

## Case Study

Ad Tech  
Agency

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Identity Graph Analysis at Scale  
Provides Ad Tech Agency Customers  
with Greater ROI**INDUSTRY**

Advertising / Marketing

**USE CASE**

Audience Identity-as-a-Service / Internet of Things (IoT)

**GOAL**

Provide advertisers with the ability to track consumer behavior across multiple devices

**CHALLENGE**

Original product was only optimized to track user behavior on one device

**SOLUTION**

Added Neo4j to their stack to provide a cross-device identity graph to their customers

**RESULTS**

- Efficiently query relationships between billions of data points
- Track consumer behaviors across devices to provide greater ROI to their advertising customers

*This Ad Tech Agency relies on over one terabyte of graph data in Neo4j, combined with larger amounts of non-graph data to provide major companies with consumer insights for targeted marketing and advertising opportunities. By building the identity graph using Neo4j, they were able to expand their services to track users across multiple devices and provide their customers with a greater ROI.*

**The Company**

Powered by an intelligent cross-device graph, this Ad Tech Agency provides companies with a holistic picture of potential customers in order to glean powerful consumer insights. The ability to capture information about consumer behavior and purchasing intent used a combination of geolocation and online behavior, which makes the company truly one of a kind. Founded in 2011, they now have offices in five major cities across the United States.

**The Challenge**

When the agency was founded in 2011, they analyzed public declarations of location on social media. As the company grew, that analysis expanded to other forms of declarative data beyond social media.

But as time went on, people were not only using more devices, they were performing different actions on each. And the Ad Tech agency's original product wasn't optimized for recognizing a consumer across all devices.

"We needed to be able to capture data from multiple devices and associate it to a single individual," said the Chief Technology Officer of the Ad Tech Agency.

Even more challenging was the fact that pieces of data were continually changing, a result of the fact that people frequently purchase new devices and clear cookies from their browser.

As a company that defines and sells audiences to large companies across several industries – from automotive to beauty to entertainment – the agency needed to find a way to provide cross-device insights, fast.

They found their solution in Neo4j.

## Case Study

“We needed to understand consumer behavior across devices in order to capture a complete picture. Conceptually we could have done this in a relational database, but the multiple JOINS would have made it much too complicated.”

– Chief Technology Officer,  
Ad Tech Agency

### The Solution

The Ad Tech Agency now relies on a stack that includes Neo4j, Node.js, Ruby, Go, Python, Hadoop, Apache Spark, BigQuery and MongoDB.

When the agency's identity graph receives a signal from a device, it collects an originating device and/or cookie ID, which then points to the owner of the device – the user. The identity graph then queries the device and all signals associated with it, and performs processing based on the user ID. They can then export audience data to any target device ID in the identity graph to potential advertisers.

Their identity graph relies on Spirograph (an internal Ruby app) to communicate with Neo4j by either inserting data into or pulling data from the graph in Ruby, which is then processed in Hadoop, Spark and BigQuery. The identity graph also relies on Cerebro to convert user coordinates into a commercial location, which is stored in MongoDB – a tool well-suited for spatial indices.

### The Results

The Ad Tech Agency relies on a huge amount of graph data – **1.2 terabytes of data with nearly three billion nodes and nine billion relationships** – to aid in combining customer behaviors across devices. And only Neo4j has the flexibility and bandwidth to effectively query relationships in such a large volume of data.

With the addition of Neo4j to their technology stack, the agency was able to enhance their existing product with a consumer identity graph and provide companies with the ability to track consumers across multiple devices, greatly increasing their sales and conversions.

Neo4j is the leader in graph database technology. As the world's most widely deployed graph database, we help global brands – including [Comcast](#), [NASA](#), [UBS](#), and [Volvo Cars](#) – to reveal and predict how people, processes and systems are interrelated.

Using this relationships-first approach, applications built with Neo4j tackle connected data challenges such as [analytics and artificial intelligence](#), [fraud detection](#), [real-time recommendations](#), and [knowledge graphs](#). Find out more at [neo4j.com](#).

Questions about Neo4j?

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