Quant Router

Getting Started Guide

V 2.0

SmartQuant Ltd

Contents

I. The QuantRouter

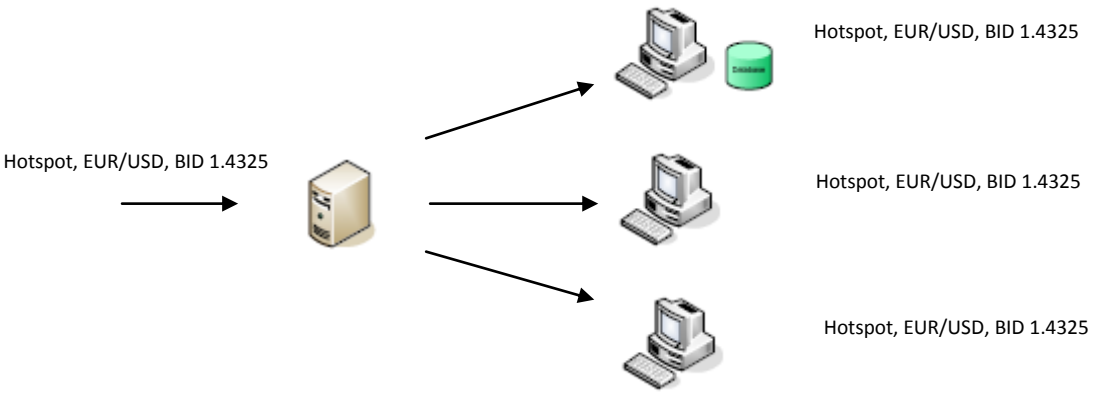
1. Introduction

SmartQuant QuantRouter is a standalone server side .NET application designed to serve clients demanding feed replication, feed consolidation, feed aggregation, feed transformation and smart order routing.

QuantRouter offers a possibility to work with multiple data feeds and brokers within a single OpenQuant application. QuantRouter also offers a possibility to connect several OpenQuant applications to the same data feed or execution account.

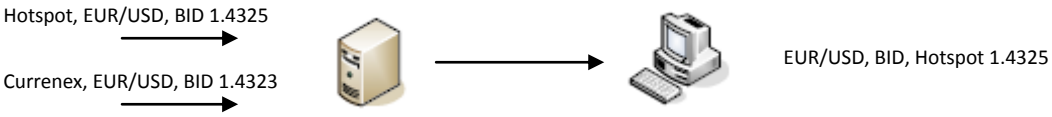
OpenQuant users can set up QuantRouter as a middleware to connect 64 bit version of OpenQuant with brokers supporting 32 bit API only.

