

# PEPITAS CRYPTOCURRENCY

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## Chapter 1

# CODING STYLE

- *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`.





## Chapter 2

# PEPITAS NETWORK PROTOCOL

## 2.1 HEADERS

### 2.1.1 Sync Headers

1. CONNECTION TO NETWORK
2. CONNECTION TO NODE
3. GET BLOCKS
4. ACTUAL HEIGHT
5. SEND BLOCK
6. GET PENDING TRANSACTION LIST
7. REJECT DEMAND

### 2.1.2 Running Headers

1. SEND PENDING TRANSACTION

### 2.1.3 Validating Headers

1. SEND BLOCK EPOCHMAN
2. SEND VOTE

### 2.1.4 CONNECTION TO NETWORK

#### Message:

- char \* : "CONNECTION TO NETWORK\r\n\r\n"

**Description** Send a request to be accepted by a network door.

### 2.1.5 CONNECTION TO NODE

**Message:**

- char \* : "CONNECTION TO NODE\r\n\r\n"

**Description** Send a request to be accepted by a network node.

### 2.1.6 GET BLOCKS

**Message:**

- char \* : "GET BLOCKS\r\n\r\n"
- uint32\_t : P\_VERSION
- char : Number of demand (max 50)
- size\_t \* : [Block](#) height

**Description** Send a request to a server for getting blocks. If the genesis block (height 0) is demand then the number of the actual blockchain height is return with "ACTUAL HEIGHT" header. If not, SEND BLOCK or REJECT DEMAND messages are returned.

### 2.1.7 ACTUAL HEIGHT

**Message:**

- char \* : "ACTUAL HEIGHT\r\n\r\n"
- size\_t : [Block](#) height

**Description** Send my actual blockchain height.

### 2.1.8 SEND BLOCK

**Message:**

- char \* : "SEND BLOCK\r\n\r\n"
- size\_t : [Block](#) height
- size\_t : [Block](#) size
- char \* : [Block](#) struct

**Description** The block of height demand by "GET BLOCKS".

### 2.1.9 GET PENDING TRANSACTION LIST

#### Message

- char \* : "GET PENDING TRANSACTION LIST\r\n\r\n"

**Description** Call "SEND PENDING TRANSACTION LIST".

### 2.1.10 SEND PENDING TRANSACTION LIST

#### Message

- char \* : "GET PENDING TRANSACTION LIST\r\n\r\n"
- size\_t : Number of [Transaction](#) id
- time\_t \* : [Transaction](#) id

**Description** Send PDT list.

### 2.1.11 REJECT DEMAND

#### Message:

- char \* : "REJECT DEMAND\r\n\r\n"

**Description** Reject a demand if can't reply. For example a "GET BLOCKS" of a not existing block.

### 2.1.12 GET PENDING TRANSACTION

#### Message:

- char \* : "GET PENDING TRANSACTION\r\n\r\n"
- time\_t : [Transaction](#) id

**Description** Demand a PENDING TRANSACTION.

### 2.1.13 SEND PENDING TRANSACTION

#### Message:

- char \* : "SEND PENDING TRANSACTION\r\n\r\n"
- size\_t : [Transaction](#) id
- size\_t : [Transaction](#) struct size octet
- char \* : [Transaction](#) struct

**Description** Send the PENDING TRANSACTION demand by SEND PENDING TRANSACTION.

### 2.1.14 SEND EPOCH BLOCK

**Message:**

- char \* : "SEND EPOCH BLOCK\r\n\r\n"
- int : Epoch id
- size\_t : [Block](#) height
- char \* : [Block](#) struct

**Description** Send the epoch block of a committee member.

### 2.1.15 SEND VOTE

**Message:**

- char \* : "SEND VOTE\r\n\r\n"
- size\_t : size epoch creator pk
- char \* : Epoch creator pk
- size\_t : block height
- int : epoch\_id
- char : 0 = False 1 = True
- char \* : signature of vote precedent vars but not "SEND VOTE\r\n\r\n"

**Description** Send the vote of a committee member.

## Chapter 3

# README

### 3.1 PEPITAS, a C cryptocurrency

PEPITAS is an EPITA project which was done during the last semester of the preparatory cycle. This cryptocurrency is based on the *proof of stake*, a newer and more eco-friendly validation consensus (used in Ethereum 2.0).

With PEPITAS, you can do whatever a modern proof of stake based money can also do :

- Send money
- Receive money
- Invest on the stake
- Validate transactions
- Earn transactions fees

All of these features are obviously based on a 2048-bits RSA protocol.

#### 3.1.1 Requirements

- A Linux system (Ubuntu, Arch,...)
- GNU Make
- OpenSSL
- GTK

#### 3.1.2 Installation & execution

1. Download the last version of the project : [PEPITAS-Cryptocurrency](#).
2. Extract the archive
3. Open a terminal in the extracted directory and type `make` (or `make client` if you just want to execute the client)
4. Go to the `build` directory
5. Execute `client.elf`, with an argument : the IP address of an existing client, or without argument if you are the first node of the network

### 3.1.3 Some explanations about how the client works

When launched, the client will try to connect to the host you provided as an argument (if provided). In the case where no argument are given to the ELF program, the client will try to establish a connect with a *serverdoor* (a node which have executed the program `serverdoor.elf`). A serverdoor is a program that provides IP addresses to a node in order to let him have a connection with the corresponding hosts.

*NB : serverdoors IP addresses are stored in the `HARD_CODED_ADDR` macro in `headers/network/network.h` and may not work if Maxence and/or Nathan decide to close the non-localhost serverdoor (currently hosted in a Google Cloud instance). If you really want to use a serverdoor, you also can refactor the `HARD_CODED_ADDR` macro and then run the program `serverdoor.elf`*

### 3.1.4 More information

If you want more information about how the peer-to-peer network or the validation protocol works, you can also read the [P2P\\_PROTOCOL.md](#) or the [VALIDATION\\_PROTOCOL.md](#) documentation.

Also, don't hesitate to check our Doxygen code documentation ( [web](#)/ [pdf](#) ).

### 3.1.5 Contributors

- **Nathan RABET**, project leader, in charge of the validation protocol and the blockchain implementation.
- **Maxence ODEN**, in charge of the networking, the multithreading and the cryptographic part of this project.
- **Souleymane SENTICI**, responsible for the user interface.
- **Luca SAINGIER**, responsible for the web implementation.

## Chapter 4

# PEPITAS VALIDATION PROTOCOL

### 4.1 Prerequisites

To understand this documentation, you need to have a good understanding of the blockchain data structure used in cryptocurrencies and the concept of the proof of stake.

### 4.2 Introduction

PEPITAS is a C written cryptocurrency. At the beginning of cryptocurrencies, the method (or consensus) used to guarantee the network security was the *proof of work*, users computers had to calculate some hashes to validate transactions (also called *mining*). These calculations ensure a good security, but are not eco-friendly (because of the huge amount of CPU's and GPU's in charge of calculating hashes). This issue enrolled a new consensus : the *proof of stake*. This type of validation protocol doesn't use calculations to prove a transaction validity, but the money users putted in a bank, named the *stake*. The more a user send money to the stake, the more he has a chance to be selected to create a new block, and by the time, to earn money as a reward. It is important to note that if the other users of the network detect that a validator validated fraudulent transactions, the corresponding validator will lose some part of his stake. This punishment ensure that all users have more interest to validate valid transactions instead of fraudulent ones.

### 4.3 Definitions

#### 4.3.1 VALIDATOR

Members of the network who can validate and create block. Each of there **STAKE** must contains at least **50** PEPITAS.

#### 4.3.2 COMMITTEE

A list containing public keys, correponding to some accounts on the network. Each account in this list is allowed to participate to the validation and the creation of a new block for the blockchain network. A committee is pseudo-randomly selected and is known by every node of the network. It changes every time a block is added to the blockchain. The more a user puts money in his stake, the more he has a chance to appear and have a low ID in a committee.

### 4.3.3 EPOCH MAN

The committee (list) ID of the block creator. The EPOCH MAN is selected by priority order in a committee with this rule : **min(awaken\_validator\_ID)** For example if the committee contains 10 members and the first awaken member is the third, EPOCH MAN is the third member of this comitte. An awaken member is a committee member who broadcast a block to the network or a committee member that send a verdict on a broadcasted block.

### 4.3.4 COMITAL

If the committee contains **n** members and the selected EPOCH MAN is the validator with the ID **m**, the comital members ID are from **0** to **m** (excluded) and from **m+1** to **n** (excluded).

### 4.3.5 VOTE

A vote is a validator judgment about a the validity of a certain block. If a validator think that a block is valid, he will send a **positive** vote, otherwise, he will send a **negative** one. Note that the block at height **0** (genesis block) is considered as valid by default.

### 4.3.6 PLÈBE

All non-validators members. Each of there **STAKE** are under **50** PEPITAS.

### 4.3.7 MEMPOOL

A directory where all pending transactions (transactions that are not in a block) are stocked.

## 4.4 How EPOCH MAN creates a block

Lets admit that the current validated block is at height **n**.

To create a block, EPOCH MAN do several things :

### 4.4.1 Last block validity checking

- First, he creates a new empty block (at height **n+1**).
- Then, he check if the validators votes ratio of the block at height **n**.
  - If the block at height **n** has more positive than negative votes.
    - \* Writes on the block at height **n+1** that the block at height **n** is valid.
    - \* Flushes the transactions in the block at height **n** from the mempool.
  - Else
    - \* Writes on the block at height **n+1** that the block at height **n** is not valid.



#### 4.4.2 Rewards and punishments attribution

To motivate the network to do the job correctly (without corruption), EPOCH MAN will create new special transactions called *rewards* and *punishments*. Rewards are transactions that *"\*send\*"* money to a validator (actually this transaction creates money) and punishments that *take of* money from a validator (this transaction delete money from an account). Before this step, EPOCH MAN checked the validators votes ratio of the block at height **n**, then, he will create rewards transactions for the majority and punishments for the others. If there is equality on votes, the block is considered as non-valid and the same rule is applied.

#### 4.4.3 Broadcast

After all these steps, EPOCH MAN broadcasts his new block.

### 4.5 How COMITAL send their verdicts

1. A validator waits for a block from a validator that has a lower ID than him in the next committee. If it receive one, he will start computing it.
2. Verify the validity of the received block.
3. Send a verdict.
4. Reiterate if the validator receive a block from another EPOCH MAN with an ID lower than the previous EPOCH MAN, for a certain amount of time.

Note that if a member of the COMITAL doesn't send any verdict, he will be punished by the next EPOCH MAN.

### 4.6 How PLÈBE adhere blocks

1. A node waits for a block from a validator
2. Adhere all verdicts from the next committee
3. Reiterate for a certain amount of time, using the same rule as the COMITAL.
4. Keep the received block
5. If the previous block is valid (info stored in the received block), then flushes the transactions in the previous block from the mempool.



## Chapter 5

# Deprecated List

Global `delete_epochs` (`size_t` height)

Global `gen_blockchain_header` (`infos_st` \*infos)



## Chapter 6

# Data Structure Index

### 6.1 Data Structures

Here are the data structures with brief descriptions:

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## Chapter 7

# File Index

### 7.1 File List

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## Chapter 8

# Data Structure Documentation

### 8.1 Block Struct Reference

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

Collaboration diagram for Block:

#### Data Fields

- uint16\_t [chunk\\_id](#)
- [BlockData](#) [block\\_data](#)
- char [block\\_signature](#) [256]
- char [validators\\_votes](#) [NB\_VOTES\_BITMAP]
- char [vote\\_signature](#) [MAX\_VALIDATORS\_PER\_BLOCK - 1][256]

#### 8.1.1 Detailed Description

Definition at line 80 of file block.h.

#### 8.1.2 Field Documentation

##### 8.1.2.1 [block\\_data](#)

[BlockData](#) [block\\_data](#)

Definition at line 83 of file block.h.

### 8.1.2.2 block\_signature

```
char block_signature[256]
```

Definition at line 85 of file block.h.

### 8.1.2.3 chunk\_id

```
uint16_t chunk_id
```

Definition at line 82 of file block.h.

### 8.1.2.4 validators\_votes

```
char validators_votes[NB_VOTES_BITMAP]
```

Definition at line 88 of file block.h.

### 8.1.2.5 vote\_signature

```
char vote_signature[MAX_VALIDATORS_PER_BLOCK - 1][256]
```

Definition at line 89 of file block.h.

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

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

## 8.2 BlockData Struct Reference

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

Collaboration diagram for BlockData:

### Data Fields

- char [magic](#)
- int [epoch\\_id](#)
- char [is\\_prev\\_block\\_valid](#)
- char [previous\\_block\\_hash](#) [SHA384\_DIGEST\_LENGTH \*2+1]
- size\_t [height](#)
- uint16\_t [nb\\_transactions](#)
- [Transaction](#) \*\* [transactions](#)
- int [nb\\_validators](#)
- RSA \* [validators\\_public\\_keys](#) [MAX\_VALIDATORS\_PER\_BLOCK]
- time\_t [block\\_timestamp](#)
- char [prev\\_validators\\_votes](#) [NB\_VOTES\_BITMAP]

### 8.2.1 Detailed Description

Definition at line 61 of file block.h.

### 8.2.2 Field Documentation

#### 8.2.2.1 block\_timestamp

```
time_t block_timestamp
```

Definition at line 75 of file block.h.

#### 8.2.2.2 epoch\_id

```
int epoch_id
```

Definition at line 64 of file block.h.

#### 8.2.2.3 height

```
size_t height
```

Definition at line 67 of file block.h.

#### 8.2.2.4 is\_prev\_block\_valid

```
char is_prev_block_valid
```

Definition at line 65 of file block.h.

#### 8.2.2.5 magic

```
char magic
```

Definition at line 63 of file block.h.

#### 8.2.2.6 nb\_transactions

```
uint16_t nb_transactions
```

Definition at line 69 of file block.h.

#### 8.2.2.7 nb\_validators

```
int nb_validators
```

Definition at line 73 of file block.h.

#### 8.2.2.8 prev\_validators\_votes

```
char prev_validators_votes[NB_VOTES_BITMAP]
```

Definition at line 77 of file block.h.

#### 8.2.2.9 previous\_block\_hash

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

Definition at line 66 of file block.h.

#### 8.2.2.10 transactions

```
Transaction** transactions
```

Definition at line 70 of file block.h.

#### 8.2.2.11 validators\_public\_keys

```
RSA* validators_public_keys[MAX_VALIDATORS_PER_BLOCK]
```

Definition at line 74 of file block.h.

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

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

## 8.3 blockinfo Struct Reference

```
#include <ui.h>
```

### Data Fields

- `size_t` [height](#)
- `size_t` [transactions](#)

### 8.3.1 Detailed Description

Definition at line 26 of file `ui.h`.

### 8.3.2 Field Documentation

#### 8.3.2.1 height

```
size_t height
```

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

#### 8.3.2.2 transactions

```
size_t transactions
```

Definition at line 29 of file `ui.h`.

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

- `/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/ui/ui.h`

## 8.4 ChunkBlockchain Struct Reference

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

Collaboration diagram for `ChunkBlockchain`:

## Data Fields

- `size_t` [chunk\\_nb](#)
- `Block**` [chunk](#)
- `int16_t` [nb\\_blocks](#)

### 8.4.1 Detailed Description

Definition at line 92 of file `block.h`.

### 8.4.2 Field Documentation

#### 8.4.2.1 `chunk`

`Block**` `chunk`

Definition at line 95 of file `block.h`.

#### 8.4.2.2 `chunk_nb`

`size_t` `chunk_nb`

Definition at line 94 of file `block.h`.

#### 8.4.2.3 `nb_blocks`

`int16_t` `nb_blocks`

Definition at line 96 of file `block.h`.

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

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

## 8.5 connection Struct Reference

```
#include <network.h>
```

## Data Fields

- pthread\_t [thread](#)
- sem\_t [lock](#)
- int [demand](#)
- int [clientfd](#)
- size\_t [Payloadsize](#)
- void \* [Payload](#)
- size\_t [actual\\_client\\_height](#)

### 8.5.1 Detailed Description

Definition at line 44 of file network.h.

### 8.5.2 Field Documentation

#### 8.5.2.1 actual\_client\_height

```
size_t actual_client_height
```

Definition at line 52 of file network.h.

#### 8.5.2.2 clientfd

```
int clientfd
```

Definition at line 49 of file network.h.

#### 8.5.2.3 demand

```
int demand
```

Definition at line 48 of file network.h.

#### 8.5.2.4 lock

```
sem_t lock
```

Definition at line 47 of file network.h.

#### 8.5.2.5 Payload

```
void* Payload
```

Definition at line 51 of file network.h.

#### 8.5.2.6 Payloadsize

```
size_t Payloadsize
```

Definition at line 50 of file network.h.

#### 8.5.2.7 thread

```
pthread_t thread
```

Definition at line 46 of file network.h.

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

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

## 8.6 infos\_st Struct Reference

```
#include <network.h>
```

### Data Fields

- char [as\\_epoch](#)
- char [is\\_validator](#)
- int [validator\\_id](#)
- size\_t [actual\\_height](#)
- size\_t [pdt](#)
- char [serv\\_type](#)
- char [is\\_synchronize](#)

#### 8.6.1 Detailed Description

Definition at line 55 of file network.h.



## 8.6.2 Field Documentation

### 8.6.2.1 actual\_height

`size_t actual_height`

Definition at line 60 of file network.h.

### 8.6.2.2 as\_epoch

`char as_epoch`

Definition at line 57 of file network.h.

### 8.6.2.3 is\_synchronize

`char is_synchronize`

Definition at line 10 of file unit\_testing.c.

### 8.6.2.4 is\_validator

`char is_validator`

Definition at line 58 of file network.h.

### 8.6.2.5 pdt

`size_t pdt`

Definition at line 61 of file network.h.

#### 8.6.2.6 serv\_type

```
char serv_type
```

Definition at line 62 of file network.h.

#### 8.6.2.7 validator\_id

```
int validator_id
```

Definition at line 59 of file network.h.

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

- [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/network.h](#)
- [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/unit\\_testing.c](#)

## 8.7 Neighbour Struct Reference

```
#include <network.h>
```

### Data Fields

- int [family](#)
- char \* [hostname](#)

#### 8.7.1 Detailed Description

Definition at line 33 of file network.h.

#### 8.7.2 Field Documentation

##### 8.7.2.1 family

```
int family
```

Definition at line 35 of file network.h.

### 8.7.2.2 hostname

```
char* hostname
```

Definition at line 36 of file network.h.

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

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

## 8.8 Node Struct Reference

```
#include <network.h>
```

Collaboration diagram for Node:

### Data Fields

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

### 8.8.1 Detailed Description

Definition at line 39 of file network.h.

### 8.8.2 Field Documentation

#### 8.8.2.1 neighbours

```
Neighbour* neighbours
```

Definition at line 41 of file network.h.

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

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

## 8.9 th\_arg Struct Reference

```
#include <network.h>
```

Collaboration diagram for th\_arg:

## Data Fields

- [infos\\_st](#) \* [infos](#)
- [connection](#) \* [client\\_con](#)

### 8.9.1 Detailed Description

Definition at line 64 of file network.h.

### 8.9.2 Field Documentation

#### 8.9.2.1 client\_con

```
connection* client_con
```

Definition at line 67 of file network.h.

#### 8.9.2.2 infos

```
infos\_st* infos
```

Definition at line 66 of file network.h.

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

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

## 8.10 Transaction Struct Reference

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

Collaboration diagram for Transaction:

## Data Fields

- [TransactionData](#) [transaction\\_data](#)
- char [transaction\\_signature](#) [256]

### 8.10.1 Detailed Description

Definition at line 51 of file block.h.

## 8.10.2 Field Documentation

### 8.10.2.1 transaction\_data

`TransactionData transaction_data`

Definition at line 53 of file block.h.

### 8.10.2.2 transaction\_signature

`char transaction_signature`

Definition at line 55 of file block.h.

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

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

## 8.11 TransactionData Struct Reference

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

### Data Fields

- char [magic](#)
- char [type](#)
- RSA \* [sender\\_public\\_key](#)
- RSA \* [receiver\\_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]

### 8.11.1 Detailed Description

Definition at line 32 of file block.h.

