CASE STUDY
Delivering Real-Time Financial Transaction Monitoring

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Background

- Customer is a US-based Payment Systems Provider
- Large Network of ATM and Cashier Operated Devices
- Successful Operation Essential to Their Business
  - Ensure Customer Experience
  - Meet SLAs / Avoid Penalties
  - Money = Money
Problem – Cash Request Declinations

- Not Enough Funds
- System Problem
- Network Problem
- Machine Problem

Card Declined
Goals

Collect Real-Time Transaction Data

Monitor Overall Transaction Volume and Declination Rate

Slice Data By Dimensions

Monitor Transaction Volume and Declination Rate Per Dimension

Alert On Increases in Declination Rate Overall and By Dimension
Collect Transaction Data From Databases In Real-Time, Prepare Data, Add Context, Slice into Dimensions, Analyze, Visualize and Send Alerts

- All Transaction Written into Database
- Transactions Collected via Change Data Capture
- Context Data Loaded into In-Memory Data Grid
- In-Memory Processing and Analytics Through SQL-based Queries
- Real-Time Visualizations in Dashboard and Alerts via Email / SMS
Data and Dimensions

The Data Contains
• Transaction ID
• Timestamp
• Terminal ID
• Transaction Code
• Response Code
• Card Type
• Network Type
• Masked Card No

We Derive Dimensions
• Response Type
• Transaction Type
• Card Type
• Network Type
• Location

Approved
No Such Issuer
Host Timeout
Institution Decline
ETC.

VISA
SHAZAM
FISERV
MDS
PULSE
ETC.

DEBIT
CREDIT
ATM
CHECK

VISA
MC
AMEX
DISC
OTHER

STATE
CITY
LAT
LONG
Application Data Flow

1. Parse
2. Join
3. 1 Min Win
4. Aggregate
5. 5 Min Win
6. Decline
7. Store
8. Store

Context & Location Info

Real-Time Dashboard
Stream Processing and Preparation

- Sourced From Database CDC
- Processed By In-Memory Continuous SQL-Based Queries
- Enriched by Context Through JOIN Queries
- Uses Time Windows for Real-Time Aggregation
- Aggregated by GROUP BY to Split Dimensions
Streaming Analytics Rules

- Overall or Any Dimension Declined by > 10% in 5 Minutes
- All Aggregates over 1 Minute Periods
- Keep Last 5 Mins (6) Aggregates
- Compare First / Last
- Alert If Last – First > 10%
Streaming Analytics Queries

SELECT LAST (LocalDtTm) AS LocalDtTm, COUNT (*) AS TotalTxVolume,
    \( \frac{\text{SUM (CASE WHEN LocalResponseCode = '01' THEN 0 ELSE 1 END)}}{\text{COUNT(*)}} \times 100 \) END AS DeclineRate,
    \( \frac{\text{SUM (CASE WHEN LocalResponseCode = '01' THEN 1 ELSE 0 END)}}{\text{COUNT(*)}} \times 100 \) END AS ApprovalRate
FROM DataAggregationWindow

SELECT FIRST (LocalDtTm) AS BeginLocalDtTm, FIRST (DeclineRate) AS BeginDeclineRate
    \( \frac{\text{LAST (LocalDtTm) - FIRST (LocalDtTm)}}{\text{FIRST (DeclineRate)}} \times 100 \) AS DeclineRateGrowth
FROM DeclineRateCheckWindow
HAVING COUNT(*) = 6

SELECT EndLocalDtTm, EndDeclineRate, BeginLocalDtTm, BeginDeclineRate,
    \( \frac{(\text{EndDeclineRate} - \text{BeginDeclineRate})}{\text{BeginDeclineRate}} \times 100 \) AS DeclineRateGrowth
FROM DeclineRateChangeStream
WHERE (EndDeclineRate - BeginDeclineRate) > (0.1 * BeginDeclineRate)
Dashboard Builder

Transaction Flow Health

Set Visualization Query

```
SELECT 
FROM TxBalVolumeByState 
WHERE (MyStateCode IS NULL OR StateCode = 'MyStateCode') 
ORDER BY LocalStmt;
```

Press Ctrl+space to add a pop-up menu of functions and cache, stream, and WATObject names.

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Main Dashboard

- Overall Approval vs Decline Rate
- Metrics By Location
- Metrics By Network
- Metrics By Card Type
- Metrics By TX Type
- Alerts for Decline > 10% in 5 Mins
Drilldown to Response Types
Drilldown to Network Types
Benefits

- Real-Time View Into Transaction Data
- Alerts On Increases in Decline Rate
- Dimension Slices -> Appropriate Actions
- Improvement in SLA / Reduction in Penalties
- Better Customer Experience
- Improved Bottom Line
Striim Is a Complete End-to-End Platform

**Streaming Integration & Analytics Platform**

*Supporting Enterprise, Cloud and IoT*

**Flexible Architecture With Deployment On-Premise / At The Edge / In The Cloud**

- **Continuous Data Collection**
  - DBs (thru CDC), files, HDFS, system logs, message queues, sensors

- **Stream Processing**
  - Real-Time Filtering, Transformation, Aggregation, Enrichment

- **Streaming Analytics**
  - Correlation, CEP, Statistical, ML, Alerts and Visualization, Trigger External Systems

- **Continuous Results Delivery**
  - Enterprise & Cloud DBs, files, Big Data, Blob Storage, Kafka, etc.

**Integration With Existing Enterprise Software**

- **Enterprise Grade Streaming First Architecture**
  - Clustered, Distributed, Scalable, Reliable and Secure
Striim’s Key Differentiation

Striim is unique in the market by providing all 4 of the following in a single platform.

- **End-to-End**
  - Easy to Use
  - Secure with built-in authentication, protection, and encryption
  - High performance and highly scalable with distributed architecture
  - Reliable with fault-tolerant architecture and “exactly once” processing

- **Easy to Integrate**
  - Log-based Change Data Capture
  - Deep integration with Kafka
  - Integrates with other technologies easily to collect data and distribute
  - Top 3 Cloud Platforms
  - Top 3 Big Data Platforms
  - Major Enterprise Databases
  - Multiple Open Source Solutions

- **Enterprise Grade**
  - Low configuration installation
  - Fast to build and deploy apps in days
  - Easy to iterate using SQL-like language
  - Continuous ingestion and processing
  - Multi-stream correlation
  - Time series/windowing

- **Single Platform for Collection, Processing, Analysis, Delivery and Visualization of Streaming Data**
  - Supports wide variety of data sources, targets, and data types
  - Converged In-Memory Platform
  - Consistent end-to-end UI

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