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# **aioethereum Documentation**

***Release 0.1.1***

**DeV1doR**

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Ethereum RPC client library for the [\(PEP 3156\)](#) Python event loop.

The library is intended to provide simple and clear interface to Ethereum node based on [asyncio](#).



# CHAPTER 1

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## Features

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|                                  |                                                         |
|----------------------------------|---------------------------------------------------------|
| <i>ujson</i> support             | Yes                                                     |
| High-level APIs                  | Yes                                                     |
| HTTP support                     | Yes                                                     |
| Unix domain socket (IPC) support | Yes                                                     |
| SSL/TLS support                  | Yes                                                     |
| Tested CPython versions          | 3.4, 3.5, 3.6                                           |
| Tested Geth versions             | 1.7.0                                                   |
| Implemented RPC apis             | <i>db, eth, miner, net, personal, shh, txpool, web3</i> |



## CHAPTER 2

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### Installation

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The easiest way to install aioethereum is by using the package on PyPi:

```
pip install aioethereum
```



## CHAPTER 3

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### Requirements

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- Python 3.3 and *asyncio* or Python 3.4+
- *ujson*



## CHAPTER 4

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### License

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The aioethereum is offered under MIT license.

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### 5.1 Getting started

This part of the documentation is a quick start for writing applications that interact with the client for ethereum nodes (geth, parity, etc.)

#### 5.1.1 Basic API description

This client provides APIs from:

- <https://github.com/ethereum/wiki/wiki/JSON-RPC>
- <https://github.com/ethereum/go-ethereum/wiki/Management-APIs>

It is simple http(s)/unix connector for ethereum node which implements standart RPC methods.



## 6.1 aioethereum API

Documentation related to various APIs available in this package.

### 6.1.1 aioethereum

**class** `aioethereum.AsyncIOHTTPClient` (*host='127.0.0.1', port=8545, tls=False, timeout=60, \*, loop=None*)

Bases: `aioethereum.client.BaseAsyncIOClient`, `aioethereum.management.RpcMixin`

Creates AsyncIOHTTPClient client to communicate via HTTP(s).

#### Parameters

- **host** (*str*) – Host on ethereum node
- **port** (*int*) – Port on ethereum node
- **tls** (*bool*) – Use SSL connection
- **timeout** (*int*) – Total time of timeout call
- **loop** (`EventLoop`) – An optional *event loop* instance (uses `asyncio.get_event_loop()` if not specified).

**Returns** `AsyncIOHTTPClient` instance.

**class** `aioethereum.AsyncIOIPCClient` (*reader, writer, unix\_path, timeout=60, \*, loop=None*)

Bases: `aioethereum.client.BaseAsyncIOClient`, `aioethereum.management.RpcMixin`

Creates AsyncIOIPCClient client to communicate via IPC.

#### Parameters

- **reader** (`asyncio.streams.StreamReader`) – Instance of the stream reader
- **writer** (`asyncio.streams.StreamWriter`) – Instance of the stream writer

- **unix\_path** (*str*) – Unix domain path
- **timeout** (*int*) – An optional total time of timeout call
- **loop** (*EventLoop*) – An optional *event loop* instance (uses `asyncio.get_event_loop()` if not specified).

Returns *AsyncIOIPCClient* instance.

**class** aioethereum.**BaseAsyncIOClient**

Bases: `abc.ABC`

Abstract class for creating client.

**rpc\_call** (*method, params=None, id\_=None*)

Implements RPC 2.0 call to node server.

#### Parameters

- **method** (*str*) – RPC node method
- **params** (*list*) – Input params for method
- **id** (*str or int*) – ID of current request

Returns *Response from RPC*

**coroutine** aioethereum.**create\_ethereum\_client** (*uri, timeout=60, \*, loop=None*)

Create client to ethereum node based on schema.

#### Parameters

- **uri** (*str*) – Host on ethereum node
- **timeout** (*int*) – An optional total time of timeout call
- **loop** (*EventLoop*) – An optional *event loop* instance (uses `asyncio.get_event_loop()` if not specified).

Returns *BaseAsyncIOClient* instance.

## 6.1.2 management

This package contains all high level features of the *aioethereum.AsyncIOIPCClient* and *aioethereum.AsyncIOHTTPClient*.

