
influxdb_client

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1.1 Query

```
from influxdb_client import InfluxDBClient, Point
from influxdb_client.client.write_api import SYNCHRONOUS

bucket = "my-bucket"

client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org")

write_api = client.write_api(write_options=SYNCHRONOUS)
query_api = client.query_api()

p = Point("my_measurement").tag("location", "Prague").field("temperature", 25.3)

write_api.write(bucket=bucket, record=p)

## using Table structure
tables = query_api.query('from(bucket:"my-bucket") |> range(start: -10m)')

for table in tables:
    print(table)
    for row in table.records:
        print (row.values)

## using csv library
csv_result = query_api.query_csv('from(bucket:"my-bucket") |> range(start: -10m)')
val_count = 0
for row in csv_result:
    for cell in row:
        val_count += 1
```

1.2 Write

The `WriteApi` supports synchronous, asynchronous and batching writes into InfluxDB 2.0. The data should be passed as a `InfluxDB Line Protocol`, `Data Point` or `Observable` stream.

:warning:

The `WriteApi` in batching mode (default mode) is supposed to run as a singleton. To flush all your data you should wrap the execution using `with client.write_api(...) as write_api:` statement or call `write_api.close()` at the end of your script.

The default instance of `WriteApi` use batching.

1.2.1 The data could be written as

1. string or bytes that is formatted as a InfluxDB's line protocol
2. `Data Point` structure
3. Dictionary style mapping with keys: `measurement`, `tags`, `fields` and `time` or custom structure
4. `NamedTuple`
5. `Data Classes`
6. `Pandas DataFrame`
7. List of above items
8. A batching type of write also supports an `Observable` that produce one of an above item

You can find write examples at GitHub: [influxdb-client-python/examples](https://github.com/influxdb/influxdb-client-python/tree/master/examples).

1.2.2 Batching

The batching is configurable by `write_options`:

Property	Description	Default Value
<code>batch_size</code>	number of data point to collect in a batch	1000
<code>flush_interval</code>	number of milliseconds before the batch is written	1000
<code>jitter_interval</code>	the number of milliseconds to increase the batch flush interval by a random amount	0
<code>retry_interval</code>	number of milliseconds to retry first unsuccessful write. The next retry delay is computed using exponential random backoff. The retry interval is used when the InfluxDB server does not specify "Retry-After" header.	5000
<code>max_retry_time</code>	total retry timeout in milliseconds.	180_000
<code>max_retries</code>	number of max retries when write fails	5
<code>max_retry_delay</code>	delay between each retry attempt in milliseconds	125_000
<code>max_close_wait</code>	amount of time to wait for batches to flush when <code>.close()</code> is called	300_000
<code>exponential_base</code>	the base for the exponential retry delay, the next delay is computed using random exponential backoff as a random value within the interval <code>retry_interval * exponential_base^(attempts-1)</code> and <code>retry_interval * exponential_base^(attempts)</code> . Example for <code>retry_interval=5_000</code> , <code>exponential_base=2</code> , <code>max_retry_delay=125_000</code> , total=5 Retry delays are random distributed values within the ranges of [5_000-10_000, 10_000-20_000, 20_000-40_000, 40_000-80_000, 80_000-125_000]	2

```

from datetime import datetime, timedelta, timezone

import pandas as pd
import reactivex as rx
from reactivex import operators as ops

from influxdb_client import InfluxDBClient, Point, WriteOptions

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as _
    client:

        with _client.write_api(write_options=WriteOptions(batch_size=500,
                                                            flush_interval=10_000,
                                                            jitter_interval=2_000,
                                                            retry_interval=5_000,
                                                            max_retries=5,
                                                            max_retry_delay=30_000,
                                                            max_close_wait=300_000,
                                                            exponential_base=2)) as _write_client:

            """
            Write Line Protocol formatted as string
            """
            _write_client.write("my-bucket", "my-org", "h2o-feet,location=coyote_creek water_
            level=1.0 1")
            _write_client.write("my-bucket", "my-org", ["h2o-feet,location=coyote_creek_
            water_level=2.0 2",
                                                         "h2o-feet,location=coyote_creek_
            water_level=3.0 3"])

            """
            Write Line Protocol formatted as byte array
            """
            _write_client.write("my-bucket", "my-org", "h2o-feet,location=coyote_creek water_
            level=1.0 1".encode())
            _write_client.write("my-bucket", "my-org", ["h2o-feet,location=coyote_creek_
            water_level=2.0 2".encode(),
                                                         "h2o-feet,location=coyote_creek_
            water_level=3.0 3".encode()])

            """
            Write Dictionary-style object
            """
            _write_client.write("my-bucket", "my-org", {"measurement": "h2o-feet", "tags": {
            "location": "coyote_creek"},
                                                         "fields": {"water_level": 1.0}, "time
            ": 1})
            _write_client.write("my-bucket", "my-org", [{"measurement": "h2o-feet", "tags": {
            "location": "coyote_creek"},
                                                         "fields": {"water_level": 2.0},
            "time": 2},
                                                         {"measurement": "h2o-feet", "tags": {
            "location": "coyote_creek"},
                                                         "fields": {"water_level": 3.0},
            "time": 3}])

```

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```

↪ "location": "coyote_creek"},
                                "fields": {"water_level": 3.0},
↪ "time": 3}}])

    """
    Write Data Point
    """
    _write_client.write("my-bucket", "my-org",
                        Point("h2o_feet").tag("location", "coyote_creek").field(
↪ "water_level", 4.0).time(4))
    _write_client.write("my-bucket", "my-org",
                        [Point("h2o_feet").tag("location", "coyote_creek").field(
↪ "water_level", 5.0).time(5),
                        Point("h2o_feet").tag("location", "coyote_creek").field(
↪ "water_level", 6.0).time(6)]]

    """
    Write Observable stream
    """
    _data = rx \
        .range(7, 11) \
        .pipe(ops.map(lambda i: "h2o_feet,location=coyote_creek water_level={0}.0 {0}"
↪ ".format(i)))

    _write_client.write("my-bucket", "my-org", _data)

    """
    Write Pandas DataFrame
    """
    _now = datetime.now(tz=timezone.utc)
    _data_frame = pd.DataFrame(data=[["coyote_creek", 1.0], ["coyote_creek", 2.0]],
                               index=[_now, _now + timedelta(hours=1)],
                               columns=["location", "water_level"])

    _write_client.write("my-bucket", "my-org", record=_data_frame, data_frame_
↪ measurement_name='h2o_feet',
                        data_frame_tag_columns=['location'])

```

1.2.3 Default Tags

Sometimes is useful to store same information in every measurement e.g. hostname, location, customer. The client is able to use static value or env property as a tag value.

The expressions:

- California Miner - static value
- \${env.hostname} - environment property

Via API

```
point_settings = PointSettings()
point_settings.add_default_tag("id", "132-987-655")
point_settings.add_default_tag("customer", "California Miner")
point_settings.add_default_tag("data_center", "${env.data_center}")

self.write_client = self.client.write_api(write_options=SYNCHRONOUS, point_
    ↪ settings=point_settings)
```

```
self.write_client = self.client.write_api(write_options=SYNCHRONOUS,
    ↪ point_settings=PointSettings(**{"id": "132-
    ↪ 987-655",
    ↪                                     "customer
    ↪ ": "California Miner"})))
```

Via Configuration file

In an `init` configuration file you are able to specify default tags by tags segment.

```
self.client = InfluxDBClient.from_config_file("config.ini")
```

```
[influx2]
url=http://localhost:8086
org=my-org
token=my-token
timeout=6000

[tags]
id = 132-987-655
customer = California Miner
data_center = ${env.data_center}
```

You can also use a [TOML](#) or a [JSON](#) format for the configuration file.

Via Environment Properties

You are able to specify default tags by environment properties with prefix `INFLUXDB_V2_TAG_`.

Examples:

- `INFLUXDB_V2_TAG_ID`
- `INFLUXDB_V2_TAG_HOSTNAME`

```
self.client = InfluxDBClient.from_env_properties()
```

1.2.4 Synchronous client

Data are writes in a synchronous HTTP request.

```
from influxdb_client import InfluxDBClient, Point
from influxdb_client.client.write_api import SYNCHRONOUS

client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org")
write_api = client.write_api(write_options=SYNCHRONOUS)

_point1 = Point("my_measurement").tag("location", "Prague").field("temperature", 25.3)
_point2 = Point("my_measurement").tag("location", "New York").field("temperature", 24.3)

write_api.write(bucket="my-bucket", record=[_point1, _point2])

client.close()
```

1.3 Delete data

The *delete_api.py* supports deletes *points* from an InfluxDB bucket.

```
from influxdb_client import InfluxDBClient

client = InfluxDBClient(url="http://localhost:8086", token="my-token")

delete_api = client.delete_api()

"""
Delete Data
"""
start = "1970-01-01T00:00:00Z"
stop = "2021-02-01T00:00:00Z"
delete_api.delete(start, stop, '_measurement="my_measurement"', bucket='my-bucket', org=
↳ 'my-org')

"""
Close client
"""
client.close()
```

1.4 Pandas DataFrame

:warning:

For DataFrame querying you should install Pandas dependency via `pip install 'influxdb-client[extra]'`.

:warning:

Note that if a query returns more than one table then the client generates a DataFrame for each of them.

The client is able to retrieve data in *Pandas DataFrame* format through `query_data_frame`:

```

from influxdb_client import InfluxDBClient, Point, Dialect
from influxdb_client.client.write_api import SYNCHRONOUS

client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org")

write_api = client.write_api(write_options=SYNCHRONOUS)
query_api = client.query_api()

"""
Prepare data
"""

_point1 = Point("my_measurement").tag("location", "Prague").field("temperature", 25.3)
_point2 = Point("my_measurement").tag("location", "New York").field("temperature", 24.3)

write_api.write(bucket="my-bucket", record=[_point1, _point2])

"""
Query: using Pandas DataFrame
"""
data_frame = query_api.query_data_frame('from(bucket:"my-bucket") '
                                         '|> range(start: -10m) '
                                         '|> pivot(rowKey:["_time"], columnKey: ["_field'
                                         '→"], valueColumn: "_value") '
                                         '|> keep(columns: ["location", "temperature"]))')
print(data_frame.to_string())

"""
Close client
"""
client.close()

```

Output:

	result table	location	temperature
0	_result	0 New York	24.3
1	_result	1 Prague	25.3

1.5 How to use Asyncio

Starting from version 1.27.0 for Python 3.7+ the influxdb-client package supports `async/await` based on [asyncio](#), [aiohttp](#) and [aiocsv](#). You can install `aiohttp` and `aiocsv` directly:

```
$ python -m pip install influxdb-client aiohttp aiocsv
```

or use the `[async]` extra:

```
$ python -m pip install influxdb-client[async]
```

:warning:

The `InfluxDBClientAsync` should be initialised inside `async` coroutine otherwise there can be unexpected behaviour. For more info see: [Why is creating a `ClientSession` outside an event loop dangerous?](#).

1.5.1 Async APIs

All async APIs are available via `influxdb_client.client.influxdb_client_async.InfluxDBClientAsync`. The async version of the client supports following asynchronous APIs:

- `influxdb_client.client.write_api_async.WriteApiAsync`
- `influxdb_client.client.query_api_async.QueryApiAsync`
- `influxdb_client.client.delete_api_async.DeleteApiAsync`
- Management services into `influxdb_client.service` supports async operation

and also check to readiness of the InfluxDB via `/ping` endpoint:

The `InfluxDBClientAsync` constructor accepts a number of **configuration properties**. Most useful among these are:

- `connection_pool_maxsize` - The total number of simultaneous connections. Defaults to `multiprocessing.cpu_count() * 5`.
- `enable_gzip` - enable gzip compression during write and query calls. Defaults to `false`.
- `proxy` - URL of an HTTP proxy to be used.
- `timeout` - The maximum number of milliseconds for handling HTTP requests from initial handshake to handling response data. This is passed directly to the underlying transport library. If large amounts of data are anticipated, for example from `query_api.query_stream(...)`, this should be increased to avoid `TimeoutError` or `CancelledError`. Defaults to 10_000 ms.

```
import asyncio

from influxdb_client.client.influxdb_client_async import InfluxDBClientAsync

async def main():
    async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
    ↪, org="my-org") as client:
        ready = await client.ping()
        print(f"InfluxDB: {ready}")

if __name__ == "__main__":
    asyncio.run(main())
```

1.5.2 Async Write API

The `influxdb_client.client.write_api_async.WriteApiAsync` supports ingesting data as:

- string or bytes that is formatted as a InfluxDB's line protocol
- `Data Point` structure
- Dictionary style mapping with keys: `measurement`, `tags`, `fields` and `time` or custom structure
- `NamedTuple`
- `Data Classes`
- `Pandas DataFrame`
- List of above items

```
import asyncio

from influxdb_client import Point
from influxdb_client.client.influxdb_client_async import InfluxDBClientAsync

async def main():
    async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
    ↪, org="my-org") as client:

        write_api = client.write_api()

        _point1 = Point("async_m").tag("location", "Prague").field("temperature", 25.3)
        ↪
        _point2 = Point("async_m").tag("location", "New York").field("temperature", 24.3)
        ↪

        successfully = await write_api.write(bucket="my-bucket", record=[_point1, _point2])
        ↪

        print(f" > successfully: {successfully}")

if __name__ == "__main__":
    asyncio.run(main())
```

1.5.3 Async Query API

The `influxdb_client.client.query_api_async.QueryApiAsync` supports retrieve data as:

- List of `influxdb_client.client.flux_table.FluxTable`
- Stream of `influxdb_client.client.flux_table.FluxRecord` via `typing.AsyncGenerator`
- `Pandas DataFrame`
- Stream of `Pandas DataFrame` via `typing.AsyncGenerator`
- Raw str output

```

import asyncio

from influxdb_client.client.influxdb_client_async import InfluxDBClientAsync

async def main():
    async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
    ↪, org="my-org") as client:
        # Stream of FluxRecords
        query_api = client.query_api()
        records = await query_api.query_stream('from(bucket:"my-bucket") '
        '|> range(start: -10m) '
        '|> filter(fn: (r) => r["_
    ↪measurement"] == "async_m")')
        async for record in records:
            print(record)

if __name__ == "__main__":
    asyncio.run(main())

```

1.5.4 Async Delete API

```

import asyncio
from datetime import datetime

from influxdb_client.client.influxdb_client_async import InfluxDBClientAsync

async def main():
    async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
    ↪, org="my-org") as client:
        start = datetime.fromtimestamp(0)
        stop = datetime.now()
        # Delete data with location = 'Prague'
        successfully = await client.delete_api().delete(start=start, stop=stop,
    ↪ bucket="my-bucket",
        predicate="location = \
    ↪\"Prague\"")
        print(f" > successfully: {successfully}")

if __name__ == "__main__":
    asyncio.run(main())

```

1.5.5 Management API

```
import asyncio

from influxdb_client import OrganizationsService
from influxdb_client.client.influxdb_client_async import InfluxDBClientAsync

async def main():
    async with InfluxDBClientAsync(url='http://localhost:8086', token='my-token',
    ↪, org='my-org') as client:
        # Initialize OrganizationsService
        organizations_service = OrganizationsService(api_client=client.api_
    ↪client)

        # Find organization with name 'my-org'
        organizations = await organizations_service.get_orgs(org='my-org')
        for organization in organizations.orgs:
            print(f'name: {organization.name}, id: {organization.id}')

if __name__ == "__main__":
    asyncio.run(main())
```

1.5.6 Proxy and redirects

You can configure the client to tunnel requests through an HTTP proxy. The following proxy options are supported:

- `proxy` - Set this to configure the http proxy to be used, ex. `http://localhost:3128`
- `proxy_headers` - A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

```
from influxdb_client.client.influxdb_client_async import InfluxDBClientAsync

async with InfluxDBClientAsync(url="http://localhost:8086",
                                token="my-token",
                                org="my-org",
                                proxy="http://localhost:3128") as client:
```

If your proxy notify the client with permanent redirect (HTTP 301) to **different host**. The client removes `Authorization` header, because otherwise the contents of `Authorization` is sent to third parties which is a security vulnerability.

Client automatically follows HTTP redirects. The default redirect policy is to follow up to 10 consecutive requests. The redirects can be configured via:

- `allow_redirects` - If set to `False`, do not follow HTTP redirects. `True` by default.
- `max_redirects` - Maximum number of HTTP redirects to follow. 10 by default.

1.6 Gzip support

InfluxDBClient does not enable gzip compression for http requests by default. If you want to enable gzip to reduce transfer data's size, you can call:

```
from influxdb_client import InfluxDBClient

_db_client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org",
                             enable_gzip=True)
```

1.7 Proxy configuration

You can configure the client to tunnel requests through an HTTP proxy. The following proxy options are supported:

- `proxy` - Set this to configure the http proxy to be used, ex. `http://localhost:3128`
- `proxy_headers` - A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086",
                    token="my-token",
                    org="my-org",
                    proxy="http://localhost:3128") as client:
```

If your proxy notify the client with permanent redirect (HTTP 301) to **different host**. The client removes Authorization header, because otherwise the contents of Authorization is sent to third parties which is a security vulnerability.