## 8.11.2 Field Documentation

### 8.11.2.1 amount

`size_t amount`

Definition at line 40 of file block.h.

### 8.11.2.2 asset

`char asset`

Definition at line 48 of file block.h.

### 8.11.2.3 cause

`char cause`

Definition at line 47 of file block.h.

### 8.11.2.4 magic

`char magic`

Definition at line 34 of file block.h.

### 8.11.2.5 receiver\_public\_key

`RSA * receiver_public_key`

Definition at line 39 of file block.h.

#### 8.11.2.6 receiver\_remaining\_money

```
size_t receiver_remaining_money
```

Definition at line 42 of file block.h.

#### 8.11.2.7 sender\_public\_key

```
RSA * sender_public_key
```

Definition at line 38 of file block.h.

#### 8.11.2.8 sender\_remaining\_money

```
size_t sender_remaining_money
```

Definition at line 41 of file block.h.

#### 8.11.2.9 transaction\_timestamp

```
time_t transaction_timestamp
```

Definition at line 43 of file block.h.

#### 8.11.2.10 type

```
char type
```

Definition at line 35 of file block.h.

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

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

## 8.12 validators\_state\_header Struct Reference

```
#include <validators.h>
```

## Data Fields

- `size_t` [nb\\_validators](#)
- `size_t` [total\\_stake](#)
- `size_t` [block\\_height\\_validity](#)

### 8.12.1 Detailed Description

Definition at line 14 of file validators.h.

### 8.12.2 Field Documentation

#### 8.12.2.1 `block_height_validity`

```
size_t block_height_validity
```

Definition at line 18 of file validators.h.

#### 8.12.2.2 `nb_validators`

```
size_t nb_validators
```

Definition at line 16 of file validators.h.

#### 8.12.2.3 `total_stake`

```
size_t total_stake
```

Definition at line 17 of file validators.h.

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

- `/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/validation/validators.h`

## 8.13 `validators_state_item` Struct Reference

```
#include <validators.h>
```



## Data Fields

- char [validator\\_pkey](#) [[RSA\\_KEY\\_SIZE](#)]
- size\_t [user\\_stake](#)
- size\_t [validator\\_power](#)

### 8.13.1 Detailed Description

Definition at line 21 of file `validators.h`.

### 8.13.2 Field Documentation

#### 8.13.2.1 `user_stake`

```
size_t user_stake
```

Definition at line 24 of file `validators.h`.

#### 8.13.2.2 `validator_pkey`

```
char validator_pkey[RSA_KEY_SIZE]
```

Definition at line 23 of file `validators.h`.

#### 8.13.2.3 `validator_power`

```
size_t validator_power
```

Definition at line 25 of file `validators.h`.

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

- `/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/validation/validators.h`

## 8.14 Wallet Struct Reference

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

## Data Fields

- RSA \* [priv\\_key](#)
- RSA \* [pub\\_key](#)
- size\_t [amount](#)
- size\_t [stake\\_amount](#)

### 8.14.1 Detailed Description

Definition at line 10 of file wallet.h.

### 8.14.2 Field Documentation

#### 8.14.2.1 amount

```
size_t amount
```

Definition at line 15 of file wallet.h.

#### 8.14.2.2 priv\_key

```
RSA* priv_key
```

Definition at line 12 of file wallet.h.

#### 8.14.2.3 pub\_key

```
RSA* pub_key
```

Definition at line 13 of file wallet.h.

#### 8.14.2.4 stake\_amount

```
size_t stake_amount
```

Definition at line 16 of file wallet.h.

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

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

## Chapter 9

# File Documentation

### 9.1 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/CODING\_STYLE.md File Reference

### 9.2 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/blockchain/block.h File Reference

```
#include <string.h>
#include <stdlib.h>
#include <sys/stat.h>
#include <unistd.h>
#include <err.h>
#include <errno.h>
#include <openssl/sha.h>
#include <openssl/pem.h>
#include <openssl/rsa.h>
#include <openssl/crypto.h>
#include <fcntl.h>
#include <sys/types.h>
#include "client.h"
#include "transaction.h"
#include "misc/files.h"
#include "blockchain/wallet.h"
#include "cryptosystem/rsa.h"
Include dependency graph for block.h:
```

### 9.3 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/blockchain/blockchain\_header.h File Reference

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

```
#include "cryptosystem/rsa.h"
#include "validation/validators.h"
#include <sys/stat.h>
#include <stdio.h>
```

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

## Functions

- void [gen\\_blockchain\\_header](#) ([infos\\_st](#) \*infos)  
*Generate block shared information.*
- size\_t [get\\_receiver\\_remaining\\_money](#) ([infos\\_st](#) \*infos, RSA \*receiver\_public\_key)  
*Get the receiver remaining money.*

### 9.3.1 Function Documentation

#### 9.3.1.1 gen\_blockchain\_header()

```
void gen_blockchain_header (
    infos\_st * infos )
```

Generate block shared information.

#### Deprecated

##### Parameters

<a href="#">infos</a>	The information
-----------------------	-----------------

Definition at line 9 of file blockchain\_header.c.

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

#### 9.3.1.2 get\_receiver\_remaining\_money()

```
size_t get_receiver_remaining_money (
    infos\_st * infos,
    RSA * receiver_public_key )
```

Get the receiver remaining money.

##### Parameters

<a href="#">infos</a>	Threads shared information
<a href="#">receiver_public_key</a>	The RSA public key of the receiver

Returns

size\_t

Definition at line 40 of file blockchain\_header.c.

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

## 9.4 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/blockchain/transaction.h File Reference

```
#include <string.h>
#include <stdlib.h>
#include <openssl/rsa.h>
#include <openssl/sha.h>
#include <openssl/pem.h>
#include <time.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <unistd.h>
#include <fcntl.h>
#include <err.h>
#include "blockchain/wallet.h"
#include "blockchain/blockchain_header.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](#)
- #define [T\\_TYPE\\_DEFAULT](#) 0
- #define [T\\_TYPE\\_ADD\\_STAKE](#) 1
- #define [T\\_TYPE\\_WITHDRAW\\_STAKE](#) 2
- #define [T\\_TYPE\\_REWARD\\_STAKE](#) 3
- #define [T\\_TYPE\\_PUNISH\\_STAKE](#) 4
- #define [TRANS\\_T](#)

### 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.*
- void [write\\_transactiondata](#) (TransactionData \*transaction, int fd)  
*Serialize a TransactionData\* structure.*
- void [write\\_transaction](#) (Transaction \*transaction, int fd)  
*Serialize a Transaction\* structure.*
- void [get\\_transaction\\_data](#) (Transaction \*trans, char \*\*buff, size\_t \*index)  
*Get the transaction data object.*
- void [convert\\_data\\_to\\_transactiondata](#) (TransactionData \*transactiondata, int fd)  
*Convert serialized TransactionData\* to TransactionData\*.*
- void [load\\_transaction](#) (Transaction \*transaction, int fd)  
*Load a serialized Transaction\* structure.*
- Transaction \* [load\\_pending\\_transaction](#) (time\_t timestamp)  
*Load a transaction in the pending transaction (pdt) directory.*
- void [add\\_pending\\_transaction](#) (Transaction \*transaction)  
*Add a transaction to the pending transaction (pdt) directory.*
- Transaction [create\\_new\\_transaction](#) (infos\_st \*infos, char type, RSA \*receiver\_public\_key, size\_t amount, char cause[512], char asset[512])  
*Create a new transaction.*
- void [flush\\_pending\\_transactions](#) (Transaction \*\*transactions, size\_t nb\_transactions)  
*Delete block transactions in the pending transaction (pdt) directory if the block is valid.*

## 9.4.1 Macro Definition Documentation

### 9.4.1.1 T\_TYPE\_ADD\_STAKE

```
#define T_TYPE_ADD_STAKE 1
```

Definition at line 22 of file transaction.h.

### 9.4.1.2 T\_TYPE\_DEFAULT

```
#define T_TYPE_DEFAULT 0
```

Definition at line 21 of file transaction.h.

### 9.4.1.3 T\_TYPE\_PUNISH\_STAKE

```
#define T_TYPE_PUNISH_STAKE 4
```

Definition at line 25 of file transaction.h.

#### 9.4.1.4 T\_TYPE\_REWARD\_STAKE

```
#define T_TYPE_REWARD_STAKE 3
```

Definition at line 24 of file transaction.h.

#### 9.4.1.5 T\_TYPE\_WITHDRAW\_STAKE

```
#define T_TYPE_WITHDRAW_STAKE 2
```

Definition at line 23 of file transaction.h.

#### 9.4.1.6 TRANS\_T

```
#define TRANS_T
```

Definition at line 28 of file transaction.h.

#### 9.4.1.7 TRANSACTION\_DATA\_SIZE

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

Definition at line 18 of file transaction.h.

#### 9.4.1.8 TRANSACTION\_SIZE

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

Definition at line 19 of file transaction.h.

### 9.4.2 Typedef Documentation

#### 9.4.2.1 Transaction

```
typedef struct Transaction Transaction
```

### 9.4.2.2 TransactionData

```
typedef struct TransactionData TransactionData
```

## 9.4.3 Function Documentation

### 9.4.3.1 add\_pending\_transaction()

```
void add_pending_transaction (
    Transaction * transaction )
```

Add a transaction to the pending transaction (pdt) directory.

#### Parameters

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

Definition at line 140 of file transaction.c.

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

### 9.4.3.2 convert\_data\_to\_transactiondata()

```
void convert_data_to_transactiondata (
    TransactionData * transactiondata,
    int fd )
```

Convert serialized TransactionData\* to TransactionData\*.

#### Parameters

<i>transactiondata</i>	The returned TransactionData*
<i>fd</i>	The serialized TransactionData FD

Definition at line 88 of file transaction.c.

Here is the caller graph for this function:

### 9.4.3.3 create\_new\_transaction()

```
Transaction create_new_transaction (
    infos_st * infos,
    char type,
    RSA * receiver_public_key,
    size_t amount,
```



```
char cause[512],
char asset[512] )
```

Create a new transaction.

#### Parameters

<i>infos</i>	Shared information object
<i>type</i>	The type of transaction
<i>receiver_public_key</i>	The receiver pkey
<i>amount</i>	The amount of PEPITAS
<i>cause</i>	The cause (deprecated)
<i>asset</i>	The asset (deprecated)

#### Returns

[Transaction](#)

Definition at line 157 of file transaction.c.

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

#### 9.4.3.4 flush\_pending\_transactions()

```
void flush_pending_transactions (
    Transaction ** transactions,
    size_t nb_transactions )
```

Delete block transactions in the pending transaction (pdt) directory if the block is valid.

#### Parameters

<i>transactions</i>	block.blockdata.transactions
<i>nb_transactions</i>	number of transactions

Definition at line 204 of file transaction.c.

#### 9.4.3.5 get\_transaction\_data()

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

Get the transaction data object.

**Parameters**

<i>trans</i>	The returned transaction
<i>buff</i>	The buffer with the serialized data
<i>index</i>	The buffer starting offset

Definition at line 40 of file transaction.c.

Here is the caller graph for this function:

**9.4.3.6 load\_pending\_transaction()**

```
Transaction* load_pending_transaction (
    time_t timestamp )
```

Load a transaction in the pending transaction (pdt) directory.

**Parameters**

<i>timestamp</i>	The timestamp of the transaction
------------------	----------------------------------

**Returns**

Transaction\*

Definition at line 127 of file transaction.c.

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

**9.4.3.7 load\_transaction()**

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

Load a serialized Transaction\* structure.

**Parameters**

<i>transaction</i>	The returned Transaction*
<i>fd</i>	The serialized Transaction FD

Definition at line 117 of file transaction.c.

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

**9.4.3.8 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.

#### 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

#### 9.4.3.9 write\_transaction()

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

Serialize a Transaction\* structure.

#### Parameters

<i>transaction</i>	The Transaction* structure to serialize
<i>fd</i>	The output file FD

Definition at line 34 of file transaction.c.

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

#### 9.4.3.10 write\_transactiondata()

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

Serialize a TransactionData\* structure.

#### Parameters

<i>transaction</i>	The TransactionData* structure to serialize
<i>fd</i>	The output file FD

Definition at line 3 of file transaction.c.

Here is the caller graph for this function:

## 9.5 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/blockchain/wallet.h File Reference

```
#include <openssl/rsa.h>
#include <stdlib.h>
#include <stdbool.h>
#include <time.h>
#include "ui/labels.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.*
- void [add\\_money\\_to\\_wallet](#) (size\_t money)  
*Add money to my wallet.*
- void [remove\\_money\\_from\\_wallet](#) (size\_t money)  
*Remove money from my wallet.*
- void [add\\_money\\_to\\_stake](#) (size\_t money)  
*Add money to my stake.*
- void [remove\\_money\\_from\\_stake](#) (size\_t money)  
*Withdraw money from my stake.*

### 9.5.1 Typedef Documentation

#### 9.5.1.1 Wallet

```
typedef struct Wallet Wallet
```

### 9.5.2 Function Documentation

#### 9.5.2.1 add\_money\_to\_stake()

```
void add_money_to_stake (
    size_t money )
```

Add money to my stake.

#### Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 45 of file wallet.c.

Here is the call graph for this function:

#### 9.5.2.2 add\_money\_to\_wallet()

```
void add_money_to_wallet (
    size_t money )
```

Add money to my wallet.

#### Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 26 of file wallet.c.

Here is the call graph for this function:

#### 9.5.2.3 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 18 of file wallet.c.

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

#### 9.5.2.4 get\_my\_wallet()

```
Wallet* get_my_wallet ( )
```

Get my wallet object.

#### Returns

[Wallet](#)

Definition at line 6 of file wallet.c.

Here is the caller graph for this function:

#### 9.5.2.5 remove\_money\_from\_stake()

```
void remove_money_from_stake (
    size_t money )
```

Withdraw money from my stake.

## Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 54 of file wallet.c.

Here is the call graph for this function:

### 9.5.2.6 remove\_money\_from\_wallet()

```
void remove_money_from_wallet (
    size_t money )
```

Remove money from my wallet.

## Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 34 of file wallet.c.

Here is the call graph for this function:

## 9.6 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/client.h File Reference

```
#include <signal.h>
#include <stdlib.h>
#include <string.h>
#include "network/network.h"
Include dependency graph for client.h:
```

### Functions

- void [new\\_transaction](#) (char type, char \*rc\_pk, size\_t amount, char cause[512], char asset[512])
- [infos\\_st \\* get\\_infos](#) ()
- void [update\\_pdt](#) (int number)
- void [move\\_file](#) (char \*src, char \*dest)
- void [Validate](#) ()
- void [join\\_network\\_door](#) ([infos\\_st](#) \*infos)
- void [connection\\_to\\_others](#) ([infos\\_st](#) \*infos)
- size\_t [update\\_blockchain\\_height](#) ([infos\\_st](#) \*infos)
- void [update\\_blockchain](#) ([infos\\_st](#) \*infos, size\_t index\_client)
- void [clear\\_transactions](#) ()
- void [clear\\_epochs](#) ()
- void [update\\_pending\\_transactions\\_list](#) ()

## 9.6.1 Function Documentation

### 9.6.1.1 clear\_epochs()

```
void clear_epochs ( )
```

Definition at line 335 of file atrier.c.

Here is the caller graph for this function:

### 9.6.1.2 clear\_transactions()

```
void clear_transactions ( )
```

Definition at line 312 of file atrier.c.

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

### 9.6.1.3 connection\_to\_others()

```
void connection_to_others (
    infos_st * infos )
```

Definition at line 228 of file atrier.c.

Here is the call graph for this function:

### 9.6.1.4 get\_infos()

```
infos_st* get_infos ( )
```

Definition at line 16 of file atrier.c.

Here is the caller graph for this function:

### 9.6.1.5 join\_network\_door()

```
void join_network_door (
    infos_st * infos )
```

Definition at line 210 of file atrier.c.

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

#### 9.6.1.6 move\_file()

```
void move_file (
    char * src,
    char * dest )
```

Definition at line 27 of file atrier.c.

Here is the call graph for this function:

#### 9.6.1.7 new\_transaction()

```
void new_transaction (
    char type,
    char * rc_pk,
    size_t amount,
    char cause[512],
    char asset[512] )
```

Definition at line 148 of file atrier.c.

Here is the caller graph for this function:

#### 9.6.1.8 update\_blockchain()

```
void update_blockchain (
    infos_st * infos,
    size_t index_client )
```

Definition at line 285 of file atrier.c.

#### 9.6.1.9 update\_blockchain\_height()

```
size_t update_blockchain_height (
    infos_st * infos )
```

Definition at line 249 of file atrier.c.

Here is the call graph for this function:

#### 9.6.1.10 update\_pdt()

```
void update_pdt (
    int number )
```

Definition at line 20 of file atrier.c.

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



**9.6.1.11 update\_pending\_transactions\_list()**

```
void update_pending_transactions_list ( )
```

Definition at line 354 of file atrier.c.

Here is the call graph for this function:

**9.6.1.12 Validate()**

```
void Validate ( )
```

Definition at line 62 of file atrier.c.

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

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

```
#include "network/network.h"
#include "network/server.h"
#include "network/get_data.h"
#include "network/send_data.h"
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netdb.h>
#include <sys/stat.h>
#include <unistd.h>
#include <err.h>
#include <errno.h>
#include <semaphore.h>
#include <stddef.h>
```

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

**Functions**

- [Node \\* get\\_my\\_node](#) (char who)  
*Get the my node object.*
- int [set\\_neighbour](#) (char who, char \*hostname, int family)  
*Sets a neighbour in the client.neighbours section.*
- void [remove\\_neighbour](#) (char who, int index)  
*Remove a neighbour in the client.neighbours section.*
- int [number\\_neighbours](#) (char who)  
*Return the nb of neighbour in the client.neighbours section.*
- void [print\\_neighbours](#) (char who, char mask)  
*Print neighbours list.*
- void [save\\_neighbours](#) (char who)

- *Save neighbours list in .neighbours/neighbours.*
- void `load_neighbours` (char who)
  - *Load neighbours list from .neighbours/neighbours.*
- `connection * listen_to` (`infos_st *infos`, `Neighbour neighbour`, char `*connection_type`, `connection *connection`)
  - *Tries to connect to the peer-to-peer network via a node in the `Node` structure.*
- int `find_empty_connection` (int max, `connection *connection`)
  - *Find if connection has any empty field.*
- int `is_in_neighbours` (char who, char `*hostname`)
  - *Check if hostname is in `client.neighbours`*
- void `* client_thread` (void `*args`)
  - *Create a client thread.*

## 9.7.1 Function Documentation

### 9.7.1.1 client\_thread()

```
void* client_thread (
    void * args )
```

Create a client thread.

#### Parameters

<code>args</code>	
-------------------	--

#### Returns

void\*

Definition at line 268 of file client.c.

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

### 9.7.1.2 find\_empty\_connection()

```
int find_empty_connection (
    int max,
    connection * connection )
```

Find if connection has any empty field.

#### Parameters

<code>max</code>	The number of maximum connections
<code>connection</code>	The connection* buffer

**Returns**

int

Definition at line 258 of file client.c.

Here is the caller graph for this function:

**9.7.1.3 get\_my\_node()**

```
Node* get_my_node (
    char who )
```

Get the my node object.

**Parameters**

<i>who</i>	Tells if it is the server or the client side
------------	--

**Returns**

Node\*

Definition at line 6 of file client.c.

Here is the caller graph for this function:

**9.7.1.4 is\_in\_neighbours()**

```
int is_in_neighbours (
    char who,
    char * hostname )
```

Check if `hostname` is in `client.neighbours`

**Parameters**

<i>who</i>	Tells if it is the server or the client side
<i>hostname</i>	The IP address to check

**Returns**

int

Definition at line 149 of file client.c.

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

### 9.7.1.5 listen\_to()

```
connection* listen_to (
    infos_st * infos,
    Neighbour neighbour,
    char * connection_type,
    connection * connection )
```

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

#### Parameters

<i>infos</i>	Some shared information
<i>neighbour</i>	The neighbour to connect with
<i>connection_type</i>	The type of connection
<i>connection</i>	The connection* structure

#### Returns

socket FD or -1 if an error occurs

Definition at line 172 of file client.c.

