
OpenQuant

A Comprehensive Solution for Quant Investors and Traders

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1 Introduction

OpenQuant helps people to create and execute computerized trading strategies. OpenQuant uses a complex event processing (CEP) architecture to represent real-life trading events accurately. There are four components in the product family:

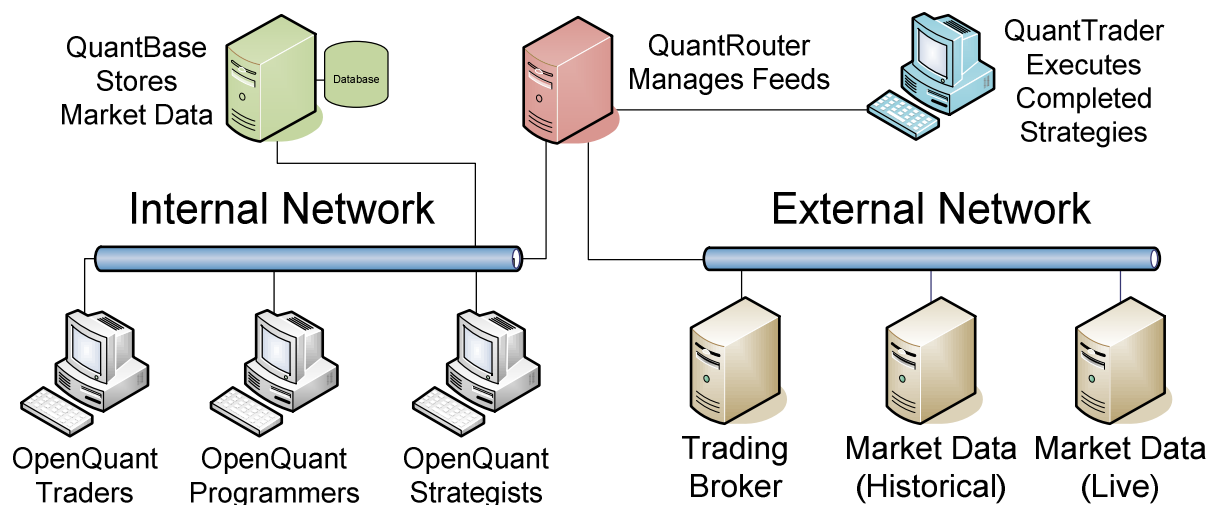
1. **OpenQuant** is a modern IDE integrated development environment for creating and testing computerized trading strategies. This is where the action is for human strategists as they create, develop, test and optimize new strategy candidates. It solves all the usual problems of importing market data, inspecting the data in table or chart form with built-in technical indicators, developing code, backtesting to evaluate performance, and visualizing trading behavior with bar charts, equity curves, performance statistics, and portfolio trading logs. The IDE uses C# on the Microsoft Windows .NET platform, and is therefore fully user-extensible.

2. **QuantTrader** is a stand-alone infrastructure application that solves the problems of how to deploy, select, configure, execute, and monitor completed strategies in a controlled production environment.

3. **QuantBase** is a stand-alone infrastructure application for managing large amounts of market data. It contains a high-speed internal database for fast access to time series data. It solves the problems of collecting, storing, managing, and exporting huge amounts of market price and volume data at very high flow rates.