You can change this behaviour by:

```
from urllib3 import Retry
Retry.DEFAULT_REMOVE_HEADERS_ON_REDIRECT = frozenset()
Retry.DEFAULT.remove_headers_on_redirect = Retry.DEFAULT_REMOVE_HEADERS_ON_REDIRECT
```

1.8 Authentication

InfluxDBClient supports three options how to authorize a connection:

- *Token*
- *Username & Password*
- *HTTP Basic*

1.8.1 Token

Use the `token` to authenticate to the InfluxDB API. In your API requests, an *Authorization* header will be sent. The header value, provide the word *Token* followed by a space and an InfluxDB API token. The word *token* is case-sensitive.

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token") as client
```

:warning:

Note that this is a preferred way how to authenticate to InfluxDB API.

1.8.2 Username & Password

Authenticates via username and password credentials. If successful, creates a new session for the user.

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", username="my-user", password="my-
↳password") as client
```

:warning:

The username/password auth is based on the HTTP “Basic” authentication. The authorization expires when the `time-to-live (TTL)` (default 60 minutes) is reached and client produces `unauthorized` exception.

1.8.3 HTTP Basic

Use this to enable basic authentication when talking to a InfluxDB 1.8.x that does not use auth-enabled but is protected by a reverse proxy with basic authentication.

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", auth_basic=True, token="my-proxy-secret
↳") as client
```

:warning:

Don’t use this when directly talking to InfluxDB 2.

1.9 Nanosecond precision

The Python’s `datetime` doesn’t support precision with nanoseconds so the library during writes and queries ignores everything after microseconds.

If you would like to use `datetime` with nanosecond precision you should use `pandas.Timestamp` that is replacement for python `datetime.datetime` object, and also you should set a `DateTimeHelper` to the client.

- sources - `nanosecond_precision.py`

```

from influxdb_client import Point, InfluxDBClient
from influxdb_client.client.util.date_utils_pandas import PandasDateTimeHelper
from influxdb_client.client.write_api import SYNCHRONOUS

"""
Set PandasDate helper which supports nanoseconds.
"""
import influxdb_client.client.util.date_utils as date_utils

date_utils.date_helper = PandasDateTimeHelper()

"""
Prepare client.
"""
client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org")

write_api = client.write_api(write_options=SYNCHRONOUS)
query_api = client.query_api()

"""
Prepare data
"""

point = Point("h2o_feet") \
    .field("water_level", 10) \
    .tag("location", "pacific") \
    .time('1996-02-25T21:20:00.001001231Z')

print(f'Time serialized with nanosecond precision: {point.to_line_protocol()}')
print()

write_api.write(bucket="my-bucket", record=point)

"""
Query: using Stream
"""
query = '''
from(bucket:"my-bucket")
  |> range(start: 0, stop: now())
  |> filter(fn: (r) => r._measurement == "h2o_feet")
'''
records = query_api.query_stream(query)

for record in records:
    print(f'Temperature in {record["location"]} is {record["_value"]} at time: {record["_time"]}')

"""
Close client
"""
client.close()

```

1.10 Handling Errors

Errors happen, and it's important that your code is prepared for them. All client related exceptions are delivered from `InfluxDBError`. If the exception cannot be recovered in the client it is returned to the application. These exceptions are left for the developer to handle.

Almost all APIs directly return unrecoverable exceptions to be handled this way:

```
from influxdb_client import InfluxDBClient
from influxdb_client.client.exceptions import InfluxDBError
from influxdb_client.client.write_api import SYNCHRONOUS

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as client:
    try:
        client.write_api(write_options=SYNCHRONOUS).write("my-bucket", record="mem,tag=a,value=86")
    except InfluxDBError as e:
        if e.response.status == 401:
            raise Exception(f"Insufficient write permissions to 'my-bucket'.") from e
        raise
```

The only exception is **batching** `WriteAPI` (for more info see [Batching](#)) where you need to register custom callbacks to handle batch events. This is because this API runs in the background in a separate thread and isn't possible to directly return underlying exceptions.

```
from influxdb_client import InfluxDBClient
from influxdb_client.client.exceptions import InfluxDBError

class BatchingCallback(object):

    def success(self, conf: (str, str, str), data: str):
        print(f"Written batch: {conf}, data: {data}")

    def error(self, conf: (str, str, str), data: str, exception: InfluxDBError):
        print(f"Cannot write batch: {conf}, data: {data} due: {exception}")

    def retry(self, conf: (str, str, str), data: str, exception: InfluxDBError):
        print(f"Retryable error occurs for batch: {conf}, data: {data} retry: {exception}")

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as client:
    callback = BatchingCallback()
    with client.write_api(success_callback=callback.success,
                          error_callback=callback.error,
                          retry_callback=callback.retry) as write_api:
        pass
```

1.10.1 HTTP Retry Strategy

By default, the client uses a retry strategy only for batching writes (for more info see [Batching](#)). For other HTTP requests there is no one retry strategy, but it could be configured by `retries` parameter of `InfluxDBClient`.

For more info about how configure HTTP retry see details in [urllib3 documentation](#).

```
from urllib3 import Retry

from influxdb_client import InfluxDBClient

retries = Retry(connect=5, read=2, redirect=5)
client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org",
↳ retries=retries)
```

1.11 Logging

The client uses Python's [logging](#) facility for logging the library activity. The following logger categories are exposed:

- `influxdb_client.client.influxdb_client`
- `influxdb_client.client.influxdb_client_async`
- `influxdb_client.client.write_api`
- `influxdb_client.client.write_api_async`
- `influxdb_client.client.write.retry`
- `influxdb_client.client.write.dataframe_serializer`
- `influxdb_client.client.util.multiprocessing_helper`
- `influxdb_client.client.http`
- `influxdb_client.client.exceptions`

The default logging level is warning without configured logger output. You can use the standard logger interface to change the log level and handler:

```
import logging
import sys

from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as
↳ client:
    for _, logger in client.conf.loggers.items():
        logger.setLevel(logging.DEBUG)
        logger.addHandler(logging.StreamHandler(sys.stdout))
```

1.11.1 Debugging

For debug purpose you can enable verbose logging of HTTP requests and set the debug level to all client's logger categories by:

```
client = InfluxDBClient(url="http://localhost:8086", token="my-token", debug=True)
```

Both HTTP request headers and body will be logged to standard output.

1.12 Examples

1.12.1 How to efficiently import large dataset

The following example shows how to import dataset with a dozen megabytes. If you would like to import gigabytes of data then use our multiprocessing example: `import_data_set_multiprocessing.py` for use a full capability of your hardware.

- sources - `import_data_set.py`

```
"""
Import VIX - CBOE Volatility Index - from "vix-daily.csv" file into InfluxDB 2.0
https://datahub.io/core/finance-vix#data
"""

from collections import OrderedDict
from csv import DictReader

import reactivex as rx
from reactivex import operators as ops

from influxdb_client import InfluxDBClient, Point, WriteOptions

def parse_row(row: OrderedDict):
    """Parse row of CSV file into Point with structure:

        financial-analysis,type=ily close=18.47,high=19.82,low=18.28,open=19.82,
↪ 11981952000000000000

    CSV format:
    Date,VIX Open,VIX High,VIX Low,VIX Close\n
    2004-01-02,17.96,18.68,17.54,18.22\n
    2004-01-05,18.45,18.49,17.44,17.49\n
    2004-01-06,17.66,17.67,16.19,16.73\n
    2004-01-07,16.72,16.75,15.5,15.5\n
    2004-01-08,15.42,15.68,15.32,15.61\n
    2004-01-09,16.15,16.88,15.57,16.75\n
    ...

    :param row: the row of CSV file
    :return: Parsed csv row to [Point]
    """
```

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```

"""
    For better performance is sometimes useful directly create a LineProtocol to avoid
    ↪unnecessary escaping overhead:
    """
    # from datetime import timezone
    # import ciso8601
    # from influxdb_client.client.write.point import EPOCH
    #
    # time = (ciso8601.parse_datetime(row["Date"]).replace(tzinfo=timezone.utc) -
    ↪EPOCH).total_seconds() * 1e9
    # return f"financial-analysis,type=vix-daily" \
    #         f" close={float(row['VIX Close'])},high={float(row['VIX High'])},low=
    ↪{float(row['VIX Low'])},open={float(row['VIX Open'])} " \
    #         f" {int(time)}"

    return Point("financial-analysis") \
        .tag("type", "vix-daily") \
        .field("open", float(row['VIX Open'])) \
        .field("high", float(row['VIX High'])) \
        .field("low", float(row['VIX Low'])) \
        .field("close", float(row['VIX Close'])) \
        .time(row['Date'])

"""
Converts vix-daily.csv into sequence of datad point
"""
data = rx \
    .from_iterable(DictReader(open('vix-daily.csv', 'r')))) \
    .pipe(ops.map(lambda row: parse_row(row)))

client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org",
    ↪debug=True)

"""
Create client that writes data in batches with 50_000 items.
"""
write_api = client.write_api(write_options=WriteOptions(batch_size=50_000, flush_
    ↪interval=10_000))

"""
Write data into InfluxDB
"""
write_api.write(bucket="my-bucket", record=data)
write_api.close()

"""
Querying max value of CBOE Volatility Index
"""
query = 'from(bucket:"my-bucket")' \
        '|> range(start: 0, stop: now())' \

```

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```

        ' |> filter(fn: (r) => r._measurement == "financial-analysis")' \
        ' |> max()'
result = client.query_api().query(query=query)

"""
Processing results
"""
print()
print("=== results ===")
print()
for table in result:
    for record in table.records:
        print('max {0:5} = {1}'.format(record.get_field(), record.get_value()))

"""
Close client
"""
client.close()

```

1.12.2 Efficiency write data from IOT sensor

- sources - iot_sensor.py

```

"""
Efficiency write data from IOT sensor - write changed temperature every minute
"""
import atexit
import platform
from datetime import timedelta

import psutil as psutil
import reactivex as rx
from reactivex import operators as ops

from influxdb_client import InfluxDBClient, WriteApi, WriteOptions

def on_exit(db_client: InfluxDBClient, write_api: WriteApi):
    """Close clients after terminate a script.

    :param db_client: InfluxDB client
    :param write_api: WriteApi
    :return: nothing
    """
    write_api.close()
    db_client.close()

def sensor_temperature():
    """Read a CPU temperature. The [psutil] doesn't support MacOS so we use [sysctl].

    :return: actual CPU temperature
    """

```

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```

"""
os_name = platform.system()
if os_name == 'Darwin':
    from subprocess import check_output
    output = check_output(["sysctl", "machdep.xcpm.cpu_thermal_level"])
    import re
    return re.findall(r'\d+', str(output))[0]
else:
    return psutil.sensors_temperatures()["coretemp"][0]

def line_protocol(temperature):
    """Create a InfluxDB line protocol with structure:

        iot_sensor,hostname=mine_sensor_12,type=temperature value=68

    :param temperature: the sensor temperature
    :return: Line protocol to write into InfluxDB
    """

    import socket
    return 'iot_sensor,hostname={},type=temperature value={}'.format(socket.
↪gethostname(), temperature)

"""
Read temperature every minute; distinct_until_changed - produce only if temperature_
↪change
"""
data = rx\
    .interval(period=timedelta(seconds=60))\
    .pipe(ops.map(lambda t: sensor_temperature()),
          ops.distinct_until_changed(),
          ops.map(lambda temperature: line_protocol(temperature)))

_db_client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org",
↪debug=True)

"""
Create client that writes data into InfluxDB
"""
_write_api = _db_client.write_api(write_options=WriteOptions(batch_size=1))
_write_api.write(bucket="my-bucket", record=data)

"""
Call after terminate a script
"""
atexit.register(on_exit, _db_client, _write_api)

input()

```

1.12.3 Connect to InfluxDB Cloud

The following example demonstrate the simplest way how to write and query data with the InfluxDB Cloud.

At first point you should create an authentication token as is described [here](#).

After that you should configure properties: `influx_cloud_url`, `influx_cloud_token`, `bucket` and `org` in a `influx_cloud.py` example.

The last step is run a python script via: `python3 influx_cloud.py`.

- sources - `influx_cloud.py`

```
"""
Connect to InfluxDB 2.0 - write data and query them
"""

from datetime import datetime, timezone

from influxdb_client import Point, InfluxDBClient
from influxdb_client.client.write_api import SYNCHRONOUS

"""
Configure credentials
"""
influx_cloud_url = 'https://us-west-2-1.aws.cloud2.influxdata.com'
influx_cloud_token = '...'
bucket = '...'
org = '...'

client = InfluxDBClient(url=influx_cloud_url, token=influx_cloud_token)
try:
    kind = 'temperature'
    host = 'host1'
    device = 'opt-123'

    """
    Write data by Point structure
    """
    point = Point(kind).tag('host', host).tag('device', device).field('value', 25.3).
    ↪time(time=datetime.now(tz=timezone.utc))

    print(f'Writing to InfluxDB cloud: {point.to_line_protocol()} ...')

    write_api = client.write_api(write_options=SYNCHRONOUS)
    write_api.write(bucket=bucket, org=org, record=point)

    print()
    print('success')
    print()
    print()

    """
    Query written data
    """
```

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```

query = f'from(bucket: "{bucket}") |> range(start: -1d) |> filter(fn: (r) => r._
↳ measurement == "{kind}")'
print(f'Querying from InfluxDB cloud: "{query}" ...')
print()

query_api = client.query_api()
tables = query_api.query(query=query, org=org)

for table in tables:
    for row in table.records:
        print(f'{row.values["_time"]}: host={row.values["host"]},device={row.values[
↳ "device"]}' '
                f'{row.values["_value"]}' 'C')

print()
print('success')

except Exception as e:
    print(e)
finally:
    client.close()

```

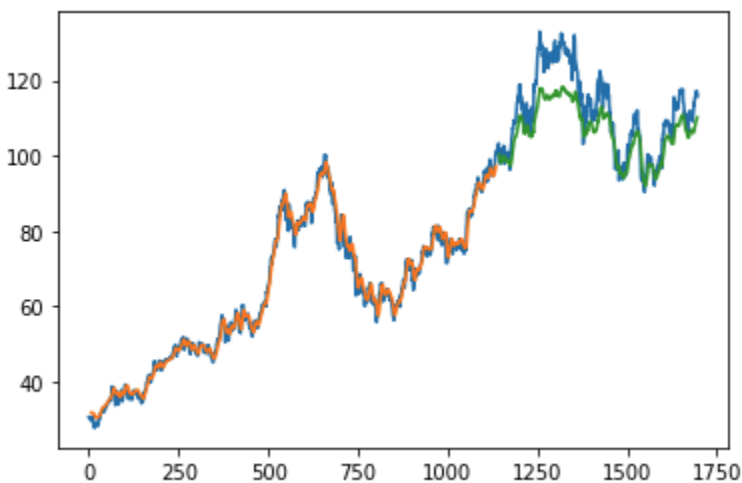
1.12.4 How to use Jupyter + Pandas + InfluxDB 2

The first example shows how to use client capabilities to predict stock price via [Keras](#), [TensorFlow](#), [sklearn](#):

The example is taken from [Kaggle](#).

- sources - *stock-predictions.ipynb*

Result:



The second example shows how to use client capabilities to realtime visualization via [hvPlot](#), [Streamz](#), [RxPY](#):

- sources - *realtime-stream.ipynb*

1.12.5 Other examples

You can find all examples at GitHub: [influxdb-client-python/examples](https://github.com/influxdb/influxdb-client-python/tree/master/examples).

API REFERENCE

- *InfluxDBClient*
- *QueryApi*
- *WriteApi*
- *BucketsApi*
- *LabelsApi*
- *OrganizationsApi*
- *UsersApi*
- *TasksApi*
- *InvokableScriptsApi*
- *DeleteApi*
- *Helpers*

2.1 InfluxDBClient