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

### 9.7.1.6 load\_neighbours()

```
void load_neighbours (
    char who )
```

Load neighbours list from .neighbours/neighbours.

#### Parameters

<i>who</i>	Tells if it is the server or the client side
------------	--

Definition at line 113 of file client.c.

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

### 9.7.1.7 number\_neighbours()

```
int number_neighbours (
    char who )
```

Return the nb of neighbour in the client.neighbours section.

#### Parameters

<i>who</i>	Tells if it is the server or the client side
------------	--

Definition at line 160 of file client.c.

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

#### 9.7.1.8 print\_neighbours()

```
void print_neighbours (
    char who,
    char mask )
```

Print neighbours list.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>mask</i>	

Definition at line 58 of file client.c.

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

#### 9.7.1.9 remove\_neighbour()

```
void remove_neighbour (
    char who,
    int index )
```

Remove a neighbour in the client.neighbours section.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>index</i>	The index of the neighbour to remove in client.neighbours

Definition at line 47 of file client.c.

Here is the call graph for this function:

#### 9.7.1.10 save\_neighbours()

```
void save_neighbours (
    char who )
```

Save neighbours list in .neighbours/neighbours.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
------------	--

Definition at line 74 of file client.c.

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

#### 9.7.1.11 set\_neighbour()

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

Sets a neighbour in the client.neighbours section.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>hostname</i>	The neighbour IP adress
<i>family</i>	The type of IP adress

##### Returns

0 if success, -1 otherwise if full

Definition at line 19 of file client.c.

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

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

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

#### 9.8.1 Function Documentation

##### 9.8.1.1 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:

#### 9.8.1.2 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:

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

```
#include "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.h: 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` (char \*password)  
*Get the keys object.*

### 9.9.1 Macro Definition Documentation

#### 9.9.1.1 RSA\_BEGIN\_SIZE

```
#define RSA_BEGIN_SIZE 31
```

Definition at line 21 of file rsa.h.

#### 9.9.1.2 RSA\_END\_SIZE

```
#define RSA_END_SIZE 29
```

Definition at line 22 of file rsa.h.

#### 9.9.1.3 RSA\_FILE\_TOTAL\_SIZE

```
#define RSA_FILE_TOTAL_SIZE 426
```

Definition at line 20 of file rsa.h.

#### 9.9.1.4 RSA\_KEY\_SIZE

```
#define RSA_KEY_SIZE 366
```

Definition at line 19 of file rsa.h.



## 9.9.2 Function Documentation

### 9.9.2.1 get\_keys()

```
void get_keys (
    char * password )
```

Get the keys object.

Here is the caller graph for this function:

## 9.10 /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 "blockchain/wallet.h"
#include "blockchain/block.h"
#include "validation/epoch_man.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, void \*buffer)  
*buffer <- encrypt(SHA284(msg,len\_data),wallet\_priv\_key)*
- char \* [sign\\_message\\_with\\_key](#) (char \*data, size\_t len\_data, RSA \*key, void \*buffer)  
*encrypt(SHA284(msg,len\_data),key) buffer <- encrypt(SHA284(msg,len\_data),key)*
- int [verify\\_signature](#) (void \*data, size\_t data\_len, char \*signature, RSA \*pub\_key)  
*Verifies if SHA384(data) == decrypt(signature,pub\_key)*
- 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)  
*Converts transactions to char \* buffer.*
- 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 with my private key.*

- void `sign_block_with_key` (`Block *block`, `RSA *key`)

*Signs a block.*

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

*Signs a transaction with my private key.*

- void `sign_transaction_with_key` (`Transaction *transaction`, `RSA *key`)

*Signs a transaction.*

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

*Signs all transactions of a block with my private key.*

## 9.10.1 Function Documentation

### 9.10.1.1 `get_transaction_data()`

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

Converts 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)

Converts transactions to char \* buffer.

#### Parameters

<i>trans</i>	The returned transaction
<i>buff</i>	The buffer with the serialized data
<i>index</i>	The buffer starting offset

Definition at line 40 of file transaction.c.

### 9.10.1.2 `sign_block()`

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

Signs a block with my private key.

#### Parameters

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

Definition at line 108 of file signature.c.

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

#### 9.10.1.3 sign\_block\_transactions()

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

Signs all transactions of a block with my private key.

#### Parameters

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

Definition at line 138 of file signature.c.

Here is the call graph for this function:

#### 9.10.1.4 sign\_block\_with\_key()

```
void sign_block_with_key (
    Block * block,
    RSA * key )
```

Signs a block.

#### Parameters

<i>block</i>	The block to sign
<i>key</i>	The key to use for the signature

Definition at line 115 of file signature.c.

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

#### 9.10.1.5 sign\_message()

```
char* sign_message (
    char * data,
    size_t len_data,
    void * buffer )
```

```
buffer <- encrypt(SHA284(msg,len_data),wallet_priv_key)
```

If buffer == NULL, return a new allocated buffer

**Parameters**

<i>data</i>	The data to sign
<i>len_data</i>	The length of the data
<i>buffer</i>	The buffer to put signature into

**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:

**9.10.1.6 sign\_message\_with\_key()**

```
char* sign_message_with_key (  
    char * data,  
    size_t len_data,  
    RSA * key,  
    void * buffer )
```

encrypt(SHA284(msg,len\_data),key) buffer <- encrypt(SHA284(msg,len\_data),key)

If buffer == NULL, return a new allocated buffer

**Parameters**

<i>data</i>	The data to sign
<i>len_data</i>	The length of the data
<i>key</i>	The key to use for the signature
<i>buffer</i>	The buffer to put signature into

**Returns**

char\*

Definition at line 34 of file signature.c.

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

**9.10.1.7 sign\_transaction()**

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

Signs a transaction with my private key.

**Parameters**

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

Definition at line 122 of file signature.c.

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

**9.10.1.8 sign\_transaction\_with\_key()**

```
void sign_transaction_with_key (  
    Transaction * transaction,  
    RSA * key )
```

Signs a transaction.

**Parameters**

<i>transaction</i>	The transaction to sign
<i>key</i>	The key to use for the signature

Definition at line 130 of file signature.c.

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

**9.10.1.9 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 83 of file signature.c.

Here is the call graph for this function:

**9.10.1.10 verify\_signature()**

```
int verify_signature (  
    void * data,
```

```
size_t data_len,  
char * signature,  
RSA * pub_key )
```

Verifies if `SHA384(data) == decrypt(signature, pub_key)`

#### 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 <code>SHA384(data, len_data)</code>
<i>pub_key</i>	The RSA public key used for the decryption

#### Returns

int

Definition at line 57 of file `signature.c`.

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

#### 9.10.1.11 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 95 of file `signature.c`.

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

#### 9.10.1.12 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 228 of file block.c.

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

**9.10.1.13 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 196 of file block.c.

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

## 9.11 [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/misc/bits.h](#) File Reference

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

## 9.12 [/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.



## 9.12.1 Function Documentation

### 9.12.1.1 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.

## 9.13 /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)

## 9.13.1 Macro Definition Documentation

### 9.13.1.1 MAX

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

Definition at line 10 of file math.h.

### 9.13.1.2 MIN

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

Definition at line 9 of file math.h.

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

```
#include <stdio.h>
#include <stdlib.h>
#include <err.h>
#include <unistd.h>
#include <string.h>
#include <errno.h>
#include <sys/types.h>
#include <sys/socket.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.*
- int [safe\\_send](#) (int fd, const void \*buf, ssize\_t count)  
*Send safely to a file descriptor.*
- ssize\_t [safe\\_read](#) (int fd, const void \*\*buf, size\_t \*bufsize)  
*Reads safely in a file descriptor until '\n\n\n'.*
- ssize\_t [safe\\_fread](#) (void \*buffer, const size\_t size, const size\_t n, FILE \*file)  
*Calls 'fread' but safely !*

### 9.14.1 Function Documentation

#### 9.14.1.1 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 58 of file safe.c.

Here is the caller graph for this function:

### 9.14.1.2 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 31 of file safe.c.

Here is the caller graph for this function:

### 9.14.1.3 safe\_send()

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

Send 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 17 of file safe.c.

Here is the caller graph for this function:

**9.14.1.4 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 3 of file safe.c.

Here is the caller graph for this function:

## 9.15 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/get\_data.h File Reference

```
#include <string.h>
#include "network/network.h"
#include "network/client.h"
#include "network/server.h"
#include "network/send_data.h"
#include "validation/validation_engine.h"
#include "ui/ui.h"
```

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

**Functions**

- `size_t read_header (int sockfd, infos_st *infos)`  
*Waits a header in 'sockfd', reads it and processes it.*

- int [fetch\\_client\\_list](#) (char who, int fd)  
*Fetches the client list from a socket fd.*
- int [read\\_get\\_blocks](#) (int fd, [infos\\_st](#) \*infos)  
*Read blocks from a sock fd.*
- size\_t [read\\_actual\\_height](#) (int fd)  
*Get the actual height of a node via its sock fd.*
- int [read\\_send\\_block](#) (int fd)  
*Read a socket sended block.*
- int [read\\_vote](#) (int fd, [infos\\_st](#) \*infos)  
*Read a socket sended vote.*
- int [read\\_epoch\\_block](#) (int fd)  
*Read a socket sended epoch block.*
- int [read\\_get\\_pending\\_transaction](#) (int fd)  
*Get a socket sended pending transaction.*
- int [read\\_send\\_pending\\_transaction](#) (int fd, [infos\\_st](#) \*infos)  
*Read a socket sended pending transaction.*
- int [read\\_send\\_pending\\_transaction\\_list](#) (int fd, [infos\\_st](#) \*infos)  
*Read a socket sended pending transaction list.*
- int [epoch\\_validation\\_process](#) (int blockfile, size\_t height, int id)  
*Epoch validation protocol.*

## 9.15.1 Function Documentation

### 9.15.1.1 epoch\_validation\_process()

```
int epoch_validation_process (
    int blockfile,
    size_t height,
    int id )
```

Epoch validation protocol.

#### Parameters

<i>blockfile</i>	The epoch FD
<i>height</i>	The epoch height
<i>id</i>	The epoch ID

#### Returns

int

Definition at line 482 of file get\_data.c.

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

### 9.15.1.2 `fetch_client_list()`

```
int fetch_client_list (
    char who,
    int fd )
```

Fetches the client list from a socket fd.

#### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>fd</i>	The socket fd

#### Returns

0 if success, -1 otherwise

Definition at line 107 of file `get_data.c`.

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

### 9.15.1.3 `read_actual_height()`

```
size_t read_actual_height (
    int fd )
```

Get the actual height of a node via its sock fd.

#### Parameters

<i>fd</i>	The sock fd
-----------	-------------

#### Returns

`size_t`

Definition at line 186 of file `get_data.c`.

Here is the caller graph for this function:

### 9.15.1.4 `read_epoch_block()`

```
int read_epoch_block (
    int fd )
```

Read a socket sended epoch block.

#### Parameters

<i>fd</i>	The socket fd
-----------	---------------

**Returns**

int

Definition at line 420 of file get\_data.c.

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

**9.15.1.5 read\_get\_blocks()**

```
int read_get_blocks (
    int fd,
    infos_st * infos )
```

Read blocks from a sock fd.

**Parameters**

<i>fd</i>	The sock fd
<i>infos</i>	Shared information

**Returns**

int

Definition at line 155 of file get\_data.c.

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

**9.15.1.6 read\_get\_pending\_transaction()**

```
int read_get_pending_transaction (
    int fd )
```

Get a socket sended pending transaction.

**Parameters**

<i>fd</i>	The socket fd
-----------	---------------

**Returns**

int

Definition at line 629 of file get\_data.c.

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

### 9.15.1.7 read\_header()

```
size_t read_header (
    int sockfd,
    infos_st * infos )
```

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

#### Parameters

<i>sockfd</i>	The sock FD
<i>infos</i>	Shared information

#### Returns

0 if success, -1 otherwise

Definition at line 136 of file get\_data.c.

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

### 9.15.1.8 read\_send\_block()

```
int read_send_block (
    int fd )
```

Read a socket send block.

#### Parameters

<i>fd</i>	The socket fd
-----------	---------------

#### Returns

int

Definition at line 193 of file get\_data.c.

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

### 9.15.1.9 read\_send\_pending\_transaction()

```
int read_send_pending_transaction (
    int fd,
    infos_st * infos )
```

Read a socket send pending transaction.



## Parameters

<i>fd</i>	The socket fd
<i>infos</i>	Shared information

## Returns

int

Definition at line 571 of file get\_data.c.

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

**9.15.1.10 read\_send\_pending\_transaction\_list()**

```
int read_send_pending_transaction_list (  
    int fd,  
    infos_st * infos )
```

Read a socket sended pending transaction list.

## Parameters

<i>fd</i>	The socket fd
<i>infos</i>	Shared information

## Returns

int

Definition at line 549 of file get\_data.c.

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

**9.15.1.11 read\_vote()**

```
int read_vote (  
    int fd,  
    infos_st * infos )
```

Read a socket sended vote.

## Parameters

<i>fd</i>	The socket fd
<i>infos</i>	Shared information

**Returns**

int

Definition at line 279 of file `get_data.c`.

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

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

```
#include <pthread.h>
#include <semaphore.h>
#include <stdint.h>
```

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

**Data Structures**

- struct [Neighbour](#)
- struct [Node](#)
- struct [connection](#)
- struct [infos\\_st](#)
- struct [th\\_arg](#)

**Macros**

- #define [SIZE\\_OF\\_HOSTNAME](#) 39
- #define [NB\\_HARD\\_CODED\\_ADDR](#) 2
- #define [MAX\\_CONNECTION](#) 5
- #define [STATIC\\_PORT](#) "4242"
- #define [P\\_VERSION](#) 0
- #define [IM\\_SERVER](#) 0
- #define [IM\\_CLIENT](#) 1
- #define [MAX\\_NEIGHBOURS](#) 64
- #define [NODESERVER](#) 0
- #define [DOORSERVER](#) 1
- #define [MAX\\_SERVER](#) 20
- #define [MAX\\_VALIDATORS\\_PER\\_BLOCK](#) 512
- #define [SOL\\_TCP](#) 6
- #define [TCP\\_USER\\_TIMEOUT](#) 18
- #define [HD\\_GET\\_CLIENT\\_LIST](#) "GET CLIENT LIST\r\n\r\n"
- #define [HD\\_SEND\\_CLIENT\\_LIST](#) "SEND CLIENT LIST\r\n\r\n"
- #define [HD\\_CONNECTION\\_TO\\_NETWORK](#) "CONNECTION TO NETWORK\r\n\r\n"
- #define [HD\\_CONNECTION\\_TO\\_NODE](#) "CONNECTION TO NODE\r\n\r\n"
- #define [HD\\_GET\\_BLOCKS](#) "GET BLOCKS\r\n\r\n"
- #define [HD\\_ACTUAL\\_HEIGHT](#) "ACTUAL HEIGHT\r\n\r\n"
- #define [HD\\_SEND\\_BLOCK](#) "SEND BLOCK\r\n\r\n"
- #define [HD\\_GET\\_PENDING\\_TRANSACTION\\_LIST](#) "GET PENDING TRANSACTION LIST\r\n\r\n"
- #define [HD\\_SEND\\_PENDING\\_TRANSACTION\\_LIST](#) "SEND PENDING TRANSACTION LIST\r\n\r\n"

- `#define HD_REJECT_DEMAND "REJECT DEMAND\\n\\n\\n"`
- `#define HD_GET_PENDING_TRANSACTION "GET PENDING TRANSACTION\\n\\n\\n"`
- `#define HD_SEND_PENDING_TRANSACTION "SEND PENDING TRANSACTION\\n\\n\\n"`
- `#define HD_SEND_EPOCH_BLOCK "SEND EPOCH BLOCK\\n\\n\\n"`
- `#define HD_SEND_VOTE "SEND VOTE\\n\\n\\n"`
- `#define DD_GET_HEIGHT 1`
- `#define DD_GET_BLOCKS 2`
- `#define DD_SEND_TRANSACTION 3`
- `#define DD_GET_TRANSACTION_LIST 4`
- `#define DD_SEND_VOTE 5`
- `#define DD_SEND_EPOCH 6`
- `#define SERVERMSG printf("\\033[0;31m[S]:\\033[0m ");`
- `#define CLIENTMSG printf("\\033[0;34m[C]:\\033[0m ");`
- `#define MANAGERMSG printf("\\033[0;32m[M]:\\033[0m ");`
- `#define WARNINGMSG(x) printf("\\033[0;35m[W]: %s\\033[0m\\n", x);`

## Typedefs

- `typedef struct Neighbour Neighbour`
- `typedef struct Node Node`
- `typedef struct connection connection`
- `typedef struct infos_st infos_st`
- `typedef struct th_arg th_arg`

## Functions

- `struct __attribute__((__packed__)) get_blocks_t`

## Variables

- `const Neighbour HARD_CODED_ADDR []`
- `get_blocks_t`

### 9.16.1 Macro Definition Documentation

#### 9.16.1.1 CLIENTMSG

```
#define CLIENTMSG printf("\\033[0;34m[C]:\\033[0m ");
```

Definition at line 99 of file network.h.

#### 9.16.1.2 DD\_GET\_BLOCKS

```
#define DD_GET_BLOCKS 2
```

Definition at line 90 of file network.h.

#### 9.16.1.3 DD\_GET\_HEIGHT

```
#define DD_GET_HEIGHT 1
```

Definition at line 89 of file network.h.

#### 9.16.1.4 DD\_GET\_TRANSACTION\_LIST

```
#define DD_GET_TRANSACTION_LIST 4
```

Definition at line 92 of file network.h.

#### 9.16.1.5 DD\_SEND\_EPOCH

```
#define DD_SEND_EPOCH 6
```

Definition at line 94 of file network.h.

#### 9.16.1.6 DD\_SEND\_TRANSACTION

```
#define DD_SEND_TRANSACTION 3
```

Definition at line 91 of file network.h.

#### 9.16.1.7 DD\_SEND\_VOTE

```
#define DD_SEND_VOTE 5
```

Definition at line 93 of file network.h.

#### 9.16.1.8 DOORSERVER

```
#define DOORSERVER 1
```

Definition at line 23 of file network.h.

#### 9.16.1.9 HD\_ACTUAL\_HEIGHT

```
#define HD_ACTUAL_HEIGHT "ACTUAL HEIGHT\r\n\r\n"
```

Definition at line 78 of file network.h.

#### 9.16.1.10 HD\_CONNECTION\_TO\_NETWORK

```
#define HD_CONNECTION_TO_NETWORK "CONNECTION TO NETWORK\r\n\r\n"
```

Definition at line 75 of file network.h.

#### 9.16.1.11 HD\_CONNECTION\_TO\_NODE

```
#define HD_CONNECTION_TO_NODE "CONNECTION TO NODE\r\n\r\n"
```

Definition at line 76 of file network.h.

#### 9.16.1.12 HD\_GET\_BLOCKS

```
#define HD_GET_BLOCKS "GET BLOCKS\r\n\r\n"
```

Definition at line 77 of file network.h.

#### 9.16.1.13 HD\_GET\_CLIENT\_LIST

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

Definition at line 73 of file network.h.

#### 9.16.1.14 HD\_GET\_PENDING\_TRANSACTION

```
#define HD_GET_PENDING_TRANSACTION "GET PENDING TRANSACTION\r\n\r\n"
```

Definition at line 83 of file network.h.

#### 9.16.1.15 HD\_GET\_PENDING\_TRANSACTION\_LIST

```
#define HD_GET_PENDING_TRANSACTION_LIST "GET PENDING TRANSACTION LIST\r\n\r\n"
```

Definition at line 80 of file network.h.

#### 9.16.1.16 HD\_REJECT\_DEMAND

```
#define HD_REJECT_DEMAND "REJECT DEMAND\r\n\r\n"
```

Definition at line 82 of file network.h.

#### 9.16.1.17 HD\_SEND\_BLOCK

```
#define HD_SEND_BLOCK "SEND BLOCK\r\n\r\n"
```

Definition at line 79 of file network.h.

