
nano Documentation

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Daniel Dourvaris

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This library contains a python wrapper for the Nano (RaiBlocks) RPC server which tries to make it a little easier to work with by converting RPC responses to native python ones and exposing a pythonic api for making RPC calls.

Also included are utilities such as converting rai/xrb and interesting accounts

Nano (RaiBlocks) Python Library

This library contains a python wrapper for the Nano (RaiBlocks) RPC server which tries to make it a little easier to work with by converting RPC responses to native python ones and exposing a pythonic api for making RPC calls.

Also included are utilities such as converting rai/xrb and interesting accounts

1.1 Installation

```
pip install nano-python
```

1.2 Documentation

<https://nano-python.readthedocs.io/>

1.3 RPC client

You can browse the available [RPC methods list](#) or check the [RPC Client API documentation](#) for examples of usage.

Warning: The RPC client **DOES NOT** handle timeouts or retries automatically since this could lead to unwanted retries of requests causing **double spends**. Keep this in mind when implementing retries.

```
>>> import nano
>>> rpc = nano.rpc.Client('http://localhost:7076')
>>> rpc.version()
{
  'rpc_version': 1,
```

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```
'store_version': 10,
'node_vendor': 'RaiBlocks 9.0'
}>>> rpc.peers()
{
'[:,ffff:75.171.168.5]:7075': 4,
'[:,ffff:108.44.38.183]:1032': 4
}
```

1.4 Conversion

```
>>> from nano import convert
>>> convert(12, from_unit='XRB', to_unit='raw')
Decimal('1.2E+31')

>>> convert(0.4, from_unit='krai', to_unit='XRB')
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ValueError: float values can lead to unexpected
precision loss, please use a Decimal or string
eg. convert('0.4', 'krai', 'XRB')

>>> convert('0.4', from_unit='krai', to_unit='XRB')
Decimal('0.0004')
```

1.5 Known Accounts / Constants

```
>>> from nano import GENESIS_BLOCK_HASH
>>> GENESIS_BLOCK_HASH
'991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948'
```

```
>>> from nano import KNOWN_ACCOUNT_IDS
>>> KNOWN_ACCOUNT_IDS['xrb_
↳ 1ipx847tk8o46pwxt5qjdbncjqcbwcc1rrmqnkztrfjy5k7z4imsrata9est']
'Developer Fund'
```

[illegible]

1.6 Development

1.6.1 Setup

```
virtualenv venv
source venv/bin/activate
```

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```
pip install -r requirements.pip -r requirements-dev.pip
python setup.py develop
```

1.6.2 Running tests

```
# regular
pytest

# coverage
./coverage
```

1.6.3 Building docs

```
cd docs

# generate once
make html

# live building
make live
```

1.6.4 Making a release

- Update CHANGELOG.rst
- bumpversion [major|minor|patch]
- python setup.py upload

CHAPTER 2

RPC methods

This documents the available methods on the `nano.rpc.Client`

2.1 Account

2.1.1 `account_balance`

Returns how many RAW is owned and how many have not yet been received by **account** `nano.rpc.Client.account_balance(account)`

2.1.2 `account_block_count`

Get number of blocks for a specific **account** `nano.rpc.Client.account_block_count(account)`

2.1.3 `account_create`

Creates a new account, insert next deterministic key in **wallet** `nano.rpc.Client.account_create(wallet, work=True)`

2.1.4 `account_get`

Get account number for the **public key** `nano.rpc.Client.account_get(key)`

2.1.5 `account_history`

Reports send/receive information for a **account** `nano.rpc.Client.account_history(account, count)`

2.1.6 account_info

Returns frontier, open block, change representative block, balance, last modified timestamp from local database & block count for **account** `nano.rpc.Client.account_info(account, representative=False, weight=False, pending=False)`

2.1.7 account_key

Get the public key for **account** `nano.rpc.Client.account_key(account)`

2.1.8 account_list

Lists all the accounts inside **wallet** `nano.rpc.Client.account_list(wallet)`

2.1.9 account_move

Moves **accounts** from **source** to **wallet** `nano.rpc.Client.account_move(source, wallet, accounts)`

2.1.10 account_remove

Remove **account** from **wallet** `nano.rpc.Client.account_remove(wallet, account)`

2.1.11 account_representative

Returns the representative for **account** `nano.rpc.Client.account_representative(account)`

2.1.12 account_representative_set

Sets the representative for **account** in **wallet** `nano.rpc.Client.account_representative_set(wallet, account, representative, work=None)`

2.1.13 account_weight

Returns the voting weight for **account** `nano.rpc.Client.account_weight(account)`

2.1.14 accounts_balances

Returns how many RAW is owned and how many have not yet been received by **accounts** list `nano.rpc.Client.accounts_balances(accounts)`

2.1.15 accounts_create

Creates new accounts, insert next deterministic keys in **wallet** up to **count** `nano.rpc.Client.accounts_create(wallet, count, work=True)`

2.1.16 accounts_frontiers

Returns a list of pairs of account and block hash representing the head block for **accounts** list `nano.rpc.Client.accounts_frontiers(accounts)`

2.1.17 accounts_pending

Returns a list of block hashes which have not yet been received by these **accounts** `nano.rpc.Client.accounts_pending(accounts, count=None, threshold=None, source=False)`

2.1.18 block_account

Returns the account containing block `nano.rpc.Client.block_account(hash)`

2.1.19 delegators

Returns a list of pairs of delegator names given **account** a representative and its balance `nano.rpc.Client.delegators(account)`

2.1.20 delegators_count

Get number of delegators for a specific representative **account** `nano.rpc.Client.delegators_count(account)`

2.1.21 frontiers

Returns a list of pairs of account and block hash representing the head block starting at **account** up to **count** `nano.rpc.Client.frontiers(account, count)`

2.1.22 ledger

Returns frontier, open block, change representative block, balance, last modified timestamp from local database & block count starting at **account** up to **count** `nano.rpc.Client.ledger(account, count=None, representative=False, weight=False, pending=False, sorting=False)`

2.1.23 payment_wait

Wait for payment of **amount** to arrive in **account** or until **timeout** milliseconds have elapsed. `nano.rpc.Client.payment_wait(account, amount, timeout)`

2.1.24 pending

Returns a list of pending block hashes with amount more or equal to **threshold** `nano.rpc.Client.pending(account, count=None, threshold=None, source=False)`

2.1.25 receive

Receive pending **block** for **account** in **wallet** `nano.rpc.Client.receive(wallet, account, block, work=None)`

2.1.26 send

Send **amount** from **source** in **wallet** to **destination** `nano.rpc.Client.send(wallet, source, destination, amount, work=None)`

2.1.27 validate_account_number

Check whether **account** is a valid account number `nano.rpc.Client.validate_account_number(account)`

2.2 Block

2.2.1 block

Retrieves a json representation of **block** `nano.rpc.Client.block(hash)`

2.2.2 block_account

Returns the account containing block `nano.rpc.Client.block_account(hash)`

2.2.3 block_count

Reports the number of blocks in the ledger and unchecked synchronizing blocks `nano.rpc.Client.block_count()`

2.2.4 block_count_type

Reports the number of blocks in the ledger by type (send, receive, open, change) `nano.rpc.Client.block_count_type()`

2.2.5 block_create

Creates a json representations of new block based on input data & signed with private key or account in **wallet** for offline signing `nano.rpc.Client.block_create(type, account, wallet=None, representative=None, key=None, destination=None, amount=None, balance=None, previous=None, source=None, work=None)`

2.2.6 blocks

Retrieves a json representations of **blocks** `nano.rpc.Client.blocks(hashes)`

2.2.7 blocks_info

Retrieves a json representations of **blocks** with transaction **amount** & block **account** `nano.rpc.Client.blocks_info(hashes, pending=False, source=False)`

2.2.8 chain

Returns a list of block hashes in the account chain starting at **block** up to **count** `nano.rpc.Client.chain(block, count)`

2.2.9 history

Reports send/receive information for a chain of blocks `nano.rpc.Client.history(hash, count)`

2.2.10 pending_exists

Check whether block is pending by **hash** `nano.rpc.Client.pending_exists(hash)`