### admin

Admin related features

**class** aioethereum.management.admin.**AdminMixin**

Bases: `object`

### db

Db related features

**class** aioethereum.management.db.**DbMixin**

Bases: `object`

**db\_getHex** (*db\_name*, *key*)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#db\\_gethex](https://github.com/ethereum/wiki/wiki/JSON-RPC#db_gethex)

DEPRECATED

**coroutine db\_getString** (*db\_name*, *key*)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#db\\_getstring](https://github.com/ethereum/wiki/wiki/JSON-RPC#db_getstring)

DEPRECATED

**coroutine db\_putHex** (*db\_name*, *key*, *value*)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#db\\_puthex](https://github.com/ethereum/wiki/wiki/JSON-RPC#db_puthex)

DEPRECATED

**coroutine db\_putString** (*db\_name*, *key*, *value*)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#db\\_putstring](https://github.com/ethereum/wiki/wiki/JSON-RPC#db_putstring)

DEPRECATED

## debug

Debug related features

**class** aioethereum.management.debug.**DebugMixin**

Bases: object

## eth

Eth related features

**class** aioethereum.management.eth.**EthMixin**

Bases: object

**coroutine eth\_accounts** ()

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_accounts](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_accounts)

**coroutine eth\_blockNumber** ()

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_blocknumber](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_blocknumber)

**coroutine eth\_call** (*from\_*, *to*=None, *gas*=None, *gas\_price*=None, *value*=None, *data*=None, *block*='latest')

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_call](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_call)

**coroutine eth\_coinbase** ()

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_coinbase](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_coinbase)

**coroutine eth\_compileLLL** (*code*)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_compilelll](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_compilelll) DEPRECATED

**coroutine eth\_compileSerpent** (*code*)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_compileserpent](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_compileserpent) DEPRECATED

**coroutine eth\_compileSolidity** (*code*)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_compilesolidity](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_compilesolidity) DEPRECATED

**coroutine eth\_estimateGas** (*from\_*, *to*=None, *gas*=None, *gas\_price*=None, *value*=None, *data*=None)

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_estimategas](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_estimategas)

**coroutine eth\_gasPrice** ()

[https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\\_gasprice](https://github.com/ethereum/wiki/wiki/JSON-RPC#eth_gasprice)

```
coroutine eth_getBalance (address, block='latest')  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getbalance  
  
coroutine eth_getBlockByHash (bhash, tx_objects=True)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getblockbyhash  
  
coroutine eth_getBlockByNumber (block='latest', tx_objects=True)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getblockbynumber  
  
coroutine eth_getBlockTransactionCountByHash (bhash)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getblocktransactioncountbyhash  
  
coroutine eth_getBlockTransactionCountByNumber (block='latest')  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getblocktransactioncountbynumber  
  
coroutine eth_getCode (address, block='latest')  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getcode  
  
coroutine eth_getCompilers ()  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getcompilers DEPRECATED  
  
coroutine eth_getFilterChanges (filter_id)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getfilterchanges  
  
coroutine eth_getFilterLogs (filter_id)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getfilterlogs  
  
coroutine eth_getLogs (from_block='latest', to_block='latest', address=None, topics=None)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getlogs  
  
coroutine eth_getStorageAt (address, position=0, block='latest')  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getstorageat  
  
coroutine eth_getTransactionByBlockHashAndIndex (bhash, index=0)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_gettransactionbyblockhashandindex  
  
coroutine eth_getTransactionByBlockNumberAndIndex (block='latest', index=0)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_gettransactionbyblocknumberandindex  
  
coroutine eth_getTransactionByHash (txhash)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_gettransactionbyhash  
  
coroutine eth_getTransactionCount (address, block='latest')  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_gettransactioncount  
  
coroutine eth_getTransactionReceipt (txhash)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_gettransactionreceipt  
  
coroutine eth_getUncleByBlockHashAndIndex (bhash, index=0)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getunclebyblockhashandindex  
  
coroutine eth_getUncleByBlockNumberAndIndex (block='latest', index=0)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getunclebyblocknumberandindex  
  
coroutine eth_getUncleCountByBlockHash (bhash)  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getunclecountbyblockhash  
  
coroutine eth_getUncleCountByBlockNumber (block='latest')  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getunclecountbyblocknumber  
  
coroutine eth_getWork ()  
    https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_getwork
```

```

coroutine eth_hashrate()
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_hashrate

coroutine eth_mining()
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_mining

coroutine eth_newBlockFilter()
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_newblockfilter

coroutine eth_newFilter (from_block='latest', to_block='latest', address=None, top-
                          ics=None)
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_newfilter

coroutine eth_newPendingTransactionFilter()
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_newpendingtransactionfilter

coroutine eth_protocolVersion()
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_protocolversion

coroutine eth_sendRawTransaction (data)
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_sendrawtransaction

coroutine eth_sendTransaction (from_, to=None, gas=None, gas_price=None, value=None,
                                data=None, nonce=None)
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_sendtransaction

coroutine eth_sign (address, data)
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_sign

coroutine eth_submitHashrate (hashrate, id_)
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_submithashrate

coroutine eth_submitWork (nonce, header, mix_digest)
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_submitwork

coroutine eth_syncing()
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_syncing

coroutine eth_uninstallFilter (filter_id)
https://github.com/ethereum/wiki/wiki/JSON-RPC#eth\_uninstallfilter

