
aio sonic

Release 0.14.1

Johanderson Mogollon

May 14, 2022

CONTENTS

1	Features	3
2	Requirements	5
3	Install	7
4	Getting Started	9
5	Benchmarks	11
6	Contributing	13
7	Indices and tables	15
7.1	Examples	15
7.2	Reference	19
	Index	25

Really Fast Python asyncio HTTP 1.1 client, Support for http 2.0 is planned.

Current version is 0.14.1.

Repo is hosted at [Github](#).

FEATURES

- Keepalive and Smart Pool of Connections
- Multipart File Uploads
- Chunked responses handling
- Chunked requests
- Fully type annotated.
- Connection Timeouts
- Automatic Decompression
- Follow Redirects
- 100% test coverage (Sometimes not).

REQUIREMENTS

- Python>=3.6
- PyPy >=3.6

CHAPTER THREE

INSTALL

```
$ pip install aiosonic
```


GETTING STARTED

```
import asyncio
import aiohttp
import json

async def run():
    client = aiohttp.HTTPClient()

    # #####
    # Sample get request
    # #####
    response = await client.get('https://www.google.com/')
    assert response.status_code == 200
    assert 'Google' in (await response.text())

    # #####
    # Post data as multipart form
    # #####
    url = "https://postman-echo.com/post"
    posted_data = {'foo': 'bar'}
    response = await client.post(url, data=posted_data)

    assert response.status_code == 200
    data = json.loads(await response.content())
    assert data['form'] == posted_data

    # #####
    # Posted as json
    # #####
    response = await client.post(url, json=posted_data)

    assert response.status_code == 200
    data = json.loads(await response.content())
    assert data['json'] == posted_data

    # #####
    # Sample request + timeout
    # #####
    from aiohttp.timeout import Timeouts
    timeouts = Timeouts(
```

(continues on next page)

(continued from previous page)

```
        sock_read=10,
        sock_connect=3
    )
    response = await client.get('https://www.google.com/', timeouts=timeouts)
    assert response.status_code == 200
    assert 'Google' in (await response.text())
    await client.shutdown()

    print('success')

if __name__ == '__main__':
    loop = asyncio.get_event_loop()
    loop.run_until_complete(run())
```

BENCHMARKS

Some benchmarking

```
» python tests/performance.py
doing tests...
{
  "aiosonic": "1000 requests in 182.03 ms",
  "aiosonic cyclic": "1000 requests in 370.55 ms",
  "aiohttp": "1000 requests in 367.66 ms",
  "requests": "1000 requests in 4613.77 ms",
  "httpx": "1000 requests in 812.41 ms"
}
aiosonic is 101.97% faster than aiohttp
aiosonic is 2434.55% faster than requests
aiosonic is 103.56% faster than aiosonic cyclic
aiosonic is 346.29% faster than httpx
```

This is a *very basic, dummy test*, machine dependant. If you look for performance, test and compare your code with this and other packages like aiohttp.

You can perform this test by installing all test dependencies with `pip install -e “[test]”` and doing `python tests/performance.py` in your own machine

CONTRIBUTING

1. Fork
2. create a branch *feature/your_feature*
3. commit - push - pull request

Thanks :)

INDICES AND TABLES

- `genindex`
- `modindex`
- `search`

7.1 Examples

TODO: More examples

7.1.1 Download file

```
import asyncio
import aiohttp
import json

async def run():
    url = 'https://images.dog.ceo/breeds/leonberg/n02111129_2301.jpg'
    async with aiohttp.ClientSession() as client:

        res = await client.get(url)
        assert res.status_code == 200

        if res.chunked:
            # write in chunks
            with open('dog_image.jpg', 'wb') as _file:
                async for chunk in res.read_chunks():
                    _file.write(chunk)
        else:
            # or write all bytes, for chunked this also works
            with open('dog_image.jpg', 'wb') as _file:
                _file.write(await res.content())

if __name__ == '__main__':
    loop = asyncio.get_event_loop()
    loop.run_until_complete(run())
```