```
class influxdb_client.InfluxDBClient(url, token: Optional[str] = None, debug=None, timeout=10000,
                                     enable_gzip=False, org: Optional[str] = None, default_tags:
                                     Optional[dict] = None, **kwargs)
```

InfluxDBClient is client for InfluxDB v2.

Initialize defaults.

Parameters

- **url** – InfluxDB server API url (ex. <http://localhost:8086>).
- **token** – token to authenticate to the InfluxDB API
- **debug** – enable verbose logging of http requests
- **timeout** – HTTP client timeout setting for a request specified in milliseconds. If one number provided, it will be total request timeout. It can also be a pair (tuple) of (connection, read) timeouts.
- **enable_gzip** – Enable Gzip compression for http requests. Currently, only the “Write” and “Query” endpoints supports the Gzip compression.

- **org** – organization name (used as a default in Query, Write and Delete API)

Key bool verify_ssl

Set this to false to skip verifying SSL certificate when calling API from https server.

Key str ssl_ca_cert

Set this to customize the certificate file to verify the peer.

Key str cert_file

Path to the certificate that will be used for mTLS authentication.

Key str cert_key_file

Path to the file contains private key for mTLS certificate.

Key str cert_key_password

String or function which returns password for decrypting the mTLS private key.

Key ssl.SSLContext ssl_context

Specify a custom Python SSL Context for the TLS/ mTLS handshake. Be aware that only delivered certificate/ key files or an SSL Context are possible.

Key str proxy

Set this to configure the http proxy to be used (ex. <http://localhost:3128>)

Key str proxy_headers

A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

Key int connection_pool_maxsize

Number of connections to save that can be reused by urllib3. Defaults to “multiprocessing.cpu_count() * 5”.

Key urllib3.util.retry.Retry retries

Set the default retry strategy that is used for all HTTP requests except batching writes. As a default there is no one retry strategy.

Key bool auth_basic

Set this to true to enable basic authentication when talking to a InfluxDB 1.8.x that does not use auth-enabled but is protected by a reverse proxy with basic authentication. (defaults to false, don't set to true when talking to InfluxDB 2)

Key str username

username to authenticate via username and password credentials to the InfluxDB 2.x

Key str password

password to authenticate via username and password credentials to the InfluxDB 2.x

Key list[str] profilers

list of enabled Flux profilers

authorizations_api() → AuthorizationsApi

Create the Authorizations API instance.

Returns

authorizations api

buckets_api() → *BucketsApi*

Create the Bucket API instance.

Returns

buckets api

build() → *str*

Return the build type of the connected InfluxDB Server.

Returns

The type of InfluxDB build.

close()

Shutdown the client.

delete_api() → *DeleteApi*

Get the delete metrics API instance.

Returns

delete api

classmethod from_config_file(*config_file: str = 'config.ini', debug=None, enable_gzip=False, **kwargs*)

Configure client via configuration file. The configuration has to be under 'influx' section.

Parameters

- **config_file** – Path to configuration file
- **debug** – Enable verbose logging of http requests
- **enable_gzip** – Enable Gzip compression for http requests. Currently, only the “Write” and “Query” endpoints supports the Gzip compression.

Key config_name

Name of the configuration section of the configuration file

Key str proxy_headers

A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

Key urllib3.util.retry.Retry retries

Set the default retry strategy that is used for all HTTP requests except batching writes. As a default there is no one retry strategy.

Key ssl.SSLContext ssl_context

Specify a custom Python SSL Context for the TLS/ mTLS handshake. Be aware that only delivered certificate/ key files or an SSL Context are possible.

The supported formats:

- <https://docs.python.org/3/library/configparser.html>
- <https://toml.io/en/>
- <https://www.json.org/json-en.html>

Configuration options:

- url
- org
- token
- timeout,
- verify_ssl
- ssl_ca_cert

- cert_file
- cert_key_file
- cert_key_password
- connection_pool_maxsize
- auth_basic
- profilers
- proxy

config.ini example:

```
[influx2]
url=http://localhost:8086
org=my-org
token=my-token
timeout=6000
connection_pool_maxsize=25
auth_basic=false
profilers=query,operator
proxy=http:proxy.domain.org:8080

[tags]
id = 132-987-655
customer = California Miner
data_center = ${env.data_center}
```

config.toml example:

```
[influx2]
  url = "http://localhost:8086"
  token = "my-token"
  org = "my-org"
  timeout = 6000
  connection_pool_maxsize = 25
  auth_basic = false
  profilers="query, operator"
  proxy = "http://proxy.domain.org:8080"

[tags]
  id = "132-987-655"
  customer = "California Miner"
  data_center = "${env.data_center}"
```

config.json example:

```
{
  "url": "http://localhost:8086",
  "token": "my-token",
  "org": "my-org",
  "active": true,
  "timeout": 6000,
  "connection_pool_maxsize": 55,
```

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```

    "auth_basic": false,
    "profilers": "query, operator",
    "tags": {
        "id": "132-987-655",
        "customer": "California Miner",
        "data_center": "${env.data_center}"
    }
}

```

classmethod `from_env_properties(debug=None, enable_gzip=False, **kwargs)`

Configure client via environment properties.

Parameters

- **debug** – Enable verbose logging of http requests
- **enable_gzip** – Enable Gzip compression for http requests. Currently, only the “Write” and “Query” endpoints supports the Gzip compression.

Key `str proxy`

Set this to configure the http proxy to be used (ex. <http://localhost:3128>)

Key `str proxy_headers`

A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

Key `urllib3.util.retry.Retry` **retries**

Set the default retry strategy that is used for all HTTP requests except batching writes. As a default there is no one retry strategy.

Key `ssl.SSLContext` **ssl_context**

Specify a custom Python SSL Context for the TLS/ mTLS handshake. Be aware that only delivered certificate/ key files or an SSL Context are possible.

Supported environment properties:

- INFLUXDB_V2_URL
- INFLUXDB_V2_ORG
- INFLUXDB_V2_TOKEN
- INFLUXDB_V2_TIMEOUT
- INFLUXDB_V2_VERIFY_SSL
- INFLUXDB_V2_SSL_CA_CERT
- INFLUXDB_V2_CERT_FILE
- INFLUXDB_V2_CERT_KEY_FILE
- INFLUXDB_V2_CERT_KEY_PASSWORD
- INFLUXDB_V2_CONNECTION_POOL_MAXSIZE
- INFLUXDB_V2_AUTH_BASIC
- INFLUXDB_V2_PROFILERS
- INFLUXDB_V2_TAG

health() → *HealthCheck*

Get the health of an instance.

Returns

HealthCheck

invokable_scripts_api() → *InvokableScriptsApi*

Create an InvokableScripts API instance.

Returns

InvokableScripts API instance

labels_api() → *LabelsApi*

Create the Labels API instance.

Returns

labels api

organizations_api() → *OrganizationsApi*

Create the Organizations API instance.

Returns

organizations api

ping() → *bool*

Return the status of InfluxDB instance.

Returns

The status of InfluxDB.

query_api() (*query_options*: ~*influxdb_client.client.query_api.QueryOptions* =
~*influxdb_client.client.query_api.QueryOptions* object>) → *QueryApi*

Create an Query API instance.

Parameters

query_options – optional query api configuration

Returns

Query api instance

ready() → *Ready*

Get The readiness of the InfluxDB 2.0.

Returns

Ready

tasks_api() → *TasksApi*

Create the Tasks API instance.

Returns

tasks api

users_api() → *UsersApi*

Create the Users API instance.

Returns

users api

version() → *str*

Return the version of the connected InfluxDB Server.

Returns

The version of InfluxDB.

write_api(*write_options=<influxdb_client.client.write_api.WriteOptions object>*,
point_settings=<influxdb_client.client.write_api.PointSettings object>, ***kwargs*) → *WriteApi*

Create Write API instance.

Example:

```
from influxdb_client import InfluxDBClient
from influxdb_client.client.write_api import SYNCHRONOUS

# Initialize SYNCHRONOUS instance of WriteApi
with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-
    org") as client:
    write_api = client.write_api(write_options=SYNCHRONOUS)
```

If you would like to use a **background batching**, you have to configure client like this:

```
from influxdb_client import InfluxDBClient

# Initialize background batching instance of WriteApi
with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org
    ") as client:
    with client.write_api() as write_api:
        pass
```

There is also possibility to use callbacks to notify about state of background batches:

```
from influxdb_client import InfluxDBClient
from influxdb_client.client.exceptions import InfluxDBError

class BatchingCallback(object):

    def success(self, conf: (str, str, str), data: str):
        print(f"Written batch: {conf}, data: {data}")

    def error(self, conf: (str, str, str), data: str, exception: InfluxDBError):
        print(f"Cannot write batch: {conf}, data: {data} due: {exception}")

    def retry(self, conf: (str, str, str), data: str, exception: InfluxDBError):
        print(f"Retryable error occurs for batch: {conf}, data: {data} retry:
    {exception}")

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org
    ") as client:
    callback = BatchingCallback()
    with client.write_api(success_callback=callback.success,
        error_callback=callback.error,
        retry_callback=callback.retry) as write_api:
        pass
```

Parameters

- **write_options** – Write API configuration
- **point_settings** – settings to store default tags

Key success_callback

The callable callback to run after successfully written a batch.

The callable must accept two arguments:

- *Tuple*: (bucket, organization, precision)
- *str*: written data

[batching mode]**Key error_callback**

The callable callback to run after unsuccessfully written a batch.

The callable must accept three arguments:

- *Tuple*: (bucket, organization, precision)
- *str*: written data
- *Exception*: an occurred error

[batching mode]**Key retry_callback**

The callable callback to run after retryable error occurred.

The callable must accept three arguments:

- *Tuple*: (bucket, organization, precision)
- *str*: written data
- *Exception*: an retryable error

[batching mode]**Returns**

write api instance

2.2 QueryApi

```
class influxdb_client.QueryApi(influxdb_client,  
                               query_options=<influxdb_client.client.query_api.QueryOptions object>)
```

Implementation for '/api/v2/query' endpoint.

Initialize query client.

Parameters

influxdb_client – influxdb client

query(query: *str*, org=None, params: *Optional[dict]* = None) → *TableList*

Execute synchronous Flux query and return result as a *FluxTable* list.

Parameters

- **query** – the Flux query

- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClient.org` is used.
- **params** – bind parameters

Returns

FluxTable list wrapped into *TableList*

Return type

TableList

Serialization the query results to flattened list of values via `to_values()`:

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as client:

    # Query: using Table structure
    tables = client.query_api().query('from(bucket:"my-bucket") |> range(start:-10m)')

    # Serialize to values
    output = tables.to_values(columns=['location', '_time', '_value'])
    print(output)
```

```
[
  ['New York', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593, tzinfo=tzutc()), 24.3],
  ['Prague', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593, tzinfo=tzutc()), 25.3],
  ...
]
```

Serialization the query results to JSON via `to_json()`:

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as client:

    # Query: using Table structure
    tables = client.query_api().query('from(bucket:"my-bucket") |> range(start:-10m)')

    # Serialize to JSON
    output = tables.to_json(indent=5)
    print(output)
```

```
[
  {
    "_measurement": "mem",
    "_start": "2021-06-23T06:50:11.897825+00:00",
    "_stop": "2021-06-25T06:50:11.897825+00:00",
```

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```

        "_time": "2020-02-27T16:20:00.897825+00:00",
        "region": "north",
        "_field": "usage",
        "_value": 15
    },
    {
        "_measurement": "mem",
        "_start": "2021-06-23T06:50:11.897825+00:00",
        "_stop": "2021-06-25T06:50:11.897825+00:00",
        "_time": "2020-02-27T16:20:01.897825+00:00",
        "region": "west",
        "_field": "usage",
        "_value": 10
    },
    ...
]

```

query_csv(query: *str*, org=None, dialect: *Dialect* = {'annotations': ['datatype', 'group', 'default'], 'comment_prefix': '#', 'date_time_format': 'RFC3339', 'delimiter': ',', 'header': True}, params: *Optional[dict]* = None) → *CSVIterator*

Execute the Flux query and return results as a CSV iterator. Each iteration returns a row of the CSV file.

Parameters

- **query** – a Flux query
- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClient.org` is used.
- **dialect** – csv dialect format
- **params** – bind parameters

Returns

`Iterator[List[str]]` wrapped into *CSVIterator*

Return type

CSVIterator

Serialization the query results to flattened list of values via `to_values()`:

```

from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as client:

    # Query: using CSV iterator
    csv_iterator = client.query_api().query_csv('from(bucket:"my-bucket") |>
    range(start: -10m)')

    # Serialize to values
    output = csv_iterator.to_values()
    print(output)

```

```
[
    ['#datatype', 'string', 'long', 'dateTime:RFC3339', 'dateTime:RFC3339',
     ↪ 'dateTime:RFC3339', 'double', 'string', 'string', 'string']
    ['#group', 'false', 'false', 'true', 'true', 'false', 'false', 'true', 'true',
     ↪ 'true']
    ['#default', '_result', '', '', '', '', '', '', '', '']
    ['', 'result', 'table', '_start', '_stop', '_time', '_value', '_field', '_
     ↪ measurement', 'location']
    ['', '', '0', '2022-06-16', '2022-06-16', '2022-06-16', '24.3', 'temperature',
     ↪ 'my_measurement', 'New York']
    ['', '', '1', '2022-06-16', '2022-06-16', '2022-06-16', '25.3', 'temperature',
     ↪ 'my_measurement', 'Prague']
    ...
]
```

If you would like to turn off Annotated CSV header's you can use following code:

```
from influxdb_client import InfluxDBClient, Dialect

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org",
↪) as client:

    # Query: using CSV iterator
    csv_iterator = client.query_api().query_csv('from(bucket:"my-bucket") |>
     ↪ range(start: -10m)',
                                                dialect=Dialect(header=False,
     ↪ annotations=[]))

    for csv_line in csv_iterator:
        print(csv_line)
```

```
[
    ['', '_result', '0', '2022-06-16', '2022-06-16', '2022-06-16', '24.3',
     ↪ 'temperature', 'my_measurement', 'New York']
    ['', '_result', '1', '2022-06-16', '2022-06-16', '2022-06-16', '25.3',
     ↪ 'temperature', 'my_measurement', 'Prague']
    ...
]
```

query_data_frame(query: str, org=None, data_frame_index: Optional[List[str]] = None, params: Optional[dict] = None, use_extension_dtypes: bool = False)

Execute synchronous Flux query and return Pandas DataFrame.

Note: If the query returns tables with differing schemas than the client generates a DataFrame for each of them.

Parameters

- **query** – the Flux query
- **org** (str, Organization) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from InfluxDBClient.org is used.

- **data_frame_index** – the list of columns that are used as DataFrame index
- **params** – bind parameters
- **use_extension_dtypes** – set to True to use panda's extension data types. Useful for queries with pivot function. When data has missing values, column data type may change (to object or float64). Nullable extension types (Int64, Float64, boolean) support `panda.NA` value. For more info, see https://pandas.pydata.org/docs/user_guide/missing_data.html.

Returns

DataFrame or List[DataFrame]

Warning: For the optimal processing of the query results use the `pivot()` function which align results as a table.

```
from(bucket:"my-bucket")
  |> range(start: -5m, stop: now())
  |> filter(fn: (r) => r._measurement == "mem")
  |> pivot(rowKey:["_time"], columnKey: ["_field"], valueColumn: "_value")
```

For more info see:

- <https://docs.influxdata.com/resources/videos/pivots-in-flux/>
- <https://docs.influxdata.com/flux/latest/stdlib/universe/pivot/>
- <https://docs.influxdata.com/flux/latest/stdlib/influxdata/influxdb/schema/fieldsascols/>

query_data_frame_stream(*query: str, org=None, data_frame_index: Optional[List[str]] = None, params: Optional[dict] = None, use_extension_dtypes: bool = False*)

Execute synchronous Flux query and return stream of Pandas DataFrame as a Generator[DataFrame].

Note: If the query returns tables with differing schemas than the client generates a DataFrame for each of them.

Parameters

- **query** – the Flux query
- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClient.org` is used.
- **data_frame_index** – the list of columns that are used as DataFrame index
- **params** – bind parameters
- **use_extension_dtypes** – set to True to use panda's extension data types. Useful for queries with pivot function. When data has missing values, column data type may change (to object or float64). Nullable extension types (Int64, Float64, boolean) support `panda.NA` value. For more info, see https://pandas.pydata.org/docs/user_guide/missing_data.html.

Returns

Generator[DataFrame]

Warning: For the optimal processing of the query results use the `pivot()` function which align results as a table.

