TBP01: Lecture Summary

Overview

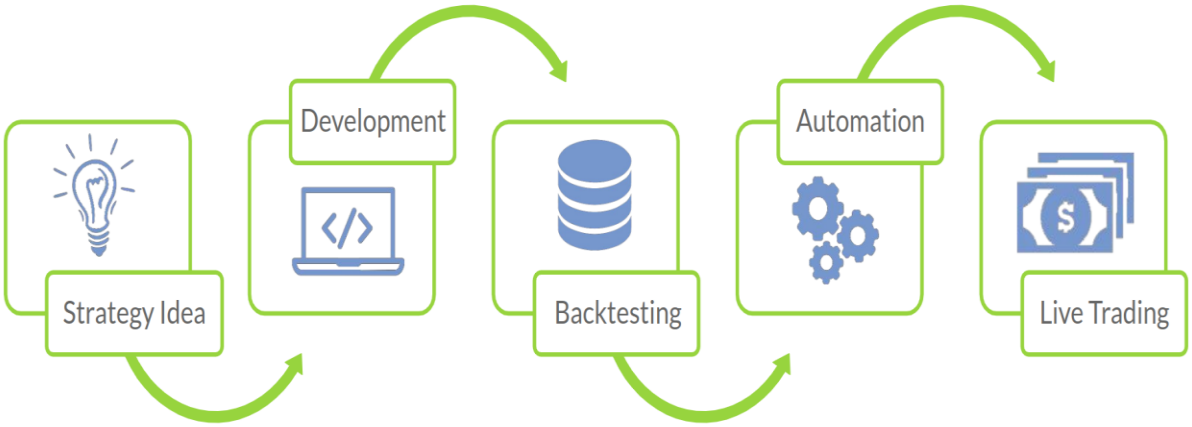
The TBP (Trading and Backtesting Platforms) module helps you understand trading using IB python API, Blueshift and IBridgePy. This document summarises the TBP-01 lecture on using Python API for Interactive Brokers (IB). After this lecture, you should be able to create trading algorithms and deploy them in live markets.

The lecture covers the following topics:

1. The life cycle of a strategy
2. Working with IB TWS
3. Understanding IB TWS API architecture
4. IB API demonstrations in Python
5. Limitations of IB API
6. Overview of cloud computing

The life cycle of a strategy

The following snapshot shows different stages of building a strategy.



Working with IB TWS

IB TWS is Interactive Brokers' Trader WorkStation (TWS) which can be downloaded from here. Details are provided in the installation guide on the LMS portal.

There are two ways to work with the IB platform -

1. Manual trading
2. Automated trading

Manual trading workflow

Automated trading workflow

Understanding IB TWS API structure

Overview

In the automated trading workflow, we use IB API to interact with IB TWS.

- It is the official API by IB.
- It allows operations including but not limited to:
    - Order placement
    - Receiving market data and portfolio data
    - Receiving account values

- Querying financial instrument details
- It supports multiple account types and programming languages

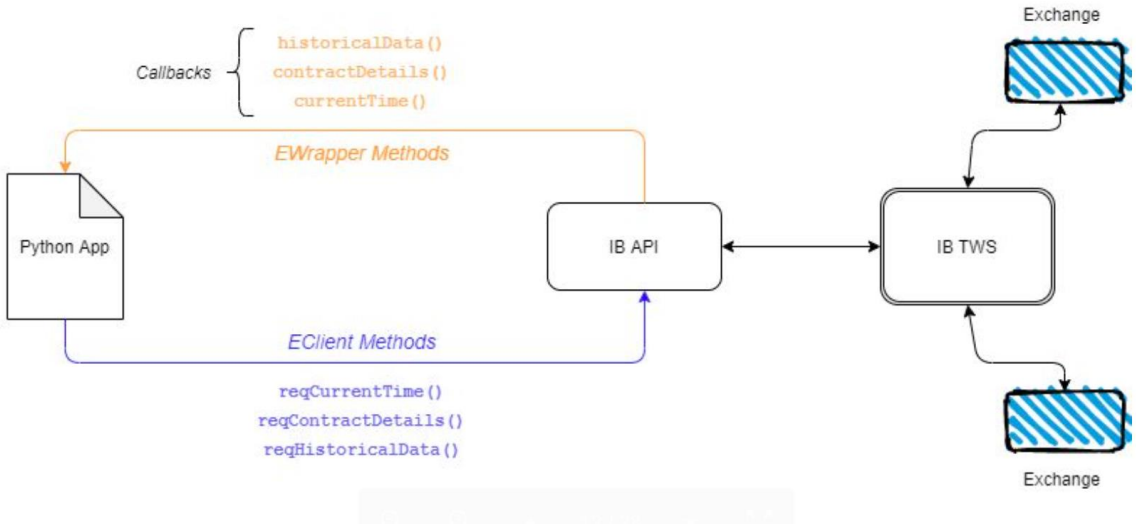
The installation guide is available on the LMS portal.