7.1.2 Concurrent Requests

```
import aiosonic
import asyncio

async def main():
    urls = [
        'https://www.facebook.com/',
        'https://www.google.com/',
        'https://twitch.tv/',
        'https://linkedin.com/',
    ]
    async with aiosonic.HTTPClient() as client:
        # asyncio.gather is the key for concurrent requests.
        responses = await asyncio.gather(*[client.get(url) for url in urls])

        # stream/chunked responses doesn't release the connection acquired
        # from the pool until the response has been read, so better to read
        # it.
        for response in responses:
            if response.chunked:
                await response.text()

        assert all([res.status_code in [200, 301] for res in responses])

loop = asyncio.get_event_loop()
loop.run_until_complete(main())
```

7.1.3 Chunked Requests

Specifying an iterator as the request body, it will make the request transfer made by chunks

```
import aiosonic
import asyncio
import json

async def main():
    async def data():
        yield b'foo'
        yield b'bar'

    async with aiosonic.HTTPClient() as client:
        url = 'https://postman-echo.com/post'
        response = await client.post(url, data=data())
        print(json.dumps(await response.json(), indent=10))

loop = asyncio.get_event_loop()
loop.run_until_complete(main())
```

7.1.4 Cookies handling

Adding `handle_cookies=True` to the client, it will save response cookies and send it again for new requests. This is useful to have same cookies workflow as in browsers, also for web scraping.

```
import aiosonic
import asyncio

async def main():
    async with aiosonic.HTTPClient(handle_cookies=True) as client:
        cookies = {'foo1': 'bar1', 'foo2': 'bar2'}
        url = 'https://postman-echo.com/cookies/set'
        # server will respond those cookies
        response = await client.get(url, params=cookies, follow=True)
        # client keep cookies in "cookies_map"
        print(client.cookies_map['postman-echo.com'])
        print(await response.text())

loop = asyncio.get_event_loop()
loop.run_until_complete(main())
```

7.1.5 Use custom DNS

Install `aiodns` in your dependencies and use `AsyncResolver`

```
import aiosonic
import asyncio
from aiosonic.resolver import AsyncResolver

async def main():
    resolver = AsyncResolver(nameservers=["8.8.8.8", "8.8.4.4"])
    connector = aiosonic.TCPConnector(resolver=resolver)

    async with aiosonic.HTTPClient(connector=connector) as client:
        data = {'foo1': 'bar1', 'foo2': 'bar2'}
        url = 'https://postman-echo.com/post'
        # server will respond those cookies
        response = await client.post(url, json=data)
        # client keep cookies in "cookies_map"
        print(await response.text())

loop = asyncio.get_event_loop()
loop.run_until_complete(main())
```

7.1.6 Use a Proxy Server

Just use Proxy class.

You can install `proxy.py` and use it as a proxy demo.

```
import asyncio

from aiosonic import HTTPClient, Proxy

async def main():
    # Proxy class accepts `auth` argument in the format `user:password`
    client = HTTPClient(proxy=Proxy("http://localhost:8899"))

    res = await client.get("https://www.google.com/")
    print(res)
    print(await res.text())
    assert res.status_code == 200

asyncio.run(main())
```

7.1.7 Debug log

Configure aiosonic logger at debug level to see some logging

```
import asyncio
import aiosonic
import json
import logging

async def run():
    # setup debug level at log
    logger = logging.getLogger('aiosonic')
    logger.setLevel(logging.DEBUG)

    async with aiosonic.HTTPClient() as client:
        response = await client.get('https://www.google.com/')
        assert response.status_code == 200
        assert 'Google' in (await response.text())

loop = asyncio.get_event_loop()
loop.run_until_complete(run())
```

7.2 Reference

TODO: get better this page

7.2.1 Connector and Client

```
class aiosonic.connectors.TCPConnector(pool_size: int = 25, timeouts:  
                                       Optional[aiosonic.timeout.Timeouts] = None,  
                                       connection_cls=None, pool_cls=None, resolver=None,  
                                       ttl_dns_cache=10000, use_dns_cache=True)
```

TCPConnector.

