

Leveraging Extreme-scale Data in Real Time to Prevent Federal Fraud

USE CASE

Every year, federal agencies dispense hundreds of billions of dollars in grants, contract payments, loans, disaster relief, safety net benefits, subsidies, tax refunds, disability payments, purchase card transactions, insurance claims, pandemic-related assistance, pensions, and more. Unfortunately, a high percentage of those outlays every year are considered improper – 7.2% in 2021 – and include losses due to fraud, waste, and abuse.¹

As a result, federal leaders are renewing their commitment to payment integrity and coming under increasing pressure to be more proactive in preventing improper payments from occurring in the first place. The 2021 OMB memo cited above, for example, directs agencies to “thoroughly review prepayment and pre-award procedures and ensure available databases with relevant information are checked to determine eligibility and prevent [improper payments] and [unknown payments] before the release of any Federal funds.”²

Getting to a more proactive, preventative approach to payment integrity is necessary, but it is hard to achieve. Agencies face constraints in the amount of data they can process and the speed at which they can do that – typically, as data grows, processing slows. That’s a huge problem, especially for anti-fraud artificial intelligence (AI) and machine learning (ML) algorithms, which rely on large-scale data sets and extremely fast processing speeds. And when thousands or millions of transactions are made monthly or even weekly, these constraints become prohibitive, and agencies have little choice but to resort to a “pay and chase” model of accountability.

So how can federal agencies shift successfully to a *preventive* approach to fraud, waste, and abuse?

‘To be effective, programs should not operate in a “pay-and-chase” model and instead, should prioritize efforts toward preventing improper payments and unknown payments from occurring. The reason for this is not only to avoid the IP and the UP but also to avoid expending resources to try and recover the overpayment.’

Office of Management and Budget
memo M-21-19, “Transmittal of Appendix C to OMB Circular A-123, Requirements for Payment Integrity Improvement,”
March 5, 2021

1 <https://www.whitehouse.gov/omb/briefing-room/2021/12/30/updated-data-on-improper-payments/>

2 OMB Memo M-21-19, “Transmittal of Appendix C to OMB Circular A-123, Requirements for Payment Integrity Improvement”, March 5, 2021.
<https://www.whitehouse.gov/wp-content/uploads/2021/03/M-21-19.pdf>

Aerospike: A real-time data platform for federal fraud prevention

Aerospike is uniquely capable of marrying extreme-scale data and sub-millisecond processing speeds to optimally serve a wide range of federal fraud-prevention and counter-fraud use cases, including transaction (payment) fraud, application and identity fraud; account takeover (ATO) fraud; and anti-money laundering (AML) fraud. *In short, it is a real-time data store for any size job, enabling real-time decisions and responses, even as suspicious transactions are unfolding.* Moreover, Aerospike does this while:

- Dramatically reducing infrastructure footprint to deliver exceedingly low total cost of ownership (TCO); and
- Delivering five-nines – 99.999% – availability to support even the most mission-critical federal applications and networks.

The benefits of Aerospike for federal counter-fraud operations

With Aerospike, federal agencies can:

- Ingest extreme-scale data at submillisecond speeds from multiple sources – including streaming data, data lakes, satellite data, signals data, social media, and more – and service any AI/ML solution or data visualization tool for real-time decisions and responsiveness.
- Stop transactions or payments, identity fraud, account takeovers, and money laundering *before* they result in financial or reputational damage.
- Reduce fraud exposure by up to 30X.
- Reduce false positives (by employing 10X the number of attributes within the same calculation time window).
- Reduce risk in ML model testing (via challenger/champion testing).
- Employ more historical data to bring greater accuracy to AI/ML models.
- Save significant amounts of money through less fraud.
- Future-proof their fraud-prevention and counter-fraud solutions with the ability to scale from 10's of terabytes up to petabytes without degradation in system performance nor the undue burden of server sprawl.

Aerospike in a nutshell

The Aerospike Real-time Data Platform enables organizations to act instantly across billions of transactions while reducing server footprint by up to 80%. This multi-patented, multi-cloud platform was purpose built to handle up to many petabytes of disaggregated data from disparate sources and dynamically route data to power any application with predictable, sub-millisecond performance. In this way, Aerospike accelerates decisions and triggering actions up to the point of events. Whether those apps fight fraud, enable global digital payments, provide cyberthreat and kinetic awareness, drive autonomous vehicles, increase battlefield advantage for warfighters, or predict the next big weather event, Aerospike processes data at the point of need to dramatically accelerate federal mission outcomes.

Fraud prevention case study: PayPal

PayPal is the world's largest online money transfer, billing, and payments system. In 2019, it generated more than \$712 billion in payment volume and supports more than 325 million consumers and merchants in more than 200 markets. The company was looking to further reduce its fraud rate of more than 0.17% of revenue. Although its fraud rate was well below the industry average of 1.86%, it still was losing more than \$1 billion of transactions per year to fraud. Moreover, PayPal's data challenges consisted of hundreds of petabytes, including more than 4,000 database instances and 32% data storage growth each year. In addition, the company was striving to grow from 3.5 million to 7 million transactions per second. With Aerospike, PayPal was able to:

- Reduce its fraud rate to 0.3%
- Meet 99.95% of fraud calculation SLAs
- Improve query performance and data consistency
- Maintain consistent high availability in a 24/7 environment
- Accommodate an annual projected 32% data growth
- Enable 8 million-plus executions per second

To learn more about how Aerospike can deliver real-time, extreme-scale fraud prevention operations to your agency, please go to aerospike.com/solutions/industry/public-sector/.

AEROSPIKE

Aerospike unleashes the power of real-time data to meet the demands of The Right Now Economy. Global innovators and builders choose the Aerospike real-time, multi-model, NoSQL data platform for its predictable sub-millisecond performance at unlimited scale with dramatically reduced infrastructure costs. With support for strong consistency and globally distributed, multi-cloud environments, Aerospike is an essential part of the modern data stack for Adobe, Airtel, Criteo, DBS Bank, Experian, PayPal, Snap, Sony Interactive Entertainment, The Trade Desk, and Wayfair. A global company, Aerospike is headquartered in Mountain View, California, with offices in London, Bangalore, and Tel Aviv.

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