2.2.11 process

Publish **block** to the network `nano.rpc.Client.process(block)`

2.2.12 receive

Receive pending **block** for **account** in **wallet** `nano.rpc.Client.receive(wallet, account, block, work=None)`

2.2.13 republish

Rebroadcast blocks starting at **hash** to the network `nano.rpc.Client.republish(hash, count=None, sources=None, destinations=None)`

2.2.14 successors

Returns a list of block hashes in the account chain ending at **block** up to **count** `nano.rpc.Client.successors(block, count)`

2.2.15 unchecked

Returns a list of pairs of unchecked synchronizing block hash and its json representation up to **count** `nano.rpc.Client.unchecked(count=None)`

2.2.16 unchecked_clear

Clear unchecked synchronizing blocks `nano.rpc.Client.unchecked_clear()`

2.2.17 unchecked_get

Retrieves a json representation of unchecked synchronizing block by **hash** `nano.rpc.Client.unchecked_get(hash)`

2.2.18 unchecked_keys

Retrieves unchecked database keys, blocks hashes & a json representations of unchecked pending blocks starting from **key** up to **count** `nano.rpc.Client.unchecked_keys(key=None, count=None)`

2.2.19 work_validate

Check whether **work** is valid for block `nano.rpc.Client.work_validate(work, hash)`

2.3 Global

2.3.1 available_supply

Returns how many rai are in the public supply `nano.rpc.Client.available_supply()`

2.3.2 block_count

Reports the number of blocks in the ledger and unchecked synchronizing blocks `nano.rpc.Client.block_count()`

2.3.3 block_count_type

Reports the number of blocks in the ledger by type (send, receive, open, change) `nano.rpc.Client.block_count_type()`

2.3.4 frontier_count

Reports the number of accounts in the ledger `nano.rpc.Client.frontier_count()`

2.3.5 representatives

Returns a list of pairs of representative and its voting weight `nano.rpc.Client.representatives(count=None, sorting=False)`

2.4 Node

2.4.1 bootstrap

Initialize bootstrap to specific **IP address** and **port** `nano.rpc.Client.bootstrap(address, port)`

2.4.2 bootstrap_any

Initialize multi-connection bootstrap to random peers `nano.rpc.Client.bootstrap_any()`

2.4.3 keepalive

Tells the node to send a keepalive packet to **address:port** `nano.rpc.Client.keepalive(address, port)`

2.4.4 peers

Returns a list of pairs of peer IPv6:port and its node network version `nano.rpc.Client.peers()`

2.4.5 receive_minimum

Returns receive minimum for node `nano.rpc.Client.receive_minimum()`

2.4.6 receive_minimum_set

Set **amount** as new receive minimum for node until restart `nano.rpc.Client.receive_minimum_set(amount)`

2.4.7 search_pending_all

Tells the node to look for pending blocks for any account in all available wallets `nano.rpc.Client.search_pending_all()`

2.4.8 stop

Stop the node `nano.rpc.Client.stop()`

2.4.9 unchecked

Returns a list of pairs of unchecked synchronizing block hash and its json representation up to **count** `nano.rpc.Client.unchecked(count=None)`

2.4.10 unchecked_clear

Clear unchecked synchronizing blocks `nano.rpc.Client.unchecked_clear()`

2.4.11 unchecked_get

Retrieves a json representation of unchecked synchronizing block by **hash** `nano.rpc.Client.unchecked_get(hash)`

2.4.12 unchecked_keys

Retrieves unchecked database keys, blocks hashes & a json representations of unchecked pending blocks starting from **key** up to **count** `nano.rpc.Client.unchecked_keys(key=None, count=None)`

2.4.13 version

Returns the node's RPC version `nano.rpc.Client.version()`

2.5 Utility

2.5.1 deterministic_key

Derive deterministic keypair from **seed** based on **index** `nano.rpc.Client.deterministic_key(seed, index)`

2.5.2 key_create

Generates an **adhoc random keypair** `nano.rpc.Client.key_create()`

2.5.3 key_expand

Derive public key and account number from **private key** `nano.rpc.Client.key_expand(key)`

2.5.4 krai_from_raw

Divide a raw amount down by the krai ratio. `nano.rpc.Client.krai_from_raw(amount)`

2.5.5 krai_to_raw

Multiply an krai amount by the krai ratio. `nano.rpc.Client.krai_to_raw(amount)`

2.5.6 mrai_from_raw

Divide a raw amount down by the Mrai ratio. `nano.rpc.Client.mrai_from_raw(amount)`

2.5.7 mrai_to_raw

Multiply an Mrai amount by the Mrai ratio. `nano.rpc.Client.mrai_to_raw(amount)`

2.5.8 rai_from_raw

Divide a raw amount down by the rai ratio. `nano.rpc.Client.rai_from_raw(amount)`

2.5.9 rai_to_raw

Multiply an rai amount by the rai ratio. `nano.rpc.Client.rai_to_raw(amount)`

2.6 Wallet

2.6.1 account_create

Creates a new account, insert next deterministic key in **wallet** `nano.rpc.Client.account_create(wallet, work=True)`

2.6.2 account_list

Lists all the accounts inside **wallet** `nano.rpc.Client.account_list(wallet)`

2.6.3 account_move

Moves **accounts** from **source** to **wallet** `nano.rpc.Client.account_move(source, wallet, accounts)`

2.6.4 account_remove

Remove **account** from **wallet** `nano.rpc.Client.account_remove(wallet, account)`

2.6.5 account_representative_set

Sets the representative for **account** in **wallet** `nano.rpc.Client.account_representative_set(wallet, account, representative, work=None)`

2.6.6 accounts_create

Creates new accounts, insert next deterministic keys in **wallet** up to **count** `nano.rpc.Client.accounts_create(wallet, count, work=True)`

2.6.7 password_change

Changes the password for **wallet** to **password** `nano.rpc.Client.password_change(wallet, password)`

2.6.8 password_enter

Enters the **password** in to **wallet** `nano.rpc.Client.password_enter(wallet, password)`

2.6.9 password_valid

Checks whether the password entered for **wallet** is valid `nano.rpc.Client.password_valid(wallet)`

2.6.10 payment_begin

Begin a new payment session. Searches wallet for an account that's marked as available and has a 0 balance. If one is found, the account number is returned and is marked as unavailable. If no account is found, a new account is created, placed in the wallet, and returned. `nano.rpc.Client.payment_begin(wallet)`

2.6.11 payment_end

End a payment session. Marks the account as available for use in a payment session. `nano.rpc.Client.payment_end(account, wallet)`

2.6.12 payment_init

Marks all accounts in wallet as available for being used as a payment session. `nano.rpc.Client.payment_init(wallet)`

2.6.13 receive

Receive pending **block** for **account** in **wallet** `nano.rpc.Client.receive(wallet, account, block, work=None)`

2.6.14 search_pending

Tells the node to look for pending blocks for any account in **wallet** `nano.rpc.Client.search_pending(wallet)`

2.6.15 send

Send **amount** from **source** in **wallet** to **destination** `nano.rpc.Client.send(wallet, source, destination, amount, work=None)`

2.6.16 wallet_add

Add an adhoc private key **key** to **wallet** `nano.rpc.Client.wallet_add(wallet, key, work=True)`

2.6.17 wallet_balance_total

Returns the sum of all accounts balances in **wallet** `nano.rpc.Client.wallet_balance_total(wallet)`

2.6.18 wallet_balances

Returns how many rai is owned and how many have not yet been received by all accounts in **wallet** `nano.rpc.Client.wallet_balances(wallet)`

2.6.19 wallet_change_seed

Changes seed for **wallet** to **seed** `nano.rpc.Client.wallet_change_seed(wallet, seed)`

2.6.20 wallet_contains

Check whether **wallet** contains **account** `nano.rpc.Client.wallet_contains(wallet, account)`

2.6.21 wallet_create

Creates a new random wallet id `nano.rpc.Client.wallet_create()`

2.6.22 wallet_destroy

Destroys **wallet** and all contained accounts `nano.rpc.Client.wallet_destroy(wallet)`

2.6.23 wallet_export

Return a json representation of **wallet** `nano.rpc.Client.wallet_export(wallet)`

2.6.24 wallet_frontiers

Returns a list of pairs of account and block hash representing the head block starting for accounts from **wallet** `nano.rpc.Client.wallet_frontiers(wallet)`