#### 9.16.1.18 HD\_SEND\_CLIENT\_LIST

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

Definition at line 74 of file network.h.

#### 9.16.1.19 HD\_SEND\_EPOCH\_BLOCK

```
#define HD_SEND_EPOCH_BLOCK "SEND EPOCH BLOCK\r\n\r\n"
```

Definition at line 85 of file network.h.

#### 9.16.1.20 HD\_SEND\_PENDING\_TRANSACTION

```
#define HD_SEND_PENDING_TRANSACTION "SEND PENDING TRANSACTION\r\n\r\n"
```

Definition at line 84 of file network.h.

#### 9.16.1.21 HD\_SEND\_PENDING\_TRANSACTION\_LIST

```
#define HD_SEND_PENDING_TRANSACTION_LIST "SEND PENDING TRANSACTION LIST\r\n\r\n"
```

Definition at line 81 of file network.h.

#### 9.16.1.22 HD\_SEND\_VOTE

```
#define HD_SEND_VOTE "SEND VOTE\r\n\r\n"
```

Definition at line 86 of file network.h.

#### 9.16.1.23 IM\_CLIENT

```
#define IM_CLIENT 1
```

Definition at line 18 of file network.h.

#### 9.16.1.24 IM\_SERVER

```
#define IM_SERVER 0
```

Definition at line 17 of file network.h.

#### 9.16.1.25 MANAGERMSG

```
#define MANAGERMSG printf("\033[0;32m[M]:\033[0m ");
```

Definition at line 100 of file network.h.

**9.16.1.26 MAX\_CONNECTION**

```
#define MAX_CONNECTION 5
```

Definition at line 11 of file network.h.

**9.16.1.27 MAX\_NEIGHBOURS**

```
#define MAX_NEIGHBOURS 64
```

Definition at line 20 of file network.h.

**9.16.1.28 MAX\_SERVER**

```
#define MAX_SERVER 20
```

Definition at line 25 of file network.h.

**9.16.1.29 MAX\_VALIDATORS\_PER\_BLOCK**

```
#define MAX_VALIDATORS_PER_BLOCK 512
```

Definition at line 27 of file network.h.

**9.16.1.30 NB\_HARD\_CODED\_ADDR**

```
#define NB_HARD_CODED_ADDR 2
```

Definition at line 10 of file network.h.

**9.16.1.31 NODESERVER**

```
#define NODESERVER 0
```

Definition at line 22 of file network.h.



#### 9.16.1.32 P\_VERSION

```
#define P_VERSION 0
```

Definition at line 15 of file network.h.

#### 9.16.1.33 SERVERMSG

```
#define SERVERMSG printf("\033[0;31m[S]:\033[0m ");
```

Definition at line 98 of file network.h.

#### 9.16.1.34 SIZE\_OF\_HOSTNAME

```
#define SIZE_OF_HOSTNAME 39
```

Definition at line 9 of file network.h.

#### 9.16.1.35 SOL\_TCP

```
#define SOL_TCP 6
```

Definition at line 29 of file network.h.

#### 9.16.1.36 STATIC\_PORT

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

Definition at line 13 of file network.h.

#### 9.16.1.37 TCP\_USER\_TIMEOUT

```
#define TCP_USER_TIMEOUT 18
```

Definition at line 30 of file network.h.

### 9.16.1.38 WARNINGMSG

```
#define WARNINGMSG(  
    x ) printf("\033[0;35m[W]:  %s\033[0m\n", x);
```

Definition at line 101 of file network.h.

## 9.16.2 Typedef Documentation

### 9.16.2.1 connection

```
typedef struct connection connection
```

### 9.16.2.2 infos\_st

```
typedef struct infos_st infos_st
```

### 9.16.2.3 Neighbour

```
typedef struct Neighbour Neighbour
```

### 9.16.2.4 Node

```
typedef struct Node Node
```

### 9.16.2.5 th\_arg

```
typedef struct th_arg th_arg
```

## 9.16.3 Function Documentation

### 9.16.3.1 \_\_attribute\_\_()

```
struct __attribute__ (  
    (__packed__) )
```

Definition at line 103 of file network.h.

## 9.16.4 Variable Documentation

### 9.16.4.1 get\_blocks\_t

```
get_blocks_t
```

Definition at line 108 of file network.h.

### 9.16.4.2 HARD\_CODED\_ADDR

```
const Neighbour HARD_CODED_ADDR[ ]
```

Definition at line 5 of file network.c.

## 9.17 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/network/send\_data.h File Reference

```
#include "network/server.h"  
#include <dirent.h>  
#include <stdio.h>
```

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

## Functions

- int [send\\_client\\_list](#) (char who, int sockfd, char \*sockip)  
*Sends my client list to a node via 'sockfd'.*
- void [send\\_get\\_blocks](#) ([connection](#) \*cc)  
*Sends get blocks.*
- void [send\\_actual\\_height](#) (int fd, [infos\\_st](#) \*infos)
- void [send\\_reject\\_demand](#) (int fd)
- void [send\\_send\\_block](#) (int fd, [size\\_t](#) height)
- void [send\\_pending\\_transaction\\_list](#) (int fd)
- void [send\\_send\\_pending\\_transaction](#) (int fd, [time\\_t](#) txid)
- void [send\\_get\\_pending\\_transaction](#) (int fd, [time\\_t](#) txid)
- void [send\\_epoch\\_block](#) ([connection](#) \*cc)
- void [send\\_vote\\_fd](#) ([connection](#) \*cc)

## 9.17.1 Function Documentation

### 9.17.1.1 `send_actual_height()`

```
void send_actual_height (
    int fd,
    infos_st * infos )
```

Definition at line 58 of file `send_data.c`.

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

### 9.17.1.2 `send_client_list()`

```
int send_client_list (
    char who,
    int sockfd,
    char * sockip )
```

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:

### 9.17.1.3 `send_epoch_block()`

```
void send_epoch_block (
    connection * cc )
```

Definition at line 173 of file `send_data.c`.

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

### 9.17.1.4 `send_get_blocks()`

```
void send_get_blocks (
    connection * cc )
```

Sends get blocks.

Definition at line 52 of file `send_data.c`.

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

#### 9.17.1.5 send\_get\_pending\_transaction()

```
void send_get_pending_transaction (
    int fd,
    time_t txid )
```

Definition at line 165 of file send\_data.c.

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

#### 9.17.1.6 send\_pending\_transaction\_list()

```
void send_pending_transaction_list (
    int fd )
```

Definition at line 104 of file send\_data.c.

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

#### 9.17.1.7 send\_reject\_demand()

```
void send_reject_demand (
    int fd )
```

Definition at line 65 of file send\_data.c.

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

#### 9.17.1.8 send\_send\_block()

```
void send_send_block (
    int fd,
    size_t height )
```

Definition at line 71 of file send\_data.c.

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

#### 9.17.1.9 send\_send\_pending\_transaction()

```
void send_send_pending_transaction (
    int fd,
    time_t txid )
```

Definition at line 127 of file send\_data.c.

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

### 9.17.1.10 send\_vote\_fd()

```
void send_vote_fd (
    connection * cc )
```

Definition at line 209 of file send\_data.c.

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

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

```
#include <sys/socket.h>
#include <sys/types.h>
#include <semaphore.h>
#include <netdb.h>
#include <arpa/inet.h>
#include "blockchain/block.h"
#include "network/client.h"
#include "network/get_data.h"
#include "network/send_data.h"
#include "network/network.h"
#include "misc/safe.h"
```

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

### Functions

- void \* [init\\_server](#) (void \*args)

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

### 9.18.1 Function Documentation

#### 9.18.1.1 init\_server()

```
void* init_server (
    void * args )
```

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

#### Parameters

<i>type</i>	Type of the server
-------------	--------------------

## Returns

0 if success, -1 otherwise

Definition at line 106 of file server.c.

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

## 9.19 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/ui/labels.h File Reference

```
#include <gtk/gtk.h>
#include <stdio.h>
#include <string.h>
#include <err.h>
#include <time.h>
```

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

## Functions

- void [change\\_label\\_text](#) (GtkLabel \*label, char \*text)
- void [add\\_new\\_blockinfo](#) (size\_t height, size\_t transaction)

## Variables

- GtkLabel \* [balance\\_1](#)
- GtkLabel \* [balance\\_2](#)
- GtkLabel \* [stake\\_label1](#)
- GtkLabel \* [stake\\_label2](#)
- GtkLabel \* [stake\\_label3](#)
- GtkLabel \* [synchro\\_label](#)
- GtkLabel \* [block\\_amount\\_label](#)
- GtkLabel \* [connections\\_label](#)
- GtkLabel \* [mempool\\_label](#)

### 9.19.1 Function Documentation

#### 9.19.1.1 [add\\_new\\_blockinfo\(\)](#)

```
void add_new_blockinfo (
    size_t height,
    size_t transaction )
```

Definition at line 322 of file ui.c.

### 9.19.1.2 `change_label_text()`

```
void change_label_text (
    GtkWidget * label,
    char * text )
```

Definition at line 233 of file ui.c.

Here is the caller graph for this function:

## 9.19.2 Variable Documentation

### 9.19.2.1 `balance_1`

```
GtkWidget* balance_1
```

Definition at line 24 of file ui.c.

### 9.19.2.2 `balance_2`

```
GtkWidget* balance_2
```

Definition at line 25 of file ui.c.

### 9.19.2.3 `block_amount_label`

```
GtkWidget* block_amount_label
```

Definition at line 30 of file ui.c.

### 9.19.2.4 `connections_label`

```
GtkWidget* connections_label
```

Definition at line 31 of file ui.c.



#### 9.19.2.5 mempool\_label

GtkLabel\* mempool\_label

Definition at line 32 of file ui.c.

#### 9.19.2.6 stake\_label1

GtkLabel\* stake\_label1

Definition at line 26 of file ui.c.

#### 9.19.2.7 stake\_label2

GtkLabel\* stake\_label2

Definition at line 27 of file ui.c.

#### 9.19.2.8 stake\_label3

GtkLabel\* stake\_label3

Definition at line 28 of file ui.c.

#### 9.19.2.9 synchro\_label

GtkLabel\* synchro\_label

Definition at line 29 of file ui.c.

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

```
#include <dirent.h>
#include <gtk/gtk.h>
#include <stdio.h>
#include <string.h>
#include <err.h>
#include <time.h>
#include "network/network.h"
#include "cryptosystem/rsa.h"
#include "cryptosystem/hash.h"
#include "blockchain/wallet.h"
#include "blockchain/block.h"
#include "client.h"
```

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

## Data Structures

- struct [blockinfo](#)

## Functions

- void \* [setup](#) (void \*args)  
*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\\_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.*
- void [change\\_label\\_text](#) (GtkLabel \*label, char \*text)
- 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\\_with\\_pkey](#) (double amount, char \*public\_key, char \*date)
- void [add\\_transaction\\_with\\_contact](#) (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)
- void [add\\_new\\_blockinfo](#) (size\_t height, size\_t transaction)
- void [update\\_sync](#) (size\_t actual, size\_t final)
- gboolean [set\\_block\\_viewer\\_plus](#) (GtkWidget \*widget, GdkEventKey \*event, gpointer user\_data)
- gboolean [set\\_block\\_viewer\\_minus](#) (GtkWidget \*widget, GdkEventKey \*event, gpointer user\_data)
- void [set\\_block\\_viewer](#) (int height)

## Variables

- GtkWidget \* [balance\\_1](#)
- GtkWidget \* [balance\\_2](#)
- GtkWidget \* [stake\\_label1](#)
- GtkWidget \* [stake\\_label2](#)
- GtkWidget \* [stake\\_label3](#)
- GtkWidget \* [synchro\\_label](#)
- GtkWidget \* [block\\_amount\\_label](#)
- GtkWidget \* [connections\\_label](#)
- GtkWidget \* [mempool\\_label](#)
- struct [blockinfo](#) [blocksinfo](#) [3]

## 9.20.1 Function Documentation

### 9.20.1.1 `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

### 9.20.1.2 `add_contact_to_combobox()`

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

Definition at line 624 of file ui.c.

Here is the caller graph for this function:

### 9.20.1.3 add\_contacts\_from\_file()

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

Definition at line 632 of file ui.c.

Here is the caller graph for this function:

### 9.20.1.4 add\_new\_blockinfo()

```
void add_new_blockinfo (
    size_t height,
    size_t transaction )
```

Definition at line 322 of file ui.c.

### 9.20.1.5 add\_transaction\_from\_file()

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

Definition at line 480 of file ui.c.

Here is the caller graph for this function:

### 9.20.1.6 add\_transaction\_with\_contact()

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

Definition at line 460 of file ui.c.

Here is the caller graph for this function:

### 9.20.1.7 add\_transaction\_with\_pkey()

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

Definition at line 440 of file ui.c.

Here is the caller graph for this function:

### 9.20.1.8 `change_label_text()`

```
void change_label_text (
    GtkWidget * label,
    char * text )
```

Definition at line 233 of file ui.c.

Here is the caller graph for this function:

### 9.20.1.9 `get_public_key_from_contacts()`

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

Definition at line 667 of file ui.c.

Here is the caller graph for this function:

### 9.20.1.10 `load_contacts_from_file()`

```
void load_contacts_from_file ( )
```

Definition at line 641 of file ui.c.

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

### 9.20.1.11 `load_transaction_from_file()`

```
void load_transaction_from_file ( )
```

### 9.20.1.12 `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

**9.20.1.13 on\_connect\_but\_press()**

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

**9.20.1.14 on\_create\_key\_but1\_press()**

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

**9.20.1.15 on\_create\_key\_but2\_press()**

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

**9.20.1.16 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

**9.20.1.17 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

**9.20.1.18 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 358 of file ui.c.

### 9.20.1.19 on\_main\_window\_destroy()

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

Quits GTK when the program ends.

### 9.20.1.20 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

### 9.20.1.21 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



#### 9.20.1.22 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

#### 9.20.1.23 set\_block\_viewer()

```
void set_block_viewer (
    int height )
```

Definition at line 270 of file ui.c.

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

#### 9.20.1.24 set\_block\_viewer\_minus()

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

#### 9.20.1.25 set\_block\_viewer\_plus()

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

#### 9.20.1.26 **setup()**

```
void* setup (
    void * args )
```

Setups the gtk widgets for the GUI.

##### Returns

int Returns 1 if there is an error, 0 otherwise

Definition at line 80 of file ui.c.

Here is the caller graph for this function:

#### 9.20.1.27 **update\_labels()**

```
void update_labels ( )
```

Definition at line 796 of file ui.c.

Here is the call graph for this function:

#### 9.20.1.28 **update\_sync()**

```
void update_sync (
    size_t actual,
    size_t final )
```

Definition at line 339 of file ui.c.

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

### 9.20.2 **Variable Documentation**

#### 9.20.2.1 **balance\_1**

```
GtkLabel* balance_1
```

Definition at line 24 of file ui.c.

#### 9.20.2.2 balance\_2

```
GtkLabel* balance_2
```

Definition at line 25 of file ui.c.

#### 9.20.2.3 block\_amount\_label

```
GtkLabel* block_amount_label
```

Definition at line 30 of file ui.c.

#### 9.20.2.4 blocksinfo

```
struct blockinfo blocksinfo[3]
```

Definition at line 32 of file ui.h.

#### 9.20.2.5 connections\_label

```
GtkLabel* connections_label
```

Definition at line 31 of file ui.c.

#### 9.20.2.6 mempool\_label

```
GtkLabel* mempool_label
```

Definition at line 32 of file ui.c.

#### 9.20.2.7 stake\_label1

```
GtkLabel* stake_label1
```

Definition at line 26 of file ui.c.

### 9.20.2.8 stake\_label2

```
GtkLabel* stake_label2
```

Definition at line 27 of file ui.c.

### 9.20.2.9 stake\_label3

```
GtkLabel* stake_label3
```

Definition at line 28 of file ui.c.

### 9.20.2.10 synchro\_label

```
GtkLabel* synchro_label
```

Definition at line 29 of file ui.c.

## 9.21 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/validation/epoch\_man.h File Reference

```
#include "blockchain/transaction.h"
#include "blockchain/block.h"
#include "cryptosystem/signature.h"
#include "validation_engine.h"
#include "misc/bits.h"
#include "validators.h"
#include <openssl/rsa.h>
#include <dirent.h>
```

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

## Functions

- char \* [create\\_vote\\_data](#) ([Block](#) \*block, char vote, int validator\_index, size\_t \*data\_length)
- [Block](#) \* [create\\_epoch\\_block](#) ()  
*Create a block object with the previous block hash & votes.*
- RSA \* [get\\_epoch\\_man\\_pkey](#) ([BlockData](#) \*block\_data)  
*Give the pkey of the creator of a block.*
- void [give\\_punishments\\_and\\_rewards](#) ([Block](#) \*prev\_block, [Block](#) \*current\_block)  
*Add punishment and reward transactions to validators of the 'prev\_block' into 'current\_block'.*

## 9.21.1 Function Documentation

### 9.21.1.1 create\_epoch\_block()

```
Block* create_epoch_block ( )
```

Create a block object with the previous block hash & votes.

#### See also

The function create a block based on the local last block

#### Returns

Block\*

Definition at line 141 of file epoch\_man.c.

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

### 9.21.1.2 create\_vote\_data()

```
char* create_vote_data (
    Block * block,
    char vote,
    int validator_index,
    size_t * data_length )
```

Definition at line 10 of file epoch\_man.c.

### 9.21.1.3 get\_epoch\_man\_pkey()

```
RSA* get_epoch_man_pkey (
    BlockData * block_data )
```

Give the pkey of the creator of a block.

#### Parameters

<i>block_data</i>	The created block data
-------------------	------------------------

#### Returns

RSA\*, NULL if the data is corrupted

Definition at line 3 of file epoch\_man.c.

Here is the caller graph for this function:

#### 9.21.1.4 give\_punishments\_and\_rewards()

```
void give_punishments_and_rewards (
    Block * prev_block,
    Block * current_block )
```

Add punishment and reward transactions to validators of the 'prev\_block' into 'current\_block'.

See also

Number of added transactions = number of validators in 'prev\_block'

Parameters

<i>prev_block</i>	The last validated block
<i>current_block</i>	The current block (in creation)

Definition at line 31 of file epoch\_man.c.

Here is the caller graph for this function:

## 9.22 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/validation/plebe.h File Reference

```
#include "blockchain/block.h"
#include "validation/validation_engine.h"
```

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

### Functions

- int [plebe\\_adhere\\_block](#) (Block \*block)  
*Adhere a block, write it locally.*

#### 9.22.1 Function Documentation

##### 9.22.1.1 plebe\_adhere\_block()

```
int plebe_adhere_block (
    Block * block )
```

Adhere a block, write it locally.

#### Parameters

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

#### Returns

0 if success, 2 if need to sync error, 1 if data corrupted error

Definition at line 7 of file plebe.c.

Here is the call graph for this function:

## 9.23 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/headers/validation/validation\_engine.h File Reference

```
#include "blockchain/block.h"
#include "cryptosystem/signature.h"
#include "cryptosystem/rsa.h"
#include "cryptosystem/hash.h"
#include "network/get_data.h"
#include "misc/math.h"
#include "misc/files.h"
#include "misc/bits.h"
#include "misc/safe.h"
#include <string.h>
#include <openssl/bio.h>
#include <stdbool.h>
#include <openssl/evp.h>
```

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

#### Macros

- #define VERIDCT\_NO 0
- #define VERIDCT\_YES 1

#### Functions

- int [send\\_verdict](#) ([Block](#) \*block, char verdict)  
*Broadcast a verdict about a block validity to the network.*
- [Transaction](#) \*\* [validate\\_transactions](#) ([Transaction](#) \*\*transaction\_to\_validate, size\_t nb\_transactions, size\_t \*nb\_returned\_transactions)  
*Validate some transactions.*
- int [comital\\_validate\\_block](#) ([Block](#) \*block)  
*For the comital, check block validity.*
- char [plebe\\_verify\\_block](#) ([Block](#) \*block)  
*For the plèbe, check block validity.*

## Variables

- [connection](#) \* [client\\_connections](#)

## 9.23.1 Macro Definition Documentation

### 9.23.1.1 VERIDCT\_NO

```
#define VERIDCT_NO 0
```

Definition at line 19 of file validation\_engine.h.

