Customer Case Study: A Global Exchange Trading Company chooses Volt Active Data to accelerate growth for High-Frequency Crypto Trading

Overview

Launched in June 2022, this Global Crypto Trading Exchange customer is an all-in-one cryptocurrency trading platform. Offering a comprehensive suite of services including; futures/spot trading, copy trading, leveraged trading and a task-center. Operating in 160 countries and serving approximately 5 million users, handling a substantial daily trading volume of $1 billion USDT. Delivering 24/7 customer support, prioritising strong trading depth, liquidity and security, including DDoS protection and cold wallet storage.

To sustain this high-frequency, global operation, the customer recognized the need for a data platform that could guarantee both performance and transactional accuracy. They chose **Volt Active Data** to power their core transactional systems, including account management, market display, trading, and position-sorting.

Key Performance Results with Volt

By integrating Volt Active Data, the customer achieved immediate, measurable improvements:

Ultra-Low Latency: P99 latency of 5 ms for most high-frequency transactions.

Massive Scalability to adapt to high concurrency workload due to user growth.

Critical Risk Management Speed: P99 latency of 50 ms for its critical, complex Auto-Deleveraging (ADL) logic.

Guaranteed Transactional Integrity: Full ACID compliance at massive scale, eliminating risks of data anomalies.

This architectural transformation enabled them to confidently scale their platform to meet the extreme demands of a modern crypto exchange.

Business Challenge

The cryptocurrency exchange market is defined by volatility, exponential user growth, and intense regulatory demands. For the customer, offering an all-in-one platform supporting spot, futures, leveraged, and copy trading, user trust is entirely dependent on **real-time accuracy and 24/7 uptime**.

As the customers global footprint grew approaching billions in daily trading volume the existing data architecture began to impose significant business risks and operational constraints:

- **Real-Time Responsiveness and Trust:** Traders demand sub-second order execution and immediate balance updates, especially during peak market volatility. Any perceived delay or data mismatch immediately translates into eroded confidence and potential revenue loss.
- **Guaranteeing Transactional Integrity:** With thousands of concurrent trades and instantaneous fund movements, ensuring data consistency and preventing critical issues like "double-spending" or "order errors" became a major systemic challenge.
- **Slowed Innovation & Agility:** The previous monolithic system required complex code changes for every new feature or business update. This reduced agility, slowed product launches, and increased overall operational overhead.
- **Balancing Performance and Reliability:** Critical risk-management features, such as Auto-Deleveraging (ADL), required ultra-low latency execution while simultaneously demanding *full* ACID guarantees to maintain data safety and position consistency.

The customers leadership team recognized that achieving long-term growth required a fundamental re-architecture of their data layer to support real-time decisioning, guaranteed transactional consistency and effortless scalability.

Technical Challenge

The customers rapid growth exposed critical limitations in their existing data infrastructure (Java + Redis + MySQL):

- **Compromised ACID Compliance:** The use of Redis for caching and MySQL as the primary datastore forced core transactional logic to be handled within the client-side Java application code. Since Redis lacks full ACID guarantees, this architectural pattern introduced code complexity, increased risk of data anomalies and slowed development .
- **Scalability Barriers:** As the user count grew into the millions and peak throughput approached ~50,000+ transactions per second (TPS), the monolithic Java + Redis + MySQL stack struggled. . The architecture proved difficult to evolve and scale horizontally without costly sharding and performance bottlenecks.,
- **Extreme Low Latency Demands:** Latency-sensitive workloads particularly Auto-Deleveraging (ADL) pipeline and position sorting, required guaranteed low-latency performance. IBIT required sub-100 ms completion for ADL (their previous benchmark was ~200 ms) In high-volatility market events, delays in ADL calculations expose the exchange to critical, cascading margin-related risk.
- **Operational and Architectural Rigidity:** With critical business logic deeply embedded in the Java client code, every required change demanded extensive rewrites and complex redeployments — slowing innovation, increasing operational risk, and reducing overall agility.

The Volt Solution: Transactional Processing re-architected for High Frequency Trading (HFT)

The customer strategically selected Volt Active Data for a targeted rollout on their highest-frequency, highest-value transactional workloads: account management, market display, trading position sorting and the ADL pipeline.

