neo4j

CASE STUDY

200 Percent Increase in Fraud Detection

Banks must approve or deny transactions fast, before the user experience starts to crumble. TODO1 Services Inc. uses Neo4j's powerful graph database as the foundation for iuviPROFILER, its own proprietary solution for assessing fraud risk in an instant.

BY THE NUMBERS

200M nodes
2B relationships
200% increase in fraud detection
>500 transactions per second
100 milliseconds per query

PLATFORM
Neo4j Enterprise Edition on Microsoft Azure

INDUSTRY
Financial Services

USE CASE
Fraud Detection

CHALLENGE
Create an extremely fast, always-reliable fraud detection application that outperformed an incumbent solution.

SOLUTION
Used Neo4j as the foundation for a real-time fraud detection application

RESULTS
- Doubled the fraud detection rate compared to the incumbent solution
- Seamlessly shifted from one cloud hosting provider to another mid-project

The Company
TODO1 Services Inc. provides digital risk and security solutions for the financial services and banking sector in Latin America with products that focus on the end user and ease of use. TODO1 empowers banks to conduct business in a way that reduces the friction between individuals and their financial institutions with a full spectrum of solutions, including fraud detection.

The Challenge
Latin America is one the fastest growing regions for digital banking and payments. Banks must deliver a seamless user experience, giving them, at most, half a second to approve or deny the transaction before the experience starts to crumble. This is especially true in Latin America, where payments are typically processed by banks in real time. People expect things to happen fast.

That half second is where TODO1 Services Inc. operates – using Neo4j's powerful graph database as the foundation for iuviPROFILER, its own proprietary solution for assessing the risk of fraud in an instant. It's an important part of TODO1's offering, which handles the entire digital channel and customer experience for major banks in Latin America.

"Doing fraud detection in real time with a traditional, relational database is a nonstarter," said Dr. Edgar Osuna, Chief Data and Analytics Officer at TODO1. "There are simply too many JOINs between too many tables to make it feasible."

Fraud detection is something banks need. It was clear to Osuna that he needed to use a new type of data structure to solve this problem. "When you're working the problem on the whiteboard, you start drawing what happens in a fraud. You have lots of dots and lines. Those are graphs."

"The problem was 'screaming graphs'," he said. The solution would be a graph application that was flexible – and extremely fast.

Osuna's financial and tech background helped him see this challenge from all angles. More than 20 years as an executive in multinational financial institutions gives him deep insights into business requirements and customer needs. He has the technical chops to match: his research was awarded the IEEE Longuet-Higgins Prize for published contributions in the field of machine learning.

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Dr. Edgar Osuna, Chief Data and Analytics Officer, TODO1 Services, Inc.

"We've all lived through a rejected transaction on a credit card or a call back on something," said Osuna. "It's not just that the transfer on the phone gets executed with the right journey, but also that you don't stop for fraud if it isn't fraud."

The Solution

The TODO1 team developed iuviPROFILER as an alternative to a commercial fraud detection tool that was no longer serving the customer's needs. The solution uses Neo4j as a component to process data and identify risk.

As Osuna puts it, "iuviPROFILER empowers banks to conduct business securely. We want to reduce the friction between individuals and their financial world."

Osuna said he chose Neo4j because the technology is mature enough to handle hundreds of transactions a second, reliably, and especially during periods of peak demand such as holidays and paydays. iuviPROFILER can sustain hundreds of transactions a second, spending merely tens of milliseconds on a single query, thanks to the streamlined logic behind the Cypher query language.

The TODO1 team originally engineered iuviPROFILER to run on a different cloud platform. In the end they migrated from one major cloud provider to another. The migration "worked beautifully," he said. "It ended up not being a difference besides some fine-tuning."

The Results

TODO1 replaced a well-known fraud detection product with its own application written on Neo4j and was able to compare results side by side. "For the same false positive rate, we're able to achieve twice the detection rate," he said. "And that in the end is less friction for the customer, less losses for the bank, and a better feeling in terms of protection for their customers."

It has been more than two years since TODO1 leveraged Neo4j to launch iuviPROFILER, and over time its graph data model has evolved. And the beauty of it, Osuna said, is that "the data model itself has been morphing without having to stop the service."

"And that was one of the things that I think we saw in the beginning that was powerful," he said. "You can always add to Neo4j."

In our digital era, where data and analytics and information is so often stripped away and isolated from the real people behind the numbers, Osuna likes to stay focused on who he views as the true client. "In the end we're serving the person using the app," said Osuna. "We want them to feel confident when they use the app."

Questions about Neo4j?

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