

Innovation in Investment Banking Technology

Athena

Athena is a next generation pricing, risk management, analysis and trade management platform. Athena implements a rapid development and deployment model that puts developers at the heart of the business.

Power and Versatility

- Athena provides a development environment optimized for financial applications.
- Rapid turnaround for innovative financial solutions.

Key Business Challenges

- Clients demand rapid product innovation; regulators demand a controlled risk management environment.
- Fast changing markets require fast changing risk management tools.
- Exotic products and diverse client base can lead to operational complexity, fractured systems, and increased technology and operational cost.

Key Benefits (Business/Clients)

- Using Athena, developers can deliver improved tools to the trading desk intraday, every day, in a controlled environment.
- As Financial models, market data and J.P. Morgan trade data are globally available in the same environment, developers can more easily deliver innovative solutions to the trading desk, making the business more profitable.
- Athena provides a standard, but flexible way of modeling a trading business that is consistent across different financial products. This simplifies operations of the business, and eliminates redundant processes, leading to increased control and lower costs.
- As Athena is 100% built in-house, it provides an advantage over competitors.

Technology Overview

- Financial markets and products modeled as dependency graph
- Fast, globally replicated object store for persistence
- Python based rapid development environment
- Built in APIs to compute farm

LOB/Function(s) Impacted

- Credit
- Rates/FX
- Commodities
- Risk Management

Functionality Overview

Athena is a platform for technologists and quantitative analysts to develop risk, pricing and trade management solutions to the desk. It makes developers more productive and gives them increased impact on the bottom line.

Why is the technology innovative?

Dependency graph - developers define specially decorated Python classes to represent markets, financial instruments and deals. A runtime parser inspects the classes to build an in-memory dependency graph representing the relationships between them. This provides a natural and powerful way to explore 'what-if' scenarios by moving market rates and examining the impact on prices derived from them.

Reactive Athena is a framework within Athena that allows building efficient event-driven applications for algorithmic trading, simulations, back-testing, signal generation, calibration and the like. At the core of the framework is a forward-propagating graph, where nodes contain units of work scheduled for execution based on their ranking (topologically sorted order) in the graph.

Athena is based around a fast, globally replicated object store database. This in-house database is integrated with the dependency graph, and the persistent properties of objects are defined by the same Python decorator syntax.

A traditional compiled language (C++) is used for the high performance core of the system, while a high-level language (Python) is used for building business logic and applications.

Athena provides easy access for developers to high performance compute farms, including financial models optimized to run on GPUs.

Testing, code analysis and rapid release tools are built in to the development environment to allow developers to concentrate on delivery to the business. New code can be released globally to several thousand users directly from a developer's IDE.

Development/Delivery

Timeline

- Ongoing expansion and rollout as strategic platform of choice for Commodities, Rates, FX, Credit and Emerging Markets financial products

Partners

- Developed in close conjunction with business aligned technology and quantitative teams

Reactive Athena Diagram