Holds the main logic for making connections to destination hosts.

Params:

- **pool_size**: size for pool of connections
- **timeouts**: global timeouts to use for connections with this connector. default: `aiosonic.timeout.Timeouts` instance with default args.
- **connection_cls**: connection class to be used. default: `aiosonic.connection.Connection`
- **pool_cls**: pool class to be used. default: `aiosonic.pools.SmartPool`
- **resolver**: resolver to be used. default: `aiosonic.resolver.DefaultResolver`
- **ttl_dns_cache**: ttl in milliseconds for dns cache. default: `10000` 10 seconds
- **use_dns_cache**: Flag to indicate usage of dns cache. default: `True`

```
class aiosonic.HTTPClient(connector: Optional[aiosonic.connectors.TCPConnector] = None,  
                         handle_cookies=False, verify_ssl=True, proxy: Optional[aiosonic.proxy.Proxy] =  
                         None)
```

aiosonic.HTTPClient class.

This class holds the client creation that will be used for requests.

Params:

- **connector**: TCPConnector to be used if provided
- **handle_cookies**: **Flag to indicate if keep response cookies in** client and send them in next requests.
- **verify_ssl**: Flag to indicate if verify ssl certificates.

```
async aiosonic.HTTPClient.request(self, url: str, method: str = 'GET', headers: Optional[Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders]] = None, params: Optional[Union[Dict[str, str], Sequence[Tuple[str, str]]]] = None, data: Optional[Union[str, bytes, dict, tuple, AsyncIterator[bytes], Iterator[bytes]]] = None, multipart: bool = False, verify: bool = True, ssl: Optional[ssl.SSLContext] = None, timeouts: Optional[aiosonic.timeout.Timeouts] = None, follow: bool = False, http2: bool = False) → aiosonic.HttpResponse
```

Do http request.

Params:

- **url**: url of request
- **method**: Http method of request
- **headers**: headers to add in request
- **params**: query params to add in request if not manually added
- **data**: Data to be sent, this param is ignored for get requests.
- **multipart**: Tell aiosonic if request is multipart
- **verify**: parameter to indicate whether to verify ssl
- **ssl**: this parameter allows to specify a custom ssl context
- **timeouts**: parameter to indicate timeouts for request
- **follow**: parameter to indicate whether to follow redirects
- **http2**: flag to indicate whether to use http2 (experimental)

```
async aiosonic.HTTPClient.get(self, url: str, headers: Optional[Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders]] = None, params: Optional[Union[Dict[str, str], Sequence[Tuple[str, str]]]] = None, verify: bool = True, ssl: Optional[ssl.SSLContext] = None, timeouts: Optional[aiosonic.timeout.Timeouts] = None, follow: bool = False, http2: bool = False) → aiosonic.HttpResponse
```

Do get http request.

```
async aiosonic.HTTPClient.post(self, url: str, data: Optional[Union[str, bytes, dict, tuple, AsyncIterator[bytes], Iterator[bytes]]] = None, headers: Optional[Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders]] = None, json: Optional[Union[dict, list]] = None, params: Optional[Union[Dict[str, str], Sequence[Tuple[str, str]]]] = None, json_serializer=<function dumps>, multipart: bool = False, verify: bool = True, ssl: Optional[ssl.SSLContext] = None, timeouts: Optional[aiosonic.timeout.Timeouts] = None, follow: bool = False, http2: bool = False) → aiosonic.HttpResponse
```