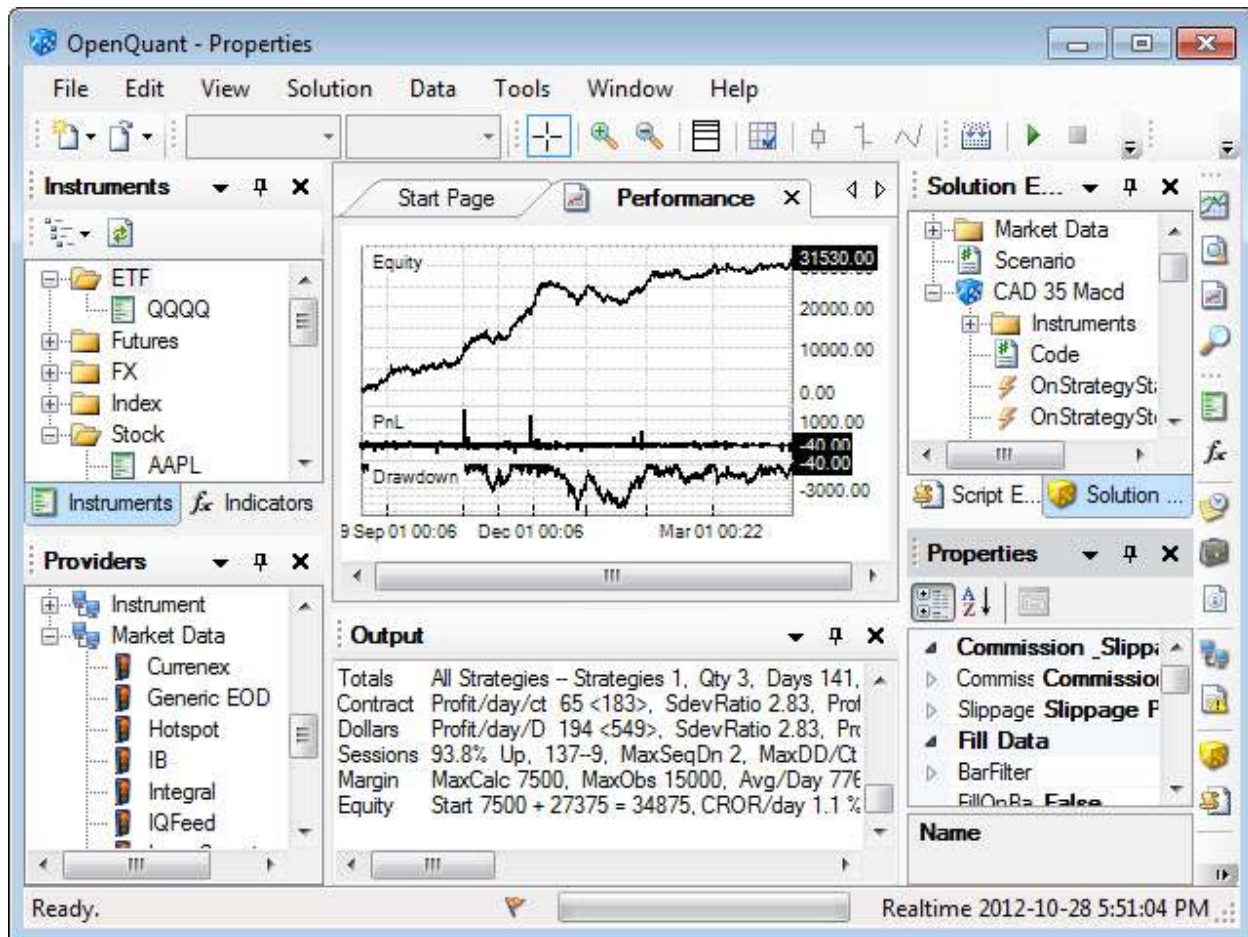
4. **QuantRouter** is a stand-alone infrastructure application for routing, combining, and splitting data feeds from multiple data sources and routing order feeds to multiple brokers. It solves the problem of centralizing the data and order feeds to and from production QuantTrader instances, as well as QuantBase at the same time.

A Scenario Showing All 4 Components



2 Functional

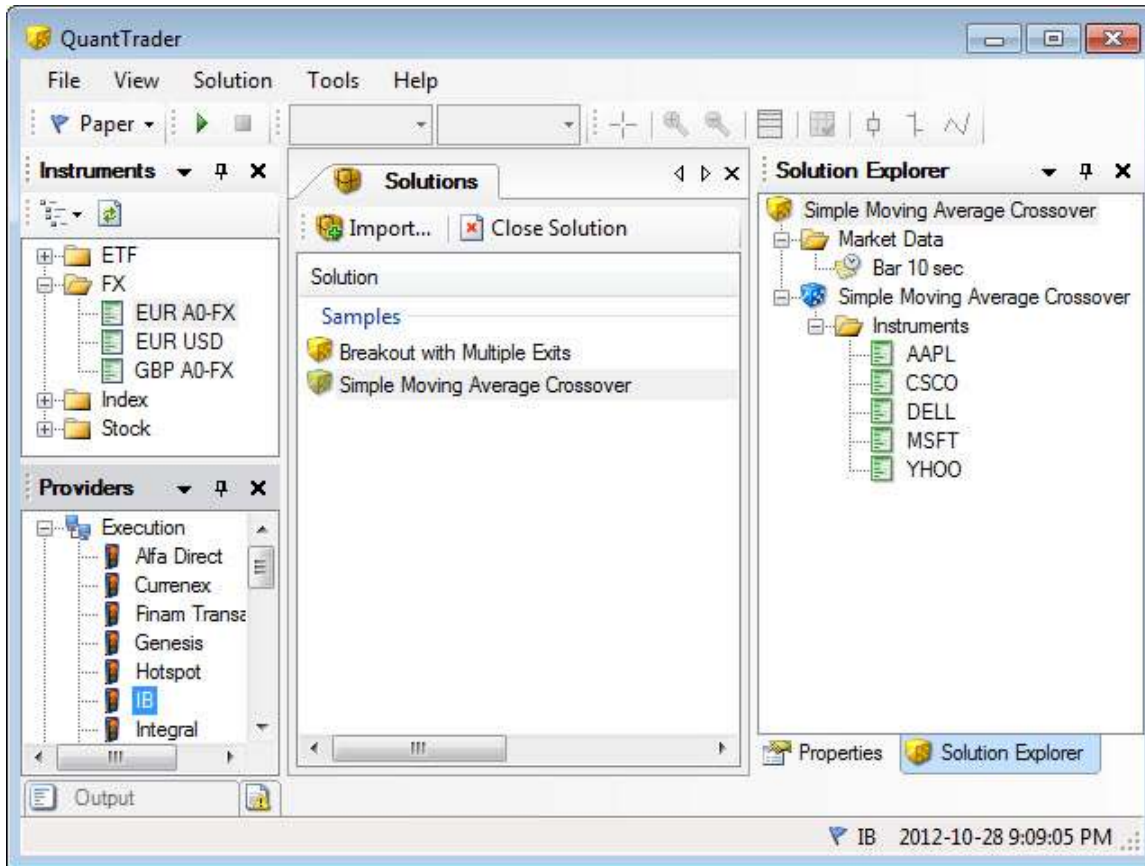
2.1 OpenQuant - Create, back test, optimize, and run strategies in one IDE



OpenQuant functionally supports all of the typical tasks required to create and test computerized trading strategies:

- Capture live market data into a database for later use in back testing.
- Drag and drop indicators on charts of the data, to explore new strategy ideas.
- Code strategies using the built-in editor and C# CEP architecture model.
- Back test strategies with stored data, and see results, charts, and statistics.
- Switch between backtest, paper, and live trading modes with a menu click.
- Execute a completed strategy in live-trading mode using live market data.
- Export a completed strategy to deploy it to production use in QuantTrader.

