AEROSPIKE

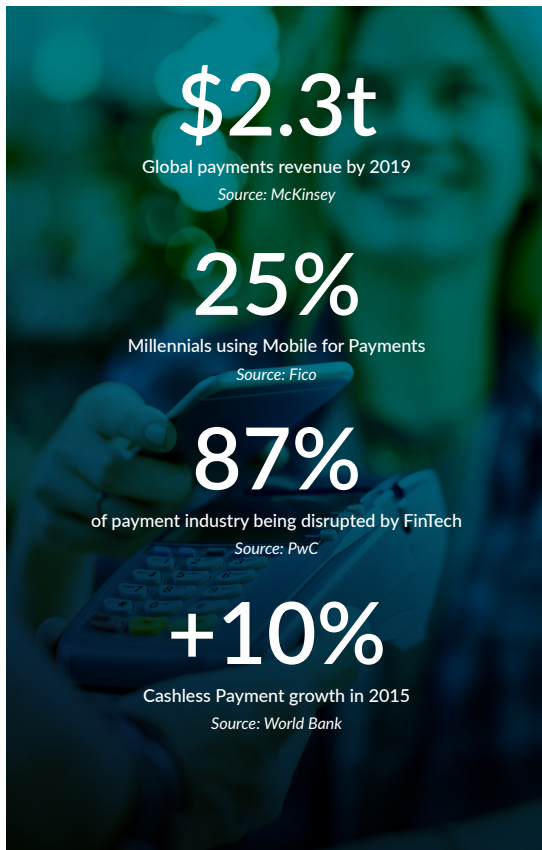# ENABLING DIGITAL PAYMENTS TRANSFORMATION

Fraud Detection, Identity Resolution, Settlement and Clearing all Benefit from Real-time Decisioning

$2.3t

Global payments revenue by 2019
Source: McKinsey

25%

Millennials using Mobile for Payments
Source: Fico

87%

of payment industry being disrupted by FinTech
Source: PwC

+10%

Cashless Payment growth in 2015
Source: World Bank

The Rise of Digitalization is Changing the Payments Industry

Global payments are expected to exceed $2.3 trillion by 2019, and each year, non-cash payments are accounting for an increasing share of this massive market. Cashless transactions are growing by 10%, and according to one study, are likely to represent over one million transactions every minute by 2020. The growing adoption of mobile payments, particularly among millennials, combined with a rapid uptake in eCommerce "Card Not Present" (CNP) transactions, and the emergence of non-banking payment service providers (FinTech) are among the many factors causing turbulence and disintermediation in discrete parts of banking and the payments landscape.

Challenges in the Payments Industry

There are constant challenges in the payments industry ranging from preventing fraud, verifying identities, and decreasing risk. Other items to grapple with include scaling a solution to deal with rapid growth and meeting strict SLAs while, of course, containing costs. Plus, to remain competitive, new solutions will require development, such as those that deliver value from customer payment data.

Unfortunately, conventional data architectures prevalent in the industry have limitations. They are built to store transactional and analytical data separately, in silos. Consequently, bringing their respective data together in real-time is difficult, leading to unacceptable response times, outdated information, or incomplete information. This can lead to customer abandonment, payment denial, fraud and missed cross-sell opportunities that can hurt the customer experience.

Payments Value Chains have Multiple Opportunities for Real-time Decisioning

In the management of the lifecycle of an account, there are risks and decisions at various checkpoints that don't just require real-time responsiveness, but benefit from combined transactional data and historical/behavioral data that can (and should) be analyzed.

For example, at enrollment, is the user who they say they are? Can you access a global identity network to verify them even before they open an account? Can you process and assess their credit worthiness?

Once they are a customer and they login, can you, again, properly authenticate their identity, especially
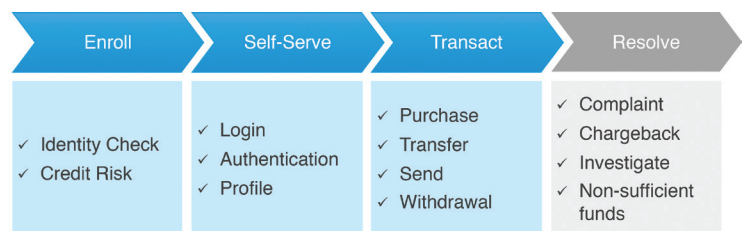

Figure 1 - Digital Payments Value Chain

when updating their profile information (lest they be a bad actor and change critical account information). For transaction requests, should their

identity be verified, can fraud be aptly detected? What machine learning algorithms are in place, acting on what amount of data are in place? Without a speedy fraud prevention calculation, a false positive can lead to customer abandonment, payment denial, fraud and missed cross-sell opportunities.