2.6.25 wallet_key_valid

Returns if a **wallet** key is valid `nano.rpc.Client.wallet_key_valid(wallet)`

2.6.26 wallet_lock

Locks a **wallet** `nano.rpc.Client.wallet_lock(wallet)`

2.6.27 wallet_locked

Checks whether **wallet** is locked `nano.rpc.Client.wallet_locked(wallet)`

2.6.28 wallet_pending

Returns a list of block hashes which have not yet been received by accounts in this **wallet** `nano.rpc.Client.wallet_pending(wallet, count=None, threshold=None, source=False)`

2.6.29 wallet_representative

Returns the default representative for **wallet** `nano.rpc.Client.wallet_representative(wallet)`

2.6.30 wallet_representative_set

Sets the default **representative** for **wallet** `nano.rpc.Client.wallet_representative_set(wallet, representative)`

2.6.31 wallet_republish

Rebroadcast blocks for accounts from **wallet** starting at frontier down to **count** to the network `nano.rpc.Client.wallet_republish(wallet, count)`

2.6.32 wallet_unlock

Unlocks **wallet** using **password** `nano.rpc.Client.wallet_unlock(wallet, password)`

2.7 Work

2.7.1 wallet_work_get

Returns a list of pairs of account and work from **wallet** `nano.rpc.Client.wallet_work_get(wallet)`

2.7.2 work_cancel

Stop generating **work** for block `nano.rpc.Client.work_cancel(hash)`

2.7.3 work_generate

Generates **work** for block `nano.rpc.Client.work_generate(hash)`

2.7.4 work_get

Retrieves work for **account** in **wallet** `nano.rpc.Client.work_get(wallet, account)`

2.7.5 work_peer_add

Add specific **IP address** and **port** as work peer for node until restart `nano.rpc.Client.work_peer_add(address, port)`

2.7.6 work_peers

Retrieve work peers `nano.rpc.Client.work_peers()`

2.7.7 work_peers_clear

Clear work peers node list until restart `nano.rpc.Client.work_peers_clear()`

2.7.8 work_set

Set **work** for **account** in **wallet** `nano.rpc.Client.work_set(wallet, account, work)`

2.7.9 work_validate

Check whether **work** is valid for block `nano.rpc.Client.work_validate(work, hash)`

3.1 Conversion tools

For converting between rai/xrb amounts.

The `nano.conversion.convert()` function takes `int`, `Decimal` or `string` arguments (no `float`):

```
>>> from nano import convert
>>> convert(12, from_unit='XRB', to_unit='raw')
Decimal('1.2E+31')

>>> convert(0.4, from_unit='krai', to_unit='XRB')
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ValueError: float values can lead to unexpected
precision loss, please use a Decimal or string
eg. convert('0.4', 'krai', 'XRB')

>>> convert('0.4', from_unit='krai', to_unit='XRB')
Decimal('0.0004')
```

Warning: Careful not to mix up 'XRB' and 'xrb' as they are different units

```
>>> convert(2000000000000000000000000000, 'raw', 'XRB')
Decimal('0.000002')
>>> convert(2000000000000000000000000000, 'raw', 'xrb')
Decimal('2')
```

For a dict of all available units and their amount in raw:

```
>>> from nano import UNITS_TO_RAW
>>> UNITS_TO_RAW
```

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```
{'Grai': Decimal('1000000000000000000000000000000'),  
  'Gxrb': Decimal('1000000000000000000000000000000'),  
  'Mr ai': Decimal('100000000000000000000000000000'),  
  'Mxrb': Decimal('100000000000000000000000000000'),  
  'XRB': Decimal('100000000000000000000000000000'),  
  'krai': Decimal('100000000000000000000000000000'),  
  'kxrb': Decimal('100000000000000000000000000000'),  
  'mrai': Decimal('10000000000000000000000000000'),  
  'mxrb': Decimal('10000000000000000000000000000'),  
  'rai': Decimal('10000000000000000000000000000'),  
  'raw': 1,  
  'urai': Decimal('10000000000000000000000000000'),  
  'uxrb': Decimal('10000000000000000000000000000'),  
  'xrb': Decimal('10000000000000000000000000000')}
```

3.2 Known Accounts / Constants

```
>>> from nano import GENESIS_BLOCK_HASH, KNOWN_ACCOUNT_IDS, KNOWN_ACCOUNT_NAMES
>>> KNOWN_ACCOUNT_IDS['xrb_
↳lipx847tk8o46pwxt5qjdbncjqcbwcc1rrmqnkztrfjy5k7z4imsrata9est']
'Developer Fund'
>>> KNOWN_ACCOUNT_NAMES['Burn']
'xrb_11111111111111111111111111111111111111111111111111111111111111111111hifc8npp'
>>> GENESIS_BLOCK_HASH
'991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948'
```

4.2 nano.accounts module

nano.accounts.KNOWN_ACCOUNT_IDS: dict of account ids => names eg.

nano.accounts.KNOWN_ACCOUNT_NAMES: dict of names => account ids

`nano.accounts.bytes_to_xrb(value)`

`nano.accounts.hex_to_xrb(value)`

`nano.accounts.xrb_to_bytes` (*value*)

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```
>>> xrb_encode(b'ejkp4s54eokpe')
b'deadbeef'
```

`nano.accounts.xrb_to_hex(value)`
 Encodes an xrb string to hex

```
>>> xrb_encode(b'utpuxur')
b'deadbeef'
```

4.3 nano.blocks module

`nano.blocks.GENESIS_BLOCK_HASH = '991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F1'`
 Genesis block hash

4.4 nano.conversion module

Conversion tools for converting xrb

Gxrb = 100000000000000000000000000000000raw, 10^{33}

Mxrb = 10000000000000000000000000000000raw, 10^{30}

kxrb = 1000000000000000000000000000000raw, 10^{27}

xrb = 100000000000000000000000000000raw, 10^{24}

mxrb = 10000000000000000000000000000raw, 10^{21}

uxrb = 1000000000000000000000000000raw, 10^{18}

1 Mxrb used to be also called 1 Mrai 1 xrb is 10^{24} raw 1 raw is the smallest possible division

Mrari are XRB 1rai = 1000krai = 1,000,000mrai = 0,000001 XRB

`nano.conversion.convert(value, from_unit, to_unit)`
 Converts a value from *from_unit* units to *to_unit* units

Parameters

- **value** (*int* or *str* or *decimal.Decimal*) – value to convert
- **from_unit** (*str*) – unit to convert from
- **to_unit** (*str*) – unit to convert to

```
>>> convert(value='1.5', from_unit='xrb', to_unit='krai')
Decimal('0.0015')
```

4.5 nano.rpc module

class `nano.rpc.Client` (*host='http://localhost:7076', session=None*)
 Bases: `object`

Nano (RaiBlocks) node RPC client

Parameters

- **host** – RPC server host, defaults to `'http://localhost:7076'`
- **session** – optional `requests.Session` session to use for this client

```
>>> from nano.rpc import Client
>>> rpc = Client('http://localhost:7076')
>>> rpc.version()
{
  'rpc_version': 1,
  'store_version': 10,
  'node_vendor': 'RaiBlocks 9.0'
}
```

account_balance (*account*)

Returns how many RAW is owned and how many have not yet been received by **account**

Parameters **account** (*str*) – Account id to return balance of

Raises *nano.rpc.RPCException*

```
>>> rpc.account_balance(
...     account="xrb_
↪3e3j5tkog48pnny9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000"
... )
{
  "balance": 10000,
  "pending": 10000
}
```

account_block_count (*account*)

Get number of blocks for a specific **account**

Parameters **account** (*str*) – Account to get number of blocks for

Raises *nano.rpc.RPCException*

```
>>> rpc.account_block_count(account="xrb_
↪3t6k35gi95xu6tergt6p69ck76ogmitsa8mni1tpxm9fkcm736xtoncuohr3")
19
```

account_create (*wallet*, *work=True*)

Creates a new account, insert next deterministic key in **wallet**

Parameters

- **wallet** (*str*) – Wallet to insert new account into
- **work** (*bool*) – If false, disables work generation after creating account