### 9.23.1.2 VERIDCT\_YES

```
#define VERIDCT_YES 1
```

Definition at line 20 of file validation\_engine.h.

## 9.23.2 Function Documentation

### 9.23.2.1 comital\_validate\_block()

```
int comital_validate_block (  
    Block * block )
```

For the comital, check block validity.

#### Parameters

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

#### Returns

int

Definition at line 242 of file validation\_engine.c.

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



### 9.23.2.2 plebe\_verify\_block()

```
char plebe_verify_block (
    Block * block )
```

For the plèbe, check block validity.

#### Parameters

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

#### Returns

int

Definition at line 199 of file validation\_engine.c.

Here is the caller graph for this function:

### 9.23.2.3 send\_verdict()

```
int send_verdict (
    Block * block,
    char verdict )
```

Broadcast a verdict about a block validity to the network.

#### Parameters

<i>block</i>	The block awaiting validation
<i>verdict</i>	The verdict : 0 -> "SHAME ! The block is not valid at all", 1 -> "The block is valid for me"

#### Returns

0 if the broadcast succeed, -1 if not

Definition at line 305 of file validation\_engine.c.

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

### 9.23.2.4 validate\_transactions()

```
Transaction** validate_transactions (
    Transaction ** transaction_to_validate,
    size_t nb_transactions,
    size_t * nb_returned_transactions )
```

Validate some transactions.

**See also**

The verification must take into account :

- Sender != receiver
- If the sender signature is correct
- If the sender exists in the blockchain and has enough money
- If the receiver exists
- If sender and receiver remaining money fields are correct

**Parameters**

<i>transaction_to_validate</i>	The transactions to validate
<i>nb_transactions</i>	The number of transactions to validate
<i>nb_returned_transactions</i>	The number of returned (valid) transactions

**Returns**

Transaction\*\*, the valid transactions

Definition at line 3 of file validation\_engine.c.

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

### 9.23.3 Variable Documentation

#### 9.23.3.1 client\_connections

```
connection* client_connections
```

Definition at line 4 of file client.c.

## 9.24 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/headers/validation/validators.h File Reference

```
#include <stdlib.h>
#include <string.h>
#include <openssl/rsa.h>
#include <openssl/pem.h>
#include "cryptosystem/hash.h"
#include "cryptosystem/rsa.h"
#include "misc/files.h"
#include "misc/safe.h"
#include "misc/math.h"
```

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

## Data Structures

- struct [validators\\_state\\_header](#)
- struct [validators\\_state\\_item](#)

## Macros

- `#define` [MAX\\_VALIDATORS\\_PER\\_BLOCK](#) 512

## Functions

- void [init\\_validators\\_state](#) ()  
*Init the `validators.state` file if it doesn't exists.*
- RSA \*\* [get\\_comittee](#) (size\_t [block\\_height](#), int \*nb\_validators)  
*Get the a comittee RSA public keys on a specific epoch.*
- RSA \*\* [get\\_next\\_comittee](#) (int \*nb\_validators)  
*Get the a comittee RSA public keys on a specific epoch.*
- ssize\_t [get\\_validators\\_states\\_total\\_stake](#) ()  
*Get the total stake of the network (parse '`validators.state`')*
- ssize\_t [get\\_validators\\_states\\_nb\\_validators](#) ()  
*Get the number of validators of the network (parse '`validators.state`')*
- ssize\_t [get\\_validators\\_states\\_block\\_height\\_validity](#) ()  
*Get the validators states block height validity (parse '`validators.state`')*
- ssize\_t [get\\_validator\\_stake](#) (size\_t validator\_id)  
*Get a validator total stake (parse '`validators.state`')*
- ssize\_t [get\\_validator\\_power](#) (size\_t validator\_id)  
*Get a validator power (parse '`validators.state`')*
- RSA \* [get\\_validator\\_pkey](#) (size\_t validator\_id)  
*Get the validator pkey as RSA\* (parse '`validators.state`')*
- ssize\_t [get\\_validator\\_id](#) (RSA \*pkey)  
*Get the validator id in '`validators.state`'.*
- int [i\\_am\\_commitee\\_member](#) ()  
*Check if the current user is a member of the next comitee.*
- char [update\\_validators\\_state](#) (Block \*block)  
*Given a block, update the '`validators.state`' with the transactions.*

### 9.24.1 Macro Definition Documentation

#### 9.24.1.1 MAX\_VALIDATORS\_PER\_BLOCK

```
#define MAX_VALIDATORS_PER_BLOCK 512
```

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

## 9.24.2 Function Documentation

### 9.24.2.1 `get_comittee()`

```
RSA** get_comittee (
    size_t block_height,
    int * nb_validators )
```

Get the a comittee RSA public keys on a specific epoch.

#### Parameters

<i>block_height</i>	The height of the block you want a comitte from
<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 46 of file validators.c.

### 9.24.2.2 `get_next_comittee()`

```
RSA** get_next_comittee (
    int * nb_validators )
```

Get the a comittee RSA public keys on a specific epoch.

#### 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 135 of file validators.c.

Here is the caller graph for this function:

**9.24.2.3 get\_validator\_id()**

```
ssize_t get_validator_id (
    RSA * pkey )
```

Get the validator id in 'validators.state'.

**Parameters**

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

**Returns**

ssize\_t, the validator index

Definition at line 247 of file validators.c.

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

**9.24.2.4 get\_validator\_pkey()**

```
RSA* get_validator_pkey (
    size_t validator_id )
```

Get the validator pkey as RSA\* (parse 'validators.state')

**Parameters**

<i>validator_id</i>	The id of the validator in 'validators.state'
---------------------	---

**Returns**

RSA\*

Definition at line 216 of file validators.c.

Here is the call graph for this function:

**9.24.2.5 get\_validator\_power()**

```
ssize_t get_validator_power (
    size_t validator_id )
```

Get a validator power (parse 'validators.state')

**Parameters**

<i>validator_id</i>	The id of the validator in 'validators.state'
---------------------	---

**Returns**

ssize\_t

Definition at line 199 of file validators.c.

Here is the call graph for this function:

**9.24.2.6 get\_validator\_stake()**

```
ssize_t get_validator_stake (
    size_t validator_id )
```

Get a validator total stake (parse 'validators.state')

**Parameters**

<i>validator</i> ↔ _id	The id of the validator in 'validators.state'
---------------------------	---

**Returns**

ssize\_t

Definition at line 182 of file validators.c.

Here is the call graph for this function:

**9.24.2.7 get\_validators\_states\_block\_height\_validity()**

```
ssize_t get_validators_states_block_height_validity ( )
```

Get the validators states block height validity (parse 'validators.state')

**Returns**

ssize\_t

Definition at line 168 of file validators.c.

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

**9.24.2.8 get\_validators\_states\_nb\_validators()**

```
ssize_t get_validators_states_nb_validators ( )
```

Get the number of validators of the network (parse 'validators.state')

**Returns**

ssize\_t

Definition at line 154 of file validators.c.

Here is the call graph for this function:

**9.24.2.9 get\_validators\_states\_total\_stake()**

```
ssize_t get_validators_states_total_stake ( )
```

Get the total stake of the network (parse 'validators.state')

**Returns**

ssize\_t

Definition at line 140 of file validators.c.

Here is the call graph for this function:

**9.24.2.10 i\_am\_committee\_member()**

```
int i_am_committee_member ( )
```

Check if the current user is a member of the next comitee.

**Returns**

The id in the comittee, -1 if you are not member of the comittee

Definition at line 281 of file validators.c.

Here is the caller graph for this function:

**9.24.2.11 init\_validators\_state()**

```
void init_validators_state ( )
```

Init the validators.state file if it doesn't exists.

Definition at line 33 of file validators.c.

Here is the caller graph for this function:

**9.24.2.12 update\_validators\_state()**

```
char update_validators_state (
    Block * block )
```

Given a block, update the 'validators.state' with the transactions.

**Parameters**

block	
-------	--

**Returns**

0, -1 if the given block height is not 'validators.state' height + 1

Definition at line 333 of file validators.c.

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

## 9.25 [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/P2P\\_PROTOCOL.md](#) File Reference

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

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

```
#include "blockchain/block.h"
#include "client.h"
#include "network/client.h"
#include "network/server.h"
#include "network/send_data.h"
#include "network/get_data.h"
#include "misc/safe.h"
#include "blockchain/transaction.h"
#include <openssl/rsa.h>
#include "ui/ui.h"
#include "blockchain/blockchain_header.h"
```

Include dependency graph for client.c:

**Functions**

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

**Variables**

- [connection](#) \* [client\\_connections](#)
- [infos\\_st](#) \* [ac\\_infos](#)

### 9.27.1 Function Documentation



### 9.27.1.1 main()

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

Definition at line 18 of file client.c.

Here is the call graph for this function:

## 9.27.2 Variable Documentation

### 9.27.2.1 ac\_infos

```
infos_st* ac_infos
```

Definition at line 15 of file client.c.

### 9.27.2.2 client\_connections

```
connection* client_connections
```

Definition at line 4 of file client.c.

## 9.28 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/network/client.c File Reference

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

## Functions

- `Node * get_my_node` (char who)  
*Get the my node object.*
- int `set_neighbour` (char who, char \*hostname, int family)  
*Sets a neighbour in the client.neighbours section.*
- void `remove_neighbour` (char who, int index)  
*Remove a neighbour in the client.neighbours section.*
- void `print_neighbours` (char who, char mask)  
*Print neighbours list.*
- void `save_neighbours` (char who)  
*Save neighbours list in .neighbours/neighbours.*
- void `load_neighbours` (char who)  
*Load neighbours list from .neighbours/neighbours.*
- int `is_in_neighbours` (char who, char \*hostname)  
*Check if hostname is in client.neighbours*
- int `number_neighbours` (char who)  
*Return the nb of neighbour in the client.neighbours section.*
- `connection * listen_to` (`infos_st *infos`, `Neighbour` neighbour, char \*connection\_type, `connection *connection`)  
*Tries to connect to the peer-to-peer network via a node in the `Node` structure.*
- int `find_empty_connection` (int max, `connection *connections`)  
*Find if connection has any empty field.*
- void \* `client_thread` (void \*args)  
*Create a client thread.*

## Variables

- `connection * client_connections` = NULL

### 9.28.1 Function Documentation

#### 9.28.1.1 client\_thread()

```
void* client_thread (
    void * args )
```

Create a client thread.

##### Parameters

<code>args</code>	
-------------------	--

##### Returns

void\*

Definition at line 268 of file client.c.

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

### 9.28.1.2 find\_empty\_connection()

```
int find_empty_connection (
    int max,
    connection * connection )
```

Find if connection has any empty field.

#### Parameters

<i>max</i>	The number of maximum connections
<i>connection</i>	The connection* buffer

#### Returns

int

Definition at line 258 of file client.c.

Here is the caller graph for this function:

### 9.28.1.3 get\_my\_node()

```
Node* get_my_node (
    char who )
```

Get the my node object.

#### Parameters

<i>who</i>	Tells if it is the server or the client side
------------	--

#### Returns

Node\*

Definition at line 6 of file client.c.

Here is the caller graph for this function:

### 9.28.1.4 is\_in\_neighbours()

```
int is_in_neighbours (
    char who,
    char * hostname )
```

Check if hostname is in client.neighbours

**Parameters**

<i>who</i>	Tells if it is the server or the client side
<i>hostname</i>	The IP adress to check

**Returns**

int

Definition at line 149 of file client.c.

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

**9.28.1.5 listen\_to()**

```
connection* listen_to (
    infos_st * infos,
    Neighbour neighbour,
    char * connection_type,
    connection * connection )
```

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

**Parameters**

<i>infos</i>	Some shared information
<i>neighbour</i>	The neighbour to connect with
<i>connection_type</i>	The type of connection
<i>connection</i>	The connection* structure

**Returns**

socket FD or -1 if an error occurs

Definition at line 172 of file client.c.

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

**9.28.1.6 load\_neighbours()**

```
void load_neighbours (
    char who )
```

Load neighbours list from .neighbours/neighbours.

**Parameters**

<i>who</i>	Tells if it is the server or the client side
------------	--

Definition at line 113 of file client.c.

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

#### 9.28.1.7 number\_neighbours()

```
int number_neighbours (  
    char who )
```

Return the nb of neighbour in the client.neighbours section.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
------------	--

Definition at line 160 of file client.c.

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

#### 9.28.1.8 print\_neighbours()

```
void print_neighbours (  
    char who,  
    char mask )
```

Print neighbours list.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>mask</i>	

Definition at line 58 of file client.c.

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

#### 9.28.1.9 remove\_neighbour()

```
void remove_neighbour (  
    char who,  
    int index )
```

Remove a neighbour in the client.neighbours section.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>index</i>	The index of the neighbour to remove in client.neighbours

Definition at line 47 of file client.c.

Here is the call graph for this function:

#### 9.28.1.10 save\_neighbours()

```
void save_neighbours (
    char who )
```

Save neighbours list in .neighbours/neighbours.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
------------	--

Definition at line 74 of file client.c.

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

#### 9.28.1.11 set\_neighbour()

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

Sets a neighbour in the client.neighbours section.

##### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>hostname</i>	The neighbour IP adress
<i>family</i>	The type of IP adress

##### Returns

0 if sucess, -1 otherwise if full

Definition at line 19 of file client.c.

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

## 9.28.2 Variable Documentation

### 9.28.2.1 client\_connections

```
connection* client_connections = NULL
```

Definition at line 4 of file client.c.

## 9.29 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/atrier.c File Reference

```
#include "blockchain/block.h"
#include "client.h"
#include "network/client.h"
#include "network/server.h"
#include "network/send_data.h"
#include "network/get_data.h"
#include "misc/safe.h"
#include "blockchain/transaction.h"
#include <openssl/rsa.h>
#include "ui/ui.h"
#include "blockchain/blockchain_header.h"
```

Include dependency graph for atrier.c:

### Functions

- `infos_st * get_infos ()`
- `void update_pdt (int number)`
- `void move_file (char *src, char *dest)`
- `void Validate ()`
- `void new_transaction (char type, char *rc_pk, size_t amount, char cause[512], char asset[512])`
- `void join_network_door (infos_st *infos)`
- `void connection_to_others (infos_st *infos)`
- `size_t update_blockchain_height (infos_st *infos)`
- `void update_blockchain (infos_st *infos, size_t index_client)`
- `void clear_transactions ()`
- `void clear_epochs ()`
- `void update_pending_transactions_list ()`

### Variables

- `connection * client_connections`
- `infos_st * ac_infos`

### 9.29.1 Function Documentation

#### 9.29.1.1 clear\_epochs()

```
void clear_epochs ( )
```

Definition at line 335 of file atrier.c.

Here is the caller graph for this function:

#### 9.29.1.2 clear\_transactions()

```
void clear_transactions ( )
```

Definition at line 312 of file atrier.c.

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

#### 9.29.1.3 connection\_to\_others()

```
void connection_to_others (
    infos_st * infos )
```

Definition at line 228 of file atrier.c.

Here is the call graph for this function:

#### 9.29.1.4 get\_infos()

```
infos_st* get_infos ( )
```

Definition at line 16 of file atrier.c.

Here is the caller graph for this function:

#### 9.29.1.5 join\_network\_door()

```
void join_network_door (
    infos_st * infos )
```

Definition at line 210 of file atrier.c.

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

#### 9.29.1.6 move\_file()

```
void move_file (
    char * src,
    char * dest )
```

Definition at line 27 of file atrier.c.

Here is the call graph for this function:



### 9.29.1.7 new\_transaction()

```
void new_transaction (
    char type,
    char * rc_pk,
    size_t amount,
    char cause[512],
    char asset[512] )
```

Definition at line 148 of file atrier.c.

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

### 9.29.1.8 update\_blockchain()

```
void update_blockchain (
    infos_st * infos,
    size_t index_client )
```

Definition at line 285 of file atrier.c.

### 9.29.1.9 update\_blockchain\_height()

```
size_t update_blockchain_height (
    infos_st * infos )
```

Definition at line 249 of file atrier.c.

Here is the call graph for this function:

### 9.29.1.10 update\_pdt()

```
void update_pdt (
    int number )
```

Definition at line 20 of file atrier.c.

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

### 9.29.1.11 update\_pending\_transactions\_list()

```
void update_pending_transactions_list ( )
```

Definition at line 354 of file atrier.c.

Here is the call graph for this function:

### 9.29.1.12 Validate()

```
void Validate ( )
```

Definition at line 62 of file atrier.c.

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

## 9.29.2 Variable Documentation

### 9.29.2.1 ac\_infos

```
infos_st* ac_infos
```

Definition at line 14 of file atrier.c.

### 9.29.2.2 client\_connections

```
connection* client_connections
```

Definition at line 4 of file client.c.

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

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

Include dependency graph for block.c:

## Functions

- `ChunkBlockchain * load_blockchain (size_t nb_chunk)`  
*Loads a blockchain object with a padding of 'nb\_chunk'.*
- `ChunkBlockchain * load_last_blockchain ()`  
*Load the last local blockchain chunk.*
- `void write_block_file (Block block)`  
*Writes a block struct in a file.*
- `void convert_data_to_blockdata (BlockData *blockdata, int fd)`
- `void convert_data_to_block (Block *block, int fd)`  
*Convert serialized data to Block\*.*
- `Block * get_block (size_t block_height)`  
*Get a block object.*
- `void free_block (Block *block)`  
*Free a block structure.*
- `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  $h-1$*
- `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 update_wallet_with_block (Block block)`  
*Update the Wallet\* structure with the transactions in a block.*
- `void delete_epochs (size_t height)`  
*Delete specific epoches (draft blocks)*
- `Block * get_epoch (int id, size_t height)`  
*Get the epoch object.*
- `void clear_block (Block *block)`  
*Free block data, without deleting it structure.*

### 9.30.1 Function Documentation

#### 9.30.1.1 clear\_block()

```
void clear_block (
    Block * block )
```

Free block data, without deleting it structure.

#### Parameters

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

Definition at line 337 of file block.c.

Here is the caller graph for this function:

#### 9.30.1.2 convert\_data\_to\_block()

```
void convert_data_to_block (
    Block * block,
    int fd )
```

Convert serialized data to Block\*.

##### Parameters

<i>block</i>	The return Block*
<i>fd</i>	The file descriptor where data are serialized

Definition at line 103 of file block.c.

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

#### 9.30.1.3 convert\_data\_to\_blockdata()

```
void convert_data_to_blockdata (
    BlockData * blockdata,
    int fd )
```

Definition at line 70 of file block.c.

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

#### 9.30.1.4 delete\_epochs()

```
void delete_epochs (
    size_t height )
```

Delete specific epoches (draft blocks)

#### Deprecated

##### Parameters

<i>height</i>	The height of the epochs
---------------	--------------------------

Definition at line 301 of file block.c.

Here is the caller graph for this function:

### 9.30.1.5 free\_block()

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

Free a block structure.

#### Parameters

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

Definition at line 133 of file block.c.

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

### 9.30.1.6 get\_block()

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

Get a block object.

#### Parameters

<i>block_height</i>	The height of the block
---------------------	-------------------------

#### Returns

Block\*

Definition at line 111 of file block.c.

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

### 9.30.1.7 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 159 of file block.c.

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

**9.30.1.8 get\_epoch()**

```
Block* get_epoch (
    int id,
    size_t height )
```

Get the epoch object.

**Parameters**

<i>id</i>	The ID of the epoch
<i>height</i>	The height of the epoch

**Returns**

Block\*

Definition at line 316 of file block.c.

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

**9.30.1.9 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 139 of file block.c.

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

### 9.30.1.10 `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 previous Block\*

Definition at line 149 of file block.c.

