influxdb_client

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USER GUIDE

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 suppose 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.

1.2.2 Batching

The batching is configurable by `write_options`:

Property	Description	Default Value
batch_size	the number of data point to collect in a batch	1000
flush_interval	the number of milliseconds before the batch is written	1000
jitter_interval	the number of milliseconds to increase the batch flush interval by a random amount	0
retry_interval	the 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
max_retry_time	maximum total retry timeout in milliseconds.	180_000
max_retries	the number of max retries when write fails	5
max_retry_delay	the maximum delay between each retry attempt in milliseconds	125_000
max_close_wait	the maximum amount of time to wait for batches to flush when *.close()* is called	300_000
exponential_base	the base for the exponential retry delay, the next delay is computed using random exponential backoff as a random value within the interval `retry_interval * exponential_base^(attempts-1)` and `retry_interval * exponential_base^(attempts)`. Example for `retry_interval=5_000, exponential_base=2, max_retry_delay=125_000, 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

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"])
```

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```
        """
        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}])

        """
        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.utcnow()
```

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```
        _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 a 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
```

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```
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=
```

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```
↪'my-org')

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

1.4 Pandas DataFrame

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

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

The `client` is able to retrieve data in Pandas DataFrame format thought `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 of 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:

```
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.utcfromtimestamp(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 async 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:
```

Note: 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:
```

Note: 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 send. 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
```

Note: 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 proper `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)
```

Note: 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 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␣
↪1198195200000000000

    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
```

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```
    :return: Parsed csv row to [Point]
    """

    """
     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
"""
```

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```
query = 'from(bucket:"my-bucket")' \
        ' |> range(start: 0, stop: now())' \
        ' |> 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].
```

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```
    :return: actual CPU temperature
    """
    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)
```

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```
input()
```

1.12.3 Connect to InfluxDB Cloud

The following example demonstrate a simplest way how to write and query date 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

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.utcnow())

    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()
```

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```
    """
    Query written data
    """
    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()
```

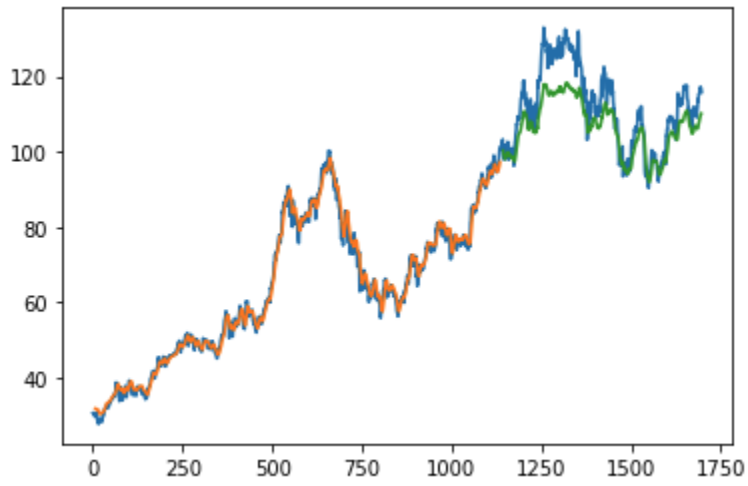
1.12.4 How to use Jupyter + Pandas + InfluxDB 2

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.

CHAPTER

TWO

API REFERENCE

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 writen 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 writen 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*)

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

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*)

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

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

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
    },
    {
        "_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-
↪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 writen 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 writen 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",
                        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
```

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```
    },
    "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 after
The 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

`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,␣
↪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:
```

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```
    # 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
```

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```
    csv_iterator = client.invokable_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: tzinfo = datetime.timezone.utc*)

DateHelper that use Pandas library with nanosecond precision.

Initialize defaults.

Parameters
timezone – Default timezone used for serialization "datetime" without "tzinfo". 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",␣
```

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```
↪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

CHAPTER

THREE

ASYNC API REFERENCE

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.QueryO 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*)

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

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*)

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

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: ~influxdb_client.client.write_api.PointSettings = <influxdb_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
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 = ...
```

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```
# 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

CHAPTER

FOUR

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

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: -10000d)
  |> 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.

CHAPTER

FIVE

DEVELOPMENT

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

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

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

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**.

CHAPTER

SIX

DOCUMENTATION

This section contains links to the client library documentation.

- Product documentation, *Getting Started*
- Examples
- API Reference
- Changelog

CHAPTER

SEVEN

INFLUXDB 2.0 CLIENT FEATURES

- **Querying data**
  - using the Flux language
  - into csv, raw data, flux_table structure, Pandas DataFrame
  - *How to queries*
- **Writing data using**
  - Line Protocol
  - Data Point
  - RxPY Observable
  - Pandas DataFrame
  - *How to writes*
- **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`_

CHAPTER

EIGHT

INSTALLATION

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

Python 3.7 or later is required.

Note: 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)

CHAPTER

NINE

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
```

CHAPTER

TEN

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}
```

CHAPTER

ELEVEN

INDICES AND TABLES

- genindex
- modindex
- search

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