2.2 QuantTrader - Deploy strategies in a safe monitoring environment



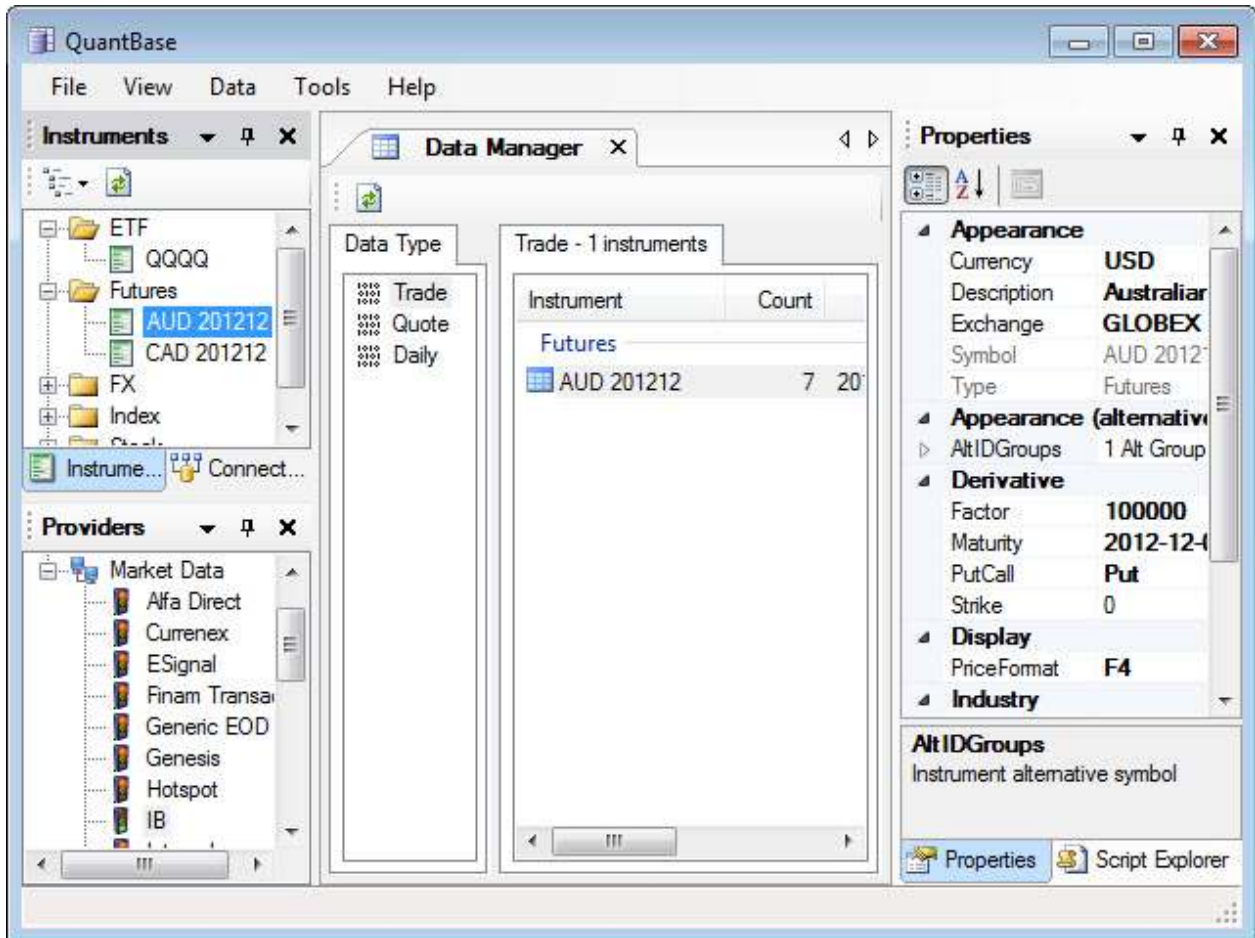
QuantTrader is a lightweight version of OpenQuant, for deploying strategies in a production environment. It has the same paper and live trading capabilities as OpenQuant—including portfolio and strategy monitoring—but without back testing or production code editing capabilities (strategy parameters can still be changed).

QuantTrader makes your strategy source code invisible to users, allowing you to deploy securely and confidentially into shared co-location environments.

To work with QuantTrader, import completed strategies from OpenQuant. Select a strategy and set parameters to use. Monitor your strategy as it executes, just like you would in OpenQuant. See incoming market data prices, bar charts, technical indicators, trading signals, performance statistics, and trade logs, all in real-time.

