

Whitepaper: Unlocking Real-Time Billing Data

A Proven Approach for the Telecom Industry

Executive Summary

In the cable and fiber telecom industry, access to real-time billing data remains a critical obstacle. Even the largest operators struggle with accessing fresh operational data from their most important systems. While these platforms are trusted for transactional integrity and regulatory compliance, they are difficult to interface with in real-time. This limitation slows operational agility, delays insights, and degrades customer experience—leaving companies dependent on outdated, T-minus-one-day data or worse.

The team at Constellation SaaS has deep, first-hand experience solving this problem. Our team designed, deployed, and operated a near real-time data synchronization engine for one of the largest telecom operators in the United States. This platform provided internal systems with access to billing data as fresh as 10 seconds old—running reliably at scale for over a decade. It became the data backbone for modern analytics, application development, and operational resilience.

The Industry Challenge

Billing systems are optimized for financial accuracy — not real-time access. Consequently:

- Data latency slows down customer service, application responsiveness, and alerting.
- Analytics teams are forced to rely on lagging indicators, hampering predictive capabilities.
- Operational reactivity is impaired, increasing the risk of customer dissatisfaction and revenue leakage.

These systems generally operate on batch cycles, rely on delayed replication, and expose limited APIs. Extracting live data is often expensive, brittle, or technically infeasible.

The Constellation Approach

The executives at Constellation SaaS have built a resilient, scalable, and secure data synchronization engine that enables near real-time parity between core billing systems and downstream business tools:

- **Latency:** Reduced to less than 10 seconds for priority data elements.
- **Uptime:** Architected for 99.999% reliability.
- **Volume:** Handles hundreds of millions of rows per day without performance degradation.

Key Design Principles

1. **Non-invasive integration:** Read-only footprint to protect core billing functions.
2. **Incremental updates:** Use of Change Data Capture (CDC) for minimal load.
3. **Schema abstraction:** Normalized views for easy consumption across platforms.
4. **Real-time monitoring:** Dashboards and alerts for lag, failures, and latency thresholds.

A Proven Path to Agility, Efficiency, and Operational Control

Architecture Overview

The following architecture ensures continuous, lossless data flow without compromising the stability of the billing environment:

- **Source Systems:** Billers such as ICOMS and AMDOCS
- **Middleware Layer:** Change Data Capture engine + message queue (Kafka/Redis)
- **Transformation:** Normalization, schema mapping, and deduplication
- **Delivery Layer:** Downstream databases, APIs, and analytics environments

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Benefits Achieved

By deploying this architecture, the telecom operator realized tangible improvements:

- Enhanced customer service with up-to-the-minute transaction views
- Faster time-to-market for applications relying on fresh billing data
- Real-time analytics enabling predictive revenue and churn modeling
- Proactive fraud detection based on current usage trends

Broader Industry Implications

Access to real-time billing data is more than an IT enhancement—it's a competitive differentiator:

- Enables hyper-personalized offers and usage alerts
- Synchronizes user experience across channels and touchpoints
- Fuels AI and machine learning initiatives with current data

Constellation's approach makes this capability achievable without a costly conversion of existing billing platforms.

Real-Time Billing Architecture