Raises *nano.rpc.RPCException*

```
>>> rpc.account_create(
...     wallet=
↪"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
... )
"xrb_3e3j5tkog48pnny9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000"
```

account_get (*key*)

Get account number for the **public key**

Parameters **key** (*str*) – Public key to get account for

Raises *nano.rpc.RPCException*

```
>>> rpc.account_get (
...     key="3068BB1CA04525BB0E416C485FE6A67FD52540227D267CC8B6E8DA958A7FA039"
... )
"xb1e5aqegcljb7qe964u4adzmcezyo6o146zb8hm6dft8tkp79za3sxwjym5rx"
```

account_history (*account*, *count*)

Reports send/receive information for a **account**

Parameters

- **account** (*str*) – Account to get send/receive information for
- **count** (*int*) – number of blocks to return

Raises *nano.rpc.RPCException*

```
>>> rpc.account_history(
...     account="xrb_
↳3e3j5tkog48pnn9dmfzj1rl6pg8t1e76dz5tmac6iq689wyjfp00000000",
...     count=1
... )
[
  {
    "hash":
↳"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
    "type": "receive",
    "account": "xrb_
↳3e3j5tkog48pnn9dmfzj1rl6pg8t1e76dz5tmac6iq689wyjfp00000000",
    "amount": 100000000000000000000000000000000
  }
]
```

account_info (*account*, *representative=False*, *weight=False*, *pending=False*)

Returns frontier, open block, change representative block, balance, last modified timestamp from local database & block count for **account**

Parameters

- **account** (*str*) – Account to return info for
- **representative** (*bool*) – if True, also returns the representative block
- **weight** (*bool*) – if True, also returns the voting weight
- **pending** (*bool*) – if True, also returns the pending balance

Raises `nano.rpc.RPCException`

```
>>> rpc.account_info(
...     account="xrb_
↳3t6k35gi95xu6tergt6p69ck76ogmitsa8mnijtpxm9fkcm736xtoncuohr3"
... )
{
  "frontier":
  ↳FF84533A571D953A596EA401FD41743AC85D04F406E76FDE4408EAED50B473C5",
  "open_block":
  ↳991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948",
  "representative_block":
  ↳991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948",
```

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```

    "balance": "235580100176034320859259343606608761791",
    "modified_timestamp": "1501793775",
    "block_count": "33"
}

```

account_key (*account*)Get the public key for **account****Parameters** **account** (*str*) – Account to get public key for**Raises** *nano.rpc.RPCException*

```

>>> rpc.account_key(
...     account="xrb_
↳ 1e5aqegc1jb7qe964u4adzmcezyo6o146zb8hm6dft8tkp79za3sxwjym5rx"
... )
"3068BB1CA04525BB0E416C485FE6A67FD52540227D267CC8B6E8DA958A7FA039"

```

account_list (*wallet*)Lists all the accounts inside **wallet****Parameters** **wallet** (*str*) – Wallet to get account list for**Raises** *nano.rpc.RPCException*

```

>>> rpc.account_list(
...     wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
... )
[
    "xrb_3e3j5tkog48pnn9dmfzjlrl6pg8tle76dz5tmac6iq689wyjfpi00000000"
]

```

account_move (*source, wallet, accounts*)Moves **accounts** from **source** to **wallet****Parameters**

- **source** (*str*) – wallet to move accounts from
- **wallet** (*str*) – wallet to move accounts to
- **accounts** (*list of str*) – accounts to move

Raises *nano.rpc.RPCException*

```

>>> rpc.account_move(
...     source=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
...     wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
...     accounts=[
...         "xrb_3e3j5tkog48pnn9dmfzjlrl6pg8tle76dz5tmac6iq689wyjfpi00000000"
...     ]
... )
True

```

account_remove (*wallet, account*)Remove **account** from **wallet**

Parameters

- **wallet** (*str*) – Wallet to remove account from
- **account** (*str*) – Account to remove

Raises *nano.rpc.RPCException*

```
>>> rpc.account_remove(  
...     wallet=  
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",  
...     account="xrb_  
↪ 39a73oy5ungrhxy5z5oaolxso4zo7dmgpjd4u74xcrx3rlw6rtazuouw6qfi"  
... )  
True
```

account_representative (*account*)

Returns the representative for **account**

Parameters **account** (*str*) – Account to get representative for

Raises *nano.rpc.RPCException*

```
>>> rpc.account_representative(  
...     account="xrb_  
↪ 39a73oy5ungrhxy5z5oaolxso4zo7dmgpjd4u74xcrx3rlw6rtazuouw6qfi"  
... )  
"xrb_16uluufyoig8777y6r8iqjtrw8sg8maqrm36zzcm95jmbd9i9aj5i8abr8u5"
```

account_representative_set (*wallet, account, representative, work=None*)

Sets the representative for **account** in **wallet**

Parameters

- **wallet** (*str*) – Wallet to use for account
- **account** (*str*) – Account to set representative for
- **representative** (*str*) – Representative to set to
- **work** (*str*) – If set, is used as the work for the block

Raises *nano.rpc.RPCException*

```
>>> rpc.account_representative_set(  
...     wallet=  
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",  
...     account="xrb_  
↪ 39a73oy5ungrhxy5z5oaolxso4zo7dmgpjd4u74xcrx3rlw6rtazuouw6qfi",  
...     representative="xrb_  
↪ 16uluufyoig8777y6r8iqjtrw8sg8maqrm36zzcm95jmbd9i9aj5i8abr8u5"  
... )  
"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
```

account_weight (*account*)

Returns the voting weight for **account**

Parameters **account** (*str*) – Account to get voting weight for

Raises *nano.rpc.RPCException*

```
>>> rpc.account_weight (
...     account="xrb_
↪3e3j5tkog48pnn9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000"
... )
10000
```

accounts_balances (*accounts*)

Returns how many RAW is owned and how many have not yet been received by **accounts** list

Parameters **accounts** (*list of str*) – list of accounts to return balances for

Raises *nano.rpc.RPCException*

```
>>> rpc.accounts_balances (
...     accounts=[
...         "xrb_3e3j5tkog48pnn9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000
↪",
...         "xrb_3ilaqlcchnmbn9x5rsbap8b15akfh7wj7pwskuzi7ahz8oq6cobd99d4r3b7"
...     ]
... )
{
  "xrb_3e3j5tkog48pnn9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000": {
    "balance": 10000,
    "pending": 10000
  },
  "xrb_3ilaqlcchnmbn9x5rsbap8b15akfh7wj7pwskuzi7ahz8oq6cobd99d4r3b7": {
    "balance": 10000000,
    "pending": 0
  }
}
```

accounts_create (*wallet, count, work=True*)

Creates new accounts, insert next deterministic keys in **wallet** up to **count**

Parameters

- **wallet** (*str*) – Wallet to create new accounts in
- **count** (*int*) – Number of accounts to create
- **work** (*bool*) – If false, disables work generation after creating account

Raises *nano.rpc.RPCException*

```
>>> rpc.accounts_create (
...     wallet=
↪"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
...     count=2
... )
[
  "xrb_3e3j5tkog48pnn9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000",
  "xrb_1e5aqegc1jb7qe964u4adzmcezyo6o146zb8hm6dft8tkp79za3s00000000"
]
```

accounts_frontiers (*accounts*)

Returns a list of pairs of account and block hash representing the head block for **accounts** list

Parameters **accounts** (*list of str*) – Accounts to return frontier blocks for

Raises *nano.rpc.RPCException*

```
>>> rpc.accounts_frontiers(
...     accounts=[
...         "xrb_3t6k35gi95xu6tergt6p69ck76ogmitsa8mni jtpxm9fkcm736xtoncuohr3",
...         "xrb_3ilaqlcchnmbn9x5rsbap8b15akfh7wj7pwskuzi7ahz8oq6cobd99d4r3b7"
...     ]
... )
{
  "xrb_3t6k35gi95xu6tergt6p69ck76ogmitsa8mni jtpxm9fkcm736xtoncuohr3":
    "791AF413173EEE674A6FCF633B5DFC0F3C33F397F0DA08E987D9E0741D40D81A",
  "xrb_3ilaqlcchnmbn9x5rsbap8b15akfh7wj7pwskuzi7ahz8oq6cobd99d4r3b7":
    "6A32397F4E95AF025DE29D9BF1ACE864D5404362258E06489FABDBA9DCCC046F"
}
```

accounts_pending (*accounts*, *count=None*, *threshold=None*, *source=False*)

Returns a list of block hashes which have not yet been received by these **accounts**

Parameters

- **accounts** (*list of str*) – Accounts to return list of block hashes for
- **count** (*int*) – Max number of blocks to returns
- **threshold** (*int*) – Minimum amount in raw per block
- **source** (*bool*) – if True returns the source as well

Raises *nano.rpc.RPCException*