Since QuantTrader is priced lower than OpenQuant, QuantTrader is also a cost-effective way to deploy strategies into multiple production environments.

2.3 QuantBase - Store, retrieve, and manage market data efficiently



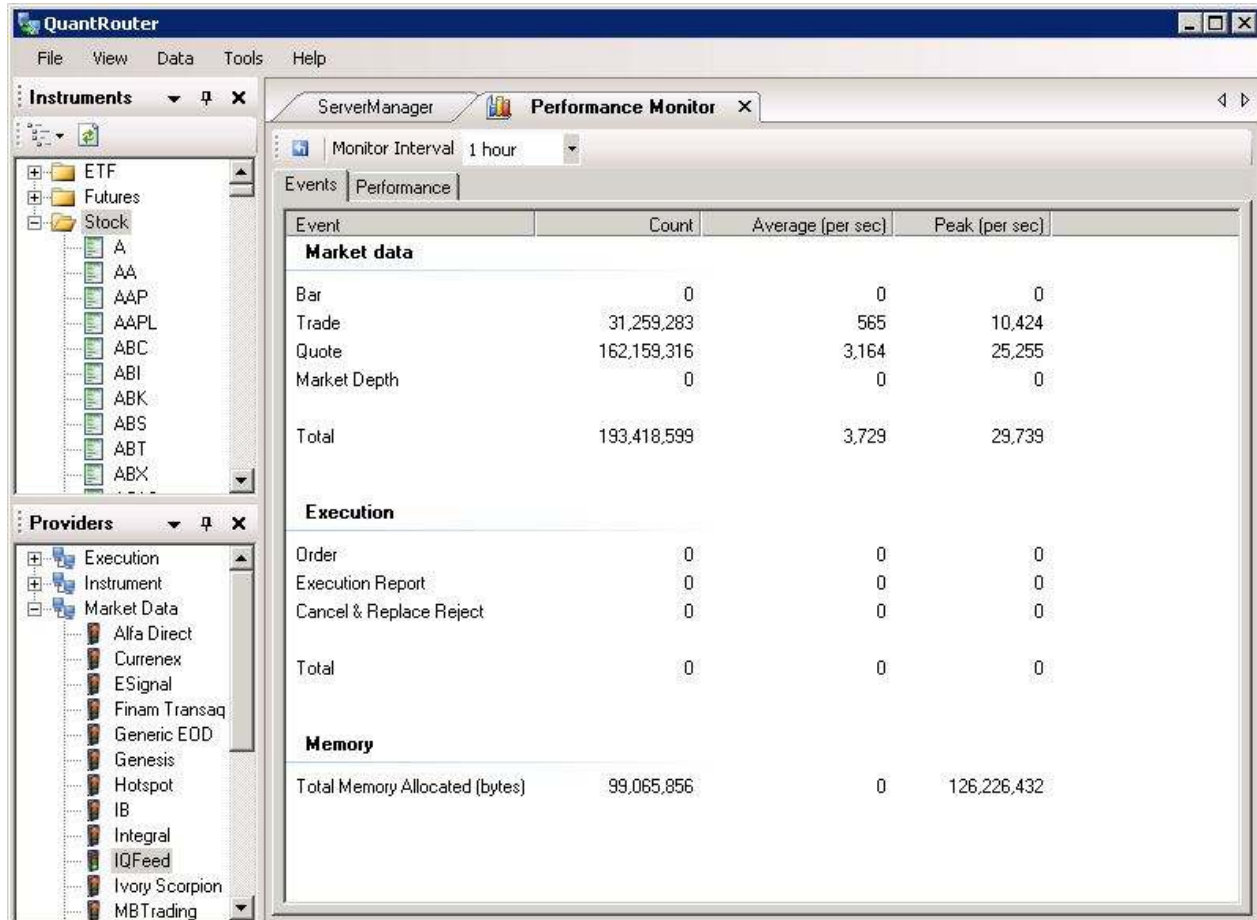
The main problem with working with time series is that there can be huge amounts of data to process—for example, a time series of 5-second price bars for a 1 week period contains tens of thousands of elements, for only one financial instrument. It's easy to get gigabytes of data in a modern quant world. Then you need speed.

QuantBase uses high-speed database technology and compressed binary storage formats that provide speed and performance for large amounts of time series data. Connect QuantBase to multiple data sources to capture real-time data. Compress existing data into new bar series with simple menu clicks. Write powerful C# scripts for advanced data processing. Serve stored market data at high speeds.

QuantBase makes it easy for OpenQuant users to import clean, processed data for the instruments and time ranges they require for their specific strategy projects.

The same fast database is used in OpenQuant, QuantBase, and QuantTrader.

2.4 QuantRouter -- Capture, combine, and reroute data feeds



The screenshot shows the QuantRouter Performance Monitor window. The left sidebar contains 'Instruments' (ETF, Futures, Stock) and 'Providers' (Execution, Instrument, Market Data, and various providers like Alfa Direct, Currenex, etc.). The main window displays a table with columns: Event, Count, Average (per sec), and Peak (per sec). The table is divided into three sections: Market data, Execution, and Memory.