While Figure 1 (above) represents a generic digital payment value-chain (e.g. mobile wallet, credit account or credit card), Figure 2 (below) represents a more traditional credit card four-party open-loop payment network. At authorization (step 1) for either the issuer or acquirer, risk evaluation is conducted. Many data points and machine learnings can (and should) be applied at this stage. For clearing (step 2) and settlement (step 3), speedy processing is required for e.g. collecting the transaction data, validating the transaction, fee calculations, reporting, and creation of wire instructions. Both speed and scale are needed; it's not uncommon for a payment network to process 250 million decisions a day, leading to 60 billion database read-writes per day across a global network.
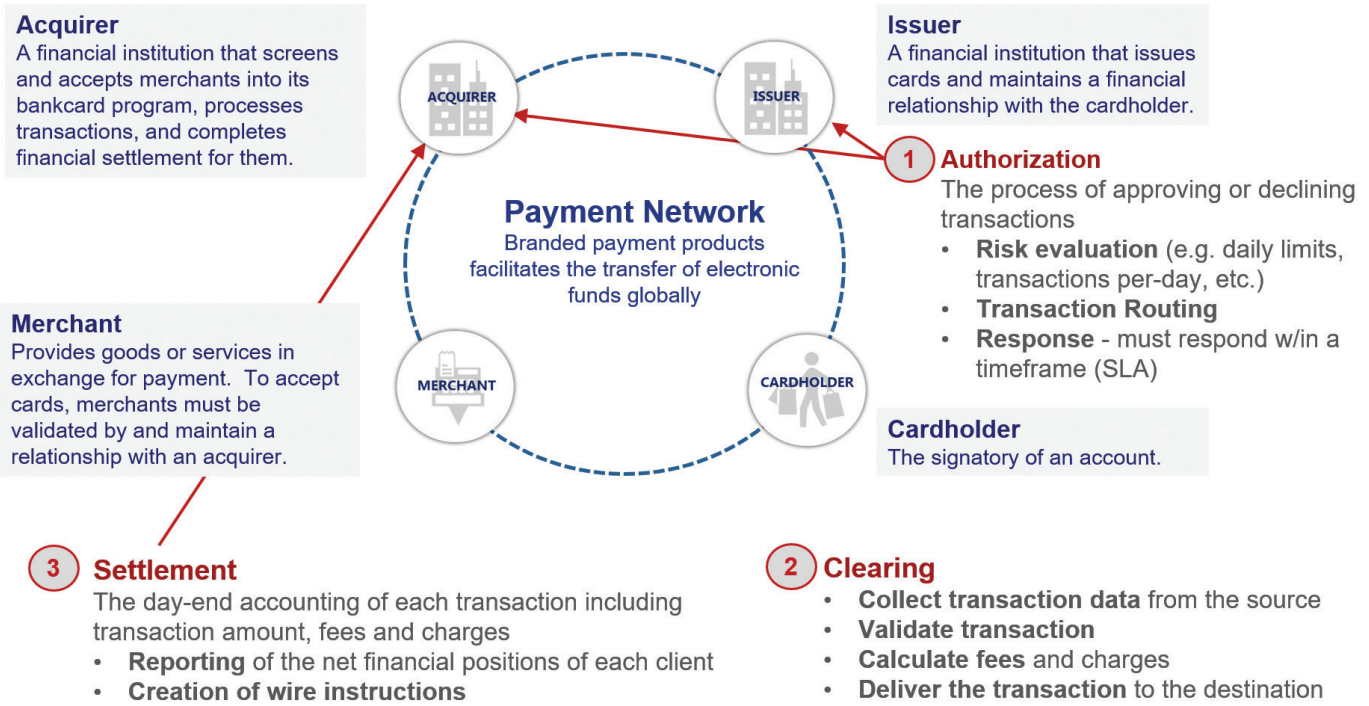
Acquirer
A financial institution that screens and accepts merchants into its bankcard program, processes transactions, and completes financial settlement for them.

Issuer
A financial institution that issues cards and maintains a financial relationship with the cardholder.