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

### 9.30.1.11 `load_blockchain()`

```
ChunkBlockchain* load_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 3 of file block.c.

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

### 9.30.1.12 `load_last_blockchain()`

```
ChunkBlockchain* load_last_blockchain ( )
```

Load the last local blockchain chunk.

#### Parameters

<i>nb_chunk</i>	
-----------------	--

**Returns**

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

Definition at line 47 of file block.c.

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

**9.30.1.13 update\_wallet\_with\_block()**

```
void update_wallet_with_block (
    Block block )
```

Update the Wallet\* structure with the transactions in a block.

**Parameters**

<i>block</i>	The block to fetch update from
--------------	--------------------------------

Definition at line 236 of file block.c.

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

**9.30.1.14 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 228 of file block.c.

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

**9.30.1.15 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 52 of file block.c.

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

#### 9.30.1.16 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 196 of file block.c.

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

## 9.31 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/src/core/blockchain/blockchain\_header.c File Reference

```
#include "blockchain/blockchain_header.h"
Include dependency graph for blockchain_header.c:
```

### Functions

- void [write\\_block\\_header](#) (FILE \*fd, [Block](#) \*block, size\_t height)
- void [gen\\_blockchain\\_header](#) ([infos\\_st](#) \*infos)  
*Generate block shared information.*
- size\_t [get\\_receiver\\_remaining\\_money](#) ([infos\\_st](#) \*infos, RSA \*receiver\_public\_key)  
*Get the receiver remaining money.*

### 9.31.1 Function Documentation

#### 9.31.1.1 gen\_blockchain\_header()

```
void gen_blockchain_header (
    infos_st * infos )
```

Generate block shared information.

**Deprecated**

## Parameters

<i>infos</i>	The information
--------------	-----------------

Definition at line 9 of file blockchain\_header.c.

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

### 9.31.1.2 get\_receiver\_remaining\_money()

```
size_t get_receiver_remaining_money (
    infos_st * infos,
    RSA * receiver_public_key )
```

Get the receiver remaining money.

## Parameters

<i>infos</i>	Threads shared information
<i>receiver_public_key</i>	The RSA public key of the receiver

## Returns

size\_t

Definition at line 40 of file blockchain\_header.c.

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

### 9.31.1.3 write\_block\_header()

```
void write_block_header (
    FILE * fd,
    Block * block,
    size_t height )
```

Definition at line 3 of file blockchain\_header.c.

Here is the caller graph for this function:

## 9.32 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/blockchain/transaction.c File Reference

```
#include "blockchain/transaction.h"
Include dependency graph for transaction.c:
```

## Functions

- void `write_transactiondata` (`TransactionData` \*transaction, int fd)  
*Serialize a TransactionData\* structure.*
- void `write_transaction` (`Transaction` \*transaction, int fd)  
*Serialize a Transaction\* structure.*
- void `get_transaction_data` (`Transaction` \*trans, char \*\*buff, size\_t \*index)  
*Get the transaction data object.*
- void `convert_data_to_transactiondata` (`TransactionData` \*transactiondata, int fd)  
*Convert serialized TransactionData\* to TransactionData\*.*
- void `load_transaction` (`Transaction` \*transaction, int fd)  
*Load a serialized Transaction\* structure.*
- `Transaction` \* `load_pending_transaction` (time\_t timestamp)  
*Load a transaction in the pending transaction (pdt) directory.*
- void `add_pending_transaction` (`Transaction` \*transaction)  
*Add a transaction to the pending transaction (pdt) directory.*
- `Transaction` `create_new_transaction` (`infos_st` \*infos, char type, RSA \*receiver\_public\_key, size\_t amount, char cause[512], char asset[512])  
*Create a new transaction.*
- void `flush_pending_transactions` (`Transaction` \*\*transactions, size\_t nb\_transactions)  
*Delete block transactions in the pending transaction (pdt) directory if the block is valid.*

### 9.32.1 Function Documentation

#### 9.32.1.1 add\_pending\_transaction()

```
void add_pending_transaction (
    Transaction * transaction )
```

Add a transaction to the pending transaction (pdt) directory.

##### Parameters

<code>transaction</code>	The transaction to add
--------------------------	------------------------

Definition at line 140 of file transaction.c.

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

#### 9.32.1.2 convert\_data\_to\_transactiondata()

```
void convert_data_to_transactiondata (
    TransactionData * transactiondata,
    int fd )
```

Convert serialized TransactionData\* to TransactionData\*.

## Parameters

<i>transactiondata</i>	The returned TransactionData*
<i>fd</i>	The serialized <a href="#">TransactionData</a> FD

Definition at line 88 of file transaction.c.

Here is the caller graph for this function:

### 9.32.1.3 create\_new\_transaction()

```
Transaction create_new_transaction (
    infos_st * infos,
    char type,
    RSA * receiver_public_key,
    size_t amount,
    char cause[512],
    char asset[512] )
```

Create a new transaction.

## Parameters

<i>infos</i>	Shared information object
<i>type</i>	The type of transaction
<i>receiver_public_key</i>	The receiver pkey
<i>amount</i>	The amount of PEPITAS
<i>cause</i>	The cause (deprecated)
<i>asset</i>	The asset (deprecated)

## Returns

[Transaction](#)

Definition at line 157 of file transaction.c.

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

### 9.32.1.4 flush\_pending\_transactions()

```
void flush_pending_transactions (
    Transaction ** transactions,
    size_t nb_transactions )
```

Delete block transactions in the pending transaction (pdt) directory if the block is valid.

## Parameters

<i>transactions</i>	block.blockdata.transactions
<i>nb_transactions</i>	number of transactions

Definition at line 204 of file transaction.c.

#### 9.32.1.5 `get_transaction_data()`

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

Get the transaction data object.

Converts transactions to char \* buffer.

##### Parameters

<i>trans</i>	The returned transaction
<i>buff</i>	The buffer with the serialized data
<i>index</i>	The buffer starting offset

Definition at line 40 of file transaction.c.

Here is the caller graph for this function:

#### 9.32.1.6 `load_pending_transaction()`

```
Transaction* load_pending_transaction (
    time_t timestamp )
```

Load a transaction in the pending transaction (pdt) directory.

##### Parameters

<i>timestamp</i>	The timestamp of the transaction
------------------	----------------------------------

##### Returns

Transaction\*

Definition at line 127 of file transaction.c.

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

#### 9.32.1.7 `load_transaction()`

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

Load a serialized Transaction\* structure.

**Parameters**

<i>transaction</i>	The returned Transaction*
<i>fd</i>	The serialized <a href="#">Transaction</a> FD

Definition at line 117 of file transaction.c.

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

**9.32.1.8 write\_transaction()**

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

Serialize a Transaction\* structure.

**Parameters**

<i>transaction</i>	The Transaction* structure to serialize
<i>fd</i>	The output file FD

Definition at line 34 of file transaction.c.

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

**9.32.1.9 write\_transactiondata()**

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

Serialize a TransactionData\* structure.

**Parameters**

<i>transaction</i>	The TransactionData* structure to serialize
<i>fd</i>	The output file FD

Definition at line 3 of file transaction.c.

Here is the caller graph for this function:

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

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

```
#include "cryptosystem/rsa.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.*
- `void add_money_to_wallet (size_t money)`  
*Add money to my wallet.*
- `void remove_money_from_wallet (size_t money)`  
*Remove money from my wallet.*
- `void add_money_to_stake (size_t money)`  
*Add money to my stake.*
- `void remove_money_from_stake (size_t money)`  
*Withdraw money from my stake.*

### 9.33.1 Function Documentation

#### 9.33.1.1 add\_money\_to\_stake()

```
void add_money_to_stake (
    size_t money )
```

Add money to my stake.

##### Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 45 of file wallet.c.

Here is the call graph for this function:

#### 9.33.1.2 add\_money\_to\_wallet()

```
void add_money_to_wallet (
    size_t money )
```

Add money to my wallet.

##### Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 26 of file wallet.c.

Here is the call graph for this function:

#### 9.33.1.3 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 18 of file wallet.c.

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

#### 9.33.1.4 get\_my\_wallet()

```
Wallet* get_my_wallet ( )
```

Get my wallet object.

##### Returns

Wallet

Definition at line 6 of file wallet.c.

Here is the caller graph for this function:

#### 9.33.1.5 remove\_money\_from\_stake()

```
void remove_money_from_stake (
    size_t money )
```

Withdraw money from my stake.

##### Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 54 of file wallet.c.

Here is the call graph for this function:



### 9.33.1.6 remove\_money\_from\_wallet()

```
void remove_money_from_wallet (
    size_t money )
```

Remove money from my wallet.

#### Parameters

<i>money</i>	The amount of PEPITAS
--------------	-----------------------

Definition at line 34 of file wallet.c.

Here is the call graph for this function:

## 9.34 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/cryptosystem/hash.c File Reference

```
#include <openssl/sha.h>
#include "cryptosystem/hash.h"
#include "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.*

### 9.34.1 Function Documentation

#### 9.34.1.1 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:

**9.34.1.2 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:

## 9.35 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/cryptosystem/rsa.c File Reference

```
#include "cryptosystem/rsa.h"
Include dependency graph for rsa.c:
```

**Macros**

- #define [RSA\\_NUM\\_E](#) 3

**Functions**

- void [get\\_keys](#) ([\\_\\_attribute\\_\\_\(\(unused\)\)](#) char \*password)

**9.35.1 Macro Definition Documentation**

### 9.35.1.1 RSA\_NUM\_E

```
#define RSA_NUM_E 3
```

Definition at line 2 of file rsa.c.

## 9.35.2 Function Documentation

### 9.35.2.1 get\_keys()

```
void get_keys (
    __attribute__((unused)) char * password )
```

Definition at line 7 of file rsa.c.

Here is the call graph for this function:

## 9.36 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/cryptosystem/signature.c File Reference

```
#include "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, void \*buffer)  
*buffer <- encrypt(SHA284(msg,len\_data),wallet\_priv\_key)*
- char \* [sign\\_message\\_with\\_key](#) (char \*data, size\_t len\_data, RSA \*key, void \*buffer)  
*encrypt(SHA284(msg,len\_data),key) buffer <- encrypt(SHA284(msg,len\_data),key)*
- int [verify\\_signature](#) (void \*data, size\_t data\_len, char \*signature, RSA \*pub\_key)  
*Verifies if SHA384(data) == decrypt(signature,pub\_key)*
- 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 with my private key.*
- void [sign\\_block\\_with\\_key](#) (Block \*block, RSA \*key)  
*Signs a block.*
- void [sign\\_transaction](#) (Transaction \*transaction)  
*Signs a transaction with my private key.*
- void [sign\\_transaction\\_with\\_key](#) (Transaction \*transaction, RSA \*key)  
*Signs a transaction.*
- void [sign\\_block\\_transactions](#) (Block \*block)  
*Signs all transactions of a block with my private key.*

## 9.36.1 Function Documentation

### 9.36.1.1 `sign_block()`

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

Signs a block with my private key.

#### Parameters

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

Definition at line 108 of file signature.c.

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

### 9.36.1.2 `sign_block_transactions()`

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

Signs all transactions of a block with my private key.

#### Parameters

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

Definition at line 138 of file signature.c.

Here is the call graph for this function:

### 9.36.1.3 `sign_block_with_key()`

```
void sign_block_with_key (
    Block * block,
    RSA * key )
```

Signs a block.

#### Parameters

<i>block</i>	The block to sign
<i>key</i>	The key to use for the signature

Definition at line 115 of file signature.c.

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

#### 9.36.1.4 `sign_message()`

```
char* sign_message (
    char * data,
    size_t len_data,
    void * buffer )
```

`buffer <- encrypt(SHA284(msg,len_data),wallet_priv_key)`

If `buffer == NULL`, return a new allocated buffer

##### Parameters

<i>data</i>	The data to sign
<i>len_data</i>	The length of the data
<i>buffer</i>	The buffer to put signature into

##### 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:

#### 9.36.1.5 `sign_message_with_key()`

```
char* sign_message_with_key (
    char * data,
    size_t len_data,
    RSA * key,
    void * buffer )
```

`encrypt(SHA284(msg,len_data),key) buffer <- encrypt(SHA284(msg,len_data),key)`

If `buffer == NULL`, return a new allocated buffer

##### Parameters

<i>data</i>	The data to sign
<i>len_data</i>	The length of the data
<i>key</i>	The key to use for the signature
<i>buffer</i>	The buffer to put signature into

##### Returns

`char*`

Definition at line 34 of file signature.c.

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

#### 9.36.1.6 sign\_transaction()

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

Signs a transaction with my private key.

##### Parameters

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

Definition at line 122 of file signature.c.

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

#### 9.36.1.7 sign\_transaction\_with\_key()

```
void sign_transaction_with_key (
    Transaction * transaction,
    RSA * key )
```

Signs a transaction.

##### Parameters

<i>transaction</i>	The transaction to sign
<i>key</i>	The key to use for the signature

Definition at line 130 of file signature.c.

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

#### 9.36.1.8 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 83 of file signature.c.

Here is the call graph for this function:

**9.36.1.9 verify\_signature()**

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

Verifies if SHA384(data) == decrypt(signature, pub\_key)

**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>pub_key</i>	The RSA public key used for the decryption

**Returns**

int

Definition at line 57 of file signature.c.

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

**9.36.1.10 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 95 of file signature.c.

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

## 9.37 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/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.*

## 9.37.1 Macro Definition Documentation

### 9.37.1.1 \_GNU\_SOURCE

```
#define _GNU_SOURCE
```

Definition at line 1 of file files.c.

## 9.37.2 Function Documentation

### 9.37.2.1 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.

## 9.38 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/misc/safe.c File Reference

```
#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.*
- int [safe\\_send](#) (int fd, const void \*buf, ssize\_t count)  
*Send 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 !*

### 9.38.1 Function Documentation

#### 9.38.1.1 [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 58 of file safe.c.

Here is the caller graph for this function:

**9.38.1.2 safe\_read()**

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

Reads safely in a file descriptor until '\n\n\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 31 of file safe.c.

Here is the caller graph for this function:

**9.38.1.3 safe\_send()**

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

Send 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 17 of file safe.c.

Here is the caller graph for this function:

#### 9.38.1.4 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 3 of file safe.c.

Here is the caller graph for this function:

## 9.39 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/network/get\_data.c File Reference

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

### Functions

- `size_t process_header` (char \*header, int sockfd, [infos\\_st](#) \*infos)
- `int fetch_client_list` (char who, int fd)  
*Fetches the client list from a socket fd.*
- `size_t read_header` (int sockfd, [infos\\_st](#) \*infos)  
*Waits a header in 'sockfd', reads it and processes it.*
- `int read_get_blocks` (int fd, [infos\\_st](#) \*infos)  
*Read blocks from a sock fd.*
- `size_t read_actual_height` (int fd)  
*Get the actual height of a node via its sock fd.*
- `int read_send_block` (int fd)  
*Read a socket sended block.*
- `int read_vote` (int fd, [infos\\_st](#) \*infos)  
*Read a socket sended vote.*
- `int read_epoch_block` (int fd)  
*Read a socket sended epoch block.*
- `int epoch_validation_process` (int blockfile, `size_t` height, int id)

*Epoch validation protocol.*

- int [read\\_send\\_pending\\_transaction\\_list](#) (int fd, [infos\\_st](#) \*infos)  
*Read a socket sended pending transaction list.*
- int [read\\_send\\_pending\\_transaction](#) (int fd, [infos\\_st](#) \*infos)  
*Read a socket sended pending transaction.*
- int [read\\_get\\_pending\\_transaction](#) (int fd)  
*Get a socket sended pending transaction.*

## 9.39.1 Function Documentation

### 9.39.1.1 epoch\_validation\_process()

```
int epoch_validation_process (
    int blockfile,
    size_t height,
    int id )
```

Epoch validation protocol.

#### Parameters

<i>blockfile</i>	The epoch FD
<i>height</i>	The epoch height
<i>id</i>	The epoch ID

#### Returns

int

Definition at line 482 of file `get_data.c`.

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

### 9.39.1.2 fetch\_client\_list()

```
int fetch_client_list (
    char who,
    int fd )
```

Fetches the client list from a socket fd.

#### Parameters

<i>who</i>	Tells if it is the server or the client side
<i>fd</i>	The socket fd

### Returns

0 if success, -1 otherwise

Definition at line 107 of file get\_data.c.

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

#### 9.39.1.3 process\_header()

```
size_t process_header (
    char * header,
    int sockfd,
    infos_st * infos )
```

Definition at line 3 of file get\_data.c.

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

#### 9.39.1.4 read\_actual\_height()

```
size_t read_actual_height (
    int fd )
```

Get the actual height of a node via its sock fd.

### Parameters

<i>fd</i>	The sock fd
-----------	-------------

### Returns

size\_t

Definition at line 186 of file get\_data.c.

Here is the caller graph for this function:

#### 9.39.1.5 read\_epoch\_block()

```
int read_epoch_block (
    int fd )
```

Read a socket sended epoch block.

### Parameters

<i>fd</i>	The socket fd
-----------	---------------

**Returns**

int

Definition at line 420 of file get\_data.c.

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

**9.39.1.6 read\_get\_blocks()**

```
int read_get_blocks (  
    int fd,  
    infos_st * infos )
```

Read blocks from a sock fd.

**Parameters**

<i>fd</i>	The sock fd
<i>infos</i>	Shared information

**Returns**

int

Definition at line 155 of file get\_data.c.

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

**9.39.1.7 read\_get\_pending\_transaction()**

```
int read_get_pending_transaction (  
    int fd )
```

Get a socket sended pending transaction.

**Parameters**

<i>fd</i>	The socket fd
-----------	---------------

**Returns**

int

Definition at line 629 of file get\_data.c.

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

### 9.39.1.8 read\_header()

```
size_t read_header (
    int sockfd,
    infos_st * infos )
```

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

#### Parameters

<i>sockfd</i>	The sock FD
<i>infos</i>	Shared information

#### Returns

0 if success, -1 otherwise

Definition at line 136 of file get\_data.c.

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

### 9.39.1.9 read\_send\_block()

```
int read_send_block (
    int fd )
```

Read a socket sended block.

#### Parameters

<i>fd</i>	The socket fd
-----------	---------------

#### Returns

int

Definition at line 193 of file get\_data.c.

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

### 9.39.1.10 read\_send\_pending\_transaction()

```
int read_send_pending_transaction (
    int fd,
    infos_st * infos )
```

Read a socket sended pending transaction.

**Parameters**

<i>fd</i>	The socket fd
<i>infos</i>	Shared information

**Returns**

int

Definition at line 571 of file get\_data.c.

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

**9.39.1.11 read\_send\_pending\_transaction\_list()**

```
int read_send_pending_transaction_list (
    int fd,
    infos_st * infos )
```

Read a socket sended pending transaction list.

**Parameters**

<i>fd</i>	The socket fd
<i>infos</i>	Shared information

**Returns**

int

Definition at line 549 of file get\_data.c.

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

**9.39.1.12 read\_vote()**

```
int read_vote (
    int fd,
    infos_st * infos )
```

Read a socket sended vote.

**Parameters**

<i>fd</i>	The socket fd
<i>infos</i>	Shared information



#### Returns

int

Definition at line 279 of file get\_data.c.

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

## 9.40 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/network/network.c File Reference

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

#### Variables

- const [Neighbour](#) `HARD_CODED_ADDR` [ ]

### 9.40.1 Variable Documentation

#### 9.40.1.1 `HARD_CODED_ADDR`

```
const Neighbour HARD_CODED_ADDR[ ]
```

##### Initial value:

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

Definition at line 5 of file network.c.

## 9.41 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/network/send\_data.c File Reference

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

## Functions

- int [send\\_client\\_list](#) (char who, int sockfd, char \*sockip)  
*Sends my client list to a node via 'sockfd'.*
- void [send\\_get\\_blocks](#) (connection \*cc)  
*Sends get blocks.*
- void [send\\_actual\\_height](#) (int fd, [infos\\_st](#) \*infos)
- void [send\\_reject\\_demand](#) (int fd)
- void [send\\_send\\_block](#) (int fd, size\_t height)
- void [send\\_pending\\_transaction\\_list](#) (int fd)
- void [send\\_send\\_pending\\_transaction](#) (int fd, time\_t txid)
- void [send\\_get\\_pending\\_transaction](#) (int fd, time\_t txid)
- void [send\\_epoch\\_block](#) (connection \*cc)
- void [send\\_vote\\_fd](#) (connection \*cc)

### 9.41.1 Function Documentation

#### 9.41.1.1 [send\\_actual\\_height\(\)](#)