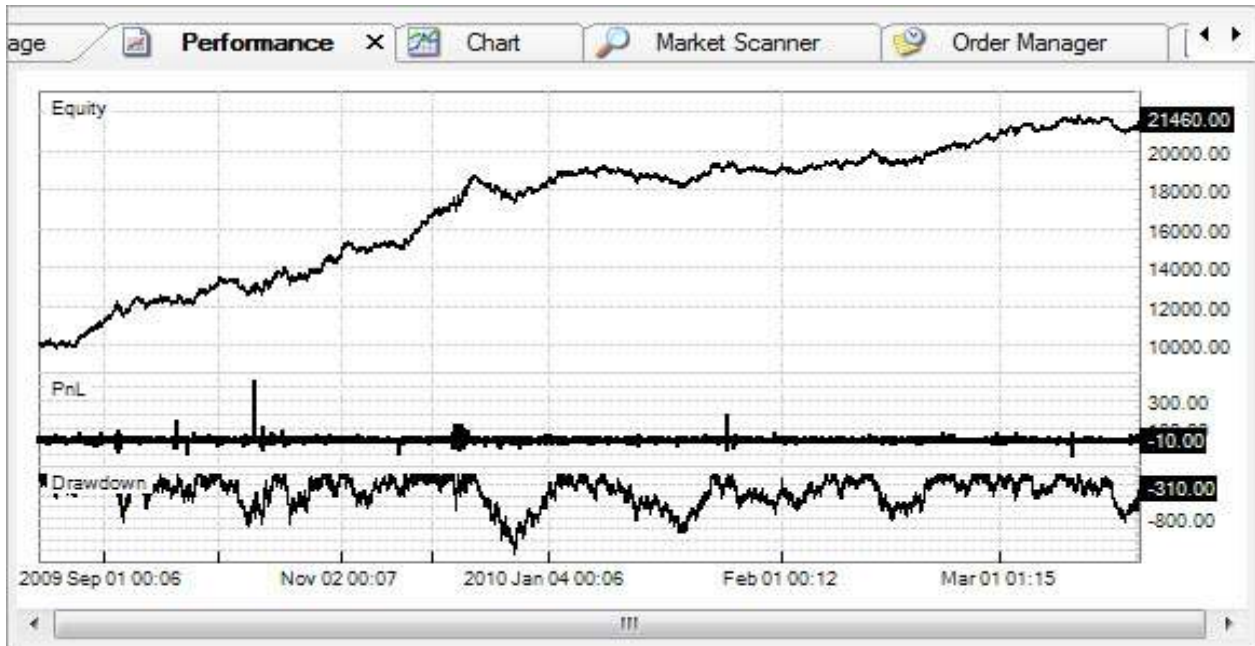
Event	Count	Average (per sec)	Peak (per sec)
Market data			
Bar	0	0	0
Trade	31,259,283	565	10,424
Quote	162,159,316	3,164	25,255
Market Depth	0	0	0
Total	193,418,599	3,729	29,739
Execution			
Order	0	0	0
Execution Report	0	0	0
Cancel & Replace Reject	0	0	0
Total	0	0	0
Memory			
Total Memory Allocated (bytes)	99,065,856	0	126,226,432

QuantRouter gives you lots of configuration flexibility:

- **Feed replication** – Share a single input data feed among a team of people by replicating the input feed into multiple output feeds.
- **Feed aggregation** – Choose the best market price by combining multiple vendor input feeds into one “best prices” output feed into your strategy.
- **Feed consolidation** – Combine multiple input feeds into one output feed that contains prices for all of the input feeds (eg to store into QuantBase).
- **Feed transformation** – Generate a synthetic pricing feed by taking the sum, average, etc. of multiple input feeds from actual instruments.
- **Order routing** – Choose which instruments are sent to particular brokers.

3 Visual

3.1 Graphical summary charts for Equity, Drawdowns



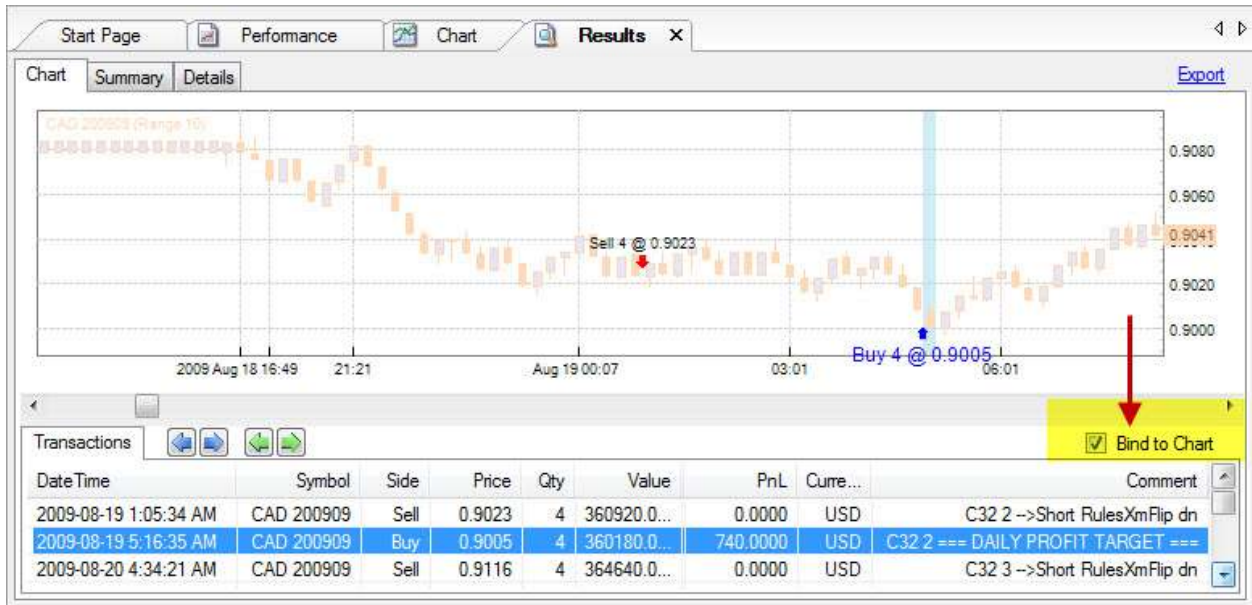
See a big picture of how well your strategy earns equity while minimizing draw-downs. See at a glance if your strategy is a consistent profit generator.