```
>>> rpc.accounts_pending(
...     accounts=[
...         "xrb_111111111111111111111111111111111111111111111111111111117353trpda",
...         "xrb_3t6k35gi95xu6tergt6p69ck76ogmitsa8mni jtpxm9fkcm736xtoncuohr3"
...     ],
...     count=1
... )
{
    "xrb_111111111111111111111111111111111111111111111111111111117353trpda": [
        "142A538F36833D1CC78B94E11C766F75818F8B940771335C6C1B8AB880C5BB1D"
    ],
    "xrb_3t6k35gi95xu6tergt6p69ck76ogmitsa8mni jtpxm9fkcm736xtoncuohr3": [
        "4C1FEFF0BEA7F50BE35489A1233FE002B212DEA554B55B1B470D78BD8F210C74"
    ]
}
```

```
available_supply()
```

Returns how many rai are in the public supply

Raises *nano.rpc.RPCException*

```
>>> rpc.available_supply()
10000
```

block (*hash*)Retrieves a json representation of **block**

Parameters `hash(str)` – Hash of block to return representation for

Raises `nano.rpc.RPCException`

```
>>> rpc.block_account (
...     hash="000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F
...     ↵
... )
"xb_3e3j5tkog48pnny9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000"
```

```
>>> rpc.block_count()
{
  "count": 1000,
  "unchecked": 10
}
```

```
>>> rpc.block_count_type()
{
  "send": 1000,
  "receive": 900,
  "open": 100,
  "change": 50
}
```

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Parameters

- **type** (*str*) – Type of block to create one of **open**, **receive**, **change**, **send**
- **account** (*str*) – Account for the signed block
- **wallet** (*str*) – Wallet to use
- **representative** (*str*) – Representative account for **open** and **change** blocks
- **key** (*str*) – Private key to use to open account for **open** blocks
- **destination** (*str*) – Destination account for **send** blocks
- **amount** (*int*) – Amount in raw for **send** blocks
- **balance** (*int*) – Balance in raw of account for **send** blocks
- **previous** (*str*) – Previous block hash for **receive**, **send** and **change** blocks
- **source** (*str*) – Source block for **open** and **receive** blocks
- **work** (*str*) – Work value to use for block from external source

Raises *nano.rpc.RPCException*

[illegible]

```
>>> rpc.block_create(
...     type="receive",
...     account="xrb_
↳3kdbxitaj7f6mrir6miiwtw4muhcc58e6tn5st6rfaxsdbn7gr4roudwn951",
...     previous=
↳"F47B23107E5F34B2CE06F562B5C435DF72A533251CB414C51B2B62A8F63A00E4",
...     source=
↳"19D3D919475DEED4696B5D13018151D1AF88B2BD3BCFF048B45031C1F36D1858",
...     wallet=
↳"000D1BAFC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3E"
```

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```

... )
{
  "block": {
    "previous":
    ↪ "F47B23107E5F34B2CE06F562B5C435DF72A533251CB414C51B2B62A8F63A00E4",
    "signature":
    ↪ "A13FD22527771667D5DFF33D69787D734836A3561D8A490C1F4917A05D77EA09860461D5FBFC"
    ↪ ",
    "source":
    ↪ "19D3D919475DEED4696B5D13018151D1AF88B2BD3BCFF048B45031C1F36D1858",
    "type": "receive",
    "work": "6acb5dd43a38d76a"
  },
  "hash": "314BA8D9057678C1F53371C2DB3026C1FAC01EC8E7802FD9A2E8130FC523429E"
}

```

```
>>> rpc.block_create(
...     type="change",
...     account="xrb_
↳3kdbxita7f6mrir6miiwtw4muhcc58e6tn5st6rfaxsdbn7gr4roudwn951",
...     representative="xrb_
↳18gmu6engqghtjnpqqam181o5nfhj4sdtgyhy36dan3jr9spt84rzwmktafc",
...     previous=
↳"F958305C0FF0551421D4ABEDCCF302079D020A0A3833E33F185E2B0415D4567A",
...     wallet=
↳"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
```

4.5. nano.rpc module

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```

{
  "block": {
    "previous":
    ↪ "F958305C0FF0551421D4ABEDCCF302079D020A0A3833E33F185E2B0415D4567A",
    "representative": "xrb_
    ↪ 18gmu6engqhgtjnpqqam181o5nfhj4sdtgyhy36dan3jr9spt84rzwmktafc",
    "signature":
    ↪ "98B4D56881D9A88B170A6B2976AE21900C26A27F0E2C338D93FDED56183B73D19AA5BEB48E43FCBB8FF8293FD
    ↪ ",
    "type": "change",
    "work": "55e5b7a83edc3f4f"
  },
  "hash": "654FA425CEBFC9E7726089E4EDE7A105462D93DBC915FFB70B50909920A7D286"
}

```

blocks (*hashes*)Retrieves a json representations of **blocks**

Parameters **hashes** (*list of str*) – List of block hashes to return

Raises *nano.rpc.RPCException*

[illegible]**blocks_info** (*hashes, pending=False, source=False*)

Retrieves a json representations of **blocks** with transaction **amount** & block **account**

Parameters

- **hashes** (*list of str*) – List of block hashes to return info for
- **pending** (*bool*) – If true, returns pending amount as well
- **source** (*bool*) – If true, returns source account as well

Raises *nano.rpc.RPCException*

```
>>> rpc.blocks_info(hashes=[
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"])
{
```

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```
"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F": {  
    "block_account": "xrb_  
→3e3j5tkog48pnny9dmfzjlrl16pg8tle76dz5tmac6iq689wyjfpi00000000",  
    "amount": "10000000000000000000000000000000",  
    "contents": {  
        "account": "xrb_  
→3e3j5tkog48pnny9dmfzjlrl16pg8tle76dz5tmac6iq689wyjfpi00000000",  
        "work": "0000000000000000",  
        "source":  
→"FA5B51D063BADDF345EFD7EF0D3C5FB115C85B1EF4CDE89D8B7DF3EAF60A04A4",  
        "representative": "xrb_  
→3e3j5tkog48pnny9dmfzjlrl16pg8tle76dz5tmac6iq689wyjfpi00000000",  
        "signature":  
→"00000000000000000000000000000000000000000000000000000000000000000000000000000000"  
→",  
        "type": "open"  
    }  
}  
  
}
```

Initialize bootstrap to specific IP address and port

- **address** (*str*) – Ip address to bootstrap
- **port** (*int*) – Port to bootstrap

```
>>> rpc.bootstrap(address="::ffff:138.201.94.249", port="7075")
True
```

Initialize multi-connection bootstrap to random peers

```
>>> rpc.bootstrap_any()
True
```

Makes an RPC call to the server and returns the json response

- **action** (*str*) – RPC method to call
- **params** (*dict*) – Dict of arguments to send with RPC call

```
>>> rpc.call(
...     action='account_balance',
...     params={
...         'account': xrb_
...     }
... )
3t6k35gi95xu6tergt6p69ck76ogmitsa8mni jtpxm9fkcm736xtoncuohr3'
```

4.5. nano.rpc module

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```
...    })
{'balance': '325586539664609129644855132177',
 'pending': '2309370940000000000000000000000000'}
```

chain (*block, count*)

Returns a list of block hashes in the account chain starting at **block** up to **count**

Parameters

- **block** (*str*) – Block hash to start at
- **count** (*int*) – Number of blocks to return up to

Raises *nano.rpc.RPCException*

```
>>> rpc.chain(
...     block=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
...     count=1
... )
[
    "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
]
```

delegators (*account*)

Returns a list of pairs of delegator names given **account** a representative and its balance

Parameters `account` (*str*) – Account to return delegators for

Raises *nano.rpc.RPCException*