The IB API consists of the following components:

1. EClient Class
    - It's used to send requests to TWS from Python client
    - It's implemented in **client** sub-module
    - Examples: Connect to TWS, request historical data, place orders, etc.

2. EWrapper Class
    - It's used to receive responses from TWS to Python client
    - It's implemented in **wrapper** sub-module
    - Examples: Receive order updates, receive market data, receive positions updates, etc.

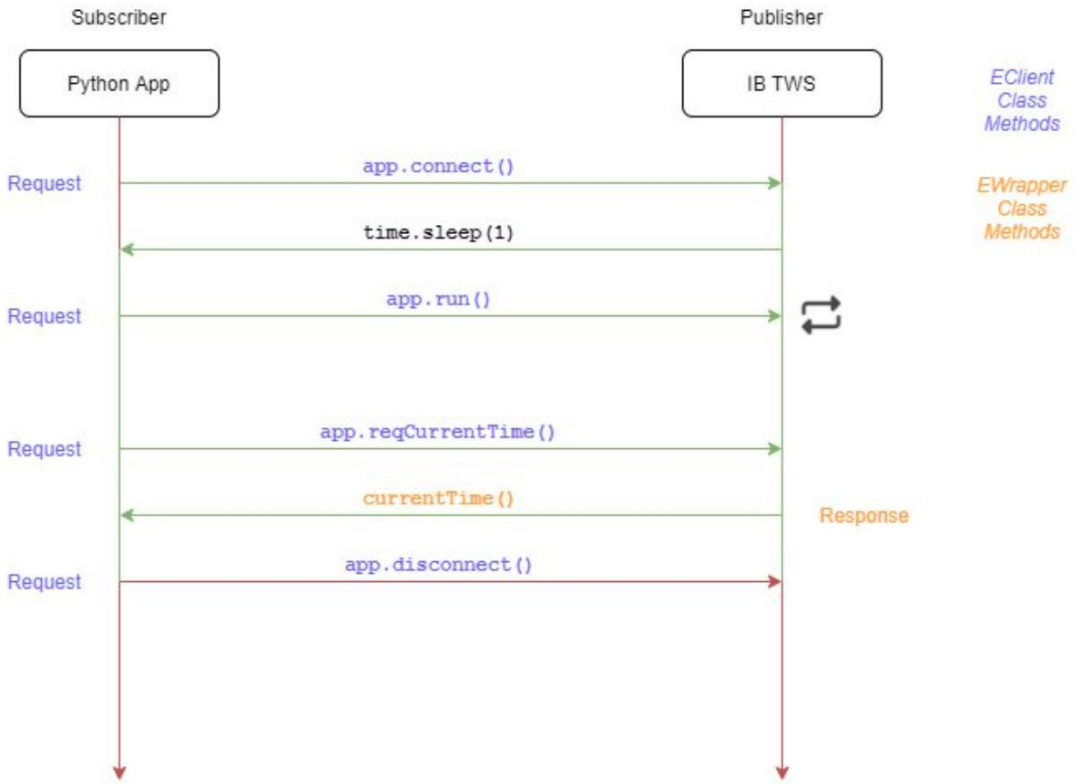
The following snapshot shows the information flow structure between a Python program (strategy) and IB TWS.



