystem/rsa.h"
#include "core/blockchain/wallet.h"
#include <stdio.h>
#include <unistd.h>
#include <openssl/sha.h>
#include "misc/safe.h"
#include <fcntl.h>
#include <math.h>
#include <sys/stat.h>
```

Include dependency graph for rsa_test.c:

Macros

- #define [MAX](#)(a, b)

Functions

- void [get_keys_test](#) ()
- void [get_keys_equality_test](#) ()

5.43.1 Macro Definition Documentation

5.43.1.1 MAX

```
#define MAX(
    a,
    b )
```

Value:

```
(( __typeof__ (a) _a = (a); \
  __typeof__ (b) _b = (b); \
  _a > _b ? _a : _b; }}
```

5.43.2 Function Documentation

5.43.2.1 get_keys_equality_test()

```
void get_keys_equality_test ( )
```

Definition at line 28 of file rsa_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.43.2.2 get_keys_test()

```
void get_keys_test ( )
```

Definition at line 14 of file rsa_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.44 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/src/cryptosystem/rsa_test.h File Reference

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

Functions

- void [get_keys_test](#) ()
- void [get_keys_equality_test](#) ()

5.44.1 Function Documentation

5.44.1.1 get_keys_equality_test()

```
void get_keys_equality_test ( )
```

Definition at line 28 of file rsa_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.44.1.2 get_keys_test()

```
void get_keys_test ( )
```

Definition at line 14 of file rsa_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.45 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/src/cryptosystem/signature_test.c File Reference

```
#include "tests_macros.h"  
#include "cryptosystem/signature.h"  
Include dependency graph for signature_test.c:
```

Functions

- void [verify_sign_test](#) ()

5.45.1 Function Documentation

5.45.1.1 verify_sign_test()

```
void verify_sign_test ( )
```

Definition at line 4 of file signature_test.c.

Here is the call graph for this function: Here is the caller graph for this function:

5.46 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/src/cryptosystem/signature_test.h File Reference

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

Functions

- void [verify_sign_test](#) ()

5.46.1 Function Documentation

5.46.1.1 [verify_sign_test](#)()

```
void verify_sign_test ( )
```

Definition at line 4 of file [signature_test.c](#).

Here is the call graph for this function: Here is the caller graph for this function:

5.47 [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/src/network/client_test.c](#) File Reference

```
#include <signal.h>
#include "tests_macros.h"
#include "network/network.h"
#include "network/client.h"
#include "network/server.h"
#include "network/send_data.h"
#include "network/get_data.h"
```

Include dependency graph for [client_test.c](#): This graph shows which files directly or indirectly include this file:

Functions

- void [network_test](#) ()

5.47.1 Function Documentation

5.47.1.1 [network_test](#)()

```
void network_test ( )
```

Definition at line 10 of file [client_test.c](#).

Here is the call graph for this function: Here is the caller graph for this function:

5.48 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/src/network/server_test.c File Reference

#include "network/server.h"
Include dependency graph for server_test.c:

Functions

- int [main](#) ()

5.48.1 Function Documentation

5.48.1.1 main()

```
int main ( )
```

Definition at line 4 of file server_test.c.

Here is the call graph for this function:

5.49 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/tests_macros.h File Reference

#include <stdio.h>
Include dependency graph for tests_macros.h: This graph shows which files directly or indirectly include this file:

Macros

- #define [DEBUG](#)(function)
- #define [LOG](#)(str...)
- #define [TEST_PASSED](#)(name...)
- #define [TEST_FAILED](#)(name, reason...)
- #define [TEST_WARNING](#)(name, reason...)

5.49.1 Macro Definition Documentation

5.49.1.1 DEBUG

```
#define DEBUG(  
    function )
```

Value:

```
printf("Testing '%s'...\n", #function); \  
function()
```

Definition at line 5 of file tests_macros.h.

5.49.1.2 LOG

```
#define LOG(  
    str... )
```

Value:

```
printf("\033[0;34m[-]  "); \  
printf(str); \  
printf("\033[0m\n")
```

Definition at line 9 of file tests_macros.h.

5.49.1.3 TEST_FAILED

```
#define TEST_FAILED(  
    name,  
    reason... )
```

Value:

```
printf("\033[0;31m[X] TEST '%s' failed\n\t-> REASON : ", name); \  
printf(reason); \  
printf("\033[0m\n"); \  
exit(1)
```

Definition at line 19 of file tests_macros.h.

5.49.1.4 TEST_PASSED

```
#define TEST_PASSED(  
    name... )
```

Value:

```
printf("\033[0;32m[OK] TEST -> "); \  
printf(name); \  
printf("' success\033[0m\n")
```

Definition at line 14 of file tests_macros.h.

5.49.1.5 TEST_WARNING

```
#define TEST_WARNING(  
    name,  
    reason... )
```

Value:

```
printf("\033[0;33m[!] WARNING '%s'\n\t-> BECAUSE : ", name); \  
printf(reason); \  
printf("\033[0m\n")
```

Definition at line 25 of file tests_macros.h.

5.50 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/unit_testing.c File Reference

```
#include "tests_macros.h"  
#include "cryptosystem/signature_test.h"  
#include "cryptosystem/rsa_test.h"  
#include "network/client_test.c"  
#include "core/blockchain/block_test.h"  
#include "core/validation/validations_test.c"  
Include dependency graph for unit_testing.c:
```

Functions

- int [main](#) ()

5.50.1 Function Documentation

5.50.1.1 main()

```
int main ( )
```

Definition at line 8 of file unit_testing.c.

Here is the call graph for this function:

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