```
>>> rpc.delegators(
...     account="xrb_
↳111111111111111111111111111111111111111111117353trpda"
... )
{
  "xrb_13bqhi1cdqq8yb9szneoc38qk899d58i5rcrgdk5mkdm86hekpoez3zxw5sd":
    "5000000000000000000000000000000000000000000000000000000000000000",
  "xrb_17k6ug685154an8gri9whhe5kb5zlmf5w6y39gokc1657sh95fegm8ht1zpn":
    "9616479708207300000000000000000000000000000000000000000000000000"
}
```

delegators_count (*account*)

Get number of delegators for a specific representative **account**

Parameters `account` (*str*) – Account to get number of delegators for

Raises `nano.rpc.RPCException`

[illegible]**deterministic_key** (*seed*, *index*)

Derive deterministic keypair from **seed** based on **index**

Parameters

- ```
ses nano.rpc.RPCException
```

```
rpc deterministic key(
```

---

Reports the number of accounts in the ledger

**Raises** *nano.rpc.RPCException*

---

Returns a list of pairs of account and block hash representing the head block starting at **account** up to **count**

- acco

- ```
ses nano.rpc.RPCException
```

```
rpc frontiers(
```

Reports send/receive information for a chain of blocks

Parameters

- hash

- ```
ses nano.rpc.RPCException
```

```
>>> rpc.history(
... hash="000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
... ,
... count=1
...)
[
 {
 "hash":
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
 "type": "receive",
 "account": "xrb_
↳ 3e3j5tkog48pnny9dmfzjlrl6pg8t1e76dz5tmac6iq689wyjfpi00000000",
 "amount": "1000000000000000000000000000000000"
 }
]
```

**keepalive** (*address, port*)

Tells the node to send a keepalive packet to **address:port**

## Parameters

- **address** (*str*) – IP address of node to send keepalive packet to
- **port** (*int*) – Port of node to send keepalive packet to

**Raises** *nano.rpc.RPCException*

```
>>> rpc.keepalive(address="::ffff:192.168.1.1", port=1024)
True
```

## key\_create()

### Generates an **adhoc** random keypair

**Raises** *nano.rpc.RPCException*

```
>>> rpc.key_create()
{
 "private": "781186FB9EF17DB6E3D1056550D9FAE5D5BBADA6A6BC370E4CBB938B1DC71DA3
 ",
 "public": "3068BB1CA04525BB0E416C485FE6A67FD52540227D267CC8B6E8DA958A7FA039
 ",
 "account": "xrb_1e5aqegcljb7qe964u4adzmcezyo6o146zb8hm6dft8tkp79za3sxxwym5rx
 "
}
```

**key\_expand** (*key*)

### Derive public key and account number from **private key**

**Parameters** **key** (*str*) – Private key to generate account and public key of

**Raises** *nano.rpc.RPCException*

```
>>> rpc.key_expand(
 key="781186FB9EF17DB6E3D1056550D9FAE5D5BBADA6A6BC370E4CBB938B1DC71DA3"
)
{
 "private": "781186FB9EF17DB6E3D1056550D9FAE5D5BBADA6A6BC370E4CBB938B1DC71DA3
 ",
 "public": "3068BB1CA04525BB0E416C485FE6A67FD52540227D267CC8B6E8DA958A7FA039
 ",
}
```

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```

"account": "xrb_1e5aqegc1jb7qe964u4adzmcezyo6o146zb8hm6dft8tkp79za3sxwjym5rx
↪ "
}

```

Divide a raw amount down by the krai ratio.

**Raises** `nano.rpc.RPCException`

Multiply an krai amount by the krai ratio.

**Raises** `nano.rpc.RPCException`

Returns frontier, open block, change representative block, balance, last modified timestamp from local database & block count starting at **account** up to **count**

- **account** (*str*) – Account to return blocks for
- **count** (*int*) – Max number of blocks to return
- **representative** (*bool*) – If true, returns the representative as well
- **weight** (*bool*) – If true, returns the voting weight as well
- **pending** (*bool*) – If true, returns the pending amount as well
- **sorting** (*bool*) – If true, sorts the response by balance

#### 4.5. nano.rpc module

(continued from previous page)

$$\left. \begin{array}{l} \{ \\ \} \end{array} \right\}$$

```
mrai_from_raw (amount)
```

Divide a raw amount down by the Mrai ratio.

**Parameters** `amount` (*int*) – Amount in raw to convert to Mrai

**Raises** `nano.rpc.RPCException`

```
>>> rpc.mrai_from_raw(amount=10000000000000000000000000000)
1
```

```
mrai_to_raw (amount)
```

Multiply an Mrai amount by the Mrai ratio.

**Parameters** `amount` (*int*) – Amount in Mrai to convert to raw

**Raises** *nano.rpc.RPCException*

```
>>> rpc.mrai_to_raw(amount=1)
1000000000000000000000000000000000000
```

**password\_change** (*wallet, password*)

Changes the password for **wallet** to **password**

## Parameters

- **wallet** (*str*) – Wallet to change password for
- **password** (*str*) – Password to set

**Raises** *nano.rpc.RPCException*

```
>>> rpc.password_change(
... wallet=
... ↵ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... password="test"
...)
True
```

**password\_enter** (*wallet, password*)

Enters the **password** in to **wallet**

## Parameters

- **wallet** (*str*) – Wallet to enter password for
- **password** (*str*) – Password to enter

**Raises** *nano.rpc.RPCException*

```
>>> rpc.password_enter(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... password="test"
...)
True
```

```
password_valid(wallet)
```

Checks whether the password entered for **wallet** is valid

**Parameters** **wallet** (*str*) – Wallet to check password for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.password_valid(
... wallet=
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
True
```

**payment\_begin** (*wallet*)

Begin a new payment session. Searches wallet for an account that's marked as available and has a 0 balance. If one is found, the account number is returned and is marked as unavailable. If no account is found, a new account is created, placed in the wallet, and returned.

**Parameters** **wallet** (*str*) – Wallet to begin payment in

**Raises** *nano.rpc.RPCException*

```
>>> rpc.payment_begin(
... wallet="000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
"xb_3e3j5tkog48pnny9dmfzjlr16pg8tle76dz5tmac6iq689wyjfpi00000000"
```

**payment\_end** (*account*, *wallet*)

End a payment session. Marks the account as available for use in a payment session.

**Parameters**

- **account** (*str*) – Account to mark available
- **wallet** (*str*) – Wallet to end payment session for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.payment_end(
... account="xb_
↪ 3e3j5tkog48pnny9dmfzjlr16pg8tle76dz5tmac6iq689wyjfpi00000000",
... wallet=
↪ "FFFD1BAEC8EC20814BBB9059B393051AAA8380F9B5A2E6B2489A277D81789EEE"
...)
True
```

**payment\_init** (*wallet*)

Marks all accounts in wallet as available for being used as a payment session.

**Parameters** **wallet** (*str*) – Wallet to init payment in

**Raises** *nano.rpc.RPCException*

```
>>> rpc.payment_init(
... wallet=
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
True
```

**payment\_wait** (*account*, *amount*, *timeout*)

Wait for payment of **amount** to arrive in **account** or until **timeout** milliseconds have elapsed.

**Parameters**

- **account** (*str*) – Account to wait for payment

- **amount** (*int*) – Amount in raw of funds to wait for payment to arrive
- **timeout** (*int*) – Timeout in milliseconds to wait for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.payment_wait(
... account="xrb_
↳ 3e3j5tkog48pnn9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000",
... amount=1,
... timeout=1000
...)
True
```

peers ( )

Returns a list of pairs of peer IPv6:port and its node network version

**Raises** `nano.rpc.RPCException`

```
>>> rpc.peers()
{
 "[:ffff:172.17.0.1]:32841": 3
}
```

**pending** (*account*, *count=None*, *threshold=None*, *source=False*)

Returns a list of pending block hashes with amount more or equal to **threshold**

## Parameters

- **account** (*str*) – Account to get list of pending block hashes for
- **count** (*int*) – Max blocks to return
- **threshold** (*int*) – Minimum amount in raw for blocks
- **source** (*bool*) – If true, returns source address as well

**Raises** *nano.rpc.RPCException*

```
>>> rpc.pending(
... account="xrb_
↳ 117353trpda"
...)
[
 "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
]
```

```
>>> rpc.pending(
... account="xrb_
↳117353trpda",
... count=1,
... threshold=1000000000000000000000000
...)
{
 "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F":
 ↳"6000"
}
```

**pending\_exists** (*hash*)

Check whether block is pending by **hash**

**Parameters** `hash` (*str*) – Hash of block to check if pending

**process** (*block*)

## Publish **block** to the network

**Raises** *nano.rpc.RPCException*

```
>>> rpc.process(json.dumps(block))
"42A723D2B60462BF7C9A003FE9A70057D3A6355CA5F1D0A57581000000000000"
```

Divide a raw amount down by the rai ratio.