2. Feed Replication

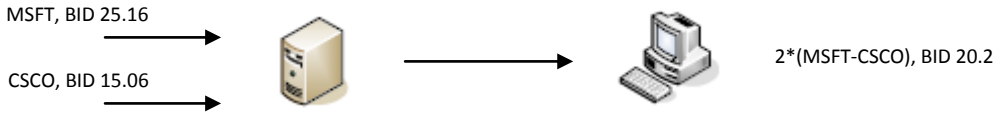


3. Feed Consolidation

4. Feed Aggregation



5. Feed Transformation



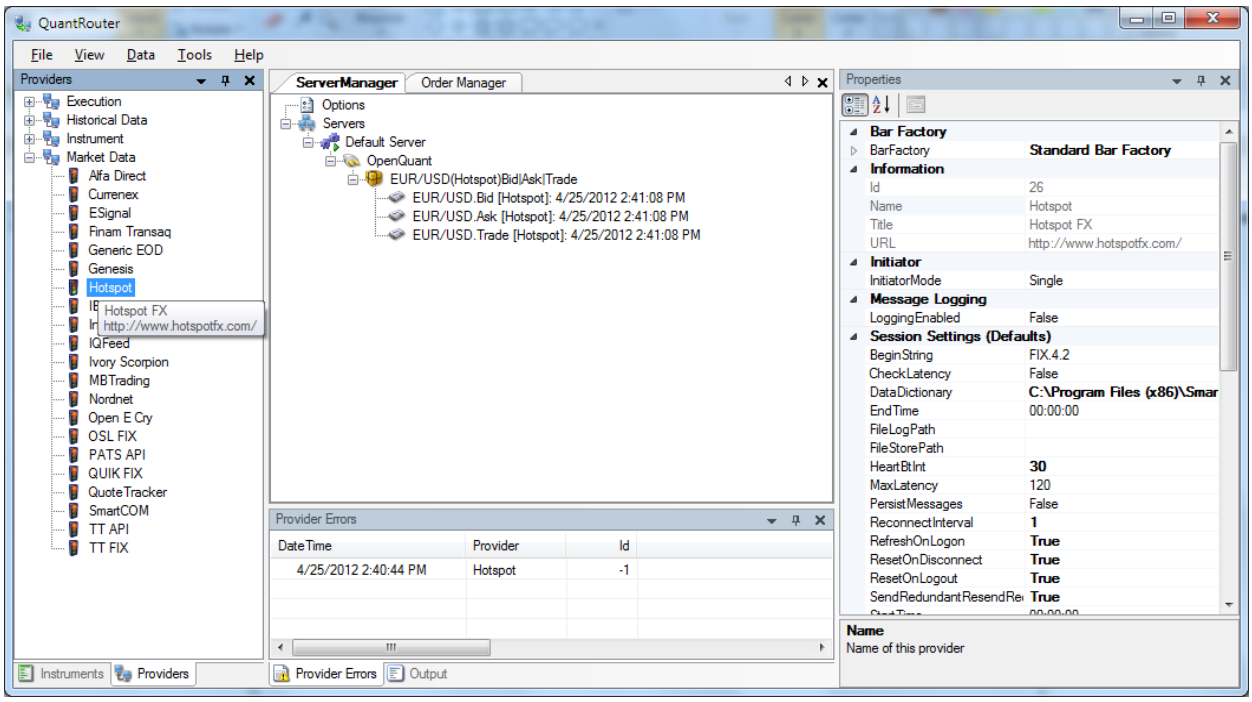
6. Setting up the QuantRouter

In order to get up and running the QuantRouter you should configure its GUI layout, add instruments and setup their properties, and adjust connectivity settings of market data providers you want to use.

6.1. Understanding and Configuring the GUI

It should be pretty easy for a new user to understand and adjust the QuantRouter GUI layout. You can open windows you need in the View menu and use drug and drop to position windows within the main application window.

A typical GUI layout is shown on the screenshot below:



6.2. Adding Instruments

Use Instruments window to add new instruments and then navigate to the Properties window to setup its property.

You can set alternative symbols and exchanges for corresponding market data providers for the same instrument using AltID property.

6.3. Adjusting Provider Settings

Click on a market data provider icon in the Providers window and adjust its property in the Properties window.

7. Market Data Provider Adapters

The QuantRouter comes with a number of built-in market data provider adapters, such as IB (Interactive Brokers), Hotspot FX, Currenex FX, Integral FX, TT FIX (Trading Technologies), MBT, etc. A complete list of built-in adapters, their properties and instrument settings for these adapters can be found in a separate document or on SmartQuant web site.

Users can develop their own adapters to market data feed providers, which are not supported out of the box in the QuantRouter. Examples of custom market data providers with full source code (MSVS project) can be found in SmartQuant Connectivity Pack.

If you feel that you don't have enough time or programming skills to develop a custom adapter yourself, you are welcome to outsource this development to SmartQuant programmers.

8. Client connectivity

8.1. Communication Protocol

Currently the QuantRouter uses custom TCP socket based transport to talk with its clients.

Given plug and play nature of SmartQuant applications, other transports, such as FIX/FAST, can be added.

8.2. OpenQuant QuantRouter Adapter

There is a QuantRouter adapter developed for OpenQuant and working similar to all other OpenQuant market data providers. You can use this adapter to get real time market data from the QuantRouter to OpenQuant running in paper trading and live trading modes.

9. Usage Scenarios

Please note that the QuantRouter is a new and evolving application. There are certain restrictions that QuantRouter users should keep in mind considering different usage scenarios. Yet we think that the current version of the QuantRouter is a useful application that can help users to solve their day to day tasks.

All subscriptions to the QuantRouter from client applications are made by specifying the subscription "formula" for a given instrument. Formula is used to define the way several subscription "streams" are combined into one data stream. Simple stream is for example MSFT Bid and Ask data coming from IB provider. Complex stream is an aggregation or consolidation of several simple streams. Several complex streams in turn can be aggregated and/or consolidated using a formula.

Formula has the following format:

ComplexStream1,ComplextStream2,...,ComplexStreamN

ComplexStream here is either:

- SimpleStream

or

- *Agg(SimpleStream1,SimpleStream2,...,SimpleStreamN)*

SimpleStream is a subscription on a given market data type(s) for a specific instrument and provider.

SimpleStream format is: *SYMBOL(PROVIDER_NAME)MDType1|MDType2|...|MDTypeN*

MDType is either Bid, Ask, Trade or Level2

Agg(SimpleStream1,SimpleStream2,...,SimpleStreamN) - defines that the tick data coming for simple streams should be aggregated.

There are several typical scenarios that client applications may use – feed replication, feed consolidation and feed aggregation. Each scenario can be implemented by using a specific type of formula as described below.

