Leading AdTech companies use Aerospike's high-performance NoSQL database to drive customer engagement, campaign effectiveness and top-line results

AEROSPIKE

Global online-advertising spend exceeded $132.24 billion last year †, with a considerable percentage of that spend attributed to banner ad sales. The banner ad market is vast and complex. Advertisers buy banner ads in bulk from Web publishers (or aggregators), who may also bundle in sales leads, offline advertising, and more.

When publishers are saddled with inventory they can't sell to advertisers, they often turn to ad exchanges, where advertisers bid for online ad space. Real-time bidding for online ad impressions occurs in milliseconds. For this reason, AdTech companies, which are essentially brokers for the advertisers and the web publishers, need to be able to write applications that can execute on extremely large data sets in near real time.

PROFILE OF AN ADTECH LEADER

1 to 6 billion unique cookies tracked

5 million auctions per second in North America

100ms rendering, **50ms** BIDDING

1ms DB ACCESS

100% UPTIME

† http://www.pwc.com/gx/en/industries/entertainment-media/outlook/segment-insights/internet-advertising.html

CHALLENGE

This world's largest, independent, real-time ad technology platform, AppNexus, empowers companies to build, manage, and optimize their entire online advertising business. Each day, hundreds of companies around the globe buy and sell billions of online ads using AppNexus':

- Real-time ad serving technology
- Advanced yield management controls
- Optimization algorithms
- Patented brand and safetymonitoring

Managing and effectively leveraging these ever growing data sets have a real impact on an organization's bottom line. AdTech platforms like AppNexus need to use what they know (the data) to power what they do (serve relevant ads) in real time. The combination of speed and scale are required to deliver tailored responses and spur immediate consumer interactions within milliseconds. The challenges are many. In this case, AppNexus needs to:
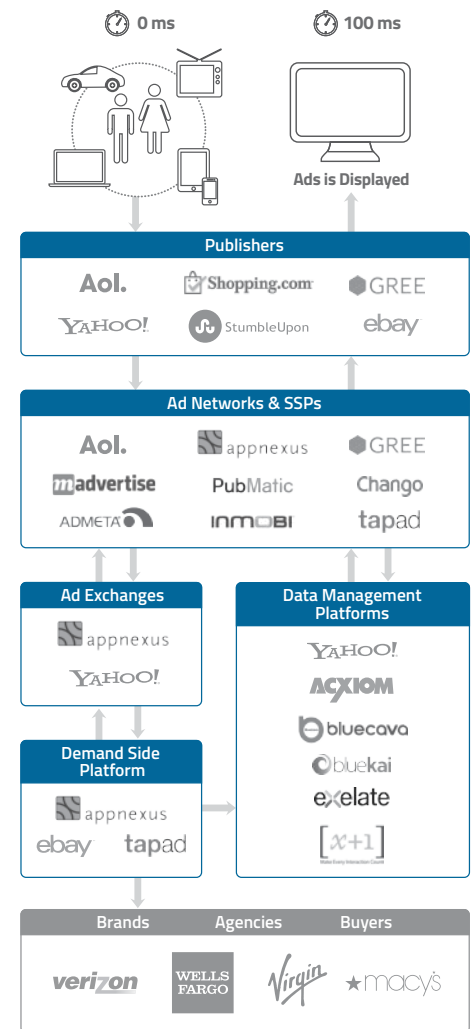
Optimize ad campaigns and increase campaign effectiveness

Capture and analyze clickstreams, transactions, video and social media data, spot trends and patterns, understand customer sentiment, unearth new relationships, and adjust campaign tactics in real-time.

Scale rapidly as business grows

With its infrastructure reaching capacity, a cost-effective database and storage solution with predictable low latency and high throughput is a critical component of its ability to continue providing high-quality service to its customers.

Manage rising infrastructure costs and complexity

With infrastructure growth comes in higher maintenance, power consumption, and operational costs.