```
>>> rpc.rai_from_raw(amount=1000000000000000000000)
1
```

Multiply an rai amount by the rai ratio.

```
>>> rpc.rai_to_raw(amount=1)
100000000000000000000000000000000
```

## Receive pending **block** for **account** in **wallet**

- **wallet** (*str*) – Wallet of account to receive block for

- **account** (*str*) – Account to receive block for
- **block** (*str*) – Block hash to receive
- **work** (*str*) – If set, uses this work for the receive block

**Raises** *nano.rpc.RPCException*

```
>>> rpc.receive(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... account="xrb_
↳ 3e3j5tkog48pnn9dmfzjlrl16pg8t1e76dz5tmac6iq689wyjfp00000000",
... block=
↳ "53EAA25CE28FA0E6D55EA9704B32604A736966255948594D55CBB05267CECD48",
... work="12041e830ad10de1"
...)
"EE5286AB32F580AB65FD84A69E107C69FBEB571DEC4D99297E19E3FA5529547B"
```

```
receive_minimum()
```

Returns receive minimum for node

**Raises** *nano.rpc.RPCException*

```
>>> rpc.receive_minimum()
100000000000000000000000000000000
```

```
receive_minimum_set(amount)
```

Set **amount** as new receive minimum for node until restart

**Parameters** **amount** (*int*) – Amount in raw to set as minimum to receive

**Raises** *nano.rpc.RPCException*

```
>>> rpc.receive_minimum_set(amount=1000000000000000000000000000)
True
```

**representatives** (*count=None, sorting=False*)

Returns a list of pairs of representative and its voting weight

## Parameters

- **count** (*int*) – Max amount of representatives to return
- **sorting** (*bool*) – If true, sorts by weight

**Raises** *nano.rpc.RPCException*

```
>>> rpc.representatives()
{
 "xrb_1111111111111111111111111111111111111117353trpda":
 3822372327060170000000000000000000000000,
 "xrb_11awsq94gtecn":
 30999999999999999999999999999999000000,
 "xrb_1l4nk4rwjctu6n6tr6g6ps6lg1w3hdpxfas4xjlqtq6i8jyomc5d858xr1xi":
 0
}
```

**republish** (*hash, count=None, sources=None, destinations=None*)

### Rebroadcast blocks starting at **hash** to the network

## Parameters

- **hash** (*str*) – Hash of block to start rebroadcasting from
- **count** (*int*) – Max number of blocks to rebroadcast
- **sources** (*int*) – If set, additionally rebroadcasts source chain blocks for receive/open up to **sources** depth
- **destinations** (*int*) – If set, additionally rebroadcasts destination chain blocks for receive/open up to **destinations** depth

Raises *nano.rpc.RPCException*

```
>>> rpc.republish(
... hash="991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948"
...)
[
 "991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948",
 "A170D51B94E00371ACE76E35AC81DC9405D5D04D4CEBC399AEACE07AE05DD293"
]
```

#### **search\_pending** (*wallet*)

Tells the node to look for pending blocks for any account in **wallet**

**Parameters** **wallet** (*str*) – Wallet to search for pending blocks

Raises *nano.rpc.RPCException*

```
>>> rpc.search_pending(
... wallet=
... ↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
True
```

#### **search\_pending\_all** ()

Tells the node to look for pending blocks for any account in all available wallets

Raises *nano.rpc.RPCException*

```
>>> rpc.search_pending_all()
True
```

#### **send** (*wallet, source, destination, amount, work=None*)

Send **amount** from **source** in **wallet** to **destination**

**Parameters**

- **wallet** (*str*) – Wallet of account used to send funds
- **source** (*str*) – Account to send funds from
- **destination** (*str*) – Account to send funds to
- **amount** (*int*) – Amount in raw to send
- **work** (*str*) – If set, uses this work for the block

Raises *nano.rpc.RPCException*

```
>>> rpc.send(
... wallet=
... ↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... source="xrb_
... ↪ 3e3j5tkog48pnny9dmfzj1r16pg8t1e76dz5tmac6iq689wyjfp00000000", (continues on next page)
```

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```
... destination="xrb_
↳ 3e3j5tkog48pnn9dmfzjlr16pg8tle76dz5tmac6iq689wyjfpi00000000",
... amount=1000000,
... work="2bf29ef00786a6bc"
...)
"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
```

```
stop()
```

Stop the node

**Raises** *nano.rpc.RPCException*

```
>>> rpc.stop()
True
```

**successors** (*block, count*)

Returns a list of block hashes in the account chain ending at **block** up to **count**.

## Parameters

- **block** (*str*) – Hash of block to start returning successors for
- **count** (*int*) – Max number of successor blocks to return

**Raises** *nano.rpc.RPCException*

```
>>> rpc.successors(
... block=
↳ "991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948",
... count=1
...)
[
 "A170D51B94E00371ACE76E35AC81DC9405D5D04D4CEBC399AEACE07AE05DD293"
]
```

**unchecked** (*count=None*)

Returns a list of pairs of unchecked synchronizing block hash and its json representation up to **count**

**Parameters** `count` (*int*) – Max amount of unchecked blocks to return

**Raises** *nano.rpc.RPCException*

[illegible]

```
unchecked_clear()
```

## Clear unchecked synchronizing blocks

**Raises** `nano.rpc.RPCException`

```
>>> rpc.unchecked_clear()
True
```

**unchecked\_get** (*hash*)Retrieves a json representation of unchecked synchronizing block by **hash**

**Parameters** `hash (str)` – Hash of unchecked block to get

**Raises** *nano.rpc.RPCException*

[illegible]**unchecked\_keys** (*key=None, count=None*)

Retrieves unchecked database keys, blocks hashes & a json representations of unchecked pending blocks starting from **key** up to **count**

## Parameters

- **key** (*str*) – Starting key to return unchecked keys for
- **count** (*int*) – Max number of keys/blocks to return

**Raises** *nano.rpc.RPCException*

```
>>> rpc.unchecked_keys(
... key="FA5B51D063BADDF345EFD7EF0D3C5FB115C85B1EF4CDE89D8B7DF3EAF60A04A4
↳ ",
... count=1
...)
[
 {
 "key":
↳ "FA5B51D063BADDF345EFD7EF0D3C5FB115C85B1EF4CDE89D8B7DF3EAF60A04A4",
 "hash":
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
 "contents": {
 "account": "xrb_
↳ 3e3j5tkog48pnn9dmfzjlrl6pg8t1e76dz5tmac6iq689wyjfp00000000",
 "work": "0000000000000000",
```

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[illegible]

```
validate_account_number(account)
```

Check whether **account** is a valid account number

**Parameters** **account** (*str*) – Account number to check

**Raises** `nano.rpc.RPCException`

```
>>> rpc.validate_account_number(
... account="xrb_
↳ 3e3j5tkog48pnny9dmfzj1rl6pg8t1e76dz5tmac6iq689wyjfp00000000"
...)
True
```

```
version()
```

Returns the node's RPC version

**Raises** *nano.rpc.RPCException*

```
>>> rpc.version()
{
 "rpc_version": 1,
 "store_version": 10,
 "node_vendor": "RaiBlocks 9.0"
}
```

**wallet\_add** (*wallet*, *key*, *work*=*True*)

### Add an adhoc private key **key** to **wallet**

## Parameters

- **wallet** (*str*) – Wallet to add private key to
- **key** (*str*) – Private key to add
- **work** (*bool*) – If false, disables work generation