Do post http request.


```
async aiosonic.HTTPClient.put(self, url: str, data: Optional[Union[str, bytes, dict, tuple,
    AsyncIterator[bytes], Iterator[bytes]]] = None, headers:
    Optional[Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders]] =
    None, json: Optional[Union[dict, list]] = None, params:
    Optional[Union[Dict[str, str], Sequence[Tuple[str, str]]]] = None,
    json_serializer=<function dumps>, multipart: bool = False, verify: bool =
    True, ssl: Optional[ssl.SSLContext] = None, timeouts:
    Optional[aiosonic.timeout.Timeouts] = None, follow: bool = False, http2:
    bool = False) → aiosonic.HttpResponse
```

Do put http request.

```
async aiosonic.HTTPClient.patch(self, url: str, data: Optional[Union[str, bytes, dict, tuple,
    AsyncIterator[bytes], Iterator[bytes]]] = None, headers:
    Optional[Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders]] =
    None, json: Optional[Union[dict, list]] = None, params:
    Optional[Union[Dict[str, str], Sequence[Tuple[str, str]]]] = None,
    json_serializer=<function dumps>, multipart: bool = False, verify: bool =
    True, ssl: Optional[ssl.SSLContext] = None, timeouts:
    Optional[aiosonic.timeout.Timeouts] = None, follow: bool = False, http2:
    bool = False) → aiosonic.HttpResponse
```

Do patch http request.

```
async aiosonic.HTTPClient.delete(self, url: str, data: Union[str, bytes, dict, tuple, AsyncIterator[bytes],
    Iterator[bytes]] = b'', headers: Optional[Union[Dict[str, str],
    List[Tuple[str, str]], aiosonic.HttpHeaders]] = None, json:
    Optional[Union[dict, list]] = None, params: Optional[Union[Dict[str,
    str], Sequence[Tuple[str, str]]]] = None, json_serializer=<function
    dumps>, multipart: bool = False, verify: bool = True, ssl:
    Optional[ssl.SSLContext] = None, timeouts:
    Optional[aiosonic.timeout.Timeouts] = None, follow: bool = False, http2:
    bool = False) → aiosonic.HttpResponse
```

Do delete http request.

```
async aiosonic.HTTPClient.wait_requests(self, timeout: int = 30)
```

Wait until all pending requests are done.

If timeout, returns false.

This is useful when doing safe shutdown of a process.

7.2.2 Classes

class aiosonic.**HttpHeaders**(*data=None, **kwargs*)
Http headers dict.

class aiosonic.**HttpResponse**
Custom HttpResponse class for handling responses.

Properties:

- **status_code** (int): response status code
- **headers** (aiosonic.[HttpHeaders](#)): headers in case insensitive dict
- **cookies** (http.cookies.SimpleCookie): instance of SimpleCookies if cookies present in response.
- **raw_headers** (List[Tuple[bytes, bytes]]): headers as raw format

async content() → bytes
Read response body.

async json(*json_decoder=<function loads>*) → dict
Read response body.

read_chunks() → AsyncIterator[bytes]
Read chunks from chunked response.

property status_code: int
Get status code.

async text() → str
Read response body.

7.2.3 Timeout Class

class aiosonic.timeout.**Timeouts**(*sock_connect: Optional[float] = 5, sock_read: Optional[float] = 30, pool_acquire: Optional[float] = None, request_timeout: Optional[float] = 60*)

Timeouts class wrapper.

Arguments:

- **sock_connect**(float): time for establish connection to server
- **sock_read**(float): time until get first read
- **pool_acquire**(float): time until get connection from connection's pool
- **request_timeout**(float): time until complete request.

7.2.4 Pool Classes

class aiosonic.pools.**SmartPool**(connector, pool_size, connection_cls)
Pool which utilizes alive connections.

async acquire(urlparsed: Optional[urllib.parse.ParseResult] = None)
Acquire connection.

async cleanup() → None
Get all conn and close them, this method let this pool unusable.

is_all_free()
Indicates if all pool is free.

release(conn) → None
Release connection.

class aiosonic.pools.**CyclicQueuePool**(connector, pool_size, connection_cls)
Cyclic queue pool of connections.

async acquire(urlparsed: Optional[urllib.parse.ParseResult] = None)
Acquire connection.

async cleanup()
Get all conn and close them, this method let this pool unusable.

is_all_free()
Indicates if all pool is free.

async release(conn)
Release connection.