```
from(bucket:"my-bucket")
  |> range(start: -5m, stop: now())
  |> filter(fn: (r) => r._measurement == "mem")
  |> pivot(rowKey:["_time"], columnKey: ["_field"], valueColumn: "_value")
```

For more info see:

- <https://docs.influxdata.com/resources/videos/pivots-in-flux/>
- <https://docs.influxdata.com/flux/latest/stdlib/universe/pivot/>
- <https://docs.influxdata.com/flux/latest/stdlib/influxdata/influxdb/schema/fieldsascols/>

query_raw(*query*: *str*, *org*=None, *dialect*={'annotations': ['datatype', 'group', 'default'], 'comment_prefix': '#', 'date_time_format': 'RFC3339', 'delimiter': ',', 'header': True}, *params*: *Optional[dict]* = None)

Execute synchronous Flux query and return result as raw unprocessed result as a str.

Parameters

- **query** – a Flux query
- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClient.org` is used.
- **dialect** – csv dialect format
- **params** – bind parameters

Returns

str

query_stream(*query*: *str*, *org*=None, *params*: *Optional[dict]* = None) → *Generator[FluxRecord, Any, None]*

Execute synchronous Flux query and return stream of FluxRecord as a Generator['FluxRecord'].

Parameters

- **query** – the Flux query
- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClient.org` is used.
- **params** – bind parameters

Returns

Generator['FluxRecord']

class influxdb_client.client.flux_table.FluxTable

A table is set of records with a common set of columns and a group key.

The table can be serialized into JSON by:

```
import json
from influxdb_client.client.flux_table import FluxStructureEncoder
```

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```
output = json.dumps(tables, cls=FluxStructureEncoder, indent=2)
print(output)
```

Initialize defaults.

get_group_key()

Group key is a list of columns.

A table's group key denotes which subset of the entire dataset is assigned to the table.

class influxdb_client.client.flux_table.FluxRecord(table, values=None)

A record is a tuple of named values and is represented using an object type.

Initialize defaults.

get_field()

Get field name.

get_measurement()

Get measurement name.

get_start()

Get '_start' value.

get_stop()

Get '_stop' value.

get_time()

Get timestamp.

get_value()

Get field value.

class influxdb_client.client.flux_table.TableList(iterable=(), /)

FluxTable list with additionally functional to better handle of query result.

to_json(columns: *Optional[List[str]]* = None, **kwargs) → str

Serialize query results to a JSON formatted str.

Parameters

columns – if not None then only specified columns are presented in results

Returns

str

The query results is flattened to array:

```
[
  {
    "_measurement": "mem",
    "_start": "2021-06-23T06:50:11.897825+00:00",
    "_stop": "2021-06-25T06:50:11.897825+00:00",
    "_time": "2020-02-27T16:20:00.897825+00:00",
    "region": "north",
    "_field": "usage",
    "_value": 15
```

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```

    },
    {
        "_measurement": "mem",
        "_start": "2021-06-23T06:50:11.897825+00:00",
        "_stop": "2021-06-25T06:50:11.897825+00:00",
        "_time": "2020-02-27T16:20:01.897825+00:00",
        "region": "west",
        "_field": "usage",
        "_value": 10
    },
    ...
]

```

The JSON format could be configured via `**kwargs` arguments:

```

from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as client:

    # Query: using Table structure
    tables = client.query_api().query('from(bucket:"my-bucket") |> range(start:┐
    ↪-10m)')

    # Serialize to JSON
    output = tables.to_json(indent=5)
    print(output)

```

For all available options see - `json.dump`.

to_values(columns: *Optional[List[str]]* = None) → List[List[object]]

Serialize query results to a flattened list of values.

Parameters

columns – if not None then only specified columns are presented in results

Returns

list of values

Output example:

```

[
    ['New York', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593,┐
    ↪tzinfo=tzutc()), 24.3],
    ['Prague', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593, tzinfo=tzutc()),
    ↪ 25.3],
    ...
]

```

Configure required columns:

```

from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-

```

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```

↪org") as client:

    # Query: using Table structure
    tables = client.query_api().query('from(bucket:"my-bucket") |> range(start:↪
↪-10m)')

    # Serialize to values
    output = tables.to_values(columns=['location', '_time', '_value'])
    print(output)

```

class influxdb_client.client.flux_table.CSVIterator(response: *HTTPResponse*)

Iterator[List[str]] with additionally functional to better handle of query result.

Initialize csv.reader.

to_values() → List[List[str]]

Serialize query results to a flattened list of values.

Returns

list of values

Output example:

```

[
    ['New York', '2022-06-14T08:00:51.749072045Z', '24.3'],
    ['Prague', '2022-06-14T08:00:51.749072045Z', '25.3'],
    ...
]

```

2.3 WriteApi

```

class influxdb_client.WriteApi(influxdb_client, write_options:
    ~influxdb_client.client.write_api.WriteOptions =
    <influxdb_client.client.write_api.WriteOptions object>, point_settings:
    ~influxdb_client.client.write_api.PointSettings =
    <influxdb_client.client.write_api.PointSettings object>, **kwargs)

```

Implementation for '/api/v2/write' endpoint.

Example:

```

from influxdb_client import InfluxDBClient
from influxdb_client.client.write_api import SYNCHRONOUS

# Initialize SYNCHRONOUS instance of WriteApi
with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org
↪") as client:
    write_api = client.write_api(write_options=SYNCHRONOUS)

```

Initialize defaults.

Parameters

- **influxdb_client** – with default settings (organization)

- **write_options** – write api configuration
- **point_settings** – settings to store default tags.

Key success_callback

The callable callback to run after successfully written a batch.

The callable must accept two arguments:

- *Tuple*: (bucket, organization, precision)
- *str*: written data

[batching mode]

Key error_callback

The callable callback to run after unsuccessfully written a batch.

The callable must accept three arguments:

- *Tuple*: (bucket, organization, precision)
- *str*: written data
- *Exception*: an occurred error

[batching mode]

Key retry_callback

The callable callback to run after retryable error occurred.

The callable must accept three arguments:

- *Tuple*: (bucket, organization, precision)
- *str*: written data
- *Exception*: an retryable error

[batching mode]

close()

Flush data and dispose a batching buffer.

flush()

Flush data.

write(bucket: *str*, org: *Optional[str] = None*, record: *Optional[Union[str, Iterable[str], Point, Iterable[Point], dict, Iterable[dict], bytes, Iterable[bytes], Observable, NamedTuple, Iterable[NamedTuple], dataclass, Iterable[dataclass]]] = None*, write_precision: *WritePrecision = 'ns'*, **kwargs) → *Any*

Write time-series data into InfluxDB.

Parameters

- **bucket** (*str*) – specifies the destination bucket for writes (required)
- **org** (*str*, *Organization*) – specifies the destination organization for writes; take the ID, Name or Organization. If not specified the default value from `InfluxDBClient.org` is used.
- **write_precision** (*WritePrecision*) – specifies the precision for the unix timestamps within the body line-protocol. The precision specified on a Point has precedes and is use for write.

- **record** – Point, Line Protocol, Dictionary, NamedTuple, Data Classes, Pandas DataFrame or RxPY Observable to write

Key data_frame_measurement_name

name of measurement for writing Pandas DataFrame - DataFrame

Key data_frame_tag_columns

list of DataFrame columns which are tags, rest columns will be fields - DataFrame

Key data_frame_timestamp_column

name of DataFrame column which contains a timestamp. The column can be defined as a `str` value formatted as `2018-10-26`, `2018-10-26 12:00`, `2018-10-26 12:00:00-05:00` or other formats and types supported by `pandas.to_datetime` - DataFrame

Key data_frame_timestamp_timezone

name of the timezone which is used for timestamp column - DataFrame

Key record_measurement_key

key of record with specified measurement - dictionary, NamedTuple, dataclass

Key record_measurement_name

static measurement name - dictionary, NamedTuple, dataclass

Key record_time_key

key of record with specified timestamp - dictionary, NamedTuple, dataclass

Key record_tag_keys

list of record keys to use as a tag - dictionary, NamedTuple, dataclass

Key record_field_keys

list of record keys to use as a field - dictionary, NamedTuple, dataclass

Example:

```
# Record as Line Protocol
write_api.write("my-bucket", "my-org", "h2o_feet,location=us-west_
↪level=125i 1")

# Record as Dictionary
dictionary = {
    "measurement": "h2o_feet",
    "tags": {"location": "us-west"},
    "fields": {"level": 125},
    "time": 1
}
write_api.write("my-bucket", "my-org", dictionary)

# Record as Point
from influxdb_client import Point
point = Point("h2o_feet").tag("location", "us-west").field("level", 125).
↪time(1)
write_api.write("my-bucket", "my-org", point)
```

DataFrame:

If the `data_frame_timestamp_column` is not specified the index of `Pandas DataFrame` is used as a timestamp for written data. The index can be `PeriodIndex` or its must be transformable to `datetime` by `pandas.to_datetime`.

If you would like to transform a column to `PeriodIndex`, you can use something like:

```
import pandas as pd

# DataFrame
data_frame = ...
# Set column as Index
data_frame.set_index('column_name', inplace=True)
# Transform index to PeriodIndex
data_frame.index = pd.to_datetime(data_frame.index, unit='s')
```

class influxdb_client.client.write.point.**Point**(measurement_name)

Point defines the values that will be written to the database.

Ref: <https://docs.influxdata.com/influxdb/latest/reference/key-concepts/data-elements/#point>

Initialize defaults.

field(field, value)

Add field with key and value.

static from_dict(dictionary: dict, write_precision: WritePrecision = 'ns', **kwargs)

Initialize point from 'dict' structure.

The expected dict structure is:

- measurement
- tags
- fields
- time

Example:

```
# Use default dictionary structure
dict_structure = {
    "measurement": "h2o_feet",
    "tags": {"location": "coyote_creek"},
    "fields": {"water_level": 1.0},
    "time": 1
}
point = Point.from_dict(dict_structure, WritePrecision.NS)
```

Example:

```
# Use custom dictionary structure
dictionary = {
    "name": "sensor_pt859",
    "location": "warehouse_125",
    "version": "2021.06.05.5874",
    "pressure": 125,
    "temperature": 10,
    "created": 1632208639,
}
point = Point.from_dict(dictionary,
                        write_precision=WritePrecision.S,
                        record_measurement_key="name",
```

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```
record_time_key="created",
record_tag_keys=["location", "version"],
record_field_keys=["pressure", "temperature"])
```

Int Types:

The following example shows how to configure the types of integers fields. It is useful when you want to serialize integers always as float to avoid field type conflict or use unsigned 64-bit integer as the type for serialization.

```
# Use custom dictionary structure
dict_structure = {
    "measurement": "h2o_feet",
    "tags": {"location": "coyote_creek"},
    "fields": {
        "water_level": 1.0,
        "some_counter": 108913123234
    },
    "time": 1
}

point = Point.from_dict(dict_structure, field_types={"some_counter": "uint"}
→)
```

Parameters

- **dictionary** – dictionary for serialize into data Point
- **write_precision** – sets the precision for the supplied time values

Key record_measurement_key

key of dictionary with specified measurement

Key record_measurement_name

static measurement name for data Point

Key record_time_key

key of dictionary with specified timestamp

Key record_tag_keys

list of dictionary keys to use as a tag

Key record_field_keys

list of dictionary keys to use as a field

Key field_types

optional dictionary to specify types of serialized fields. Currently, is supported customization for integer types. Possible integers types:

- **int** - serialize integers as “**Signed 64-bit integers**” - 9223372036854775807i (default behaviour)
- **uint** - serialize integers as “**Unsigned 64-bit integers**” - 9223372036854775807u
- **float** - serialize integers as “**IEEE-754 64-bit floating-point numbers**”. Useful for unify number types in your pipeline to avoid field type conflict - 9223372036854775807

The `field_types` can be also specified as part of incoming dictionary. For more info see an example above.

Returns

new data point

static measurement(*measurement*)

Create a new Point with specified measurement name.

classmethod set_str_rep(*rep_function*)

Set the string representation for all Points.

tag(*key*, *value*)

Add tag with key and value.

time(*time*, *write_precision='ns'*)

Specify timestamp for DataPoint with declared precision.

If time doesn't have specified timezone we assume that timezone is UTC.

Examples::

```

Point.measurement("h2o").field("val", 1).time("2009-11-10T23:00:00.123456Z")
Point.measurement("h2o").field("val", 1).time(1257894000123456000)
Point.measurement("h2o").field("val", 1).time(datetime(2009, 11, 10, 23, 0, 0, 123456))
Point.measurement("h2o").field("val", 1).time(1257894000123456000, write_precision=WritePrecision.NS)

```

Parameters

- **time** – the timestamp for your data
- **write_precision** – sets the precision for the supplied time values

Returns

this point

to_line_protocol(*precision=None*)

Create LineProtocol.

param precision

required precision of LineProtocol. If it's not set then use the precision from Point.

property write_precision

Get precision.

class influxdb_client.domain.write_precision.**WritePrecision**

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

WritePrecision - a model defined in OpenAPI.

NS = 'ns'**Attributes:**

openapi_types (dict): The key is attribute name and the value is attribute type.

attribute_map (dict): The key is attribute name and the value is json key in definition.

to_dict()

Return the model properties as a dict.

to_str()

Return the string representation of the model.

2.4 BucketsApi

class influxdb_client.**BucketsApi**(*influxdb_client*)

Implementation for '/api/v2/buckets' endpoint.

Initialize defaults.

create_bucket(*bucket=None, bucket_name=None, org_id=None, retention_rules=None, description=None, org=None*) → *Bucket*

Create a bucket.

Parameters

- **bucket** (*Bucket* / *PostBucketRequest*) – bucket to create
- **bucket_name** – bucket name
- **description** – bucket description
- **org_id** – org_id
- **bucket_name** – bucket name
- **retention_rules** – retention rules array or single *BucketRetentionRules*
- **org** (*str*, *Organization*) – specifies the organization for create the bucket; Take the ID, Name or Organization. If not specified the default value from *InfluxDBClient.org* is used.

Returns

Bucket If the method is called asynchronously, returns the request thread.

delete_bucket(*bucket*)

Delete a bucket.

Parameters

bucket – bucket id or *Bucket*

Returns

Bucket

find_bucket_by_id(*id*)

Find bucket by ID.

Parameters

id –

Returns

find_bucket_by_name(*bucket_name*)

Find bucket by name.

Parameters

bucket_name – bucket name

Returns

Bucket

find_buckets(kwargs)**

List buckets.

Key int offset

Offset for pagination

Key int limit

Limit for pagination

Key str afterThe last resource ID from which to seek from (but not including). This is to be used instead of *offset*.**Key str org**

The organization name.

Key str org_id

The organization ID.

Key str name

Only returns buckets with a specific name.

Returns

Buckets

find_buckets_iter(kwargs)**

Iterate over all buckets with pagination.

Key str name

Only returns buckets with the specified name

Key str org

The organization name.

Key str org_id

The organization ID.

Key str after

The last resource ID from which to seek from (but not including).

Key int limit

the maximum number of buckets in one page

Returns

Buckets iterator

update_bucket(bucket: [Bucket](#)) → [Bucket](#)

Update a bucket.

Parameters**bucket** – Bucket update to apply (required)**Returns**

Bucket

```
class influxdb_client.domain.Bucket(links=None, id=None, type='user', name=None, description=None,
                                     org_id=None, rp=None, schema_type=None, created_at=None,
                                     updated_at=None, retention_rules=None, labels=None)
```

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

Bucket - a model defined in OpenAPI.

property created_at

Get the created_at of this Bucket.

Returns

The created_at of this Bucket.

Return type

datetime

property description

Get the description of this Bucket.

Returns

The description of this Bucket.

Return type

str

property id

Get the id of this Bucket.

Returns

The id of this Bucket.

Return type

str

property labels

Get the labels of this Bucket.

Returns

The labels of this Bucket.

Return type

list[Label]

property links

Get the links of this Bucket.

Returns

The links of this Bucket.

Return type

BucketLinks

property name

Get the name of this Bucket.

Returns

The name of this Bucket.

Return type

str

property org_id

Get the org_id of this Bucket.

Returns

The org_id of this Bucket.

Return type

str

property retention_rules

Get the retention_rules of this Bucket.

Retention rules to expire or retain data. The InfluxDB /api/v2 API uses *RetentionRules* to configure the [retention period](<https://docs.influxdata.com/influxdb/latest/reference/glossary/#retention-period>). ##### InfluxDB Cloud - *retentionRules* is required. ##### InfluxDB OSS - *retentionRules* isn't required.

Returns

The retention_rules of this Bucket.

Return type

list[BucketRetentionRules]

property rp

Get the rp of this Bucket.

Returns

The rp of this Bucket.

Return type

str

property schema_type

Get the schema_type of this Bucket.

Returns

The schema_type of this Bucket.

Return type

SchemaType

to_dict()

Return the model properties as a dict.

to_str()

Return the string representation of the model.

property type

Get the type of this Bucket.

Returns

The type of this Bucket.

Return type

str

property updated_at

Get the updated_at of this Bucket.

Returns

The updated_at of this Bucket.

Return type

datetime

2.5 LabelsApi

class influxdb_client.LabelsApi(*influxdb_client*)

Implementation for '/api/v2/labels' endpoint.

Initialize defaults.

clone_label(*cloned_name: str, label: Label*) → Label

Create the new instance of the label as a copy existing label.

Parameters

- **cloned_name** – new label name
- **label** – existing label

Returns

clonned Label

create_label(*name: str, org_id: str, properties: Optional[Dict[str, str]] = None*) → Label

Create a new label.

Parameters

- **name** – label name
- **org_id** – organization id
- **properties** – optional label properties

Returns

created label

delete_label(*label: Union[str, Label]*)

Delete the label.

Parameters

label – label id or Label

find_label_by_id(*label_id: str*)

Retrieve the label by id.

Parameters

label_id –

Returns

Label

find_label_by_org(*org_id*) → List[Label]

Get the list of all labels for given organization.

Parameters

org_id – organization id

Returns

list of labels

find_labels(***kwargs*) → List[Label]

Get all available labels.

Key str org_id

The organization ID.

Returns

labels

update_label(*label: Label*)

Update an existing label name and properties.

Parameters**label** – label**Returns**

the updated label

2.6 OrganizationsApi

class influxdb_client.**OrganizationsApi**(*influxdb_client*)

Implementation for '/api/v2/orgs' endpoint.

Initialize defaults.

create_organization(*name: Optional[str] = None, organization: Optional[Organization] = None*) → *Organization*

Create an organization.

delete_organization(*org_id: str*)

Delete an organization.

find_organization(*org_id*)

Retrieve an organization.

find_organizations(***kwargs*)

List all organizations.

Key int offset

Offset for pagination

Key int limit

Limit for pagination

Key bool descending**Key str org**

Filter organizations to a specific organization name.

Key str org_id

Filter organizations to a specific organization ID.

Key str user_id

Filter organizations to a specific user ID.

me()

Return the current authenticated user.

update_organization(*organization: Organization*) → *Organization*

Update an organization.

Parameters**organization** – Organization update to apply (required)**Returns**

Organization