9.1. Feed Replication

Task

Connect a strategy trading client application (OpenQuant) and a data capture application to IB data feed. These two applications can run either locally on the same computer running the QuantRouter, or on two remote computers.

Solution

Use formula defining a simple stream.

For example to subscribe for EUR/USD Bid and Ask on Currenex use the following formula:

EUR/USD(Currenex28)Bid|Ask

9.2. Feed Consolidation

Task

Connect a strategy trading client application (OpenQuant) to a consolidated feed consisting of Hotspot FX and Currenex FX feeds.

Solution

Use formula defining a consolidated stream.

For example to subscribe for EUR/USD Bid and Ask on Currenex and Bid, Ask and Trade on HotSpot use the following formula:

EUR/USD(Currenex)Bid|Ask,EUR/USD(Hotspot)Bid|Ask|Trade

9.3. Feed Aggregation

Task

Connect a strategy trading client application (OpenQuant) to an aggregated BBO (Best Bid and Offer) feed consisting of best quotes aggregated from Hotspot FX and Currenex FX feeds.

Solution

Use formula defining an aggregated stream.

To aggregate Bid and Ask data coming from Currenex and HotSpot for EUR/USD use the following formula

Agg(EUR/USD(Currenex)Bid|Ask,EUR/USD(Hotspot)Bid|Ask)

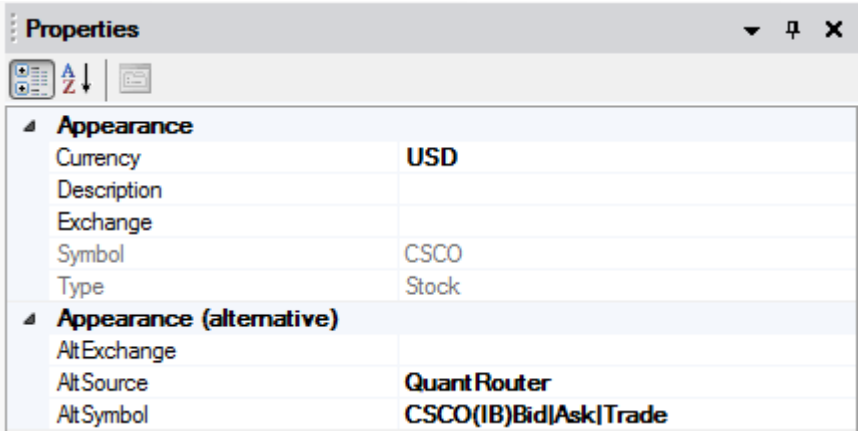
9.4. How to Specify Market Data Request Formula in OpenQuant.

In order to specify market data request formula for a given instrument in OpenQuant you can do the following: right-click the instrument in the Instruments Window and select "Properties". The Properties Window should popup. Change the following to properties:

- Set AltSource to "QuantRouter".
- Set AltSymbol to the formula value.

Note, that each formula references one or several symbols. For example the formula "Agg(EUR/USD(Hotspot)Bid|Ask, EUR/USD(Currenex)Bid|Ask)" references symbol EUR/USD. For each symbol referenced by a formula there has to be an instrument having the same symbol on QuantRouter side. These instruments have to be configured properly in QuantRouter to be subscribed to real market data providers.

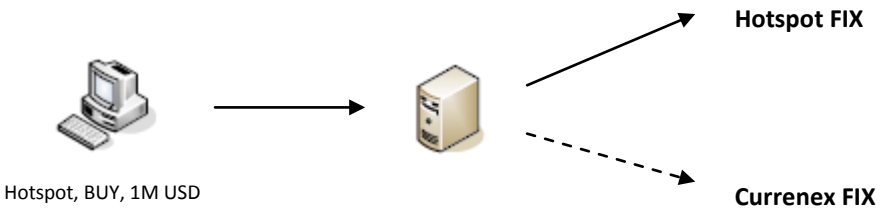
For example, to subscribe to CSCO tick data coming from IB via QuantRouter – go to CSCO instrument propeties in OpenQuant, set AltSource to "QuantRouter" and AltSymbol to "CSCO(IB)Bid|Ask|Trade" as shown on the picture below:



Pay attention that the formula references "CSCO" symbol. It means that there has to be an instrument having symbol "CSCO" in QuantRouter. This instrument should have Exchange=SMART to be successfully subscribed on IB data. You don't need to specify Exchange=SMART in CSCO instrument in OpenQuant when using QuantRouter, all the settings will be taken from CSCO instrument on QuantRouter side.

II. The Execution Server

1. Order Routing



2. Usage Scenarios

2.1. Routing Orders from OpenQuant application

```
Order order  = new BuyOrder(100);
order.Route = OrderRoute.Hotspot;
order.Send();
```