3.2 Time-synchronized charts for Bars, Indicators, Trade Signals



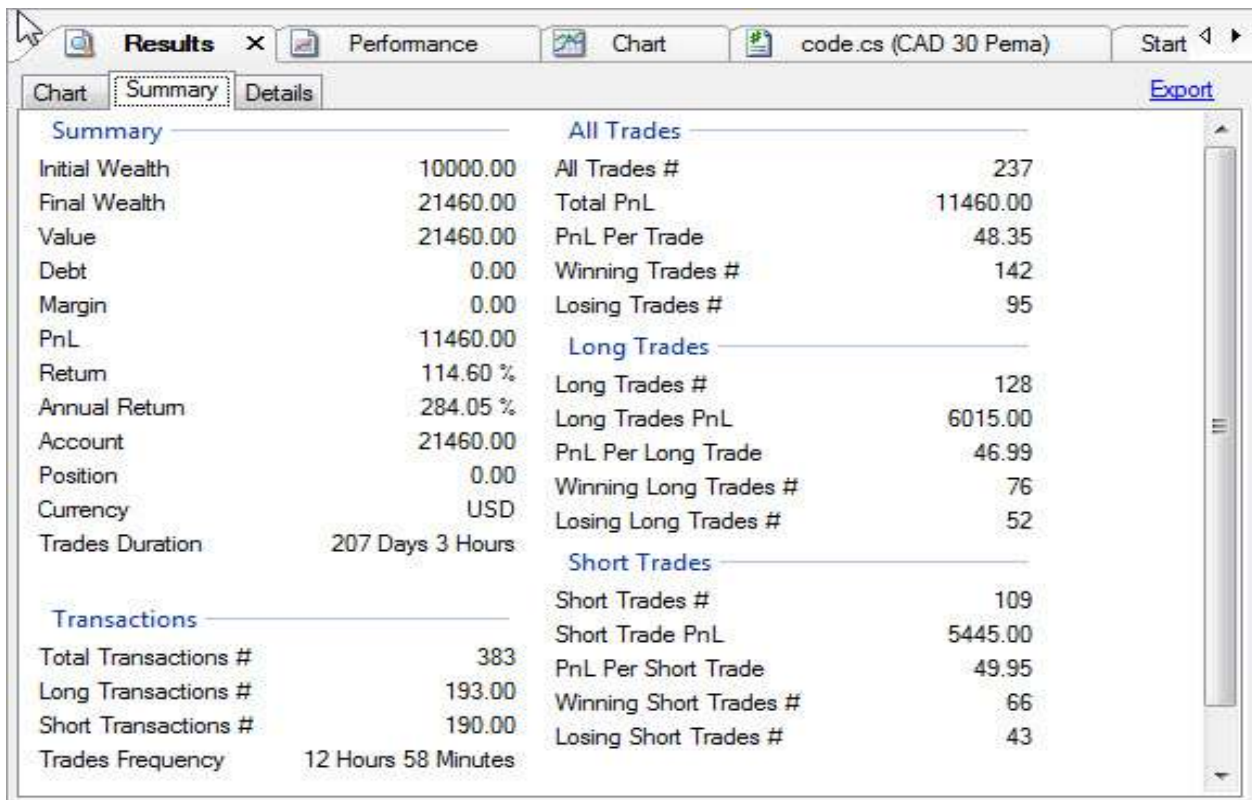
Plot your favorite technical indicators and trading signals on bar charts to see what your strategy is thinking as it trades. See when it trades, and why.

3.3 Time-synchronized charts for Prices, Orders, Trades, Positions



Jump immediately from trade to trade with a single click. Charts and trades are highlighted and synchronized. No more tedious scrolling to find the next trade.