```
class influxdb_client.domain.Organization(links=None, id=None, name=None,
                                         default_storage_type=None, description=None,
                                         created_at=None, updated_at=None, status='active')
```

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

Organization - a model defined in OpenAPI.

property created_at

Get the created_at of this Organization.

Returns

The created_at of this Organization.

Return type

datetime

property default_storage_type

Get the default_storage_type of this Organization.

Discloses whether the organization uses TSM or IOx.

Returns

The default_storage_type of this Organization.

Return type

str

property description

Get the description of this Organization.

Returns

The description of this Organization.

Return type

str

property id

Get the id of this Organization.

Returns

The id of this Organization.

Return type

str

property links

Get the links of this Organization.

Returns

The links of this Organization.

Return type

OrganizationLinks

property name

Get the name of this Organization.

Returns

The name of this Organization.

Return type*str***property status**

Get the status of this Organization.

If inactive, the organization is inactive.

Returns

The status of this Organization.

Return type*str***to_dict()**

Return the model properties as a dict.

to_str()

Return the string representation of the model.

property updated_at

Get the updated_at of this Organization.

Returns

The updated_at of this Organization.

Return type*datetime*

2.7 UsersApi

class influxdb_client.**UsersApi**(*influxdb_client*)

Implementation for '/api/v2/users' endpoint.

Initialize defaults.

create_user(*name: str*) → *User*

Create a user.

delete_user(*user: Union[str, User, UserResponse]*) → *None*

Delete a user.

Parameters

user – user id or User

Returns

None

find_users(***kwargs*) → *Users*

List all users.

Key int offset

The offset for pagination. The number of records to skip.

Key int limit

Limits the number of records returned. Default is 20.

Key str after

The last resource ID from which to seek from (but not including). This is to be used instead of *offset*.

Key str name

The user name.

Key str id

The user ID.

Returns

Buckets

me() → *User*

Return the current authenticated user.

update_password(*user*: *Union[str, User, UserResponse]*, *password*: *str*) → *None*

Update a password.

Parameters

- **user** – User to update password (required)
- **password** – New password (required)

Returns

None

update_user(*user*: *User*) → *UserResponse*

Update a user.

Parameters

user – User update to apply (required)

Returns

User

class influxdb_client.domain.**User**(*id=None, name=None, status='active'*)

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

User - a model defined in OpenAPI.

property id

Get the id of this User.

The user ID.

Returns

The id of this User.

Return type

str

property name

Get the name of this User.

The user name.

Returns

The name of this User.

Return type

str

property status

Get the status of this User.

If *inactive*, the user is inactive. Default is *active*.

Returns

The status of this User.

Return type

`str`

to_dict()

Return the model properties as a dict.

to_str()

Return the string representation of the model.

2.8 TasksApi

class influxdb_client.TasksApi(influxdb_client)

Implementation for '/api/v2/tasks' endpoint.

Initialize defaults.

add_label(label_id: `str`, task_id: `str`) → LabelResponse

Add a label to a task.

add_member(member_id, task_id)

Add a member to a task.

add_owner(owner_id, task_id)

Add an owner to a task.

cancel_run(task_id: `str`, run_id: `str`)

Cancel a currently running run.

Parameters

- **task_id** –
- **run_id** –

clone_task(task: Task) → Task

Clone a task.

create_task(task: Optional[Task] = None, task_create_request: Optional[TaskCreateRequest] = None) → Task

Create a new task.

create_task_cron(name: `str`, flux: `str`, cron: `str`, org_id: `str`) → Task

Create a new task with cron repetition schedule.

create_task_every(name, flux, every, organization) → Task

Create a new task with every repetition schedule.

delete_label(label_id: `str`, task_id: `str`)

Delete a label from a task.

delete_member(*member_id*, *task_id*)

Remove a member from a task.

delete_owner(*owner_id*, *task_id*)

Remove an owner from a task.

delete_task(*task_id*: *str*)

Delete a task.

find_task_by_id(*task_id*) → *Task*

Retrieve a task.

find_tasks(***kwargs*)

List all tasks up to set limit (max 500).

Key str name

only returns tasks with the specified name

Key str after

returns tasks after specified ID

Key str user

filter tasks to a specific user ID

Key str org

filter tasks to a specific organization name

Key str org_id

filter tasks to a specific organization ID

Key int limit

the number of tasks to return

Returns

Tasks

find_tasks_by_user(*task_user_id*)

List all tasks by user.

find_tasks_iter(***kwargs*)

Iterate over all tasks with pagination.

Key str name

only returns tasks with the specified name

Key str after

returns tasks after specified ID

Key str user

filter tasks to a specific user ID

Key str org

filter tasks to a specific organization name

Key str org_id

filter tasks to a specific organization ID

Key int limit

the number of tasks in one page

Returns

Tasks iterator

get_labels(*task_id*)

List all labels for a task.

get_logs(*task_id: str*) → List[LogEvent]

Retrieve all logs for a task.

Parameters

task_id – task id

get_members(*task_id: str*)

List all task members.

get_owners(*task_id*)

List all owners of a task.

get_run(*task_id: str, run_id: str*) → Run

Get run record for specific task and run id.

Parameters

- **task_id** – task id
- **run_id** – run id

Returns

Run for specified task and run id

get_run_logs(*task_id: str, run_id: str*) → List[LogEvent]

Retrieve all logs for a run.

get_runs(*task_id, **kwargs*) → List[Run]

Retrieve list of run records for a task.

Parameters

task_id – task id

Key str after

returns runs after specified ID

Key int limit

the number of runs to return

Key datetime after_time

filter runs to those scheduled after this time, RFC3339

Key datetime before_time

filter runs to those scheduled before this time, RFC3339

retry_run(*task_id: str, run_id: str*)

Retry a task run.

Parameters

- **task_id** – task id
- **run_id** – run id

run_manually(*task_id: str, scheduled_for: <module 'datetime' from
'/home/docs/.asdf/installs/python/3.7.17/lib/python3.7/datetime.py'> = None*)

Manually start a run of the task now overriding the current schedule.

Parameters

- **task_id** –
- **scheduled_for** – planned execution

update_task(task: [Task](#)) → [Task](#)

Update a task.

update_task_request(task_id, task_update_request: [TaskUpdateRequest](#)) → [Task](#)

Update a task.

```
class influxdb_client.domain.Task(id=None, org_id=None, org=None, name=None, owner_id=None,
                                   description=None, status=None, labels=None, authorization_id=None,
                                   flux=None, every=None, cron=None, offset=None,
                                   latest_completed=None, last_run_status=None, last_run_error=None,
                                   created_at=None, updated_at=None, links=None)
```

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

Task - a model defined in OpenAPI.

property authorization_id

Get the authorization_id of this Task.

An authorization ID. Specifies the authorization used when the task communicates with the query engine. To find an authorization ID, use the [[GET /api/v2/authorizations endpoint](#)](#operation/GetAuthorizations) to list authorizations.

Returns

The authorization_id of this Task.

Return type

[str](#)

property created_at

Get the created_at of this Task.

Returns

The created_at of this Task.

Return type

[datetime](#)

property cron

Get the cron of this Task.

A [Cron expression](<https://en.wikipedia.org/wiki/Cron#Overview>) that defines the schedule on which the task runs. InfluxDB uses the system time when evaluating Cron expressions.

Returns

The cron of this Task.

Return type

[str](#)

property description

Get the description of this Task.

A description of the task.

Returns

The description of this Task.

Return type

`str`

property every

Get the every of this Task.

The interval ([duration literal](<https://docs.influxdata.com/influxdb/latest/reference/glossary/#rfc3339-timestamp>)) at which the task runs. *every* also determines when the task first runs, depending on the specified time.

Returns

The every of this Task.

Return type

`str`

property flux

Get the flux of this Task.

The Flux script that the task executes.

Returns

The flux of this Task.

Return type

`str`

property id

Get the id of this Task.

Returns

The id of this Task.

Return type

`str`

property labels

Get the labels of this Task.

Returns

The labels of this Task.

Return type

`list[Label]`

property last_run_error

Get the last_run_error of this Task.

Returns

The last_run_error of this Task.

Return type

`str`

property last_run_status

Get the last_run_status of this Task.

Returns

The last_run_status of this Task.

Return type

str

property latest_completed

Get the latest_completed of this Task.

A timestamp ([RFC3339 date/time format](https://docs.influxdata.com/influxdb/latest/reference/glossary/#rfc3339-timestamp)) of the latest scheduled and completed run.

Returns

The latest_completed of this Task.

Return type

datetime

property links

Get the links of this Task.

Returns

The links of this Task.

Return type

TaskLinks

property name

Get the name of this Task.

The name of the task.

Returns

The name of this Task.

Return type

str

property offset

Get the offset of this Task.

A [duration](https://docs.influxdata.com/flux/v0.x/spec/lexical-elements/#duration-literals) to delay execution of the task after the scheduled time has elapsed. 0 removes the offset.

Returns

The offset of this Task.

Return type

str

property org

Get the org of this Task.

An [organization](https://docs.influxdata.com/influxdb/latest/reference/glossary/#organization) name. Specifies the organization that owns the task.

Returns

The org of this Task.

Return type

str

property org_id

Get the org_id of this Task.

An [organization](<https://docs.influxdata.com/influxdb/latest/reference/glossary/#organization>) ID. Specifies the organization that owns the task.

Returns

The org_id of this Task.

Return type

str

property owner_id

Get the owner_id of this Task.

A [user](<https://docs.influxdata.com/influxdb/latest/reference/glossary/#user>) ID. Specifies the owner of the task. To find a user ID, you can use the [GET /api/v2/users endpoint](#operation/GetUsers) to list users.

Returns

The owner_id of this Task.

Return type

str

property status

Get the status of this Task.

Returns

The status of this Task.

Return type

TaskStatusType

to_dict()

Return the model properties as a dict.

to_str()

Return the string representation of the model.

property updated_at

Get the updated_at of this Task.

Returns

The updated_at of this Task.

Return type

datetime

2.9 InvokableScriptsApi

class influxdb_client.InvokableScriptsApi(*influxdb_client*)

Use API invokable scripts to create custom InfluxDB API endpoints that query, process, and shape data.

Initialize defaults.

create_script(*create_request*: ScriptCreateRequest) → Script

Create a script.

Parameters

create_request (ScriptCreateRequest) – The script to create. (required)

Returns

The created script.

delete_script(*script_id: str*) → *None*

Delete a script.

Parameters

script_id (*str*) – The ID of the script to delete. (required)

Returns

None

find_scripts(***kwargs*)

List scripts.

Key int limit

The number of scripts to return.

Key int offset

The offset for pagination.

Returns

List of scripts.

Return type

list[Script]

invoke_script(*script_id: str, params: Optional[dict] = None*) → *TableList*

Invoke synchronously a script and return result as a *TableList*.

The bind parameters referenced in the script are substitutes with *params* key-values sent in the request body.

Parameters

- **script_id** (*str*) – The ID of the script to invoke. (required)
- **params** – bind parameters

Returns

FluxTable list wrapped into *TableList*

Return type

TableList

Serialization the query results to flattened list of values via *to_values()*:

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="https://us-west-2-1.aws.cloud2.influxdata.com", token=
    ↪ "my-token", org="my-org") as client:

    # Query: using Table structure
    tables = client.invokable_scripts_api().invoke_script(script_id="script-id")

    # Serialize to values
    output = tables.to_values(columns=['location', '_time', '_value'])
    print(output)
```

```
[
    ['New York', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593, ↪
```

(continues on next page)

(continued from previous page)

```

↪ tzinfo=tzutc()), 24.3],
    ['Prague', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593, tzinfo=tzutc()),
↪ 25.3],
    ...
]

```

Serialization the query results to JSON via `to_json()`:

```

from influxdb_client import InfluxDBClient

with InfluxDBClient(url="https://us-west-2-1.aws.cloud2.influxdata.com", token=
↪ "my-token", org="my-org") as client:

    # Query: using Table structure
    tables = client.invokable_scripts_api().invoke_script(script_id="script-id")

    # Serialize to JSON
    output = tables.to_json(indent=5)
    print(output)

```

```

[
  {
    "_measurement": "mem",
    "_start": "2021-06-23T06:50:11.897825+00:00",
    "_stop": "2021-06-25T06:50:11.897825+00:00",
    "_time": "2020-02-27T16:20:00.897825+00:00",
    "region": "north",
    "_field": "usage",
    "_value": 15
  },
  {
    "_measurement": "mem",
    "_start": "2021-06-23T06:50:11.897825+00:00",
    "_stop": "2021-06-25T06:50:11.897825+00:00",
    "_time": "2020-02-27T16:20:01.897825+00:00",
    "region": "west",
    "_field": "usage",
    "_value": 10
  },
  ...
]

```

invoke_script_csv(*script_id*: str, *params*: Optional[dict] = None) → CSVIterator

Invoke synchronously a script and return result as a CSV iterator. Each iteration returns a row of the CSV file.

The bind parameters referenced in the script are substitutes with *params* key-values sent in the request body.

Parameters

- **script_id** (str) – The ID of the script to invoke. (required)
- **params** – bind parameters

Returns

Iterator[List[str]] wrapped into *CSVIterator*

Return type

CSVIterator

Serialization the query results to flattened list of values via *to_values()*:

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org") as client:

    # Query: using CSV iterator
    csv_iterator = client.invable_scripts_api().invoke_script_csv(script_id="script-id")

    # Serialize to values
    output = csv_iterator.to_values()
    print(output)
```

```
[
    [' ', 'result', 'table', '_start', '_stop', '_time', '_value', '_field', '_measurement', 'location']
    [' ', ' ', '0', '2022-06-16', '2022-06-16', '2022-06-16', '24.3', 'temperature', 'my_measurement', 'New York']
    [' ', ' ', '1', '2022-06-16', '2022-06-16', '2022-06-16', '25.3', 'temperature', 'my_measurement', 'Prague']
    ...
]
```

invoke_script_data_frame(*script_id*: str, *params*: Optional[dict] = None, *data_frame_index*: Optional[List[str]] = None)

Invoke synchronously a script and return Pandas DataFrame.

The bind parameters referenced in the script are substitutes with *params* key-values sent in the request body.

Note: If the script returns tables with differing schemas than the client generates a DataFrame for each of them.

Parameters

- **script_id** (str) – The ID of the script to invoke. (required)
- **data_frame_index** (List[str]) – The list of columns that are used as DataFrame index.
- **params** – bind parameters

Returns

DataFrame or List[DataFrame]

Warning: For the optimal processing of the query results use the *pivot()* function which align results as a table.

