Companies understand that customer loyalty is only as strong as the consumer’s last experience. Increasingly these businesses are turning to [x+1] to deliver superior, personalized interactions across all their digital touch points.

The cloud-based [x+1] Origin platform combines an enterprise data management platform (DMP), with POE™, the company’s patented real-time decision engine, Web services APIs, advanced analytics, and multi-channel execution capabilities. Together, these enable companies to deliver the right message to the right consumer at the right time across multiple digital channels—including ad servers, content management servers, chat systems, email systems and demand-side platforms (DSPs).

The value of this approach was highlighted recently when [x+1] was inducted into the JPMorgan Chase Hall of Innovation in recognition of its significant contributions to the company’s digital marketing efforts.

To power its platform and support the high-value transactions that drive its business, [x+1] depends on the Aerospike NoSQL real-time database and key-value store. Today, Aerospike reliably processes some 4 TB of data and billions of user profiles and records across four [x+1] data centers in the United States.

**Wanted: High Value Transactions In Real-Time**

For [x+1], driving business value depends directly on the ability to use customer, behavioral and purchase data to consistently deliver relevant messages in real-time and in a format that is appropriate to the online channel being used by the customer.

“Like most marketing servers, we integrate a lot of our own data with third-party data and our client’s first-party data to provide a complete view of consumers,” explains [x+1] CTO Patrick DeAngelis. “However, we take things a step further by making multi-channel analytics actionable across multiple touch points. If those analytics and insights are not actionable, they’re not interesting to our clients.”

A central component of the [x+1] Origin platform is the ability to integrate with a company’s website to provide personalized audience targeting for each unique site visitor.

“Our clients rely on us to deliver audience targeting capabilities on their home page, and this creates extremely high value transactions that we simply can’t afford to miss out on,” Mr. DeAngelis explains. “If our system renders 10%-20% of data unavailable for even just a few hours, it has a significantly detrimental impact on the business. We have zero threshold for timing out.”

“Using Aerospike, we’re able to plug thousands of attributes into our proprietary engine and analyze predictive behavior within 4 ms, and when clients call out to us, we’re able to respond with 10 options in less than 50 ms. That’s the reason they buy from us.”

Patrick DeAngelis

CTO, [x+1]

**RESULTS**

➤ Reliably manages 4 TB of data linked to 1.7 billion profiles and 2 billion user records, and scales to handle billions of key values without compromising performance.

➤ Analyzes thousands of attributes to return a response within 4 ms, and delivers 10 relevant options to a business’ web page within 50 ms.

➤ Enables 100% uptime and no degradation in performance even during automatic rebalancing and data migration that happens in event of the node failure and during routine rolling upgrades and hardware backups and restores.

➤ Minimizes IT overhead with native flash-optimizations that result in dramatically lower server costs.

**COMPANY PROFILE**

Website: www.xplusone.com  
Industry: Marketing Technology  
HQ: New York, NY

**GOAL**

Optimize data-driven marketing interactions for industry-leading enterprise data management platform
Re-evaluating Database Options

[x+1] initially deployed other databases to meet its complex performance demands, including a traditional relational database and a popular open source NoSQL system. However, both failed to meet critical access times or provide the reliable performance required.

With a strong engineering team in place, [x+1] considered building its own solution but ultimately could not justify the cost. The company was initially hesitant about using a commercial product, but discussions with the Aerospike technical team led [x+1] to conduct a proof of concept pilot with the Aerospike database.

“The Aerospike team made themselves available, and they answered our questions well, fully and quickly,” Mr. DeAngelis noted. “They were transparent about what could and couldn’t be done, and we were in alignment about how to solve the problem.”

The pilot convinced [x+1] to move into production with the Aerospike database. Not only did it demonstrate the predictable performance and sub-millisecond response times with the [x+1] platform, the project also gave [x+1] the opportunity to experience Aerospike’s technical support.

“The Aerospike team camped with us for three days while we figured out the implementation, and they showed us how to get the most out of our system. That’s when decided we made the right choice,” said Mr. DeAngelis.

Thousands of Attributes Analyzed in 4 Milliseconds

Today, [x+1] deploys Aerospike clusters in each of its four data centers across the United States. Each 10- to 14-node Aerospike cluster manages 350 GB of unique-real time data and billions of objects on which the [x+1] platform is built. The database currently runs on standard Linux OS hardware and uses solid-state drives (SSDs).

“We have profile records that have 5,000 to 10,000 attributes. Now, using Aerospike, we’re able to plug thousands of those attributes into POE and analyze predictive behavior within 4 ms,” explains Mr. DeAngelis. “When clients call out to us, we’re able to respond with 10 options in less than 50 ms. That’s the reason marketers rely on us.”

Significantly Aerospike predictably delivers real-time performance even as the database scales to meet extremely high volumes of data.

Leveraging Aerospike For Complex Data Structures

The performance of the Aerospike NoSQL database has inspired [x+1] to look at how to implement even more complex data structures. The company also is looking at how to use the database for real-time analytics, model processing and machine-learning to drive better results for its customers.

“We are rethinking the way we store and access our data and intelligence because of the options that Aerospike gives us,” Mr. DeAngelis notes.

Additionally, in 2013, [x+1] plans to migrate from the replication system it had written to the cross data center replication functionality in the Aerospike database.

“Providing fast reliable access to data in real-time is simple to say, but it’s not easy to do,” Mr. DeAngelis observes. “Aerospike has proven that our choice to buy, not build, was the right decision.”

“It was a challenge to find an extremely high-performance, high availability database capable of supporting our core engine and keeping complex data and attributes up to date, while making it accessible in real-time and actionable within milliseconds.”

Patrick DeAngelis
CTO, [x+1]