7.2.5 DNS Resolver

For custom dns servers, you could install *aiodns* package and use Async resolver as follow

```
from aiosonic.resolver import AsyncResolver

resolver = AsyncResolver(nameservers=["8.8.8.8", "8.8.4.4"])
conn = aiosonic.TCPConnector(resolver=resolver)
```

Then, pass connector to aiosonic HTTPClient instance.

class aiosonic.resolver.**AsyncResolver**(*args: Any, **kwargs: Any)
Use the *aiodns* package to make asynchronous DNS lookups

async close() → None
Release resolver

async resolve(host: str, port: int = 0, family: int = AddressFamily.AF_INET) → List[Dict[str, Any]]
Return IP address for given hostname

class aio sonic.resolver.**ThreadedResolver**

Use Executor for synchronous getaddrinfo() calls, which defaults to concurrent.futures.ThreadPoolExecutor.

async **close()** → None

Release resolver

async **resolve**(hostname: str, port: int = 0, family: int = AddressFamily.AF_INET) → List[Dict[str, Any]]

Return IP address for given hostname

7.2.6 Proxy Support

class aio sonic.proxy.**Proxy**(host: str, auth: Optional[str] = None)

Proxy class.

Args:

- host (str): proxy server where to connect
- auth (str): auth data in the format of *user:password*

INDEX

A

`acquire()` (*aiosonic.pools.CyclicQueuePool* method), 23
`acquire()` (*aiosonic.pools.SmartPool* method), 23
`AsyncResolver` (class in *aiosonic.resolver*), 23

C

`cleanup()` (*aiosonic.pools.CyclicQueuePool* method), 23
`cleanup()` (*aiosonic.pools.SmartPool* method), 23
`close()` (*aiosonic.resolver.AsyncResolver* method), 23
`close()` (*aiosonic.resolver.ThreadedResolver* method), 24
`content()` (*aiosonic.HttpResponse* method), 22
`CyclicQueuePool` (class in *aiosonic.pools*), 23

D

`delete()` (in module *aiosonic.HTTPClient*), 21

G

`get()` (in module *aiosonic.HTTPClient*), 20

H

`HTTPClient` (class in *aiosonic*), 19
`HttpHeaders` (class in *aiosonic*), 22
`HttpResponse` (class in *aiosonic*), 22

I

`is_all_free()` (*aiosonic.pools.CyclicQueuePool* method), 23
`is_all_free()` (*aiosonic.pools.SmartPool* method), 23

J

`json()` (*aiosonic.HttpResponse* method), 22

P

`patch()` (in module *aiosonic.HTTPClient*), 21
`post()` (in module *aiosonic.HTTPClient*), 20
`Proxy` (class in *aiosonic.proxy*), 24
`put()` (in module *aiosonic.HTTPClient*), 21

R

`read_chunks()` (*aiosonic.HttpResponse* method), 22
`release()` (*aiosonic.pools.CyclicQueuePool* method), 23
`release()` (*aiosonic.pools.SmartPool* method), 23
`request()` (in module *aiosonic.HTTPClient*), 19
`resolve()` (*aiosonic.resolver.AsyncResolver* method), 23
`resolve()` (*aiosonic.resolver.ThreadedResolver* method), 24

S

`SmartPool` (class in *aiosonic.pools*), 23
`status_code` (*aiosonic.HttpResponse* property), 22

T

`TCPCConnector` (class in *aiosonic.connectors*), 19
`text()` (*aiosonic.HttpResponse* method), 22
`ThreadedResolver` (class in *aiosonic.resolver*), 24
`Timeouts` (class in *aiosonic.timeout*), 22

W

`wait_requests()` (in module *aiosonic.HTTPClient*), 21