Customer Case Study:
Global Tier-One Bank Modernises MiFID II Transaction Reporting with Volt Active Data

Executive Overview

A leading global tier-one bank, operating across equities, fixed income, FX, derivatives, and futures at scale, faces some of the most complex regulatory obligations in financial services. As a major EU and UK market participant, MiFID II transaction reporting is a core requirement: every executed trade must be reported to the FCA, accurately, completely, and with full audit traceability.

The bank's legacy reporting stack had evolved organically across asset class silos. Rising trade volumes, FCA scrutiny, and the structural impossibility of proving deterministic compliance across a fragmented, multi-database architecture forced a fundamental rethink.

The bank consolidated its intra-day regulatory reporting onto Volt Active Data, replacing multiple subsystems with a single, ACID-compliant, deterministic regulatory engine. The outcome:

- P99 validation latency cut from 150ms+ to under 12ms
- Ingestion throughput scaled from 35K to 120K+ trade events per second
- Regulatory report generation reduced from minutes to sub-second
- Full-day replay time reduced from hours to deterministic minutes
- Audit reconciliation effort reduced by more than 70%
- Six or more reporting subsystems replaced by a single Volt cluster

Regulatory compliance became a real-time system property, not a post-trade reconstruction exercise.

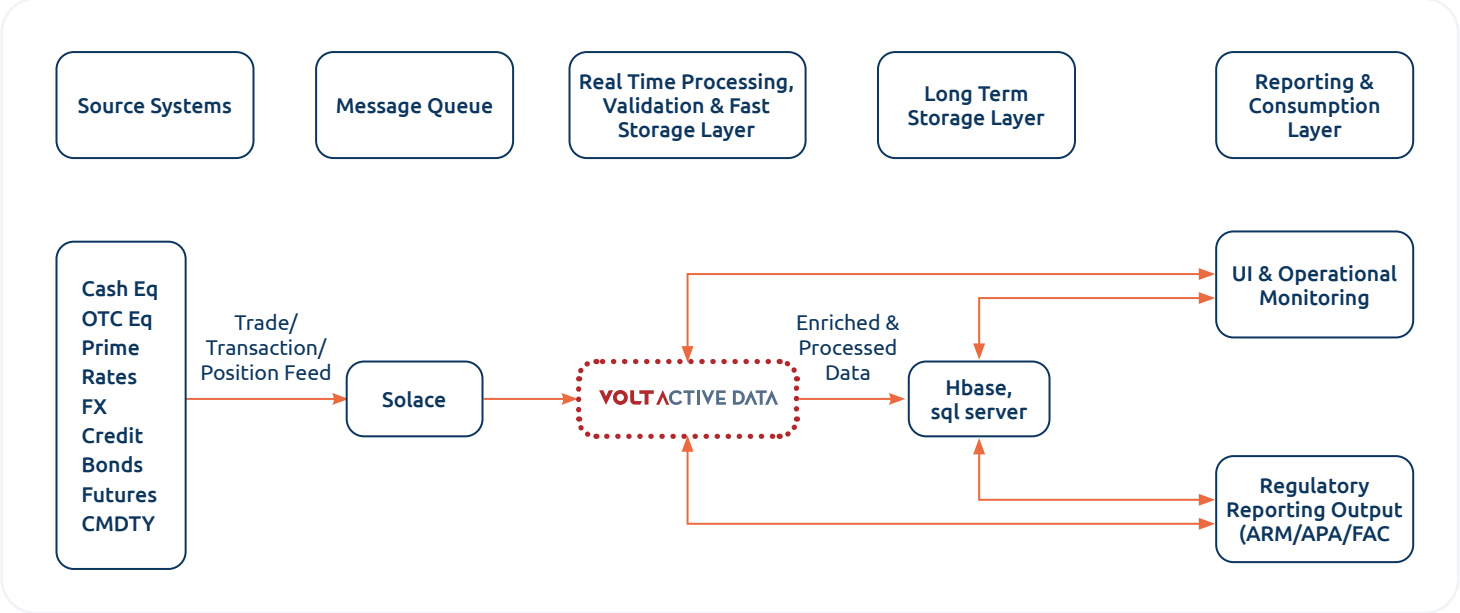
Key Performance Results

Validated under peak regulatory load and simulated failure scenarios:

Metric	Before	After Volt Active Data
P99 Validation Latency	150ms to 250ms	<12ms
Report Generation Delay	Minutes	Sub-second
Ingestion Throughput	~35K events/sec	120K+ events/sec
Replay Time (Full Day)	Hours	Deterministic minutes
Audit Reconciliation	Manual cross-check	Single authoritative source
System Components	6+ subsystems	Unified Volt platform
Consistency Risk	High (eventual)	Eliminated (ACID)

Performance remained stable under 4x ingestion bursts. Zero duplicate submissions. Zero state divergence during simulated node failure.

Technical Architecture



Business Challenge: Deterministic Compliance at Scale

MiFID II transaction reporting mandates complete trade capture, accurate enrichment, deterministic rule validation, a full intra-day audit trail, replay and reconstruction capability, and provable data lineage across systems. The bank's reporting stack had evolved to meet these demands through accumulation rather than design.

- **Massive scale:** 100K+ trade events per second across five asset class silos: Cash Equities, OTC, Bonds, FX, Futures
- **Broken replay:** Full-day recovery required hours of cross-system reconciliation, unprovable to auditors
- **Audit exposure:** Distributed, eventually consistent design made deterministic proof structurally impossible

Auditors required proof that all trades were captured, rules consistently applied, no reporting gaps existed, and intra-day state matched exported regulatory files. The current architecture could not provide this.

Technical Challenges

Four systemic issues emerged from the reference architecture, each posing direct compliance risk:

1. Fragmented State Across Multiple Systems

Trade data flowed through different middleware layers into asset-class-specific clusters before landing in individual Reporting databases. Every replicated copy introduced potential divergence. In regulatory reporting, divergence is not a data quality issue. It is a compliance failure.

2. Rule Processing Outside the Transaction Boundary

Regulatory validations ran in the application tier via Drools, decoupled from data persistence. Under concurrent load this created race conditions: timing mismatches between ingestion and reporting, and inconsistent rule application during replay. Rules and data were not atomic.

3. Replay and Recovery Complexity

MiFID II requires a demonstrable reconstruction capability. Full-day replay required re-injecting from message queues, reprocessing through application services, and cross-referencing three databases. Recovery was measured in hours, operationally risky under volatility, and could not be proven deterministic to regulators.

4. Audit and Regulatory Exposure

Eventual consistency models are non-compliant for regulatory reporting. The bank could not provide the deterministic trade lineage, clear data provenance, and evidence of consistent validation logic that MiFID II audit standards require. The exposure grew with every regulatory review.

The Volt Solution: Unified Real-Time MiFID II Reporting Core

Volt Active Data became the centralised, deterministic regulatory processing layer, replacing distributed validation services, multi-database intra-day storage, external reconciliation logic, and fragmented replay mechanisms. The architectural principle: move the regulatory logic to the data, not the data to the logic.

- Single ACID-compliant engine ingests, validates, enriches, and reports in one transaction
- 100+ MiFID validation rules encoded as Volt stored procedures, inside the transaction boundary
- Complete intra-day regulatory state in partitioned tables: lifecycle, eligibility, amendments, submission tracking, replay markers
- ARM and FCA submissions operate from a unified committed source of truth
- Replay re-injects historical events into Volt and re-executes stored procedures: identical inputs, identical outputs, guaranteed

Why Volt Active Data?

The bank evaluated traditional RDBMS platforms and modern stream processors before selecting Volt Active Data. Neither alternative could meet all five requirements simultaneously.

1. ACID Compliance for Regulatory Integrity

In a live regulatory environment, even a millisecond-level inconsistency can mean a missed submission, billing error, or audit failure. Volt's full ACID compliance ensures:

- Reliable, isolated processing of each trade event
- Consistent state updates, even across multi-step workflows
- Transactional safety during real-time validation, enrichment, and reporting

Unlike NoSQL or eventually consistent databases, Volt ensures every event is accurately accounted for with no race conditions or inconsistencies.