```
void send_actual_height (
    int fd,
    infos\_st * infos )
```

Definition at line 58 of file [send\\_data.c](#).

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

#### 9.41.1.2 [send\\_client\\_list\(\)](#)

```
int send_client_list (
    char who,
    int sockfd,
    char * sockip )
```

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

##### Parameters

<a href="#">sockfd</a>	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:

#### 9.41.1.3 send\_epoch\_block()

```
void send_epoch_block (
    connection * cc )
```

Definition at line 173 of file send\_data.c.

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

#### 9.41.1.4 send\_get\_blocks()

```
void send_get_blocks (
    connection * cc )
```

Sends get blocks.

Definition at line 52 of file send\_data.c.

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

#### 9.41.1.5 send\_get\_pending\_transaction()

```
void send_get_pending_transaction (
    int fd,
    time_t txid )
```

Definition at line 165 of file send\_data.c.

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

#### 9.41.1.6 send\_pending\_transaction\_list()

```
void send_pending_transaction_list (
    int fd )
```

Definition at line 104 of file send\_data.c.

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

#### 9.41.1.7 send\_reject\_demand()

```
void send_reject_demand (
    int fd )
```

Definition at line 65 of file send\_data.c.

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

#### 9.41.1.8 send\_send\_block()

```
void send_send_block (
    int fd,
    size_t height )
```

Definition at line 71 of file send\_data.c.

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

#### 9.41.1.9 send\_send\_pending\_transaction()

```
void send_send_pending_transaction (
    int fd,
    time_t txid )
```

Definition at line 127 of file send\_data.c.

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

#### 9.41.1.10 send\_vote\_fd()

```
void send_vote_fd (
    connection * cc )
```

Definition at line 209 of file send\_data.c.

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

## 9.42 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/network/server.c File Reference

```
#include "network/server.h"
```

Include dependency graph for server.c:

### Functions

- void \* [accept\\_connection](#) (void \*args)
- void \* [redirect\\_connection](#) (void \*arg)
- void \* [init\\_server](#) (void \*args)

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

### 9.42.1 Function Documentation

#### 9.42.1.1 accept\_connection()

```
void* accept_connection (
    void * args )
```

Definition at line 3 of file server.c.

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

#### 9.42.1.2 init\_server()

```
void* init_server (
    void * args )
```

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

##### Parameters

<i>type</i>	Type of the server
-------------	--------------------

##### Returns

0 if success, -1 otherwise

Definition at line 106 of file server.c.

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

#### 9.42.1.3 redirect\_connection()

```
void* redirect_connection (
    void * arg )
```

Definition at line 72 of file server.c.

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

## 9.43 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/ui/ui.c File Reference

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

Include dependency graph for ui.c:

## Functions

- void \* [setup](#) (void \*args)

*Setups the gtk widgets for the GUI.*

- void [change\\_label\\_text](#) (GtkLabel \*label, char \*text)
- gboolean [set\\_block\\_viewer\\_plus](#) ([\\_\\_attribute\\_\\_\(\(unused\)\)](#) GtkWidget \*widget, [\\_\\_attribute\\_\\_\(\(unused\)\)](#) GdkEventKey \*event, [\\_\\_attribute\\_\\_\(\(unused\)\)](#) gpointer user\_data)
- gboolean [set\\_block\\_viewer\\_minus](#) ([\\_\\_attribute\\_\\_\(\(unused\)\)](#) GtkWidget \*widget, [\\_\\_attribute\\_\\_\(\(unused\)\)](#) GdkEventKey \*event, [\\_\\_attribute\\_\\_\(\(unused\)\)](#) gpointer user\_data)
- void [set\\_block\\_viewer](#) (int height)
- void [add\\_new\\_blockinfo](#) (size\_t height, size\_t transaction)
- void [update\\_sync](#) (size\_t actual, size\_t final)
- 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\\_with\\_pkey](#) (double amount, char \*public\_key, char \*date)
- void [add\\_transaction\\_with\\_contact](#) (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\\_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

- GtkLabel \* [balance\\_1](#)
- GtkLabel \* [balance\\_2](#)
- GtkLabel \* [stake\\_label1](#)
- GtkLabel \* [stake\\_label2](#)
- GtkLabel \* [stake\\_label3](#)
- GtkLabel \* [synchro\\_label](#)

- GtkLabel \* [block\\_amount\\_label](#)
- GtkLabel \* [connections\\_label](#)
- GtkLabel \* [mempool\\_label](#)
- GtkLabel \* [public\\_key\\_label](#)
- GtkLabel \* [password\\_error\\_label](#)
- GtkLabel \* [latest\\_block\\_name1](#)
- GtkLabel \* [latest\\_block\\_name2](#)
- GtkLabel \* [latest\\_block\\_name3](#)
- GtkLabel \* [error\\_label](#)
- GtkLabel \* [block\\_height\\_label](#)
- GtkLabel \* [transa\\_number\\_label](#)
- GtkLabel \* [total\\_transa\\_label](#)
- GtkLabel \* [magic\\_label](#)
- GtkLabel \* [prev\\_block\\_valid\\_label](#)
- GtkLabel \* [nb\\_validators\\_label](#)
- GtkLabel \* [block\\_error\\_label](#)
- GtkLabel \* [block\\_time\\_label](#)
- GtkLabel \* [validators\\_votes\\_label](#)
- GtkEntry \* [transa\\_amount](#)
- GtkEntry \* [recipient\\_key](#)
- GtkEntry \* [asset\\_entry](#)
- GtkEntry \* [cause\\_entry](#)
- GtkEntry \* [invest\\_entry](#)
- GtkEntry \* [recover\\_entry](#)
- GtkEntry \* [name\\_entry\\_con](#)
- GtkEntry \* [public\\_key\\_entry\\_con](#)
- GtkEntry \* [password\\_entry1](#)
- GtkEntry \* [password\\_entry2](#)
- GtkEntry \* [key\\_entry](#)
- GtkTreeView \* [tv\\_con](#)
- GtkTreeStore \* [ts\\_con](#)
- GtkTreeViewColumn \* [cx1\\_con](#)
- GtkTreeViewColumn \* [cx2\\_con](#)
- GtkCellRenderer \* [cr1\\_con](#)
- GtkCellRenderer \* [cr2\\_con](#)
- GtkTreeView \* [tv\\_th](#)
- GtkTreeStore \* [ts\\_th](#)
- GtkTreeViewColumn \* [cx1\\_th](#)
- GtkTreeViewColumn \* [cx2\\_th](#)
- GtkTreeViewColumn \* [cx3\\_th](#)
- GtkCellRenderer \* [cr1\\_th](#)
- GtkCellRenderer \* [cr2\\_th](#)
- GtkCellRenderer \* [cr3\\_th](#)
- GtkComboBox \* [contacts\\_combo](#)
- GtkListStore \* [ls\\_combo](#)
- GtkCellRenderer \* [cr1\\_combo](#)
- GtkProgressBar \* [progress\\_bar\\_blockchain](#)
- size\_t [block\\_height](#) = 0

### 9.43.1 Function Documentation

#### 9.43.1.1 add\_contact()

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

Definition at line 595 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.2 add\_contact\_to\_combobox()

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

Definition at line 624 of file ui.c.

Here is the caller graph for this function:

#### 9.43.1.3 add\_contacts\_from\_file()

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

Definition at line 632 of file ui.c.

Here is the caller graph for this function:

#### 9.43.1.4 add\_new\_blockinfo()

```
void add_new_blockinfo (
    size_t height,
    size_t transaction )
```

Definition at line 322 of file ui.c.

#### 9.43.1.5 add\_transaction\_from\_file()

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

Definition at line 480 of file ui.c.

Here is the caller graph for this function:



#### 9.43.1.6 add\_transaction\_with\_contact()

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

Definition at line 460 of file ui.c.

Here is the caller graph for this function:

#### 9.43.1.7 add\_transaction\_with\_pkey()

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

Definition at line 440 of file ui.c.

Here is the caller graph for this function:

#### 9.43.1.8 change\_label\_text()

```
void change_label_text (
    GtkWidget * label,
    char * text )
```

Definition at line 233 of file ui.c.

Here is the caller graph for this function:

#### 9.43.1.9 get\_public\_key\_from\_contacts()

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

Definition at line 667 of file ui.c.

Here is the caller graph for this function:

#### 9.43.1.10 load\_contacts\_from\_file()

```
void load_contacts_from_file ( )
```

Definition at line 641 of file ui.c.

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

#### 9.43.1.11 load\_transactions\_from\_file()

```
void load_transactions_from_file ( )
```

Definition at line 490 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.12 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 586 of file ui.c.

#### 9.43.1.13 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 746 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.14 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 686 of file ui.c.

#### 9.43.1.15 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 701 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.16 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 525 of file ui.c.

#### 9.43.1.17 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 534 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.18 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 358 of file ui.c.

#### 9.43.1.19 on\_main\_window\_destroy()

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

Definition at line 367 of file ui.c.

#### 9.43.1.20 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 555 of file ui.c.

#### 9.43.1.21 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 564 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.22 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 374 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.23 set\_block\_viewer()

```
void set_block_viewer (
    int height )
```

Definition at line 270 of file ui.c.

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

#### 9.43.1.24 set\_block\_viewer\_minus()

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

Definition at line 253 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.25 set\_block\_viewer\_plus()

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

Definition at line 238 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.26 setup()

```
void* setup (
    void * args )
```

Setups the gtk widgets for the GUI.

##### Returns

int Returns 1 if there is an error, 0 otherwise

Definition at line 80 of file ui.c.

Here is the caller graph for this function:

#### 9.43.1.27 update\_labels()

```
void update_labels ( )
```

Definition at line 796 of file ui.c.

Here is the call graph for this function:

#### 9.43.1.28 update\_sync()

```
void update_sync (
    size_t actual,
    size_t final )
```

Definition at line 339 of file ui.c.

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

### 9.43.2 Variable Documentation

#### 9.43.2.1 **asset\_entry**

```
GtkEntry* asset_entry
```

Definition at line 50 of file ui.c.

#### 9.43.2.2 **balance\_1**

```
GtkLabel* balance_1
```

Definition at line 24 of file ui.c.

#### 9.43.2.3 **balance\_2**

```
GtkLabel* balance_2
```

Definition at line 25 of file ui.c.

#### 9.43.2.4 **block\_amount\_label**

```
GtkLabel* block_amount_label
```

Definition at line 30 of file ui.c.

#### 9.43.2.5 **block\_error\_label**

```
GtkLabel* block_error_label
```

Definition at line 45 of file ui.c.

#### 9.43.2.6 **block\_height**

```
size_t block_height = 0
```

Definition at line 78 of file ui.c.

#### 9.43.2.7 block\_height\_label

GtkLabel\* block\_height\_label

Definition at line 39 of file ui.c.

#### 9.43.2.8 block\_time\_label

GtkLabel\* block\_time\_label

Definition at line 46 of file ui.c.

#### 9.43.2.9 cause\_entry

GtkEntry\* cause\_entry

Definition at line 51 of file ui.c.

#### 9.43.2.10 connections\_label

GtkLabel\* connections\_label

Definition at line 31 of file ui.c.

#### 9.43.2.11 contacts\_combo

GtkComboBox\* contacts\_combo

Definition at line 73 of file ui.c.

#### 9.43.2.12 cr1\_combo

GtkCellRenderer\* cr1\_combo

Definition at line 75 of file ui.c.

**9.43.2.13 cr1\_con**

```
GtkCellRenderer* cr1_con
```

Definition at line 63 of file ui.c.

**9.43.2.14 cr1\_th**

```
GtkCellRenderer* cr1_th
```

Definition at line 70 of file ui.c.

**9.43.2.15 cr2\_con**

```
GtkCellRenderer* cr2_con
```

Definition at line 64 of file ui.c.

**9.43.2.16 cr2\_th**

```
GtkCellRenderer* cr2_th
```

Definition at line 71 of file ui.c.

**9.43.2.17 cr3\_th**

```
GtkCellRenderer* cr3_th
```

Definition at line 72 of file ui.c.

**9.43.2.18 cx1\_con**

```
GtkTreeViewColumn* cx1_con
```

Definition at line 61 of file ui.c.



#### 9.43.2.19 cx1\_th

GtkTreeViewColumn\* cx1\_th

Definition at line 67 of file ui.c.

#### 9.43.2.20 cx2\_con

GtkTreeViewColumn\* cx2\_con

Definition at line 62 of file ui.c.

#### 9.43.2.21 cx2\_th

GtkTreeViewColumn\* cx2\_th

Definition at line 68 of file ui.c.

#### 9.43.2.22 cx3\_th

GtkTreeViewColumn\* cx3\_th

Definition at line 69 of file ui.c.

#### 9.43.2.23 error\_label

GtkLabel\* error\_label

Definition at line 38 of file ui.c.

#### 9.43.2.24 invest\_entry

GtkEntry\* invest\_entry

Definition at line 52 of file ui.c.

**9.43.2.25 key\_entry**

```
GtkEntry* key_entry
```

Definition at line 58 of file ui.c.

**9.43.2.26 latest\_block\_name1**

```
GtkLabel* latest_block_name1
```

Definition at line 35 of file ui.c.

**9.43.2.27 latest\_block\_name2**

```
GtkLabel* latest_block_name2
```

Definition at line 36 of file ui.c.

**9.43.2.28 latest\_block\_name3**

```
GtkLabel* latest_block_name3
```

Definition at line 37 of file ui.c.

**9.43.2.29 ls\_combo**

```
GtkListStore* ls_combo
```

Definition at line 74 of file ui.c.

**9.43.2.30 magic\_label**

```
GtkLabel* magic_label
```

Definition at line 42 of file ui.c.

#### 9.43.2.31 mempool\_label

```
GtkLabel* mempool_label
```

Definition at line 32 of file ui.c.

#### 9.43.2.32 name\_entry\_con

```
GtkEntry* name_entry_con
```

Definition at line 54 of file ui.c.

#### 9.43.2.33 nb\_validators\_label

```
GtkLabel* nb_validators_label
```

Definition at line 44 of file ui.c.

#### 9.43.2.34 password\_entry1

```
GtkEntry* password_entry1
```

Definition at line 56 of file ui.c.

#### 9.43.2.35 password\_entry2

```
GtkEntry* password_entry2
```

Definition at line 57 of file ui.c.

#### 9.43.2.36 password\_error\_label

```
GtkLabel* password_error_label
```

Definition at line 34 of file ui.c.

**9.43.2.37 prev\_block\_valid\_label**

```
GtkLabel* prev_block_valid_label
```

Definition at line 43 of file ui.c.

**9.43.2.38 progress\_bar\_blockchain**

```
GtkProgressBar* progress_bar_blockchain
```

Definition at line 76 of file ui.c.

**9.43.2.39 public\_key\_entry\_con**

```
GtkEntry* public_key_entry_con
```

Definition at line 55 of file ui.c.

**9.43.2.40 public\_key\_label**

```
GtkLabel* public_key_label
```

Definition at line 33 of file ui.c.

**9.43.2.41 recipient\_key**

```
GtkEntry* recipient_key
```

Definition at line 49 of file ui.c.

**9.43.2.42 recover\_entry**

```
GtkEntry* recover_entry
```

Definition at line 53 of file ui.c.

#### 9.43.2.43 stake\_label1

```
GtkLabel* stake_label1
```

Definition at line 26 of file ui.c.

#### 9.43.2.44 stake\_label2

```
GtkLabel* stake_label2
```

Definition at line 27 of file ui.c.

#### 9.43.2.45 stake\_label3

```
GtkLabel* stake_label3
```

Definition at line 28 of file ui.c.

#### 9.43.2.46 synchro\_label

```
GtkLabel* synchro_label
```

Definition at line 29 of file ui.c.

#### 9.43.2.47 total\_transa\_label

```
GtkLabel* total_transa_label
```

Definition at line 41 of file ui.c.

#### 9.43.2.48 transa\_amount

```
GtkEntry* transa_amount
```

Definition at line 48 of file ui.c.

**9.43.2.49 transa\_number\_label**

```
GtkLabel* transa_number_label
```

Definition at line 40 of file ui.c.

**9.43.2.50 ts\_con**

```
GtkTreeStore* ts_con
```

Definition at line 60 of file ui.c.

**9.43.2.51 ts\_th**

```
GtkTreeStore* ts_th
```

Definition at line 66 of file ui.c.

**9.43.2.52 tv\_con**

```
GtkTreeView* tv_con
```

Definition at line 59 of file ui.c.

**9.43.2.53 tv\_th**

```
GtkTreeView* tv_th
```

Definition at line 65 of file ui.c.

**9.43.2.54 validators\_votes\_label**

```
GtkLabel* validators_votes_label
```

Definition at line 47 of file ui.c.

## 9.44 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/validation/epoch\_man.c File Reference

```
#include "validation/epoch_man.h"
Include dependency graph for epoch_man.c:
```

### Functions

- RSA \* [get\\_epoch\\_man\\_pkey](#) (BlockData \*block\_data)  
*Give the pkey of the creator of a block.*
- char \* [create\\_vote\\_data](#) (Block \*block, char vote, int validator\_index, size\_t \*data\_length)
- void [give\\_punishments\\_and\\_rewards](#) (Block \*last\_block, Block \*current\_block)  
*Add punishment and reward transactions to validators of the 'prev\_block' into 'current\_block'.*
- void [add\\_pdt\\_to\\_block](#) (Block \*block)
- Block \* [create\\_epoch\\_block](#) ()  
*Create a block object with the previous block hash & votes.*

### 9.44.1 Function Documentation

#### 9.44.1.1 add\_pdt\_to\_block()

```
void add_pdt_to_block (
    Block * block )
```

Definition at line 94 of file epoch\_man.c.

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

#### 9.44.1.2 create\_epoch\_block()

```
Block* create_epoch_block ( )
```

Create a block object with the previous block hash & votes.

#### See also

The function create a block based on the local last block

#### Returns

Block\*

Definition at line 141 of file epoch\_man.c.

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

#### 9.44.1.3 create\_vote\_data()

```
char* create_vote_data (
    Block * block,
    char vote,
    int validator_index,
    size_t * data_length )
```

Definition at line 10 of file epoch\_man.c.

#### 9.44.1.4 get\_epoch\_man\_pkey()

```
RSA* get_epoch_man_pkey (
    BlockData * block_data )
```

Give the pkey of the creator of a block.

##### Parameters

<i>block_data</i>	The created block data
-------------------	------------------------

##### Returns

RSA\*, NULL if the data is corrupted

Definition at line 3 of file epoch\_man.c.

Here is the caller graph for this function:

#### 9.44.1.5 give\_punishments\_and\_rewards()

```
void give_punishments_and_rewards (
    Block * prev_block,
    Block * current_block )
```

Add punishment and reward transactions to validators of the 'prev\_block' into 'current\_block'.

##### See also

Number of added transactions = number of validators in 'prev\_block'

##### Parameters

<i>prev_block</i>	The last validated block
<i>current_block</i>	The current block (in creation)

Definition at line 31 of file epoch\_man.c.



Here is the caller graph for this function:

## 9.45 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/src/core/validation/plebe.c File Reference

```
#include "validation/plebe.h"  
Include dependency graph for plebe.c:
```

### Functions

- int [plebe\\_adhere\\_block](#) (Block \*block)  
*Adhere a block, write it locally.*

#### 9.45.1 Function Documentation

##### 9.45.1.1 [plebe\\_adhere\\_block\(\)](#)

```
int plebe_adhere_block (  
    Block * block )
```

Adhere a block, write it locally.

#### Parameters

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

#### Returns

0 if success, 2 if need to sync error, 1 if data corrupted error

Definition at line 7 of file plebe.c.

Here is the call graph for this function:

## 9.46 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/src/core/validation/validation\_engine.c File Reference