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_add(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... key="34F0A37AAD20F4A260F0A5B3CB3D7FB50673212263E58A380BC10474BB039CE4"
...)
"xbz_3e3j5tkoq48pnny9dmfzj1rl6pq8t1e76dz5tmac6iq689wyjfp00000000"
```

**wallet\_balance\_total** (*wallet*)

Returns the sum of all accounts balances in **wallet**

**Parameters** **wallet** (*str*) – Wallet to return sum of balances for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_balance_total(
... wallet=
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
{
 "balance": 10000,
 "pending": 10000
}
```

**wallet\_balances** (*wallet*)

Returns how many rai is owned and how many have not yet been received by all accounts in **wallet**

**Parameters** **wallet** (*str*) – Wallet to return balances for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_balances(
... wallet=
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
{
 "xrb_3e3j5tkog48pnny9dmfzjlrl6pg8t1e76dz5tmac6iq689wyjfp100000000": {
 "balance": 10000,
 "pending": 10000
 }
}
```

**wallet\_change\_seed** (*wallet*, *seed*)

Changes seed for **wallet** to **seed**

**Parameters**

- **wallet** (*str*) – Wallet to change seed for
- **seed** (*str*) – Seed to change wallet to

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_change_seed(
... wallet=
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... seed="74F2B37AAD20F4A260F0A5B3CB3D7FB51673212263E58A380BC10474BB039CEE"
↪
...)
True
```

**wallet\_contains** (*wallet*, *account*)

Check whether **wallet** contains **account**

**Parameters**

- **wallet** (*str*) – Wallet to check contains **account**
- **account** (*str*) – Account to check exists in **wallet**

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_contains(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... account="xrb_
↳ 3e3j5tkog48pnny9dmfzj1rl6pg8t1e76dz5tmac6iq689wyjfp00000000"
...)
True
```

#### **wallet\_create()**

Creates a new random wallet id

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_create()
"000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
```

#### **wallet\_destroy(wallet)**

Destroys **wallet** and all contained accounts

**Parameters** **wallet** (*str*) – Wallet to destroy

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_destroy(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
True
```

#### **wallet\_export(wallet)**

Return a json representation of **wallet**

**Parameters** **wallet** (*str*) – Wallet to export

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_export(wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F")
{
 "00":
↳ "0001"
}
```

#### **wallet\_frontiers(wallet)**

Returns a list of pairs of account and block hash representing the head block starting for accounts from **wallet**

**Parameters** **wallet** (*str*) – Wallet to return frontiers for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_frontiers(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
{
 "xrb_3e3j5tkog48pnny9dmfzj1rl6pg8t1e76dz5tmac6iq689wyjfp00000000":
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
}
```

Returns if a **wallet** key is valid

### Parameters: `url` (str)

---

## Locks a wallet

## Discussion

**Revised** [PRGCE](#) [1/1](#)

---

Checks whether **wallet**

**Received** 13 July 2004

**Beiges** [more](#) [less](#) [BGC702](#) [cell line](#)

---

Returns a list of block hashes which have not yet been received by acc

..

---

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```

 "xrb_3t6k35gi95xu6tergt6p69ck76ogmitsa8mni jtpxm9fkcm736xtoncuohr3": [
 "4C1FEEF0BEA7F50BE35489A1233FE002B212DEA554B55B1B470D78BD8F210C74"
]
}

```

**wallet\_representative** (*wallet*)Returns the default representative for **wallet****Parameters** **wallet** (*str*) – Wallet to get default representative account for**Raises** *nano.rpc.RPCException*

```

>>> rpc.wallet_representative(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
"xrb_3e3j5tkog48pnny9dmfzjlrl6pg8t1e76dz5tmac6iq689wyjfp00000000"

```

**wallet\_representative\_set** (*wallet, representative*)Sets the default **representative** for **wallet****Parameters**

- **wallet** (*str*) – Wallet to set default representative account for
- **representative** (*str*) – Representative account to set for **wallet**

**Raises** *nano.rpc.RPCException*

```

>>> rpc.wallet_representative_set(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... representative="xrb_
↳ 3e3j5tkog48pnny9dmfzjlrl6pg8t1e76dz5tmac6iq689wyjfp00000000"
...)
True

```

**wallet\_republish** (*wallet, count*)Rebroadcast blocks for accounts from **wallet** starting at frontier down to **count** to the network**Parameters**

- **wallet** (*str*) – Wallet to rebroadcast blocks for
- **count** (*int*) – Max amount of blocks to rebroadcast since frontier block

**Raises** *nano.rpc.RPCException*

```

>>> rpc.wallet_republish(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... count=2
...)
[
 "991CF190094C00F0B68E2E5F75F6BEE95A2E0BD93CEAA4A6734DB9F19B728948",
 "A170D51B94E00371ACE76E35AC81DC9405D5D04D4CEBC399AEACE07AE05DD293",
 "90D0C16AC92DD35814E84BFBCC739A039615D0A42A76EF44ADAEF1D99E9F8A35"
]

```

**wallet\_unlock** (*wallet, password*)Unlocks **wallet** using **password**

**Parameters**

- **wallet** (*str*) – Wallet to unlock
- **password** (*str*) – Password to enter

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_unlock(
... wallet=
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
... password="test"
...)
True
```

**wallet\_work\_get** (*wallet*)

Returns a list of pairs of account and work from **wallet**

**Parameters** **wallet** (*str*) – Wallet to return work for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.wallet_work_get(
... wallet=
↪ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F"
...)
{
 "xrb_11hifc8npp":
 "432e5cf728c90f4f"
}
```

**work\_cancel** (*hash*)

Stop generating **work** for block

**Parameters** **hash** (*str*) – Hash to stop generating work for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.work_cancel(
... hash="718CC2121C3E641059BC1C2CFC45666C99E8AE922F7A807B7D07B62C995D79E2
↪ "
...)
True
```

**work\_generate** (*hash*)

Generates **work** for block

**Parameters** **hash** (*str*) – Hash to start generating **work** for

**Raises** *nano.rpc.RPCException*

```
>>> rpc.work_generate(
... hash="718CC2121C3E641059BC1C2CFC45666C99E8AE922F7A807B7D07B62C995D79E2
↪ "
...)
"2bf29ef00786a6bc"
```

**work\_get** (*wallet, account*)

Retrieves work for **account** in **wallet**

**Parameters**

- **wallet** (*str*) – Wallet to get account work for
- **account** (*str*) – Account to get work for

**Raises** *nano.rpc.RPCException*

[illegible]**work\_peer\_add**(*address*, *port*)

Add specific **IP address** and **port** as work peer for node until restart

## Parameters

- **address** (*str*) – IP address of work peer to add
- **port** (*int*) – Port work peer to add

**Raises** `nano.rpc.RPCException`

```
>>> rpc.work_peer_add(address="::ffff:172.17.0.1", port="7076")
True
```

```
work_peers ()
```

## Retrieve work peers

**Raises** *nano.rpc.RPCException*

```
>>> rpc.work_peers()
[
 "::ffff:172.17.0.1:7076"
]
```

```
work_peers_clear()
```

Clear work peers node list until restart

**Raises** `nano.rpc.RPCException`

```
>>> rpc.work_peers_clear()
True
```

**work\_set** (*wallet, account, work*)

### Set work for account in wallet

## Parameters

- **wallet** (*str*) – Wallet to set work for account for
- **account** (*str*) – Account to set work for
- **work** (*str*) – Work to set for account in wallet

**Raises** *nano.rpc.RPCException*

```
>>> rpc.work_set(
... wallet=
↳ "000D1BAEC8EC208142C99059B393051BAC8380F9B5A2E6B2489A277D81789F3F",
```

(continues on next page)

[illegible]

Check whether **work** is valid for block

- **work** (*str*) – Work to validate
- **hash** (*str*) – Hash of block to validate work for

```
>>> rpc.work_validate(
... work="2bf29ef00786a6bc",
... hash="718CC2121C3E641059BC1C2CFC45666C99E8AE922F7A807B7D07B62C995D79E2
... ↪"
...)
True
```

alias of `nano.rpc.Client`

Bases: `exceptions.Exception`

`nano.rpc.doc_metadata` (*categories*)

#### 4.5. nano.rpc module



## CHAPTER 5

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