BACKGROUND

One of the most important aspects of AdTech is an advertiser's ability to find the right audience at the right time. To accomplish this goal, software tools connect advertisers and publishers, facilitating the purchase of display inventory in real-time through auctions that take place in the milliseconds before a page loads. It is through these auctions that publishers are able to maximize the price for their inventory, while advertisers are able to purchase individual and relevant impressions at prices that reflect each impression's value to the campaign.

This level of precision represents a unique challenge because of both the exponential growth in data and the need to execute on that data in near real-time. All of this data must be stored and analyzed in such a way that it is instantly accessible for decision-making within milliseconds.

To tackle this problem, AdTech companies must build their applications on top of a database that provides speed and scale. Relational database technology has not kept pace, despite attempts to continuously retrofit and augment the systems, and most NoSQL databases can supply speed or scale, but not both speed and scale. Only Aerospike, a NoSQL key value store written explicitly for speed and scale, can consistently and cost effectively meet the demands of today's most innovative AdTech vendors.

Consistent quality of service for high volume, mixed Input/output Operations Per Second (IOPS) workloads

After evaluating multiple options, AppNexus decided to build its application on Aerospike's NoSQL database on SSD drives. Aerospike provided consistent quality of service for high and mixed IOPS workloads. With this configuration, the company was able to:

- Process 99% of reads in < one millisecond
- Achieve consistent low latency (milliseconds) with a 50/50 read-write load
- Deliver relevant content in < 50 milliseconds
- Realize extremely high throughput (100K to 5M operations/second)
- Realize an 80%+ improvement in hardware efficiency and cost
- Deploy global data replication for business continuity

Other NoSQL databases simply can't compete with Aerospike's Speed at Scale and lower Total Cost of Ownership (TCO). Here are just a few of the reasons why customers chose Aerospike over other NoSQL databases.

Why Aerospike?

Architected from the ground up as a NoSQL database, Aerospike is flash-optimized with a hybrid RAM/SSD storage architecture, so you can get 10x better performance using 10x fewer servers, at cost that is 10x less than main memory.

By storing data in Flash (SSDs), record data is stored contiguously with automatic defragmentation and eviction, multi-threaded with 1 read per record. This is what enables applications needing RAM-like performance to deploy on fewer servers (with less RAM). Normal file systems write the data on separate parts of a disc. Aerospike stores indexes in DRAM reducing the need to write in multiple locations, which increases speed, reduces wear and lowers the Total Cost of Ownership (TCO), while keeping the latency and throughput at the same level.

Aerospike outperforms the competition

With Aerospike, you can achieve superior speed at massive scale without increasing, and perhaps lowering, operations and infrastructure costs. None of our competitors come close. Here's why:

- Aerospike can run on 10x fewer nodes (which results in 10X better TCO) and offers 20X better read latency for key-value queries run at scale.
- Aerospike SSD optimizations for large databases with read-write load are faster and more scalable.
- Aerospike continuously provides high throughput at low latency.
- Aerospike is faster on reads and offers superior performance with heavy write loads.
- Because Aerospike was built explicitly for SSDs and SSDs are far denser than a rotating disc, Aerospike runs on smaller clusters while delivering a much lower read-latency at much higher throughput during high-write loads.

"AppNexus operates at massive scale while paying close attention to the economics of the platform. Aerospike's flash optimizations running on top of Intel® SSDs have given us the price, performance, reliability, and serviceability we need to grow our business."

– Timothy G Smith, SVP Technical Operations,

Aerospike Speed at Scale facilitates massive revenue growth

Aerospike's high-performance NoSQL solution has enabled nascent companies to become mega players in a number of industries. In fact, many Aerospike customers have seen revenue increase from tens of millions to hundreds of millions. Customers growing their business with Aerospike include AppNexus, Blue Kai, The Trade Desk, and Chango.

Aerospike is the high-performance NoSQL database that delivers Speed at Scale. Aerospike is purpose-built for the real-time transactional workloads that support mission-critical applications. These workloads have the mandate to deliver informed and immediate decisions for verticals like Financial Services, AdTech, and eCommerce. The unique combination of speed, scale, and reliability delivers 10x performance at 1/10th the cost compared to other databases.