Customer Case Study: Volt Active Data Powers Global Telecommunication Operators 5G Online Mediation

Overview

To deliver 5G-grade real-time mediation at scale, a leading Global Telecommunications Operator selected **Volt Active Data** as the foundational data platform for its **Online Mediation Platform**, deploying at a large **Polish telecom operator**. Replacing legacy systems, the new solution ensures sub-millisecond transaction processing, protocol-agnostic interoperability, and unmatched fault tolerance across multi-data center deployments.

Business Challenge: Real-Time, Always-Available Mediation for 5G Complexity

With the rise of 5G, telecom mediation is no longer about simple offline CDR aggregation. The Global operators, customers required a **next-generation mediation layer** to manage **live session charging**, **policy interactions**, and **subscriber state tracking** across millions of dynamic connections.

Key challenges included:

- **Massive volume and concurrency:** 100K+ transactions per second (TPS), thousands of concurrent subscriber sessions

- **Multi-protocol complexity:** Integration with diverse telecom systems over Diameter, Gy, N40, SOAP, LDAP, HTTP, SMPP

- **Real-time integrity:** Each transaction must be ACID-compliant to ensure no overcharging, no missed events, no state loss

- **High availability:** Zero tolerance for downtime—platform must survive node, cluster, or full data center failure without data loss

Solution: Online Mediation with Volt Active Data

The Global operators mediation platform is built to serve different telecom modules like GPRS, MMS, Special SMS, and other Value added services charging.This architecture enables the operator to serve as the real-time orchestrator between upstream systems (e.g., PGW, SMF, MMSC) and downstream rating/charging engines from different vendors like RTCG, MATRIXX, ZTE OCS, subscriber profile databases (SDA via LDAP), and messaging systems (SMSC).

The Telecom operators mediation platform operates not just as a traditional CDR mediator but as a stateful, protocol-agnostic, streaming mediation-hub that manages live subscriber sessions, rating requests, and policy triggers.

Each of serving module in the mediation platform relies on Volt Active Data platform as the real-time data engine to:

- Maintain consistent subscriber session state
- Route and process charging requests
- Orchestrate downstream interactions with OCS, PCRF, SDA, SMSC, and more
- Push enriched records (EDRs) to NCC and trigger real-time subscriber notifications center disasters.

Why Volt Active Data?

1 **ACID Compliance for Offer and Loyalty Integrity**

In a live 5G environment, even a millisecond-level transaction inconsistency can lead to billing errors, lost revenue, or regulatory breaches. Volt's full ACID compliance ensures:

- Reliable, **isolated processing** of each subscriber event
- **Consistent state updates**, even across multi-step workflows
- **Transactional safety** during real-time charging, session tracking, and policy enforcement

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

2 **High-Scale Processing with Minimal Footprint**

The platform is benchmarked with Volt at:

- **100K+ TPS** on a 3-node Volt cluster (16 vCPUs per node)
- Each cluster can bear the loss of 1 node without disrupting traffic
- Support for **millions of concurrent sessions** with low latency
- **Elastic and Linear scaling** to accommodate future growth

Even under intense telecom workloads—including real-time content charging, QoS enforcement, and session state coordination—Volt delivers consistent performance.

3 Exclusive Auto-Failover Across Data Centers

The Telecom operator leverages Volt's **XDCR (Cross Data Center Replication)** and **rack-aware architecture** to ensure:

- **Synchronous state replication** across clusters in separate data centers
- **Automated traffic failover** when a cluster becomes unavailable
- **Near-zero RPO (Recovery Point Objective)** and **RTO (Recovery Time Objective)**

This enables the Online Mediation Platform to:

- Seamlessly detect unavailability of a primary Volt cluster
- Automatically redirect traffic to a secondary site
- Maintain subscriber session state and event continuity with **zero data loss**

In production, each Volt cluster can tolerate a single node (instance) failure, providing additional in-cluster redundancy without service impact. Moreover Cross Data Center Redundancy helps in providing an entire Data Center Failure.

4 Unified Stream + Transaction Processing

Volt uniquely combines:

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

This allows the Telecom operator to process and route charging and policy requests **on the fly**, without relying on multiple middleware components or external caches—ensuring simplicity, reliability, and low-latency decisioning.

Business Outcomes for the Telecom Operators Customers;

Modern 5G-Ready Architecture: The operator replaces legacy mediation with a real-time signal mediation layer

Fault-Tolerant Operations: Auto-failover across data centers ensures zero downtime

Massive Throughput: Handles 100K+ TPS with minimal infrastructure

Accurate and Auditable Transactions: Guaranteed charging accuracy with ACID consistency

Simplified Ecosystem: One platform handles stream processing, state management, and protocol mediation

Conclusion: Enabling the Future of Telecom Mediation

With **Volt Active Data**, the global operator delivers a cutting-edge mediation platform built for the realities of 5G: high concurrency, live session management, and real-time monetization. For their customers, this translates to:

- **Operational excellence**
- **Customer satisfaction**
- **Regulatory compliance**
- **Future-readiness for evolving 5G service models**

Volt's unique combination of **ACID transactions, distributed fault-tolerance,** and **stream-processing performance** makes it the engine of choice for the operator's mission-critical telecom solutions.