Architecture & Implementation Highlights:

- **Infrastructure:** 12 vCPU distributed cluster with High Availability, deployed across on-prem virtual machines.
- **Data strategy:** Volt acts as the high-speed transactional system for real-time state. MySQL remains the long-term, primary datastore for broader, non-latency-sensitive data.
- **Data seeding:** State data is loaded from MySQL via Volt's JDBC connector in micro-batches (approximately every 14 seconds) to pre-seed Volt's in-memory data tables.
- **Logic Migration (Key Shift):** Business logic, previously embedded in Java application code is now expressed as Volt stored procedures. In particular, the ADL logic (which reads user balances, computes deleveraging triggers and closes positions) is executed completely within Volt.
- **Performance Result:** The design supports real-time state updates (user balances, positions) with ACID guarantees, pushing throughput to peak of 50K TPS and sub-5 ms P99 latencies for most operations.

Key Implementation Steps & Timeline

- Initial proof-of-concept, mapping Java logic into Volt stored procedures and verifying latency/throughput behavior.
- Application refactoring, moving logic out of the Java layer and into Volt procedures, reducing client-side complexity.
- Micro-batch data loading and integration with existing MySQL data store and Redis caching tier.
- Performance tuning to meet P99 latency targets: the ADL pipeline achieved ~50 ms P99; other transactions ~5 ms P99.
- Roll-out to production within 2 months from start to go-live.

Why the customer chose Volt Active Data

Volt stood out as the ideal platform for modernizing the crypto exchange backend;

1 Strong ACID Support at High Throughput

Volt executes transactional workloads with full ACID at high transaction volumes, enabling correct, reliable wallet and position updates. A guarantee Redis alone cannot reliably offer.

2 Low-latency, High-TPS Architecture

Designed for real-time decisioning, Volt meets the sub-10 ms latencies required for modern trading engines (aligning with the "single-digit millisecond" claim for next-generation exchange data platforms).

3 Relational Data Model Compatibility

As the customers data model was relational (account balances, trading positions, order state), Volt provided a familiar model, reducing migration friction compared to moving entirely to a NoSQL or custom in-memory solution.

4 Simplified Logic Deployment

Moving complex business logic into Volt's stored procedures drastically reduced complexity in the Java client layer, improving maintainability and increasing developer agility.

5 Scalable, Future-ready Architecture

The architecture is designed to support load spikes, multi-user concurrency and evolving business operations (e.g. the customer plans to migrate further workloads and potentially implement read-write separation/CQRS patterns leveraging Volt's ActiveN feature).

Business Outcomes: Faster ADL, enhanced trust and future scalability

METRIC	BEFORE VOLT (JAVA/REDIS/MYSQL)	AFTER VOLT ACTIVE DATA	IMPROVEMENT
ADL P99 Latency	~150 ms	~50 ms	3x Faster Risk Response
Trading P99 Latency	Higher & Variable	~5 ms	Ultra-Responsive Trading
Peak Throughput	Struggled at Scale	50,000 TPS Supported	Seamless Scalability
Time-to-Value	Long/Complex Migration	2 Months Go-Live	Accelerated Deployment

Increased reliability & correctness: Strong transactional support mitigates the critical risk of data anomalies, essential in exchange environments where balance mismatches lead to major losses.

Future-Proofing: The platform is now ready to handle more complex HFT workloads and increased user loads with less architectural friction (e.g., leveraging Volt's features for Global Distributed Resilience).

Technical Architecture Snapshot

Diagram here (Biplab is building)

Conclusion

Powering the Future of Real-Time Crypto Exchange Infrastructure

In the hyper-competitive world of cryptocurrency exchanges, this Global Trading Exchange customer's transition to Volt Active Data represents a textbook example of modernizing the data platform to meet next-generation demands for speed and reliability. By shifting high-frequency transactional logic into Volt, the customer resolved long-standing constraints around ACID compliance, latency, and scalability.

The customer now has a platform that supports advanced business logic, ensures instant settlement, and sustains user trust, performance, and correctness at scale.

READY TO FUTURE-PROOF YOUR EXCHANGE?

Download our guide on "7 Data Challenges Facing Crypto Exchanges" or Request a Free Volt Active Data Trial today!