```
#include "validation/validation_engine.h"  
Include dependency graph for validation_engine.c:
```

## Functions

- `Transaction ** validate_transactions (Transaction **transaction_to_validate, size_t nb_transactions, size_t *nb_returned_transactions)`  
*Validate some transactions.*
- `char plebe_verify_block (Block *block)`  
*For the plèbe, check block validity.*
- `int comital_validate_block (Block *block)`  
*For the comital, check block validity.*
- `int send_verdict (Block *block, char verdict)`  
*Broadcast a verdict about a block validity to the network.*

### 9.46.1 Function Documentation

#### 9.46.1.1 comital\_validate\_block()

```
int comital_validate_block (
    Block * block )
```

For the comital, check block validity.

##### Parameters

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

##### Returns

int

Definition at line 242 of file validation\_engine.c.

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

#### 9.46.1.2 plebe\_verify\_block()

```
char plebe_verify_block (
    Block * block )
```

For the plèbe, check block validity.

##### Parameters

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

## Returns

int

Definition at line 199 of file validation\_engine.c.

Here is the caller graph for this function:

### 9.46.1.3 send\_verdict()

```
int send_verdict (
    Block * block,
    char verdict )
```

Broadcast a verdict about a block validity to the network.

## Parameters

<i>block</i>	The block awaiting validation
<i>verdict</i>	The verdict : 0 -> "SHAME ! The block is not valid at all", 1 -> "The block is valid for me"

## Returns

0 if the broadcast succeed, -1 if not

Definition at line 305 of file validation\_engine.c.

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

### 9.46.1.4 validate\_transactions()

```
Transaction** validate_transactions (
    Transaction ** transaction_to_validate,
    size_t nb_transactions,
    size_t * nb_returned_transactions )
```

Validate some transactions.

## See also

The verification must take into account :

- Sender != receiver
- If the sender signature is correct
- If the sender exists in the blockchain and has enough money
- If the receiver exists
- If sender and receiver remaining money fields are correct

## Parameters

<i>transaction_to_validate</i>	The transactions to validate
<i>nb_transactions</i>	The number of transactions to validate
<i>nb_returned_transactions</i>	The number of returned (valid) transactions

## Returns

Transaction\*\*, the valid transactions

Definition at line 3 of file validation\_engine.c.

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

## 9.47 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/core/validation/validators.c File Reference

```
#include "validation/validators.h"
```

Include dependency graph for validators.c:

## Macros

- #define `NB_RSA_CHUNK` 2048 / 64
- #define `HEADER_VALIDATORS_STATE_SIZE` 3 \* sizeof(size\_t) + sizeof(char) + (RSA\_KEY\_SIZE + 2 \* sizeof(size\_t) + sizeof(char)) \* validator\_id

## Functions

- int `define_nb_validators` (size\_t n)
- char \* `hash_block_transactions_epoch` (Block \*block)
- void `init_validators_state` ()  
*Init the validators.state file if it doesn't exists.*
- RSA \*\* `get_comittee` (size\_t block\_height, int \*nb\_validators)  
*Get the a comittee RSA public keys on a specific epoch.*
- RSA \*\* `get_next_comittee` (int \*nb\_validators)  
*Get the a comittee RSA public keys on a specific epoch.*
- ssize\_t `get_validators_states_total_stake` ()  
*Get the total stake of the network (parse 'validators.state')*
- ssize\_t `get_validators_states_nb_validators` ()  
*Get the number of validators of the network (parse 'validators.state')*
- ssize\_t `get_validators_states_block_height_validity` ()  
*Get the validators states block height validity (parse 'validators.state')*
- ssize\_t `get_validator_stake` (size\_t validator\_id)  
*Get a validator total stake (parse 'validators.state')*
- ssize\_t `get_validator_power` (size\_t validator\_id)  
*Get a validator power (parse 'validators.state')*

- RSA \* [get\\_validator\\_pkey](#) (size\_t validator\_id)  
*Get the validator pkey as RSA\* (parse 'validators.state')*
- ssize\_t [get\\_validator\\_id](#) (RSA \*pkey)  
*Get the validator id in 'validators.state'.*
- int [i\\_am\\_comitee\\_member](#) ()  
*Check if the current user is a member of the next comitee.*
- ssize\_t [\\_create\\_validator\\_item](#) (FILE \*validators\_states, struct [validators\\_state\\_header](#) \*updated\_validator\_state\_header, [Transaction](#) \*transaction, bool is\_key\_on\_sender)
- char [update\\_validators\\_state](#) ([Block](#) \*block)  
*Given a block, update the 'validators.state' with the transactions.*

## 9.47.1 Macro Definition Documentation

### 9.47.1.1 HEADER\_VALIDATORS\_STATE\_SIZE

```
#define HEADER_VALIDATORS_STATE_SIZE 3 * sizeof(size_t) + sizeof(char) + (RSA_KEY_SIZE + 2 *
sizeof(size_t) + sizeof(char)) * validator_id
```

Definition at line 4 of file validators.c.

### 9.47.1.2 NB\_RSA\_CHUNK

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

Definition at line 3 of file validators.c.

## 9.47.2 Function Documentation

### 9.47.2.1 \_create\_validator\_item()

```
ssize_t _create_validator_item (
    FILE * validators_states,
    struct validators\_state\_header * updated_validators_state_header,
    Transaction * transaction,
    bool is_key_on_sender )
```

Definition at line 296 of file validators.c.

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

### 9.47.2.2 `define_nb_validators()`

```
int define_nb_validators (
    size_t n )
```

Definition at line 6 of file validators.c.

### 9.47.2.3 `get_comittee()`

```
RSA** get_comittee (
    size_t block_height,
    int * nb_validators )
```

Get the a comittee RSA public keys on a specific epoch.

#### Parameters

<i>block_height</i>	The height of the block you want a comitte from
<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 46 of file validators.c.

### 9.47.2.4 `get_next_comittee()`

```
RSA** get_next_comittee (
    int * nb_validators )
```

Get the a comittee RSA public keys on a specific epoch.

#### 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 135 of file validators.c.

Here is the caller graph for this function:

**9.47.2.5 get\_validator\_id()**

```
ssize_t get_validator_id (
    RSA * pkey )
```

Get the validator id in 'validators.state'.

**Parameters**

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

**Returns**

ssize\_t, the validator index

Definition at line 247 of file validators.c.

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

**9.47.2.6 get\_validator\_pkey()**

```
RSA* get_validator_pkey (
    size_t validator_id )
```

Get the validator pkey as RSA\* (parse 'validators.state')

**Parameters**

<i>validator_id</i>	The id of the validator in 'validators.state'
---------------------	---

**Returns**

RSA\*

Definition at line 216 of file validators.c.

Here is the call graph for this function:

#### 9.47.2.7 `get_validator_power()`

```
ssize_t get_validator_power (  
    size_t validator_id )
```

Get a validator power (parse 'validators.state')



## Parameters

<i>validator</i> ↔ _id	The id of the validator in 'validators.state'
---------------------------	---

## Returns

ssize\_t

Definition at line 199 of file validators.c.

Here is the call graph for this function:

**9.47.2.8 get\_validator\_stake()**

```
ssize_t get_validator_stake (
    size_t validator_id )
```

Get a validator total stake (parse 'validators.state')

## Parameters

<i>validator</i> ↔ _id	The id of the validator in 'validators.state'
---------------------------	---

## Returns

ssize\_t

Definition at line 182 of file validators.c.

Here is the call graph for this function:

**9.47.2.9 get\_validators\_states\_block\_height\_validity()**

```
ssize_t get_validators_states_block_height_validity ( )
```

Get the validators states block height validity (parse 'validators.state')

## Returns

ssize\_t

Definition at line 168 of file validators.c.

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

#### 9.47.2.10 `get_validators_states_nb_validators()`

```
ssize_t get_validators_states_nb_validators ( )
```

Get the number of validators of the network (parse 'validators.state')

##### Returns

`ssize_t`

Definition at line 154 of file validators.c.

Here is the call graph for this function:

#### 9.47.2.11 `get_validators_states_total_stake()`

```
ssize_t get_validators_states_total_stake ( )
```

Get the total stake of the network (parse 'validators.state')

##### Returns

`ssize_t`

Definition at line 140 of file validators.c.

Here is the call graph for this function:

#### 9.47.2.12 `hash_block_transactions_epoch()`

```
char* hash_block_transactions_epoch (
    Block * block )
```

Definition at line 21 of file validators.c.

Here is the call graph for this function:

#### 9.47.2.13 `i_am_commitee_member()`

```
int i_am_commitee_member ( )
```

Check if the current user is a member of the next comitee.

##### Returns

The id in the comittee, -1 if you are not member of the comittee

Definition at line 281 of file validators.c.

Here is the caller graph for this function:

**9.47.2.14 init\_validators\_state()**

```
void init_validators_state ( )
```

Init the `validators.state` file if it doesn't exists.

Definition at line 33 of file `validators.c`.

Here is the caller graph for this function:

**9.47.2.15 update\_validators\_state()**

```
char update_validators_state (
    Block * block )
```

Given a block, update the 'validators.state' with the transactions.

**Parameters**

<i>block</i>	
--------------	--

**Returns**

0, -1 if the given block height is not 'validators.state' height + 1

Definition at line 333 of file validators.c.

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

## 9.48 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/genesis.c File Reference

```
#include "client.h"
#include "network/client.h"
#include "network/server.h"
#include "network/send_data.h"
#include "network/get_data.h"
#include "misc/safe.h"
#include <openssl/rsa.h>
#include "blockchain/transaction.h"
#include "blockchain/block.h"
#include "ui/ui.h"
#include "blockchain/blockchain_header.h"
Include dependency graph for genesis.c:
```

**Functions**

- [infos\\_st](#) \* [get\\_infos](#) ()
- void [new\\_transaction](#) (char type, char \*rc\_pk, size\_t amount, char cause[512], char asset[512])
- int [main](#) ()

**Variables**

- [connection](#) \* [client\\_connections](#)
- [infos\\_st](#) \* [ac\\_infos](#)

**9.48.1 Function Documentation**

#### 9.48.1.1 `get_infos()`

```
infos_st* get_infos ( )
```

Definition at line 16 of file atrier.c.

#### 9.48.1.2 `main()`

```
int main ( )
```

Definition at line 69 of file genesis.c.

Here is the call graph for this function:

#### 9.48.1.3 `new_transaction()`

```
void new_transaction (
    char type,
    char * rc_pk,
    size_t amount,
    char cause[512],
    char asset[512] )
```

Definition at line 148 of file atrier.c.

Here is the call graph for this function:

### 9.48.2 Variable Documentation

#### 9.48.2.1 `ac_infos`

```
infos_st* ac_infos
```

Definition at line 15 of file genesis.c.

#### 9.48.2.2 `client_connections`

```
connection* client_connections
```

Definition at line 4 of file client.c.

## 9.49 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/src/serverdoor.c File Reference

```
#include "network/server.h"
#include "network/client.h"
#include "cryptosystem/signature.h"
#include "blockchain/block.h"
#include <time.h>
```

Include dependency graph for serverdoor.c:

### Functions

- int [main](#) ()

#### 9.49.1 Function Documentation

##### 9.49.1.1 main()

```
int main ( )
```

Definition at line 10 of file serverdoor.c.

Here is the call graph for this function:

## 9.50 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/gen/GEN\_blockchain\_files.c File Reference

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

Include dependency graph for GEN\_blockchain\_files.c: This graph shows which files directly or indirectly include this file:

### Macros

- #define [GEN\\_BLC\\_F\\_C](#)

### Functions

- void [rand\\_data](#) (size\_t size, char \*buffer)
- void [gen\\_blockchain](#) (size\_t nb\_blocks)

## 9.50.1 Macro Definition Documentation

### 9.50.1.1 GEN\_BLC\_F\_C

```
#define GEN_BLC_F_C
```

Definition at line 2 of file GEN\_blockchain\_files.c.

## 9.50.2 Function Documentation

### 9.50.2.1 gen\_blockchain()

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

Definition at line 22 of file GEN\_blockchain\_files.c.

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

### 9.50.2.2 rand\_data()

```
void rand_data (
    size_t size,
    char * buffer )
```

Definition at line 8 of file GEN\_blockchain\_files.c.

Here is the caller graph for this function:

## 9.51 /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 "tests_macros.h"
#include "validation/validators.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 GEN_VALIDATORS_FILE_H`
- `#define NB_FAKE_VALIDATORS 10`
- `#define str(x) #x`

## Functions

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

### 9.51.1 Macro Definition Documentation

#### 9.51.1.1 GEN\_VALIDATORS\_FILE\_H

```
#define GEN_VALIDATORS_FILE_H
```

Definition at line 2 of file GEN\_validators\_file.c.

#### 9.51.1.2 NB\_FAKE\_VALIDATORS

```
#define NB_FAKE_VALIDATORS 10
```

Definition at line 15 of file GEN\_validators\_file.c.

#### 9.51.1.3 str

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

Definition at line 16 of file GEN\_validators\_file.c.

### 9.51.2 Function Documentation

#### 9.51.2.1 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,  $\text{power} += \text{amount} / (\text{block\_height} + 1) + \text{amount}$  Foreach stake withdraw,  $\text{power} -= \text{power} * \text{withdraw\_stake} / \text{user\_total\_stake}$

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 32 of file GEN\_validators\_file.c.

Here is the caller graph for this function:

## 9.52 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/headers/blockchain/block\_test.h File Reference

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

### Functions

- void [block\\_test](#) (void)

### 9.52.1 Function Documentation

#### 9.52.1.1 [block\\_test\(\)](#)

```
void block_test (
    void )
```

Definition at line 13 of file block\_test.c.

Here is the call graph for this function:

## 9.53 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/headers/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](#) ()

### 9.53.1 Function Documentation

#### 9.53.1.1 [get\\_keys\\_equality\\_test\(\)](#)

```
void get_keys_equality_test ( )
```

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

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

#### 9.53.1.2 [get\\_keys\\_test\(\)](#)

```
void get_keys_test ( )
```

Definition at line 18 of file `rsa_test.c`.

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

## 9.54 [/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/headers/cryptosystem/signature\\_test.h](#) File Reference

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

## Functions

- void [verify\\_sign\\_test](#) ()

### 9.54.1 Function Documentation

#### 9.54.1.1 [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:

## 9.55 **/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/headers/network/client\_test.h** File Reference

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

### Functions

- void [network\\_test](#) ()

#### 9.55.1 Function Documentation

##### 9.55.1.1 [network\\_test\(\)](#)

```
void network_test ( )
```

Definition at line 15 of file [client\\_test.c](#).

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

## 9.56 **/home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/headers/validation/validations\_test.h** File Reference

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

### Functions

- void [validations\\_test](#) ()

#### 9.56.1 Function Documentation

##### 9.56.1.1 [validations\\_test\(\)](#)

```
void validations_test ( )
```

Definition at line 6 of file [validations\\_test.c](#).

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

## 9.57 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/main\_test.c File Reference

```
#include "blockchain/wallet.h"
```

Include dependency graph for main\_test.c:

### Macros

- #define [MAIN\\_TEST\\_C](#)

### Functions

- int [main](#) ()

#### 9.57.1 Macro Definition Documentation

##### 9.57.1.1 MAIN\_TEST\_C

```
#define MAIN_TEST_C
```

Definition at line 2 of file main\_test.c.

#### 9.57.2 Function Documentation

##### 9.57.2.1 main()

```
int main ( )
```

Definition at line 5 of file main\_test.c.

Here is the call graph for this function:

## 9.58 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/src/blockchain/block\_test.c File Reference

```
#include "tests_macros.h"
#include "blockchain/block.h"
#include "blockchain/transaction.h"
#include "gen/GEN_blockchain_files.c"
```

Include dependency graph for block\_test.c:

## Macros

- #define `BLOCK_TEST_C`
- #define `NB_BLOCK_PER_CHUNK` 10
- #define `NB MOCK_BLOCKS` 13

## Functions

- void `block_test` (void)

### 9.58.1 Macro Definition Documentation

#### 9.58.1.1 `BLOCK_TEST_C`

```
#define BLOCK_TEST_C
```

Definition at line 2 of file `block_test.c`.

#### 9.58.1.2 `NB_BLOCK_PER_CHUNK`

```
#define NB_BLOCK_PER_CHUNK 10
```

Definition at line 9 of file `block_test.c`.

#### 9.58.1.3 `NB MOCK_BLOCKS`

```
#define NB MOCK_BLOCKS 13
```

Definition at line 11 of file `block_test.c`.

### 9.58.2 Function Documentation

#### 9.58.2.1 `block_test()`

```
void block_test (  
    void )
```

Definition at line 13 of file `block_test.c`.

Here is the call graph for this function:

## 9.59 /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 "blockchain/wallet.h"
#include "misc/math.h"
#include <stdio.h>
#include <unistd.h>
#include <openssl/sha.h>
#include "misc/safe.h"
#include <fcntl.h>
#include <sys/stat.h>
Include dependency graph for rsa_test.c:
```

### Macros

- #define [RSA\\_SIZE\\_C](#)

### Functions

- void [get\\_keys\\_test](#) ()
- void [get\\_keys\\_equality\\_test](#) ()

## 9.59.1 Macro Definition Documentation

### 9.59.1.1 RSA\_SIZE\_C

```
#define RSA_SIZE_C
```

Definition at line 2 of file `rsa_test.c`.

## 9.59.2 Function Documentation

### 9.59.2.1 get\_keys\_equality\_test()

```
void get_keys_equality_test ( )
```

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

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

### 9.59.2.2 get\_keys\_test()

```
void get_keys_test ( )
```

Definition at line 18 of file rsa\_test.c.

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

## 9.60 /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](#) ()

### 9.60.1 Function Documentation

#### 9.60.1.1 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:

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

## Macros

- `#define CLIENT_TEST_C`

## Functions

- `void network_test ()`

## Variables

- `connection * client_connections`

### 9.61.1 Macro Definition Documentation

#### 9.61.1.1 CLIENT\_TEST\_C

```
#define CLIENT_TEST_C
```

Definition at line 2 of file client\_test.c.

### 9.61.2 Function Documentation

#### 9.61.2.1 network\_test()

```
void network_test ( )
```

Definition at line 15 of file client\_test.c.

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

### 9.61.3 Variable Documentation

#### 9.61.3.1 client\_connections

```
connection* client_connections
```

Definition at line 4 of file client.c.



## 9.62 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/tests/src/validation/validations\_test.c File Reference

```
#include "gen/GEN_validators_file.c"
#include "validation/validators.h"
#include "tests_macros.h"
Include dependency graph for validations_test.c:
```

### Functions

- void [validations\\_test](#) ()

#### 9.62.1 Function Documentation

##### 9.62.1.1 validations\_test()

```
void validations_test ( )
```

Definition at line 6 of file validations\_test.c.

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

## 9.63 /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...)

#### 9.63.1 Macro Definition Documentation

### 9.63.1.1 DEBUG

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

**Value:**

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

Definition at line 5 of file tests\_macros.h.

### 9.63.1.2 LOG

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

**Value:**

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

Definition at line 9 of file tests\_macros.h.

### 9.63.1.3 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.

### 9.63.1.4 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.

### 9.63.1.5 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.

## 9.64 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS-Cryptocurrency/tests/unit\_testing.c File Reference

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

### Data Structures

- struct [infos\\_st](#)

### Typedefs

- typedef struct [infos\\_st](#) [infos\\_st](#)

### Functions

- [infos\\_st](#) \* [get\\_infos](#) ()
- int [main](#) ()

### Variables

- [infos\\_st](#) \* [ac\\_infos](#)

### 9.64.1 Typedef Documentation

#### 9.64.1.1 infos\_st

```
typedef struct infos_st infos_st
```

### 9.64.2 Function Documentation

#### 9.64.2.1 get\_infos()

```
infos_st* get_infos ( )
```

Definition at line 16 of file atrier.c.

#### 9.64.2.2 main()

```
int main ( )
```

Definition at line 22 of file unit\_testing.c.

Here is the call graph for this function:

### 9.64.3 Variable Documentation

#### 9.64.3.1 ac\_infos

```
infos_st* ac_infos
```

Definition at line 18 of file unit\_testing.c.

## 9.65 /home/runner/work/PEPITAS-Cryptocurrency/PEPITAS- Cryptocurrency/VALIDATION\_PROTOCOL.md File Reference

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