```
from(bucket:"my-bucket")
  |> range(start: -5m, stop: now())
  |> filter(fn: (r) => r._measurement == "mem")
  |> pivot(rowKey:["_time"], columnKey: ["_field"], valueColumn: "_value")
```

For more info see:

- <https://docs.influxdata.com/resources/videos/pivots-in-flux/>
- <https://docs.influxdata.com/flux/latest/stdlib/universe/pivot/>
- <https://docs.influxdata.com/flux/latest/stdlib/influxdata/influxdb/schema/fieldsascols/>

invoke_script_data_frame_stream(*script_id*: *str*, *params*: *Optional[dict]* = None, *data_frame_index*: *Optional[List[str]]* = None)

Invoke synchronously a script and return stream of Pandas DataFrame as a Generator['pd.DataFrame'].

The bind parameters referenced in the script are substitutes with *params* key-values sent in the request body.

Note: If the script returns tables with differing schemas than the client generates a DataFrame for each of them.

Parameters

- **script_id** (*str*) – The ID of the script to invoke. (required)
- **data_frame_index** (*List[str]*) – The list of columns that are used as DataFrame index.
- **params** – bind parameters

Returns

Generator[DataFrame]

Warning: For the optimal processing of the query results use the `pivot()` function which align results as a table.

```
from(bucket:"my-bucket")
  |> range(start: -5m, stop: now())
  |> filter(fn: (r) => r._measurement == "mem")
  |> pivot(rowKey:["_time"], columnKey: ["_field"], valueColumn: "_value")
```

For more info see:

- <https://docs.influxdata.com/resources/videos/pivots-in-flux/>
- <https://docs.influxdata.com/flux/latest/stdlib/universe/pivot/>
- <https://docs.influxdata.com/flux/latest/stdlib/influxdata/influxdb/schema/fieldsascols/>

invoke_script_raw(*script_id*: *str*, *params*: *Optional[dict]* = None) → *Iterator[List[str]]*

Invoke synchronously a script and return result as raw unprocessed result as a str.

The bind parameters referenced in the script are substitutes with *params* key-values sent in the request body.

Parameters

- **script_id** (*str*) – The ID of the script to invoke. (required)
- **params** – bind parameters

Returns

Result as a str.

invoke_script_stream(*script_id: str, params: Optional[dict] = None*) → Generator[*FluxRecord*, Any, None]

Invoke synchronously a script and return result as a Generator['FluxRecord'].

The bind parameters referenced in the script are substitutes with *params* key-values sent in the request body.

Parameters

- **script_id** (*str*) – The ID of the script to invoke. (required)
- **params** – bind parameters

Returns

Stream of FluxRecord.

Return type

Generator['FluxRecord']

update_script(*script_id: str, update_request: ScriptUpdateRequest*) → *Script*

Update a script.

Parameters

- **script_id** (*str*) – The ID of the script to update. (required)
- **update_request** (*ScriptUpdateRequest*) – Script updates to apply (required)

Returns

The updated.

```
class influxdb_client.domain.Script(id=None, name=None, description=None, org_id=None,
                                     script=None, language=None, url=None, created_at=None,
                                     updated_at=None)
```

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

Script - a model defined in OpenAPI.

property created_at

Get the created_at of this Script.

Returns

The created_at of this Script.

Return type

datetime

property description

Get the description of this Script.

Returns

The description of this Script.

Return type

str

property id

Get the id of this Script.

Returns

The id of this Script.

Return type

str

property language

Get the language of this Script.

Returns

The language of this Script.

Return type

ScriptLanguage

property name

Get the name of this Script.

Returns

The name of this Script.

Return type

str

property org_id

Get the org_id of this Script.

Returns

The org_id of this Script.

Return type

str

property script

Get the script of this Script.

The script to execute.

Returns

The script of this Script.

Return type

str

to_dict()

Return the model properties as a dict.

to_str()

Return the string representation of the model.

property updated_at

Get the updated_at of this Script.

Returns

The updated_at of this Script.

Return type

datetime

property url

Get the url of this Script.

The invocation endpoint address.

Returns

The url of this Script.

Return type

`str`

```
class influxdb_client.domain.ScriptCreateRequest(name=None, description=None, script=None,  
                                                language=None)
```

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

ScriptCreateRequest - a model defined in OpenAPI.

property description

Get the description of this ScriptCreateRequest.

Script description. A description of the script.

Returns

The description of this ScriptCreateRequest.

Return type

`str`

property language

Get the language of this ScriptCreateRequest.

Returns

The language of this ScriptCreateRequest.

Return type

`ScriptLanguage`

property name

Get the name of this ScriptCreateRequest.

Script name. The name must be unique within the organization.

Returns

The name of this ScriptCreateRequest.

Return type

`str`

property script

Get the script of this ScriptCreateRequest.

The script to execute.

Returns

The script of this ScriptCreateRequest.

Return type

`str`

to_dict()

Return the model properties as a dict.

to_str()

Return the string representation of the model.

2.10 DeleteApi

class influxdb_client.DeleteApi(*influxdb_client*)

Implementation for '/api/v2/delete' endpoint.

Initialize defaults.

delete(*start: Union[str, datetime], stop: Union[str, datetime], predicate: str, bucket: str, org: Optional[Union[str, Organization]] = None*) → None

Delete Time series data from InfluxDB.

Parameters

- **start** (*str, datetime.datetime*) – start time
- **stop** (*str, datetime.datetime*) – stop time
- **predicate** (*str*) – predicate
- **bucket** (*str*) – bucket id or name from which data will be deleted
- **org** (*str, Organization*) – specifies the organization to delete data from. Take the ID, Name or Organization. If not specified the default value from `InfluxDBClient.org` is used.

Returns

class influxdb_client.domain.DeletePredicateRequest(*start=None, stop=None, predicate=None*)

NOTE: This class is auto generated by OpenAPI Generator.

Ref: <https://openapi-generator.tech>

Do not edit the class manually.

DeletePredicateRequest - a model defined in OpenAPI.

property predicate

Get the predicate of this DeletePredicateRequest.

An expression in [delete predicate syntax](<https://docs.influxdata.com/influxdb/latest/reference/syntax/delete-predicate/>).

Returns

The predicate of this DeletePredicateRequest.

Return type

str

property start

Get the start of this DeletePredicateRequest.

A timestamp ([RFC3339 date/time format](<https://docs.influxdata.com/influxdb/latest/reference/glossary/#rfc3339-timestamp>)). The earliest time to delete from.

Returns

The start of this DeletePredicateRequest.

Return type

datetime

property stop

Get the stop of this DeletePredicateRequest.

A timestamp ([RFC3339 date/time format](https://docs.influxdata.com/influxdb/latest/reference/glossary/#rfc3339-timestamp)). The latest time to delete from.

Returns

The stop of this DeletePredicateRequest.

Return type

datetime

to_dict()

Return the model properties as a dict.

to_str()

Return the string representation of the model.

2.11 Helpers

class influxdb_client.client.util.date_utils.**DateHelper**(*timezone: tzinfo = datetime.timezone.utc*)

DateHelper to groups different implementations of date operations.

If you would like to serialize the query results to custom timezone, you can use following code:

```
from influxdb_client.client.util import date_utils
from influxdb_client.client.util.date_utils import DateHelper
import dateutil.parser
from dateutil import tz

def parse_date(date_string: str):
    return dateutil.parser.parse(date_string).astimezone(tz.gettz('ETC/GMT+2'))

date_utils.date_helper = DateHelper()
date_utils.date_helper.parse_date = parse_date
```

Initialize defaults.

Parameters

timezone – Default timezone used for serialization “datetime” without “tzinfo”. Default value is “UTC”.

parse_date(*date_string: str*)

Parse string into Date or Timestamp.

Returns

Returns a `datetime.datetime` object or compliant implementation like class `'pandas._libs.tslibs.timestamps.Timestamp`

to_nanoseconds(*delta*)

Get number of nanoseconds in timedelta.

Solution comes from v1 client. Thx. <https://github.com/influxdata/influxdb-python/pull/811>

to_utc(*value*: <module 'datetime' from '/home/docs/.asdf/installs/python/3.7.17/lib/python3.7/datetime.py'>)

Convert datetime to UTC timezone.

Parameters

value – datetime

Returns

datetime in UTC

```
class influxdb_client.client.util.date_utils_pandas.PandasDateTimeHelper(timezone: tinfo =
                                                                    date-
                                                                    time.timezone.utc)
```

DateHelper that use Pandas library with nanosecond precision.

Initialize defaults.

Parameters

timezone – Default timezone used for serialization “datetime” without “tinfo”. Default value is “UTC”.

parse_date(*date_string: str*)

Parse date string into class *'pandas._libs.tslibs.timestamps.Timestamp'*.

to_nanoseconds(*delta*)

Get number of nanoseconds with nanos precision.

```
class influxdb_client.client.util.multiprocessing_helper.MultiprocessingWriter(**kwargs)
```

The Helper class to write data into InfluxDB in independent OS process.

Example:

```
from influxdb_client import WriteOptions
from influxdb_client.client.util.multiprocessing_helper import MultiprocessingWriter

def main():
    writer = MultiprocessingWriter(url="http://localhost:8086", token="my-token",
    org="my-org",
    write_options=WriteOptions(batch_size=100))
    writer.start()

    for x in range(1, 1000):
        writer.write(bucket="my-bucket", record=f"mem,tag=a value={x}i {x}")

    writer.__del__()

if __name__ == '__main__':
    main()
```

How to use with context_manager:

```

from influxdb_client import WriteOptions
from influxdb_client.client.util.multiprocessing_helper import \
↳ MultiprocessingWriter

def main():
    with MultiprocessingWriter(url="http://localhost:8086", token="my-token", \
↳ org="my-org",
                                write_options=WriteOptions(batch_size=100)) as \
↳ writer:
        for x in range(1, 1000):
            writer.write(bucket="my-bucket", record=f"mem,tag=a value={x}i {x}")

if __name__ == '__main__':
    main()

```

How to handle batch events:

```

from influxdb_client import WriteOptions
from influxdb_client.client.exceptions import InfluxDBError
from influxdb_client.client.util.multiprocessing_helper import \
↳ MultiprocessingWriter

class BatchingCallback(object):

    def success(self, conf: (str, str, str), data: str):
        print(f"Written batch: {conf}, data: {data}")

    def error(self, conf: (str, str, str), data: str, exception: InfluxDBError):
        print(f"Cannot write batch: {conf}, data: {data} due: {exception}")

    def retry(self, conf: (str, str, str), data: str, exception: InfluxDBError):
        print(f"Retryable error occurs for batch: {conf}, data: {data} retry: \
↳ {exception}")

def main():
    callback = BatchingCallback()
    with MultiprocessingWriter(url="http://localhost:8086", token="my-token", \
↳ org="my-org",
                                success_callback=callback.success,
                                error_callback=callback.error,
                                retry_callback=callback.retry) as writer:

        for x in range(1, 1000):
            writer.write(bucket="my-bucket", record=f"mem,tag=a value={x}i {x}")

if __name__ == '__main__':
    main()

```

Initialize defaults.

For more information how to initialize the writer see the examples above.

Parameters

kwargs – arguments are passed into `__init__` function of `InfluxDBClient` and `write_api`.

run()

Initialize `InfluxDBClient` and waits for data to writes into InfluxDB.

start() → `None`

Start independent process for writing data into InfluxDB.

terminate() → `None`

Cleanup resources in independent process.

This function **cannot be used** to terminate the `MultiprocessingWriter`. If you want to finish your writes please call: `__del__`.

write(kwargs)** → `None`

Append time-series data into underlying queue.

For more information how to pass arguments see the examples above.

Parameters

kwargs – arguments are passed into `write` function of `WriteApi`

Returns

`None`

ASYNC API REFERENCE

- *InfluxDBClientAsync*
- *QueryApiAsync*
- *WriteApiAsync*
- *DeleteApiAsync*

3.1 InfluxDBClientAsync

```
class influxdb_client.client.influxdb_client_async.InfluxDBClientAsync(url, token:
                                Optional[str] = None,
                                org: Optional[str] =
                                None, debug=None,
                                timeout=10000,
                                enable_gzip=False,
                                **kwargs)
```

InfluxDBClientAsync is client for InfluxDB v2.

Initialize defaults.

Parameters

- **url** – InfluxDB server API url (ex. <http://localhost:8086>).
- **token** – token to authenticate to the InfluxDB 2.x
- **org** – organization name (used as a default in Query, Write and Delete API)
- **debug** – enable verbose logging of http requests
- **timeout** – The maximal number of milliseconds for the whole HTTP request including connection establishment, request sending and response reading. It can also be a `ClientTimeout` which is directly pass to `aiohttp`.
- **enable_gzip** – Enable Gzip compression for http requests. Currently, only the “Write” and “Query” endpoints supports the Gzip compression.

Key bool `verify_ssl`

Set this to false to skip verifying SSL certificate when calling API from https server.

Key str `ssl_ca_cert`

Set this to customize the certificate file to verify the peer.

Key str cert_file

Path to the certificate that will be used for mTLS authentication.

Key str cert_key_file

Path to the file contains private key for mTLS certificate.

Key str cert_key_password

String or function which returns password for decrypting the mTLS private key.

Key ssl.SSLContext ssl_context

Specify a custom Python SSL Context for the TLS/ mTLS handshake. Be aware that only delivered certificate/ key files or an SSL Context are possible.

Key str proxy

Set this to configure the http proxy to be used (ex. <http://localhost:3128>)

Key str proxy_headers

A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

Key int connection_pool_maxsize

The total number of simultaneous connections. Defaults to “multiprocessing.cpu_count() * 5”.

Key bool auth_basic

Set this to true to enable basic authentication when talking to a InfluxDB 1.8.x that does not use auth-enabled but is protected by a reverse proxy with basic authentication. (defaults to false, don't set to true when talking to InfluxDB 2)

Key str username

username to authenticate via username and password credentials to the InfluxDB 2.x

Key str password

password to authenticate via username and password credentials to the InfluxDB 2.x

Key bool allow_redirects

If set to False, do not follow HTTP redirects. True by default.

Key int max_redirects

Maximum number of HTTP redirects to follow. 10 by default.

Key dict client_session_kwargs

Additional configuration arguments for ClientSession

Key type client_session_type

Type of aiohttp client to use. Useful for third party wrappers like aiohttp-retry. ClientSession by default.

Key list[str] profilers

list of enabled Flux profilers

async build() → str

Return the build type of the connected InfluxDB Server.

Returns

The type of InfluxDB build.

async close()

Shutdown the client.

delete_api() → DeleteApiAsync

Get the asynchronous delete metrics API instance.

Returns

delete api

classmethod from_config_file(*config_file*: *str* = 'config.ini', *debug*=None, *enable_gzip*=False, ***kwargs*)

Configure client via configuration file. The configuration has to be under 'influx' section.

Parameters

- **config_file** – Path to configuration file
- **debug** – Enable verbose logging of http requests
- **enable_gzip** – Enable Gzip compression for http requests. Currently, only the “Write” and “Query” endpoints supports the Gzip compression.

Key config_name

Name of the configuration section of the configuration file

Key str proxy_headers

A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

Key urllib3.util.retry.Retry retries

Set the default retry strategy that is used for all HTTP requests except batching writes. As a default there is no one retry strategy.

Key ssl.SSLContext ssl_context

Specify a custom Python SSL Context for the TLS/ mTLS handshake. Be aware that only delivered certificate/ key files or an SSL Context are possible.

The supported formats:

- <https://docs.python.org/3/library/configparser.html>
- <https://toml.io/en/>
- <https://www.json.org/json-en.html>

Configuration options:

- url
- org
- token
- timeout,
- verify_ssl
- ssl_ca_cert
- cert_file
- cert_key_file
- cert_key_password
- connection_pool_maxsize
- auth_basic
- profilers
- proxy

config.ini example:

```
[influx2]
url=http://localhost:8086
org=my-org
token=my-token
timeout=6000
connection_pool_maxsize=25
auth_basic=false
profilers=query,operator
proxy=http:proxy.domain.org:8080

[tags]
id = 132-987-655
customer = California Miner
data_center = ${env.data_center}
```

config.toml example:

```
[influx2]
  url = "http://localhost:8086"
  token = "my-token"
  org = "my-org"
  timeout = 6000
  connection_pool_maxsize = 25
  auth_basic = false
  profilers="query, operator"
  proxy = "http://proxy.domain.org:8080"

[tags]
  id = "132-987-655"
  customer = "California Miner"
  data_center = "${env.data_center}"
```

config.json example:

```
{
  "url": "http://localhost:8086",
  "token": "my-token",
  "org": "my-org",
  "active": true,
  "timeout": 6000,
  "connection_pool_maxsize": 55,
  "auth_basic": false,
  "profilers": "query, operator",
  "tags": {
    "id": "132-987-655",
    "customer": "California Miner",
    "data_center": "${env.data_center}"
  }
}
```

classmethod from_env_properties(*debug=None, enable_gzip=False, **kwargs*)

Configure client via environment properties.

Parameters

- **debug** – Enable verbose logging of http requests
- **enable_gzip** – Enable Gzip compression for http requests. Currently, only the “Write” and “Query” endpoints supports the Gzip compression.

Key str proxy

Set this to configure the http proxy to be used (ex. <http://localhost:3128>)

Key str proxy_headers

A dictionary containing headers that will be sent to the proxy. Could be used for proxy authentication.

Key urllib3.util.retry.Retry retries

Set the default retry strategy that is used for all HTTP requests except batching writes. As a default there is no one retry strategy.

Key ssl.SSLContext ssl_context

Specify a custom Python SSL Context for the TLS/ mTLS handshake. Be aware that only delivered certificate/ key files or an SSL Context are possible.

Supported environment properties:

- INFLUXDB_V2_URL
- INFLUXDB_V2_ORG
- INFLUXDB_V2_TOKEN
- INFLUXDB_V2_TIMEOUT
- INFLUXDB_V2_VERIFY_SSL
- INFLUXDB_V2_SSL_CA_CERT
- INFLUXDB_V2_CERT_FILE
- INFLUXDB_V2_CERT_KEY_FILE
- INFLUXDB_V2_CERT_KEY_PASSWORD
- INFLUXDB_V2_CONNECTION_POOL_MAXSIZE
- INFLUXDB_V2_AUTH_BASIC
- INFLUXDB_V2_PROFILERS
- INFLUXDB_V2_TAG

async ping() → *bool*

Return the status of InfluxDB instance.

Returns

The status of InfluxDB.

query_api (*query_options*: ~*influxdb_client.client.query_api.QueryOptions* = <*influxdb_client.client.query_api.QueryOptions* object>) → *QueryApiAsync*

Create an asynchronous Query API instance.

Parameters

query_options – optional query api configuration

Returns

Query api instance

async version() → *str*

Return the version of the connected InfluxDB Server.

Returns

The version of InfluxDB.

write_api(*point_settings=<influxdb_client.client.write_api.PointSettings object>*) → *WriteApiAsync*

Create an asynchronous Write API instance.

Example:

```
from influxdb_client_async import InfluxDBClientAsync

# Initialize async/await instance of Write API
async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
    ↪, org="my-org") as client:
    write_api = client.write_api()
```

Parameters

point_settings – settings to store default tags

Returns

write api instance

3.2 QueryApiAsync

class `influxdb_client.client.query_api_async.QueryApiAsync`(*influxdb_client*,
query_options=<influxdb_client.client.query_api.QueryOptions object>)

Asynchronous implementation for ‘/api/v2/query’ endpoint.

Initialize query client.

Parameters

influxdb_client – influxdb client

async query(*query: str, org=None, params: Optional[dict] = None*) → *TableList*

Execute asynchronous Flux query and return result as a *FluxTable* list.

Parameters

- **query** – the Flux query
- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClientAsync.org` is used.
- **params** – bind parameters

Returns

FluxTable list wrapped into *TableList*

Return type

TableList

Serialization the query results to flattened list of values via `to_values()`:

```

from influxdb_client import InfluxDBClient

async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
    ↪org="my-org") as client:

    # Query: using Table structure
    tables = await client.query_api().query('from(bucket:"my-bucket") |>
    ↪range(start: -10m)')

    # Serialize to values
    output = tables.to_values(columns=['location', '_time', '_value'])
    print(output)

```

```

[
    ['New York', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593,
    ↪tzinfo=tzutc()), 24.3],
    ['Prague', datetime.datetime(2022, 6, 7, 11, 3, 22, 917593, tzinfo=tzutc()),
    ↪ 25.3],
    ...
]

```

Serialization the query results to JSON via `to_json()`:

```

from influxdb_client.client.influxdb_client_async import InfluxDBClientAsync

async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
    ↪org="my-org") as client:

    # Query: using Table structure
    tables = await client.query_api().query('from(bucket:"my-bucket") |>
    ↪range(start: -10m)')

    # Serialize to JSON
    output = tables.to_json(indent=5)
    print(output)

```

```

[
  {
    "_measurement": "mem",
    "_start": "2021-06-23T06:50:11.897825+00:00",
    "_stop": "2021-06-25T06:50:11.897825+00:00",
    "_time": "2020-02-27T16:20:00.897825+00:00",
    "region": "north",
    "_field": "usage",
    "_value": 15
  },
  {
    "_measurement": "mem",
    "_start": "2021-06-23T06:50:11.897825+00:00",
    "_stop": "2021-06-25T06:50:11.897825+00:00",
    "_time": "2020-02-27T16:20:01.897825+00:00",
    "region": "west",
    "_field": "usage",

```

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```

        "_value": 10
    },
    ...
]

```

async query_data_frame(query: *str*, org=None, data_frame_index: *Optional[List[str]]* = None, params: *Optional[dict]* = None, use_extension_dtypes: *bool* = False)

Execute asynchronous Flux query and return `DataFrame`.

Note: If the query returns tables with differing schemas than the client generates a `DataFrame` for each of them.

Parameters

- **query** – the Flux query
- **org** (*str*, `Organization`) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClientAsync.org` is used.
- **data_frame_index** – the list of columns that are used as `DataFrame` index
- **params** – bind parameters
- **use_extension_dtypes** – set to `True` to use panda's extension data types. Useful for queries with `pivot` function. When data has missing values, column data type may change (to object or float64). Nullable extension types (`Int64`, `Float64`, `boolean`) support `panda.NA` value. For more info, see https://pandas.pydata.org/docs/user_guide/missing_data.html.

Returns

`DataFrame` or `List[Dataframe]`

Warning: For the optimal processing of the query results use the `pivot()` function which align results as a table.

```

from(bucket:"my-bucket")
  |> range(start: -5m, stop: now())
  |> filter(fn: (r) => r._measurement == "mem")
  |> pivot(rowKey:["_time"], columnKey: ["_field"], valueColumn: "_value")

```

For more info see:

- <https://docs.influxdata.com/resources/videos/pivots-in-flux/>
- <https://docs.influxdata.com/flux/latest/stdlib/universe/pivot/>
- <https://docs.influxdata.com/flux/latest/stdlib/influxdata/influxdb/schema/fieldsascols/>

async query_data_frame_stream(query: *str*, org=None, data_frame_index: *Optional[List[str]]* = None, params: *Optional[dict]* = None, use_extension_dtypes: *bool* = False)

Execute asynchronous Flux query and return stream of `DataFrame` as an `AsyncGenerator[Dataframe]`.

Note: If the query returns tables with differing schemas than the client generates a DataFrame for each of them.

Parameters

- **query** – the Flux query
- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClientAsync.org` is used.
- **data_frame_index** – the list of columns that are used as DataFrame index
- **params** – bind parameters
- **use_extension_dtypes** – set to True to use panda's extension data types. Useful for queries with pivot function. When data has missing values, column data type may change (to object or float64). Nullable extension types (Int64, Float64, boolean) support panda.NA value. For more info, see https://pandas.pydata.org/docs/user_guide/missing_data.html.

Returns

AsyncGenerator[:class:`DataFrame`]

Warning: For the optimal processing of the query results use the `pivot()` function which align results as a table.

```
from(bucket:"my-bucket")
  |> range(start: -5m, stop: now())
  |> filter(fn: (r) => r._measurement == "mem")
  |> pivot(rowKey:["_time"], columnKey: ["_field"], valueColumn: "_value")
```

For more info see:

- <https://docs.influxdata.com/resources/videos/pivots-in-flux/>
- <https://docs.influxdata.com/flux/latest/stdlib/universe/pivot/>
- <https://docs.influxdata.com/flux/latest/stdlib/influxdata/influxdb/schema/fieldsascols/>

async query_raw(*query: str*, *org=None*, *dialect={'annotations': ['datatype', 'group', 'default'], 'comment_prefix': '#', 'date_time_format': 'RFC3339', 'delimiter': ',', 'header': True}*, *params: Optional[dict] = None*)

Execute asynchronous Flux query and return result as raw unprocessed result as a str.

Parameters

- **query** – a Flux query
- **org** (*str*, *Organization*) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClientAsync.org` is used.
- **dialect** – csv dialect format
- **params** – bind parameters

Returns`str`

async query_stream(*query: str, org=None, params: Optional[dict] = None*) →
`AsyncGenerator[FluxRecord, None]`

Execute asynchronous Flux query and return stream of `FluxRecord` as an `AsyncGenerator[FluxRecord]`.

Parameters

- **query** – the Flux query
- **org** (`str, Organization`) – specifies the organization for executing the query; Take the ID, Name or Organization. If not specified the default value from `InfluxDBClientAsync.org` is used.
- **params** – bind parameters

Returns`AsyncGenerator[FluxRecord]`

3.3 WriteApiAsync

```
class influxdb_client.client.write_api_async.WriteApiAsync(influxdb_client, point_settings: ~in-  
                                                         fluxdb_client.client.write_api.PointSettings  
                                                         = <in-  
                                                         fluxdb_client.client.write_api.PointSettings  
                                                         object>)
```

Implementation for ‘/api/v2/write’ endpoint.

Example:

```
from influxdb_client_async import InfluxDBClientAsync

# Initialize async/await instance of Write API
async with InfluxDBClientAsync(url="http://localhost:8086", token="my-token",
                               org="my-org") as client:
    write_api = client.write_api()
```

Initialize defaults.

Parameters

- **influxdb_client** – with default settings (organization)
- **point_settings** – settings to store default tags.

async write(*bucket: str, org: Optional[str] = None, record: Optional[Union[str, Iterable[str], Point,*
Iterable[Point], dict, Iterable[dict], bytes, Iterable[bytes], NamedTuple, Iterable[NamedTuple],
*dataclass, Iterable[dataclass]]] = None, write_precision: WritePrecision = 'ns', **kwargs*) →
`bool`

Write time-series data into InfluxDB.

Parameters

- **bucket** (`str`) – specifies the destination bucket for writes (required)

- **org** (*str*, *Organization*) – specifies the destination organization for writes; take the ID, Name or Organization. If not specified the default value from `InfluxDBClientAsync.org` is used.
- **write_precision** (*WritePrecision*) – specifies the precision for the unix timestamps within the body line-protocol. The precision specified on a Point has precedes and is use for write.
- **record** – Point, Line Protocol, Dictionary, NamedTuple, Data Classes, Pandas DataFrame

Key data_frame_measurement_name

name of measurement for writing Pandas DataFrame - DataFrame

Key data_frame_tag_columns

list of DataFrame columns which are tags, rest columns will be fields - DataFrame

Key data_frame_timestamp_column

name of DataFrame column which contains a timestamp. The column can be defined as a *str* value formatted as `2018-10-26`, `2018-10-26 12:00`, `2018-10-26 12:00:00-05:00` or other formats and types supported by `pandas.to_datetime` - DataFrame

Key data_frame_timestamp_timezone

name of the timezone which is used for timestamp column - DataFrame

Key record_measurement_key

key of record with specified measurement - dictionary, NamedTuple, dataclass

Key record_measurement_name

static measurement name - dictionary, NamedTuple, dataclass

Key record_time_key

key of record with specified timestamp - dictionary, NamedTuple, dataclass

Key record_tag_keys

list of record keys to use as a tag - dictionary, NamedTuple, dataclass

Key record_field_keys

list of record keys to use as a field - dictionary, NamedTuple, dataclass

Returns

True for successfully accepted data, otherwise raise an exception

Example:

```
# Record as Line Protocol
await write_api.write("my-bucket", "my-org", "h2o_feet,location=us-west_
↪level=125i 1")

# Record as Dictionary
dictionary = {
    "measurement": "h2o_feet",
    "tags": {"location": "us-west"},
    "fields": {"level": 125},
    "time": 1
}
await write_api.write("my-bucket", "my-org", dictionary)

# Record as Point
from influxdb_client import Point
```

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```
point = Point("h2o_feet").tag("location", "us-west").field("level", 125).
    ↪time(1)
await write_api.write("my-bucket", "my-org", point)
```

DataFrame:

If the `data_frame_timestamp_column` is not specified the index of `Pandas DataFrame` is used as a timestamp for written data. The index can be `PeriodIndex` or its must be transformable to `datetime` by `pandas.to_datetime`.

If you would like to transform a column to `PeriodIndex`, you can use something like:

```
import pandas as pd

# DataFrame
data_frame = ...
# Set column as Index
data_frame.set_index('column_name', inplace=True)
# Transform index to PeriodIndex
data_frame.index = pd.to_datetime(data_frame.index, unit='s')
```

3.4 DeleteApiAsync

class `influxdb_client.client.delete_api_async.DeleteApiAsync(influxdb_client)`

Async implementation for `/api/v2/delete` endpoint.

Initialize defaults.

async delete(*start: Union[str, datetime], stop: Union[str, datetime], predicate: str, bucket: str, org: Optional[Union[str, Organization]] = None*) → bool

Delete Time series data from InfluxDB.

Parameters

- **start** (*str, datetime.datetime*) – start time
- **stop** (*str, datetime.datetime*) – stop time
- **predicate** (*str*) – predicate
- **bucket** (*str*) – bucket id or name from which data will be deleted
- **org** (*str, Organization*) – specifies the organization to delete data from. Take the ID, Name or Organization. If not specified the default value from `InfluxDBClientAsync.org` is used.

Returns

True for successfully deleted data, otherwise raise an exception

MIGRATION GUIDE

This guide is meant to help you migrate your Python code from `influxdb-python` to `influxdb-client-python` by providing code examples that cover common usages.

If there is something missing, please feel free to create a [new request](#) for a guide enhancement.

4.1 Before You Start

Please take a moment to review the following client docs:

- [User Guide, README.rst](#)
- [Examples](#)
- [API Reference](#)
- [CHANGELOG.md](#)

4.2 Content

- *Initializing Client*
- *Creating Database/Bucket*
- *Dropping Database/Bucket*
- **Writes**
 - *LineProtocol*
 - *Dictionary-style object*
 - *Structured data*
 - *Pandas DataFrame*
- *Querying*

4.3 Initializing Client

influxdb-python

```
from influxdb import InfluxDBClient

client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
↳ database='dbname')
```

influxdb-client-python

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url='http://localhost:8086', token='my-token', org='my-org') as
↳ client:
    pass
```

4.4 Creating Database/Bucket

influxdb-python

```
from influxdb import InfluxDBClient

client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
↳ database='dbname')

dbname = 'example'
client.create_database(dbname)
client.create_retention_policy('awesome_policy', '60m', 3, database=dbname, default=True)
```

influxdb-client-python

```
from influxdb_client import InfluxDBClient, BucketRetentionRules

org = 'my-org'

with InfluxDBClient(url='http://localhost:8086', token='my-token', org=org) as client:
    buckets_api = client.buckets_api()

    # Create Bucket with retention policy set to 3600 seconds and name "bucket-by-python"
    retention_rules = BucketRetentionRules(type="expire", every_seconds=3600)
    created_bucket = buckets_api.create_bucket(bucket_name="bucket-by-python",
                                                retention_rules=retention_rules,
                                                org=org)
```

4.5 Dropping Database/Bucket

influxdb-python

```
from influxdb import InfluxDBClient

client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
↳ database='dbname')

dbname = 'example'
client.drop_database(dbname)
```

influxdb-client-python

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url='http://localhost:8086', token='my-token', org='my-org') as
↳ client:
    buckets_api = client.buckets_api()

    bucket = buckets_api.find_bucket_by_name("my-bucket")
    buckets_api.delete_bucket(bucket)
```

4.6 Writing LineProtocol

influxdb-python

```
from influxdb import InfluxDBClient

client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
↳ database='dbname')

client.write('h2o_feet,location=coyote_creek water_level=1.0 1', protocol='line')
```

influxdb-client-python

```
from influxdb_client import InfluxDBClient
from influxdb_client.client.write_api import SYNCHRONOUS

with InfluxDBClient(url='http://localhost:8086', token='my-token', org='my-org') as
↳ client:
    write_api = client.write_api(write_options=SYNCHRONOUS)

    write_api.write(bucket='my-bucket', record='h2o_feet,location=coyote_creek water_
↳ level=1.0 1')
```

4.7 Writing Dictionary-style object

influxdb-python

```
from influxdb import InfluxDBClient

record = [
    {
        "measurement": "cpu_load_short",
        "tags": {
            "host": "server01",
            "region": "us-west"
        },
        "time": "2009-11-10T23:00:00Z",
        "fields": {
            "Float_value": 0.64,
            "Int_value": 3,
            "String_value": "Text",
            "Bool_value": True
        }
    }
]

client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
↳ database='dbname')

client.write_points(record)
```

influxdb-client-python

```
from influxdb_client import InfluxDBClient
from influxdb_client.client.write_api import SYNCHRONOUS

with InfluxDBClient(url='http://localhost:8086', token='my-token', org='my-org') as
↳ client:
    write_api = client.write_api(write_options=SYNCHRONOUS)

    record = [
        {
            "measurement": "cpu_load_short",
            "tags": {
                "host": "server01",
                "region": "us-west"
            },
            "time": "2009-11-10T23:00:00Z",
            "fields": {
                "Float_value": 0.64,
                "Int_value": 3,
                "String_value": "Text",
                "Bool_value": True
            }
        }
    ]
```

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```
write_api.write(bucket='my-bucket', record=record)
```