2. High-Scale Processing with Minimal Footprint

Benchmarked with Volt at:

- 120K+ trade events per second on a compact Volt cluster
- Each cluster tolerates node failure without disrupting throughput
- Elastic, linear scaling to accommodate future volume growth

Even under 4x ingestion bursts, Volt delivered consistent sub-12ms P99 validation latency.

3. Deterministic Replay and Audit Capability

Volt's stored procedure architecture guarantees replay integrity:

- Re-inject historical events, re-execute identical stored procedures
- Identical inputs always produce identical outputs: provable to regulators
- Recovery time reduced from hours to deterministic minutes

4. Unified Stream and Transaction Processing

Volt uniquely combines:

- Real-time stream ingestion and transformation
- Stateful, ACID-compliant transactions with SQL
- In-memory speed with durable persistence

This allows the bank to validate, enrich, and report trade events without relying on multiple middleware components or external caches, ensuring simplicity, reliability, and deterministic decisioning.

Architecture and Implementation Highlights

Five architectural moves define the Volt deployment:

- **Centralised ingestion:** Trade events from Solace consumed directly into Volt stored procedures with no intermediate layers
- **In-transaction rules:** All 100+ regulatory validation rules encoded as Volt stored procedures, serializable per partition
- **Single state store:** Complete intra-day state in partitioned tables.
- **Simplified submission:** EOD CSV and ARM submissions driven from a single committed source of truth; downstream systems subscribe to committed events
- **Deterministic replay:** Re-inject events, re-execute procedures: guaranteed bit-for-bit identical regulatory outcomes

Logic Migration and Architectural Shift

The transformation represented a fundamental shift in where regulatory intelligence lives:

Legacy Reporting Stack	Volt Active Data
Application-layer rule engine	**In-database deterministic logic**
EOD batch reconciliation	**Real-time status tracking**
Multiple reporting states	**Unified regulatory state**
Replay across systems	**Deterministic single-engine replay**

The key shift: regulatory logic moved to the data. Not the other way around.

Business Outcomes and Benefits

The results of the Volt Active Data deployment were immediate, measurable, and material to the bank's regulatory standing:

Modern, Compliant Architecture
Legacy multi-silo reporting replaced with a real-time, deterministic regulatory engine

Accurate and Auditable Transactions
Guaranteed reporting accuracy with full ACID consistency and single-source audit trail

Massive Throughput
120K+ events per second sustained; stable under 4x burst and simulated node failure

Reduced Regulatory Risk
Compliance is a real-time system property, not a post-trade reconciliation exercise

Simplified Ecosystem
One platform handles ingestion, validation, state management, and submission

Operational Cost Reduction
Reconciliation teams, replay services, and external rules infrastructure decommissioned

Conclusion: Enabling the Future of Regulatory Reporting

MiFID II is not a reporting exercise. It is a test of data architecture. Fragmented, eventually consistent systems can simulate compliance. They cannot prove it. And the gap between simulation and proof grows every time volumes surge, auditors questions, or regulators investigate.

With Volt Active Data, the bank delivers a regulatory reporting platform built for the realities of modern capital markets: high concurrency, live trade state management, and real-time auditability. For the bank and its regulators, this translates to:

- Operational excellence and reduced regulatory risk
- Guaranteed reporting accuracy with ACID consistency
- Future readiness for evolving regulatory obligations including EMIR, CFTC, and beyond

Volt's unique combination of ACID transactions, distributed fault-tolerance, and in-database rule execution makes it the engine of choice for mission-critical regulatory reporting.
Regulatory compliance is no longer a function of reconciliation. It is a function of architecture.

Ready to make real-time compliance a reality?

Volt Active Data is purpose-built for the latency, throughput, and determinism demands of real-time regulatory reporting. Whether you face MiFID II, EMIR, CFTC, or the next compliance legislation, Volt gives you the platform to be correct: provably, at scale, in real time.

Talk to a Volt Solutions Architect today.

Visit www.voltactivedata.com, email info@voltactivedata.com or contact your Volt account team to arrange a briefing and proof-of-concept scoping session.