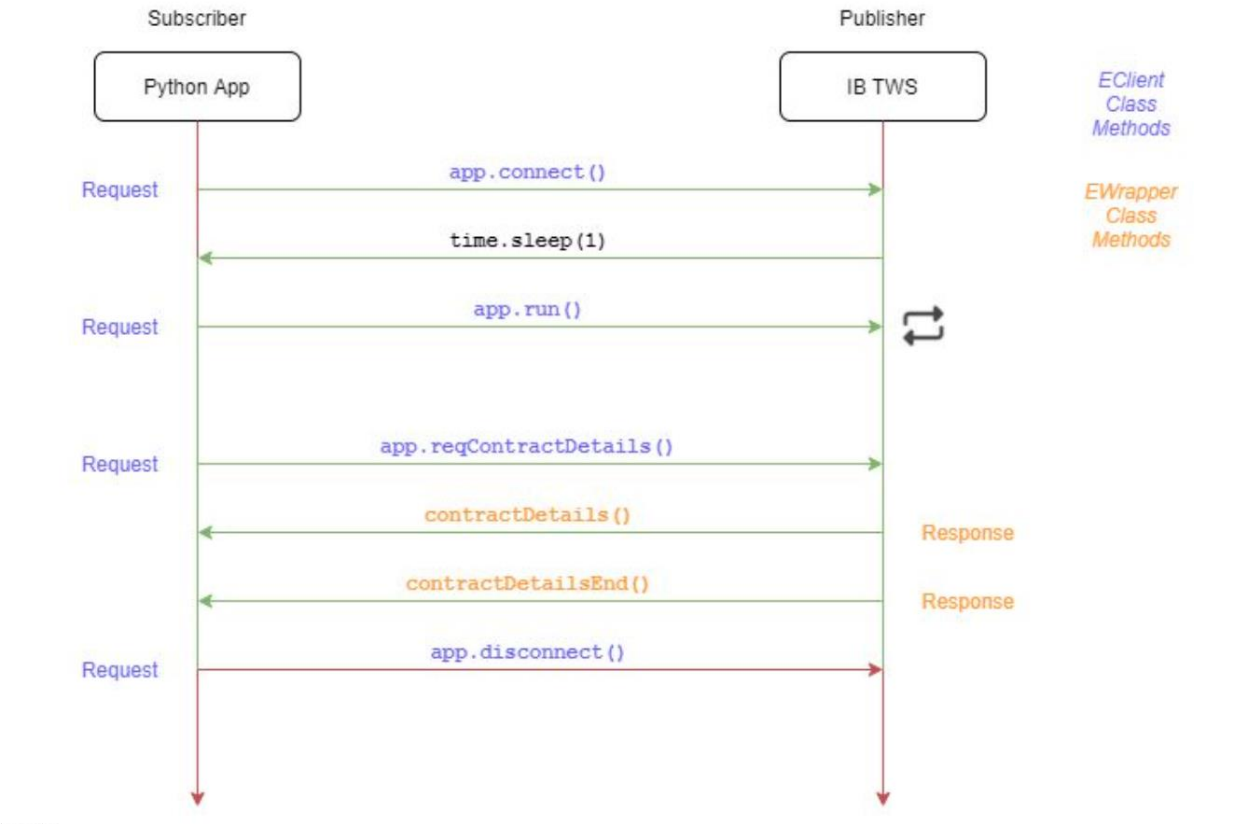
IB API Demo

Here are some examples of using python API to extract information and place orders through the IB platform.

The following snapshot represents the steps required to connect the Python program and IB TWS through python API



The following snapshot represents the steps required to fetch contract details from IB TWS through python API



Examples of using IB API have been demonstrated above. Code snippets for the same are available in the LMS portal.

Limitations of Interactive Brokers (IB) API

- Each TWS instance can listen to 32 client apps simultaneously
- Each instance can send 50 messages/second from the client to IB applications
- The maximum number of simultaneous open historical data requests from the API is 50.

Overview of cloud computing

Cloud computing essentially means using a server hosted by an organisation (AWS, Hetzner, Google, etc.) instead of your local machine. A traditional setup (setting up your server) has the following limitations -

- Pay for electricity, cooling and maintenance.
- Adding and replacing hardware takes time.
- Scaling is limited
- We might need to hire someone to monitor the infrastructure
- Dealing with disasters becomes difficult (natural calamities, power shutdown, fire,
- etc.)

Benefits of using cloud computing

- Scalability
- Cost-effectiveness
- Elasticity
- High availability

We have used Amazon Web Services (AWS) for our purpose. Detailed instructions for the installation are provided as a part of pre-reading material on the LMS portal.

Additional resources

- IB TWS download
- IB TWS API download
- IB TWS API documentation