4.8 Writing Structured Data

influxdb-python

```
from influxdb import InfluxDBClient
from influxdb import SeriesHelper

my_client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
    ↪ database='dbname')

class MySeriesHelper(SeriesHelper):
    class Meta:
        client = my_client
        series_name = 'events.stats.{server_name}'
        fields = ['some_stat', 'other_stat']
        tags = ['server_name']
        bulk_size = 5
        autocommit = True

MySeriesHelper(server_name='us.east-1', some_stat=159, other_stat=10)
MySeriesHelper(server_name='us.east-1', some_stat=158, other_stat=20)

MySeriesHelper.commit()
```

The influxdb-client-python doesn't have an equivalent implementation for MySeriesHelper, but there is an option to use Python [Data Classes](#) way:

influxdb-client-python

```
from dataclasses import dataclass

from influxdb_client import InfluxDBClient
from influxdb_client.client.write_api import SYNCHRONOUS

@dataclass
class Car:
    """
    DataClass structure - Car
    """
    engine: str
    type: str
    speed: float

with InfluxDBClient(url='http://localhost:8086', token='my-token', org='my-org') as
```

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```

↪ client:
    write_api = client.write_api(write_options=SYNCHRONOUS)

    car = Car('12V-BT', 'sport-cars', 125.25)

    write_api.write(bucket="my-bucket",
                    record=car,
                    record_measurement_name="performance",
                    record_tag_keys=["engine", "type"],
                    record_field_keys=["speed"])

```

4.9 Writing Pandas DataFrame

influxdb-python

```

import pandas as pd

from influxdb import InfluxDBClient

df = pd.DataFrame(data=list(range(30)),
                  index=pd.date_range(start='2014-11-16', periods=30, freq='H'),
                  columns=['0'])

client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
↪ database='dbname')

client.write_points(df, 'demo', protocol='line')

```

influxdb-client-python

```

import pandas as pd

from influxdb_client import InfluxDBClient
from influxdb_client.client.write_api import SYNCHRONOUS

with InfluxDBClient(url='http://localhost:8086', token='my-token', org='my-org') as ↪
↪ client:
    write_api = client.write_api(write_options=SYNCHRONOUS)

    df = pd.DataFrame(data=list(range(30)),
                      index=pd.date_range(start='2014-11-16', periods=30, freq='H'),
                      columns=['0'])

    write_api.write(bucket='my-bucket', record=df, data_frame_measurement_name='demo')

```


4.10 Querying

influxdb-python

```
from influxdb import InfluxDBClient

client = InfluxDBClient(host='127.0.0.1', port=8086, username='root', password='root',
↳ database='dbname')

points = client.query('SELECT * from cpu').get_points()
for point in points:
    print(point)
```

influxdb-client-python

```
from influxdb_client import InfluxDBClient

with InfluxDBClient(url='http://localhost:8086', token='my-token', org='my-org',
↳ debug=True) as client:
    query = '''from(bucket: "my-bucket")
|> range(start: -100000d)
|> filter(fn: (r) => r["_measurement"] == "cpu")
|> pivot(rowKey:["_time"], columnKey: ["_field"], valueColumn: "_value")
'''

    tables = client.query_api().query(query)
    for record in [record for table in tables for record in table.records]:
        print(record.values)
```

If you would like to omit boilerplate columns such as `_result`, `_table`, `_start`, ... you can filter the record values by following expression:

```
print({k: v for k, v in record.values.items() if k not in ['result', 'table', '_start',
↳ '_stop', '_measurement']})
```

For more info see [Flux Response Format](#).

DEVELOPMENT

The following document covers how to develop the InfluxDB client library locally. Including how to run tests and build the docs.

- *tl;dr*
- *Getting Started With Development*
- *Linting*
- *Testing*
 - *Code Coverage*
- *Documentation Building*

5.1 tl;dr

```
# from your forked repo, create and activate a virtualenv
python -m virtualenv venv
. venv/bin/activate
# install the library as editable with all dependencies
make install
# make edits
# run lint and tests
make lint test
```

5.2 Getting Started With Development

1. Install Python

Most distributions include Python by default, so before going too far, try running `python --version` to see if it already exists. You may also have to specify `python3 --version`, for example, on Ubuntu.

2. Fork and clone the repo

The rest of this assumes you have cloned your fork of the upstream [client library](#) and are in the same directory of the forked repo.

3. Set up a virtual environment.

Python virtual environments let you install specific versioned dependencies in a contained manner. This way, you do not pollute or have conflicts on your system with different versions.

```
python -m virtualenv venv
. venv/bin/activate
```

Having a shell prompt change via [starship](#) or something similar is nice as it will let you know when and which virtual environment in you are in.

To exit the virtual environment, run `deactivate`.

4. Install the client library

To install the local version of the client library run:

```
make install
```

This will install the library as editable with all dependencies. This includes all dependencies that are used for all possible features as well as testing requirements.

5. Make changes and test

At this point, a user can make the required changes necessary and run any tests or scripts they have.

Before putting up a PR, the user should attempt to run the *lint* and *tests* locally. Lint will ensure the formatting of the code, while tests will run integration tests against an InfluxDB instance. For details on that set up see the next section.

```
make lint test
```

5.3 Linting

The library uses flake8 to do linting and can be run with:

```
make lint
```

5.4 Testing

The built-in tests assume that there is a running instance of InfluxDB 2.x up and running. This can be accomplished by running the `scripts/influxdb-restart.sh` script. It will launch an InfluxDB 2.x instance with Docker and make it available locally on port 8086.

Once InfluxDB is available, run all the tests with:

```
make test
```

5.4.1 Code Coverage

After running the tests, an HTML report of the tests is available in the `htmlcov` directory. Users can open `html/index.html` file in a browser and see a full report for code coverage across the whole project. Clicking on a specific file will show a line-by-line report of what lines were or were not covered.

5.5 Documentation Building

The docs are built using Sphinx. To build all the docs run:

```
make docs
```

This will build and produce a sample version of the web docs at `docs/_build/html/index.html`. From there the user can view the entire site and ensure changes are rendered correctly.

This repository contains the Python client library for use with InfluxDB 2.x and Flux. InfluxDB 3.x users should instead use the lightweight [v3 client library](#). InfluxDB 1.x users should use the [v1 client library](#).

For ease of migration and a consistent query and write experience, v2 users should consider using InfluxQL and the [v1 client library](#).

The API of the **influxdb-client-python** is not the backwards-compatible with the old one - **influxdb-python**.

DOCUMENTATION

This section contains links to the client library documentation.

- [Product documentation, Getting Started](#)
- [Examples](#)
- [API Reference](#)
- [Changelog](#)

INFLUXDB 2.0 CLIENT FEATURES

- Querying data
 - using the Flux language
 - into csv, raw data, `flux_table` structure, `Pandas DataFrame`
 - *How to query*
- Writing data using
- `Line Protocol`
- `Data Point`
- `RxPY Observable`
- `Pandas DataFrame`
- *How to write*
- `InfluxDB 2.0 API` client for management
 - the client is generated from the `swagger` by using the `openapi-generator`
 - organizations & users management
 - buckets management
 - tasks management
 - authorizations
 - health check
 - ...
- *InfluxDB 1.8 API compatibility*
- Examples
 - *Connect to InfluxDB Cloud*
 - *How to efficiently import large dataset*
 - *Efficiency write data from IOT sensor*
 - *How to use Jupyter + Pandas + InfluxDB 2*
- *Advanced Usage*
 - *Gzip support*
 - *Proxy configuration*

- *Nanosecond precision*
- *Delete data*
- *Handling Errors*
- *Logging*

INSTALLATION

InfluxDB python library uses [RxPY](#) - The Reactive Extensions for Python (RxPY).

Python 3.7 or later is required.

:warning:

It is recommended to use `ciso8601` with client for parsing dates. `ciso8601` is much faster than built-in Python `datetime`. Since it's written as a C module the best way is build it from sources:

Windows:

You have to install [Visual C++ Build Tools 2015](#) to build `ciso8601` by pip.

conda:

Install from sources: `conda install -c conda-forge/label/cf202003 ciso8601`.

8.1 pip install

The python package is hosted on [PyPI](#), you can install latest version directly:

```
pip install 'influxdb-client[ciso]'
```

Then import the package:

```
import influxdb_client
```

If your application uses `async/await` in Python you can install with the `async` extra:

```
$ pip install influxdb-client[async]
```

For more info see *How to use Asyncio*.

8.2 Setuptools

Install via [Setuptools](#).

```
python setup.py install --user
```

(or `sudo python setup.py install` to install the package for all users)

GETTING STARTED

Please follow the *Installation* and then run the following:

```
from influxdb_client import InfluxDBClient, Point
from influxdb_client.client.write_api import SYNCHRONOUS

bucket = "my-bucket"

client = InfluxDBClient(url="http://localhost:8086", token="my-token", org="my-org")

write_api = client.write_api(write_options=SYNCHRONOUS)
query_api = client.query_api()

p = Point("my_measurement").tag("location", "Prague").field("temperature", 25.3)

write_api.write(bucket=bucket, record=p)

## using Table structure
tables = query_api.query('from(bucket:"my-bucket") |> range(start: -10m)')

for table in tables:
    print(table)
    for row in table.records:
        print (row.values)

## using csv library
csv_result = query_api.query_csv('from(bucket:"my-bucket") |> range(start: -10m)')
val_count = 0
for row in csv_result:
    for cell in row:
        val_count += 1
```


CLIENT CONFIGURATION

10.1 Via File

A client can be configured via *.ini file in segment influx2.

The following options are supported:

- `url` - the url to connect to InfluxDB
- `org` - default destination organization for writes and queries
- `token` - the token to use for the authorization
- `timeout` - socket timeout in ms (default value is 10000)
- `verify_ssl` - set this to false to skip verifying SSL certificate when calling API from https server
- `ssl_ca_cert` - set this to customize the certificate file to verify the peer
- `cert_file` - path to the certificate that will be used for mTLS authentication
- `cert_key_file` - path to the file contains private key for mTLS certificate
- `cert_key_password` - string or function which returns password for decrypting the mTLS private key
- `connection_pool_maxsize` - set the number of connections to save that can be reused by urllib3
- `auth_basic` - enable http basic authentication when talking to a InfluxDB 1.8.x without authentication but is accessed via reverse proxy with basic authentication (defaults to false)
- `profilers` - set the list of enabled [Flux profilers](#)

```
self.client = InfluxDBClient.from_config_file("config.ini")
```

```
[influx2]
url=http://localhost:8086
org=my-org
token=my-token
timeout=6000
verify_ssl=False
```

10.2 Via Environment Properties

A client can be configured via environment properties.

Supported properties are:

- INFLUXDB_V2_URL - the url to connect to InfluxDB
- INFLUXDB_V2_ORG - default destination organization for writes and queries
- INFLUXDB_V2_TOKEN - the token to use for the authorization
- INFLUXDB_V2_TIMEOUT - socket timeout in ms (default value is 10000)
- INFLUXDB_V2_VERIFY_SSL - set this to false to skip verifying SSL certificate when calling API from https server
- INFLUXDB_V2_SSL_CA_CERT - set this to customize the certificate file to verify the peer
- INFLUXDB_V2_CERT_FILE - path to the certificate that will be used for mTLS authentication
- INFLUXDB_V2_CERT_KEY_FILE - path to the file contains private key for mTLS certificate
- INFLUXDB_V2_CERT_KEY_PASSWORD - string or function which returns password for decrypting the mTLS private key
- INFLUXDB_V2_CONNECTION_POOL_MAXSIZE - set the number of connections to save that can be reused by urllib3
- INFLUXDB_V2_AUTH_BASIC - enable http basic authentication when talking to a InfluxDB 1.8.x without authentication but is accessed via reverse proxy with basic authentication (defaults to false)
- INFLUXDB_V2_PROFILERS - set the list of enabled [Flux profilers](#)

```
self.client = InfluxDBClient.from_env_properties()
```

10.3 Profile query

The [Flux Profiler package](#) provides performance profiling tools for Flux queries and operations.

You can enable printing profiler information of the Flux query in client library by:

- set QueryOptions.profilers in QueryApi,
- set INFLUXDB_V2_PROFILERS environment variable,
- set profilers option in configuration file.

When the profiler is enabled, the result of flux query contains additional tables “profiler/”. In order to have consistent behaviour with enabled/disabled profiler, FluxCSVParser excludes “profiler/” measurements from result.

Example how to enable profilers using API:

```
q = '''
    from(bucket: stringParam)
      |> range(start: -5m, stop: now())
      |> filter(fn: (r) => r._measurement == "mem")
      |> filter(fn: (r) => r._field == "available" or r._field == "free" or r._field ==
↪ "used")
      |> aggregateWindow(every: 1m, fn: mean)
```

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```

    |> pivot(rowKey=["_time"], columnKey: ["_field"], valueColumn: "_value")
...
p = {
    "stringParam": "my-bucket",
}

query_api = client.query_api(query_options=QueryOptions(profilers=["query", "operator"]))
csv_result = query_api.query(query=q, params=p)

```

Example of a profiler output:

```

=====
Profiler: query
=====

from(bucket: stringParam)
  |> range(start: -5m, stop: now())
  |> filter(fn: (r) => r._measurement == "mem")
  |> filter(fn: (r) => r._field == "available" or r._field == "free" or r._field == "used"
  |> aggregateWindow(every: 1m, fn: mean)
  |> pivot(rowKey=["_time"], columnKey: ["_field"], valueColumn: "_value")

=====
Profiler: profiler/query
=====

result          : _profiler
table           : 0
_measurement     : profiler/query
TotalDuration   : 8924700
CompileDuration : 350900
QueueDuration   : 33800
PlanDuration    : 0
RequeueDuration : 0
ExecuteDuration : 8486500
Concurrency     : 0
MaxAllocated    : 2072
TotalAllocated  : 0
flux/query-plan :

digraph {
    ReadWindowAggregateByTime11
    // every = 1m, aggregates = [mean], createEmpty = true, timeColumn = "_stop"
    pivot8
    generated_yield

    ReadWindowAggregateByTime11 -> pivot8
    pivot8 -> generated_yield
}

influxdb/scanned-bytes: 0

```

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```

influxdb/scanned-values: 0

=====
Profiler: profiler/operator
=====
result          : _profiler
table           : 1
_measurement     : profiler/operator
Type            : *universe.pivotTransformation
Label           : pivot8
Count           : 3
MinDuration     : 32600
MaxDuration     : 126200
DurationSum     : 193400
MeanDuration    : 64466.666666666664

=====
Profiler: profiler/operator
=====
result          : _profiler
table           : 1
_measurement     : profiler/operator
Type            : *influxdb.readWindowAggregateSource
Label           : ReadWindowAggregateByTime11
Count           : 1
MinDuration     : 940500
MaxDuration     : 940500
DurationSum     : 940500
MeanDuration    : 940500.0

```

You can also use callback function to get profilers output. Return value of this callback is type of FluxRecord.

Example how to use profilers with callback:

```

class ProfilersCallback(object):
    def __init__(self):
        self.records = []

    def __call__(self, flux_record):
        self.records.append(flux_record.values)

callback = ProfilersCallback()

query_api = client.query_api(query_options=QueryOptions(profilers=["query", "operator"],
    profiler_callback=callback))
tables = query_api.query('from(bucket:"my-bucket") |> range(start: -10m)')

for profiler in callback.records:
    print(f'Custom processing of profiler result: {profiler}')

```

Example output of this callback:

```
Custom processing of profiler result: {'result': '_profiler', 'table': 0, '_measurement': 'profiler/query', 'TotalDuration': 18843792, 'CompileDuration': 1078666, 'QueueDuration': 93375, 'PlanDuration': 0, 'RequeueDuration': 0, 'ExecuteDuration': 17371000, 'Concurrency': 0, 'MaxAllocated': 448, 'TotalAllocated': 0, 'RuntimeErrors': None, 'flux/query-plan': 'digraph {\r\n  ReadRange2\r\n  generated_yield\r\n\r\n  ReadRange2 -> generated_yield\r\n}\r\n\r\n', 'influxdb/scanned-bytes': 0, 'influxdb/scanned-values': 0}
Custom processing of profiler result: {'result': '_profiler', 'table': 1, '_measurement': 'profiler/operator', 'Type': '*influxdb.readFilterSource', 'Label': 'ReadRange2', 'Count': 1, 'MinDuration': 3274084, 'MaxDuration': 3274084, 'DurationSum': 3274084, 'MeanDuration': 3274084.0}
```


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