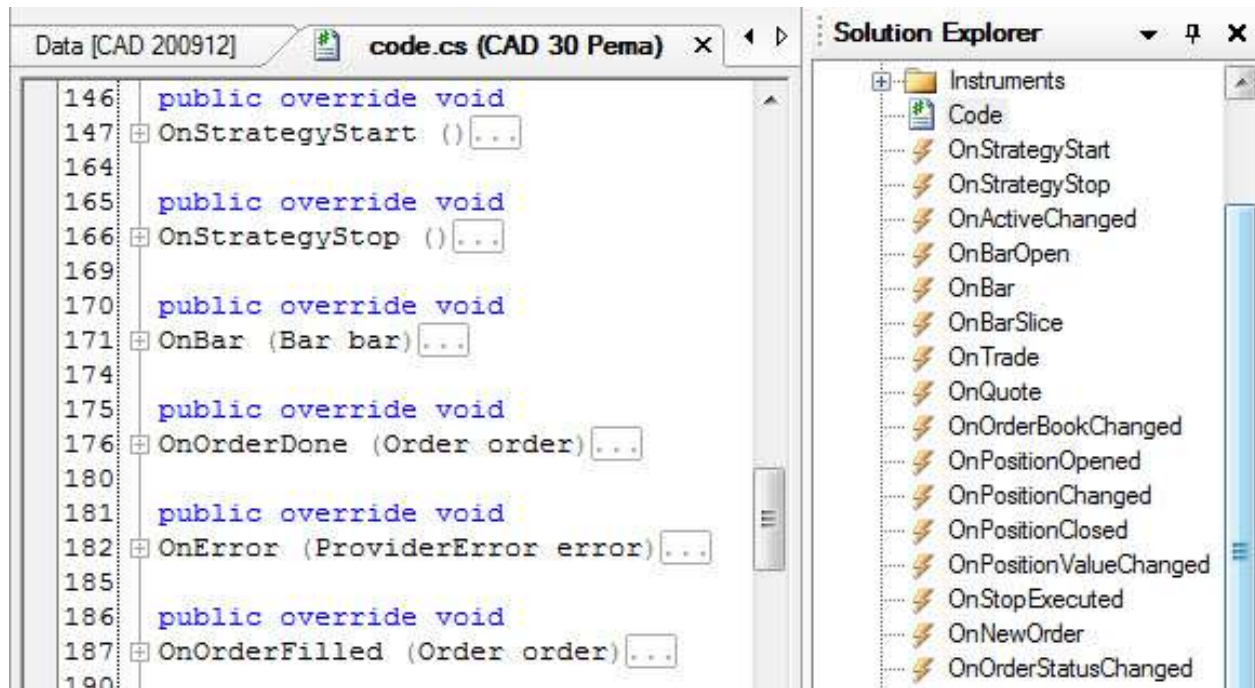
3.4 Performance Statistics for Comparing Strategies



See summary statistics on your strategy, to see how well it performed.

4 Powerful

4.1 CEP complex event processing precisely models real-life trading



CEP complex event processing architectures represent real-life, real-time trading environments much better than non-event driven architectures.

See the (partial) list of events above. Many events are supported—for bars, trades, quotes, order status, rejections, cancellations, fills, stop losses, errors, position size and value changes, strategy start/stop events, and others.

Instead of using complex if-then-else logic, programmers can respond to specific real-life trading events. Simpler logic. Less code. Fewer bugs. Higher productivity.

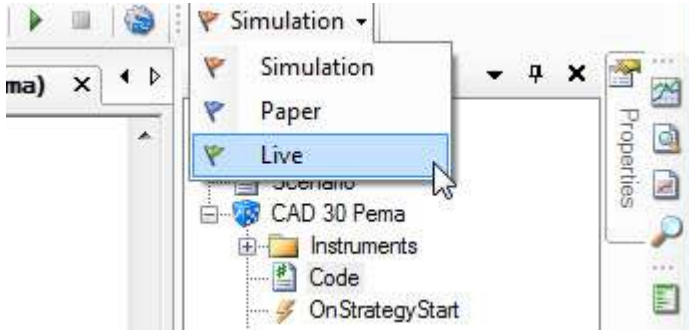
4.2 Scalable – Use simple to the most complex strategies

Since OpenQuant strategies are built on the Microsoft C# .NET platform, strategies can scale to any size the .NET framework can handle.

Strategies can be as simple as a few lines of code, taking advantage of built-in indicators and simple order types, or be complex combinations of large code libraries that include third-party mathematical analysis software.

OpenQuant is a truly flexible, extensible, and scalable system because strategies can access the full functionality of the OpenQuant API and the .NET platform.

4.3 No code changes from backtesting, to paper trading, to live trading



Switch from simulation (with historical data) to paper trading (with live data), or go completely live (with live data and orders) in a single click. No code changes at all.

5 Business-Oriented

5.1 Modular – Combine products to fit your business needs

Combine products into custom systems that meet your specific business needs.

As a skilled individual—import data and create strategies with OpenQuant alone.

As a small team—capture real-time data feeds 24/7 with QuantBase and share the data among multiple strategists and developers running OpenQuant.

As a large hedge fund—capture real-time data feeds and route them to QuantBase and various team members, create strategies with OpenQuant, export completed strategies to a production operations center, and monitor them with QuantTrader.

5.2 Reliable – SmartQuant products in world use for 10+ years

SmartQuant products have been in professional use by large and small institutions around the world for more than a decade. And since the product family is built on the very mainstream Microsoft .NET platform, you can more easily access future C# and .NET technology advances as they are developed for the platform.

