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**aiosonic**

***Release 0.10.0***

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

Current version is 0.10.0.

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.





## REQUIREMENTS

- Python>=3.6
- PyPy >=3.6



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## CHAPTER THREE

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### INSTALL

```
$ pip install aiosonic
```



## GETTING STARTED

```
import asyncio
import aiohttp
import json

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

    # #####
    # 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 Timeout
    timeouts = Timeout(
        sock_read=10,
        sock_connect=3
    )
    response = await client.get('https://www.google.com/', timeouts=timeouts)
```

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```
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 110.03 ms",
  "aiosonic cyclic": "1000 requests in 332.10 ms",
  "aiohttp": "1000 requests in 427.31 ms",
  "requests": "1000 requests in 4915.04 ms",
  "httpx": "1000 requests in 638.04 ms"
}
aiosonic is 288.36% faster than aiohttp
aiosonic is 4367.04% faster than requests
aiosonic is 201.83% faster than aiosonic cyclic
aiosonic is 479.89% faster than httpx
```





## 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])

asyncio.run(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))

asyncio.run(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())

asyncio.run(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())

asyncio.run(main())
```

## 7.2 Reference

TODO: get better this page

### 7.2.1 Connector and Client

```
class aiosonic.connectors.TCPConnector (pool_size:      int      = 25,      timeouts:
                                         aiosonic.timeout.Timeouts = None,  connec-
                                         tion_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:      aiosonic.connectors.TCPConnector = None,  han-
                                         dle_cookies=False, verify_ssl=True)
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: Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders] = None,
                                     params: Union[Dict[str, str], Sequence[Tuple[str, str]]] = None, data: Union[str, bytes, dict, tuple, AsyncIterator[bytes], Iterator[bytes]] = None, multipart: bool = False,
                                     verify: bool = True, ssl: ssl.SSLContext = None, timeouts: 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: Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders] = None, params: Union[Dict[str, str], Sequence[Tuple[str, str]]] = None,
                                verify: bool = True, ssl: ssl.SSLContext = None, timeouts: aiosonic.timeout.Timeouts = None, follow: bool = False, http2: bool = False) → aiosonic.HttpResponse
```

Do get http request.

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

Do post http request.

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

Do put http request.

```
async aiosonic.HTTPClient.patch(self, url: str, data: Union[str, bytes, dict, tuple, AsyncIterator[bytes], Iterator[bytes]] = None, headers: Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders] = None, json: dict = None, params: Union[Dict[str, str], Sequence[Tuple[str, str]]] = None, json_serializer=<function dumps>, multipart: bool = False, verify: bool = True, ssl: ssl.SSLContext = None, timeouts: 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: Union[Dict[str, str], List[Tuple[str, str]], aiosonic.HttpHeaders] = None, json: dict = None, params: Union[Dict[str, str], Sequence[Tuple[str, str]]] = None, json_serializer=<function dumps>, multipart: bool = False, verify: bool = True, ssl: ssl.SSLContext = None, timeouts: 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**  
 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*: *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*: *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 should 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*: 2>) → *List*[*Dict*[*str*,  
Any]]  
Return IP address for given hostname

**class** aiosonic.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: 2>) →

List[Dict[str, Any]]

Return IP address for given hostname



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