```

## miner

Miner related features

```

class aioethereum.management.miner.MinerMixin
    Bases: object

    coroutine miner_setEtherBase (address)
        https://github.com/ethereum/go-ethereum/wiki/Management-APIs#miner\_setetherbase

        NOT AVAILABLE

    coroutine miner_setExtra (data)
        https://github.com/ethereum/go-ethereum/wiki/Management-APIs#miner\_setextra

        Parameters data (str) – Extra data a miner can include when miner blocks
        Return type bool

    coroutine miner_setGasPrice (number)
        https://github.com/ethereum/go-ethereum/wiki/Management-APIs#miner\_setgasprice

        Parameters number (int) – Minimal accepted gas price when mining transactions

```

**Return type** bool

**coroutine miner\_start** (*number*)

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#miner\\_start](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#miner_start)

**Parameters** **number** (*int*) – CPU mining process with the given number of threads

**Return type** bool

**coroutine miner\_stop** ()

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#miner\\_stop](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#miner_stop)

**Return type** bool

## net

Net related features

**class** aioethereum.management.net.**NetMixin**

Bases: object

**coroutine net\_listening** ()

[https://github.com/ethereum/wiki/wiki/JSON-RPC#net\\_listening](https://github.com/ethereum/wiki/wiki/JSON-RPC#net_listening)

**Return type** bool

**coroutine net\_peerCount** ()

[https://github.com/ethereum/wiki/wiki/JSON-RPC#net\\_peercount](https://github.com/ethereum/wiki/wiki/JSON-RPC#net_peercount)

**Return type** int

**coroutine net\_version** ()

[https://github.com/ethereum/wiki/wiki/JSON-RPC#net\\_version](https://github.com/ethereum/wiki/wiki/JSON-RPC#net_version)

**Return type** str

## personal

Personal related features

**class** aioethereum.management.personal.**PersonalMixin**

Bases: object

**coroutine personal\_ecRecover** (*message, signature*)

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_ecrecover](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_ecrecover)

**Parameters**

- **message** (*str*) – Message for sign
- **password** (*str*) – Signature of account (optional)

**Returns** address

**Return type** hex

**coroutine personal\_importRawKey** (*keydata, passphrase*)

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_importrawkey](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_importrawkey)

**Parameters**

- **keydata** (*str*) – Unencrypted private key
- **passphrase** (*str*) – Passphrase of private key

**Returns** address

**Return type** hex

**coroutine personal\_listAccounts** ()

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_listaccounts](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_listaccounts)

**Returns** addresses

**Return type** list

**coroutine personal\_lockAccount** (*address*)

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_lockaccount](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_lockaccount)

**Parameters** **address** (*str*) – Account address

**Return type** bool

**coroutine personal\_newAccount** (*passphrase=None*)

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_newaccount](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_newaccount)