Payment Network
Branded payment products facilitates the transfer of electronic funds globally

1 Authorization
The process of approving or declining transactions
- **Risk evaluation** (e.g. daily limits, transactions per-day, etc.)
- **Transaction Routing**
- **Response** - must respond w/in a timeframe (SLA)

Merchant
Provides goods or services in exchange for payment. To accept cards, merchants must be validated by and maintain a relationship with an acquirer.

Cardholder
The signatory of an account.

3 Settlement
The day-end accounting of each transaction including transaction amount, fees and charges
- **Reporting** of the net financial positions of each client
- **Creation of wire instructions**

2 Clearing
- **Collect transaction data** from the source
- **Validate transaction**
- **Calculate fees** and charges
- **Deliver the transaction** to the destination

Figure 2 – Four-party model / open-loop payment network typical of branded credit cards have multiple needs for real-time decisioning including risk evaluation at Authorization, as well as at Clearing and Settlement.
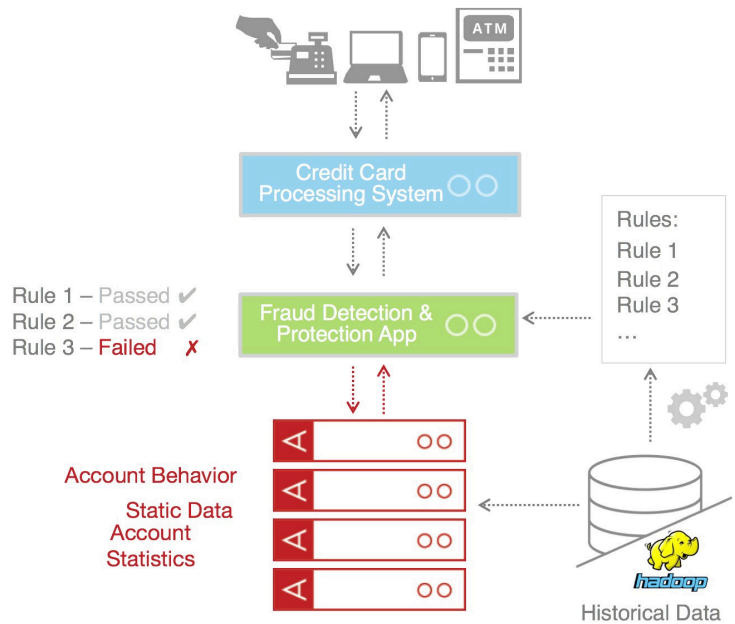

An estimated
73%
of enterprises report some form of suspicious activity that puts around $7.6 of every $100 transacted at risk,

Use Case: Fraud Detection for Digital Payments

A global payments provider is minimizing its annual fraud losses by improving its fraud detection algorithm SLAs by a factor of 30x with Aerospike. The firm moved from a 2-layer architecture consisting of Oracle RAC and 360 Terracotta servers to a 20-node Aerospike cluster. Now it runs fraud detection rules against 99.95% of its transactions within its target SLA of 750 milliseconds. The company supports real-time decision analysis by combining the transactional systems with analytics systems to drive profitable business outcomes.

Rule 1 – Passed ✔
Rule 2 – Passed ✔
Rule 3 – Failed ✗

Credit Card Processing System

Fraud Detection & Protection App

Rules:
Rule 1
Rule 2
Rule 3
…

Account Behavior
Static Data
Account Statistics

Historical Data

Use Case: Digital Identity Tracking for False Positive Reduction & Fraud Prevention

ThreatMetrix, a LexisNexis Risk Company, the world's largest Digital Identity Network, needed to manage the identity and fraud prevention for 80 million transactions a day across 40,000 websites. The ThreatMetrix ID™ formulates a unique identifier for every individual on the network. It has a graph visualization of all related tokenized attributes and generates both a confidence score and a trust score to help in smarter authentication and fraud decisioning.

It looked to Aerospike as its SLAs were becoming unpredictable in managing 130+ billion records (and growing). They replaced a 96 Node Cassandra deployment with just 28 nodes of Aerospike. As a result, they improved SLAs and their business overall for managing real-time customer trust decisions, virtually eliminating false positives and greatly enhancing fraud detection.

