



CASE STUDY

How One Global Digital Payment Provider Drove Growth by Improving Fraud Detection, Reducing False Negatives and Strengthening Customer Satisfaction

With digital payment options gaining in popularity, cyber criminals are taking notice. According to a study by LexisNexis, the cost of online fraud in 2014 grew 38% to \$32 billion in the US alone and that number is expected to grow as more transactions go mobile. But the cost of fraud extends beyond just the payment providers. Studies show that nearly one in three victims of a fraudulent transaction subsequently avoid certain merchants, further spreading the negative impact of fraud. These are just two data points among many that have caused one leading global payment provider to make fraud detection, intervention, and prevention a top priority.

Keeping digital payments fast and accurate while mitigating risk is no easy matter. This payments provider realized that the opportunity to build a better fraud algorithm, which is based on comprehensive customer profiles and leverages more real time data, was going to give it a competitive advantage.



Leveraging Aerospike to build a more sophisticated and accurate fraud application and a more profitable business

CHALLENGE

Creating a more accurate fraud detection and prevention solution required factoring in unique attributes of the payment provider's business model. The solution had to consider a myriad of realities, which included:

- The company's payments, rewards, and purchase protection programs, all of which have different rules and data-processing requirements.
- Unique profile attributes for 150 million customers, including payment and invoicing preferences, user ID, IP address, devices, location data etc.
- Mobility and multiple device dynamics that are often entry points for criminals to target mobile and "cross border" transactions.
- Visibility into payment histories and behavior patterns that help determine the validity of a transaction.
- Legacy database and infrastructure strategies that are unable to handle the requirements of a contemporary application, including leveraging near real-time data as a critical component of modern fraud algorithms.

After evaluating a broad array of data management solutions, the team decided that Aerospike was the only database that was up to the challenge. Aerospike, the high-performance NoSQL database, is a key-value store built explicitly to run on SSDs in order to deliver speed at scale. The combination of the database, complementary technologies like connectors, and significant total cost of ownership savings were deemed superior to other database providers included in the selection process.

Fulfilling a rigorous list of complex technical requirements

The solution required defining a new set of database requirements to support an application designed to leverage massive data, and real-time workloads to score fraud. To achieve the payment provider's goals, Aerospike needed to:

- Meet a 750 ms SLA to evaluate fraud on every payment transaction where the fraud algorithm creates thousands of individual database operations per transaction
- Seamlessly and cost effectively scale up in order to handle consistent growth in data and objects
- Improve query performance and data consistency
- Maintain consistent high availability in a 24x7 digital payments environment (>99.99% uptime)
- Scale up and out
- Avoid a costly rip-and-replace scenario
- Greatly reduce data load times, while providing reliable access to fresh data

The solution was built on Aerospike's high-performance NoSQL database developed explicitly for flash storage to deliver superior speed, horizontal scalability, reliability, and lower TCO.

BACKGROUND

Today, cyber thieves are getting away with billions of dollars due to the inability of legacy fraud apps to consume and analyze large data sets quickly enough to make consistently accurate decisions. Consequently, legitimate transactions are denied and fraudulent purchases are approved, hurting profits and leaving customers dissatisfied. This net result for payment providers is lower revenue, reduced profitability and customer defection.

THE RESULT

More accurate outcomes drive better profitability and customer loyalty

Aerospike's unparalleled combination of speed and scale enabled this customer to write a more comprehensive fraud application that leverages a significantly larger data set to power a more sophisticated rules algorithm. The net result is improved profitability as a result of more accurate fraud identification and a reduction in customer churn.

Aerospike delivers speed at scale

- Consistently met 750 ms SLA for fraud prevention for every financial transaction
- Increased operational database capacity to handle 60 TB of data and 30 B objects, supporting advanced algorithms for fraud detection
- Processed thousands of database reads and writes per financial transaction with predictable high throughput and consistent low latency
- Accelerated load speeds to > 1 M writes/second (limited by application design; > 8 M writes/second possible), with support for stream loading while reading from the same database
- Seamlessly scaled horizontally by adding nodes, with automated cluster management (three clusters, with data replicated 2x per cluster)
- Loaded data in 1–1.5 hours, minimizing projected data lag to seconds thus making recent activity data available to fraud detection algorithms
- Provided a flexible schema (schema-less data model) to store unstructured data efficiently; handle complex, constantly refined business rules; and enhance the application-database interaction

Predictable performance

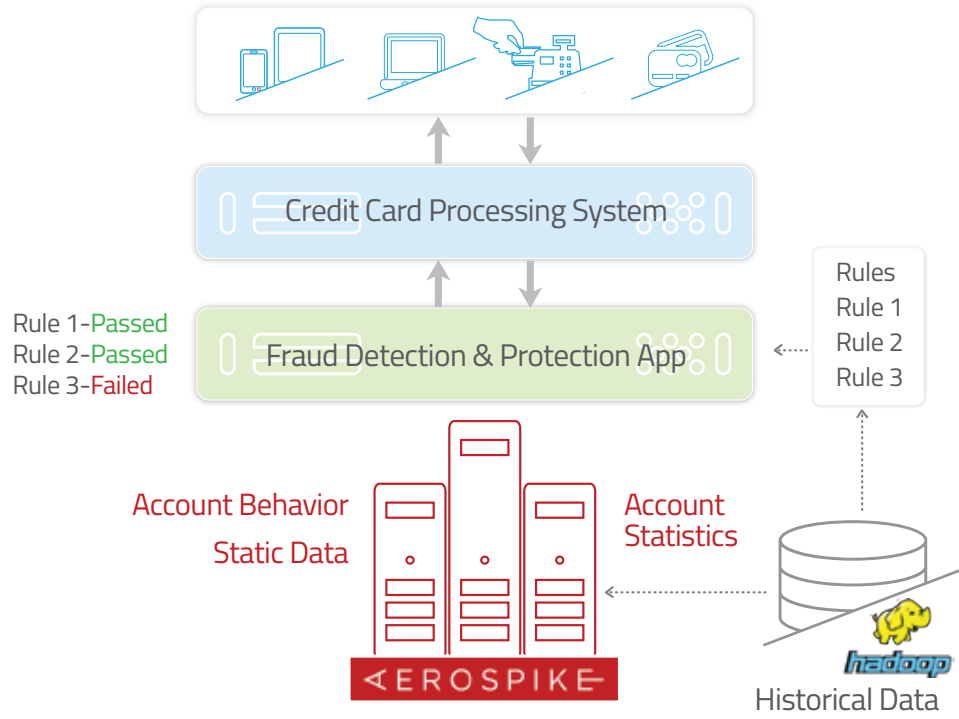
- Improved application read latency to ~250 microseconds
- Reduced total query time (at 200 DB queries per transaction) to ~75 milliseconds, a fraction of the SLA, leaving more time to detect emerging fraud scenarios

Higher reliability

- Provided instant access to historical and recent activity for improved decision-making
- Ensured built-in redundancy and automatic failover
- Enabled record-by-record data writes into the database and simultaneous reads, delivering the most recent activity to fraud detection algorithms

Lower TCO

- Eliminated an expensive caching that was built to overcome shortcomings in the previous solution
- Significantly reduced server count driving down both hardware and hardware management costs



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Aerospike is the high-performance NoSQL database that delivers Speed at Scale. Aerospike is purpose-built for the real-time transactional workloads that support mission-critical applications. These workloads have the mandate to deliver informed and immediate decisions for verticals like Financial Services, AdTech, and eCommerce. The unique combination of speed, scale, and reliability can deliver up to 10x performance or 1/10th the cost compared to most other databases.