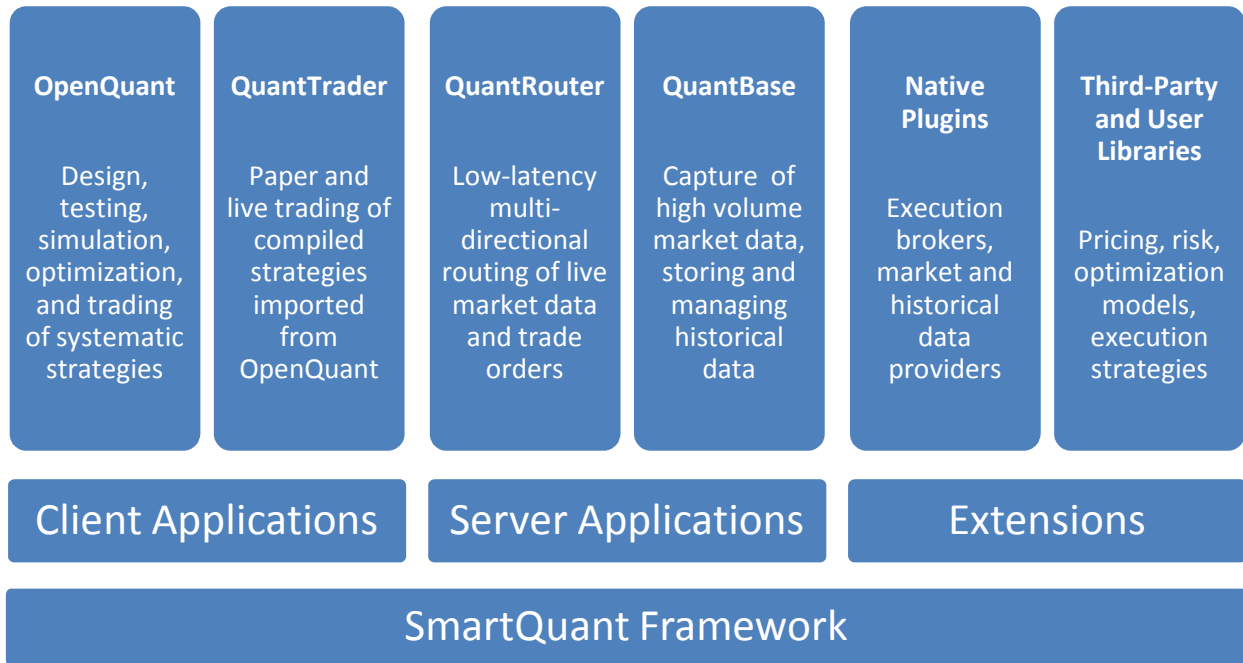
5.3 Extensible – Add your own C# .NET library features

OpenQuant strategies are very extensible because they can easily use third party code libraries written in any programming language that is supported by .NET. This means your strategies have access to more third-party library functionality.

Run your extensible strategies on a laptop, or on a server in the Amazon cloud.

6 Technical Summary

6.1 Architecture



6.2 Feature Summary

OpenQuant products have the following technical features:

- Run on Microsoft Windows / .NET platform
- Use C# as main programming and scripting language
- Can use OpenQuant or Visual Studio for editing
- Can use Visual Studio for debugging (via VS attach to process feature)
- Integrated VS Studio extension for VS 2012 is under development
- OpenQuant historical backtesting data size limited only by hardware
- OpenQuant strategy size and complexity are essentially unlimited
- QuantBase can deliver about 1M IOPS (hardware dependent)
- QuantBase can accept multiple data feed inputs
- QuantRouter can accept multiple feed inputs and multiple outputs
- Work with 20+ service providers of historical and real-time market data, and execution services, using both FIX and normal API interfaces.
- User forums provide additional OpenQuant community support

7 Institutional Quality, Priced for Emerging Managers

The OpenQuant family of products is developed with Emerging Managers and growing investment and trading firms in mind. We strive to provide the highest quality institutional solutions, which would not only satisfy their current needs but will also provide a scalable platform to carry them to the next level as they grow.

And, we strive to do that with their budget constraints in mind. The OpenQuant family of products is priced at a small fraction of the cost of comparable integrated trading solutions available from other vendors.

We offer monthly or annual license subscriptions, with annual prepaid subscriptions reflecting a discounted rate of 12 month for a price of 11.

Product	Price/month	Price/year
OpenQuant	\$399	\$4,389
QuantTrader	\$99	\$1,089
QuantRouter	\$599	\$6,589
QuantBase	\$599	\$6,589
QuantDesk license bundle 2 x OpenQuant, 3 x QuantTrader, 1 x QuantRouter, 1 x QuantBase	\$1,999	\$21,989

The QuantDesk bundle is ideal for a startup fund or a small quant desk within a larger firm, with two developer OpenQuant licenses and ability to deploy up to three QuantTrader production machines in a full scalable environment including centralized data and feed processing based on QuantRouter and QuantBase. Additional OpenQuant and QuantTrader licenses can be added as required.

We also offer significant volume licensing discounts for enterprise clients. Please inquire about the pricing.

8 Contact Information

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