Working with Aerospike helps us analyze data faster than ever—evaluating **billions of data points**, across **75 million daily transactions**, all in **real-time**. As a result, digital business can quickly and accurately distinguish between genuine users and fraudsters, making a true consumer's online experience secure and **friction-free…**"

– **Phil Steffora, Chief Security Officer, ThreatMetrix**

Use Case: Frictionless Digital Wallet and API Gateway

PhonePe, a Flipkart company, transformed from a fintech startup to 10 Billion dollars total transaction value per year with the aid of Aerospike technology. As a billion people in India transform into a cashless economy, there are 800M mobile phones and 200M smart phones. India has a Unified Payment Interface (UPI) that enables cross business, cross people, cross bank transfers which are secure and reliable. PhonePe was an early adopter of UPI, now handling 20% of all UPI transactions in India.

With Aerospike, PhonePe is able to conduct authorization and real-time fraud prevention based on user behavior and risk scoring with latency requirements under 3 ms. Plus, they are conducting in-app engagement with their users for messaging, durable mailbox, making optimized offers and deals, plus language localization. This is done all in Aerospike as a shared-nothing database system that operates on a cluster of commodity server nodes.
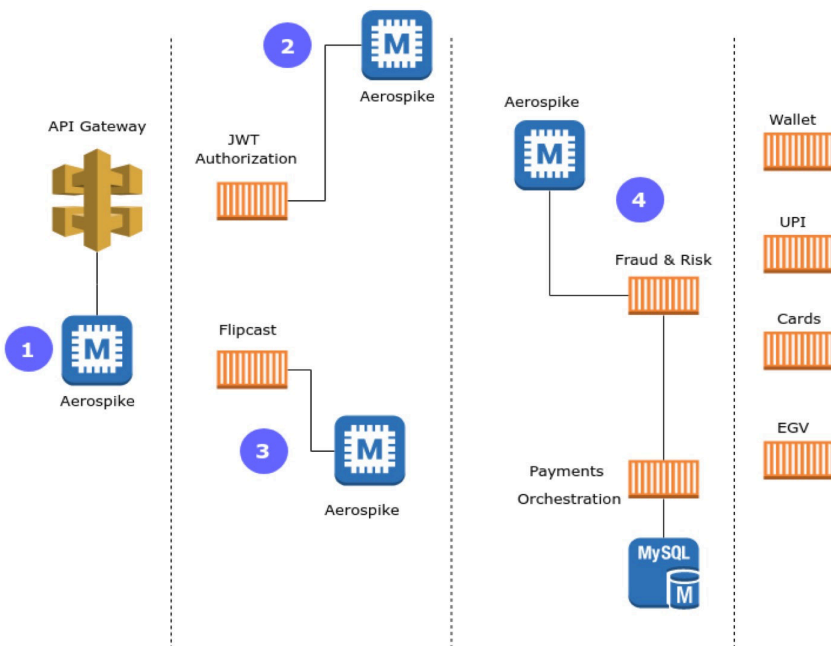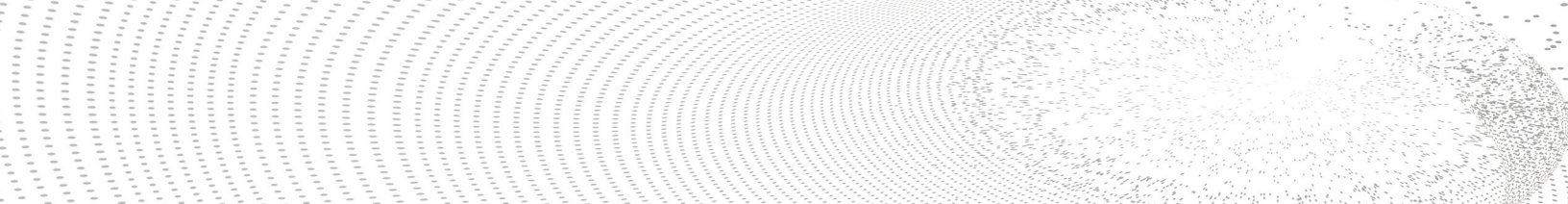
Summary of Top Benefits with Aerospike for the Payments Industry

- Provides Payment teams with a distributed, low-footprint, highly scalable, high-volume database to process and combine real-time transactional data with operational data.

- Facilitates machine learning and real-time decisioning on combined data for fraud, risk, identity resolution, clearing, and settlement calculations and decisions.

- Helps teams build customer-centric applications by spanning previously siloed user historical and in-session behavioral data into a combined data stream, processing it in real-time for offers, deals, and promotions.

- Works with existing systems of record while eliminating difficult-to-manage caching layer technologies, at scale, with exceptional uptime and reliability.