**Parameters** **passphrase** (*str*) – Passphrase of account (optional)

**Returns** address

**Return type** hex

**coroutine personal\_sendTransaction** (*from\_, to=None, gas=None, gas\_price=None, value=None, data=None, nonce=None, passphrase=None*)

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_sendtransaction](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_sendtransaction)

**Parameters**

- **from** (*str*) – From account address
- **to** (*str*) – To account address (optional)
- **gas** (*int*) – Gas amount for current transaction (optional)
- **gas\_price** (*int*) – Gas price for current transaction (optional)
- **value** (*int*) – Amount of ether to send (optional)
- **data** (*str*) – Additional data for transaction (optional)
- **nonce** (*int*) – Unique nonce for transaction (optional)
- **passphrase** (*str*) – Passphrase of account (optional)

**Returns** txhash

**Return type** hex

**coroutine personal\_sign** (*message, account, password=None*)

[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_sign](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_sign)

**Parameters**

- **message** (*str*) – Message for sign
- **account** (*str*) – Account address
- **password** (*str*) – Password of account (optional)

**Returns** signature

**Return type** hex

**coroutine** **personal\_unlockAccount** (*address, passphrase, duration=None*)  
[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal\\_unlockaccount](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#personal_unlockaccount)

**Parameters**

- **address** (*str*) – Account address
- **passphrase** (*str*) – Passphrase of account
- **duration** (*int*) – Duration to be unlocked (optional)

**Return type** bool

## shh

Shh related features

**class** aioethereum.management.shh.**ShhMixin**

Bases: object

**coroutine** **shh\_addToGroup** ()  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_addtogroup](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_addtogroup) DEPRECATED

**coroutine** **shh\_getFilterChanges** (*filter\_id*)  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_getfilterchanges](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_getfilterchanges) DEPRECATED

**coroutine** **shh\_getMessages** (*filter\_id*)  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_getmessages](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_getmessages) DEPRECATED

**coroutine** **shh\_hasIdentity** (*address*)  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_hasidentity](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_hasidentity) DEPRECATED

**coroutine** **shh\_newFilter** (*to=None, \*, topics*)  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_newfilter](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_newfilter) DEPRECATED

**coroutine** **shh\_newGroup** ()  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_newgroup](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_newgroup) DEPRECATED

**coroutine** **shh\_newIdentity** ()  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_newidentity](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_newidentity) DEPRECATED

**coroutine** **shh\_post** (*from\_=None, to=None, \*, topics, payload, priority, ttl*)  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_post](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_post)

**coroutine** **shh\_uninstallFilter** (*filter\_id*)  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_uninstallfilter](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_uninstallfilter) DEPRECATED

**coroutine** **shh\_version** ()  
[https://github.com/ethereum/wiki/wiki/JSON-RPC#shh\\_version](https://github.com/ethereum/wiki/wiki/JSON-RPC#shh_version)

## txpool

Txpool related features

**class** aioethereum.management.txpool.**TxpoolMixin**

Bases: object

**coroutine** **txpool\_content** ()  
[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#txpool\\_content](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#txpool_content)

**coroutine** **txpool\_inspect** ()  
[https://github.com/ethereum/go-ethereum/wiki/Management-APIs#txpool\\_inspect](https://github.com/ethereum/go-ethereum/wiki/Management-APIs#txpool_inspect)

```
coroutine txpool_status ()  
    https://github.com/ethereum/go-ethereum/wiki/Management-APIs#txpool\_status
```

## web3

Web3 related features

```
class aioethereum.management.web3.Web3Mixin  
    Bases: object  
  
    coroutine web3_clientVersion ()  
        https://github.com/ethereum/wiki/wiki/JSON-RPC#web3\_clientversion  
  
    coroutine web3_sha3 (data)  
        https://github.com/ethereum/wiki/wiki/JSON-RPC#web3\_sha3
```

## 6.2 Glossary

**asyncio** Reference implementation of **PEP 3156**

See <https://pypi.python.org/pypi/asyncio>

**pytest** A mature full-featured Python testing tool. See <http://pytest.org/latest/>

**ujson** UltraJSON is an ultra fast JSON encoder and decoder written in pure C with bindings for Python 2.5+ and 3.  
[ujson](#).

See <https://pypi.python.org/pypi/ujson>



## CHAPTER 7

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