Quant Replay

Powered by QUOD FINANCIAL

Why we built QuantReplay:

Realistic Multi-Asset Market Simulation for Trading Teams

THE CHALLENGE

Realistic Testing for Complex, Fragmented Markets

Modern trading teams — including developers, quants, and traders — face significant barriers when it comes to testing, validating, and improving trading strategies:

- **Lack of Realism:** Most available simulators focus on simplified, single-asset scenarios or overlook key market dynamics like fragmented liquidity, auction phases, or market structure complexity.
- **Data Limitations:** Historical market data is expensive, incomplete, or difficult to access — yet essential for accurate backtesting and stress testing.
- **Rigid Tools:** Proprietary platforms are often closed systems with limited extensibility, lacking full lifecycle order handling, or integration with real-world trading workflows.
- **Inability to Replicate Market Events:** Simulating high-volatility events, price swings, or extreme market conditions is rarely possible with existing solutions.

These limitations increase operational risk, slow down development cycles, and hinder innovation — particularly in fast-moving areas like algorithmic and automated trading.

OUR EXPERIENCE

The Need for Multi-Asset, Real-World Simulation

At Quod Financial, we develop advanced trading infrastructure for clients operating across fragmented, multi-venue environments. To properly test execution strategies, we required:

- A simulator capable of replicating diverse, real-world market scenarios across multiple asset classes.
- The ability to replay historical market data and generate synthetic orders to mimic genuine price discovery and liquidity behavior.
- A scalable, developer-friendly tool that integrates seamlessly into existing DevOps workflows.
- Support for modern trading protocols like FIX, alongside administrative control through accessible APIs.

We couldn't find a tool that offered all this — so we built **QuantReplay**.

INTRODUCING

QuantReplay: Open Source Market Simulation

QuantReplay is an open-source, multi-asset market simulator designed to meet the demands of today's trading technology landscape. It provides:

- **Multi-Asset Support:** Simulate order-driven markets including Equities, FX, Futures, Derivatives, and Digital Assets.
- **Market Listings & Phases:** Configure multiple venues with standard symbology, market rules, and distinct phases such as continuous trading and auctions.
- **Matching Engine:** Industry-standard price/time priority order book logic with full order lifecycle handling and configurable order types.
- **Historical Data Playback:** Replay multi-level market data from files or databases for realistic backtesting.
- **Synthetic Order Generation:** Inject realistic, pseudo-random orders to emulate live market activity, with control over price ranges, volumes, and update rates.
- **Interfaces Built for Developers:**
  - FIX API for order flow and market data publishing.
  - REST API for remote configuration and system monitoring.
- **Lightweight, Scalable Deployment:** Runs as a single native process per venue, fully dockerized for easy deployment to any environment.
- **Recovery Options:** Save system state for seamless restart and high-availability testing.

OPEN-SOURCE

Why Open Source? Community-Driven Innovation

QuantReplay is designed with an open, community-first approach — extensible, adaptable, and welcoming contributions. The roadmap includes:

- Additional Market Phases: Support for auctions, trade-at-last phases, and more.
- Multi-Listed-Instruments: Synchronize price behavior across multiple listings of the same asset.
- Extreme Market Events: Schedule volatility spikes, market crashes, and stress scenarios.
- Client Simulation Mode: Run QuantReplay as a market participant to inject realistic order flows into third-party trading platforms.
- AI-Driven Market Simulation: Leverage Generative Adversarial Networks (GANs) for more advanced, real-time order generation that mirrors complex market dynamics.
- Quote-Driven Market Support: Extend to bilateral pricing workflows like FX streaming, RFQ (Request For Quote) models, and fixed income simulations.

THE OUTCOME

Realistic Testing, Faster Innovation

Our goal is to empower developers, quants, and trading teams to build, test, and deploy faster — with confidence.

- Validate execution strategies across fragmented, high-volume, or extreme market conditions.
- Build confidence in trading system performance before deploying to production.
- Reduce operational and regulatory risks by stress-testing under realistic scenarios.
- Accelerate time-to-market for algorithmic strategies with streamlined, developer-friendly tools.

QuantReplay is free, open source, and built for the community.

Contributions, feedback, and feature requests are welcome — together, we can make market simulation more accessible, realistic, and powerful for all.