



fueled by Aerospike

Federated Media Publishing Powers Third Largest Ad Network With Aerospike

Competing for attention on the content-saturated Web is no small task, particularly for independent publishers that don't have the deep pockets and expansive resources of large media companies and major service platforms. Federated Media Publishing (with Lijit Networks, a wholly-owned subsidiary of FMP) is helping to level the playing field, providing advertising services, audience analytics, and reader engagement tools to more than 145,000 sites on the "Independent Web."

Today, Federated Media Publishing leverages the Aerospike real-time NoSQL database and key-value store to manage ad impressions for more than 180 million unique monthly visitors in real-time. The scale of interactions has led comScore to identify the Federated Media Publisher Network (FMPN) as the industry's third-largest network in the display ad ecosystem.

NoSQL Database Needed for Real-Time Programmatic Buying

The Federated Media Publisher Network platform powers ad delivery through a distributed architecture consisting of a main datacenter that communicates with cloud-based advertising "pods" to work with demand-side platforms, ad exchanges and ad networks for real-time bidding (RTB). Federated Media Publishing also guarantees brand safety for advertisers by looking at page-level context to ensure that ads are served on brand-safe pages, as well as providing targeting through page-level site categorization. Delivering these functions in real-time is an integral part of the company's new focus on programmatic buying, which automates the placement process by instantaneously selecting who to serve impressions to based on data an advertiser thinks is pertinent to the campaign.

"Our architecture has been set up as remote, distributed ad-serving pods, which are located in close proximity to our RTB server," explained Bill Marcum, vice president of engineering at Federated Media Publishing. "We also work in real-time to look at information on the page and provide context for brand safety and page-level site categorization to offer more targeted data."

Federated Media Publishing quickly determined that relational databases could not provide the ultra-fast response times required to deliver real-time services across its platform. Instead, the company began evaluating NoSQL

"With its sub-millisecond latency ensuring consistent ad-server latencies for driving impressions and ads, the Aerospike database has eliminated the need to worry about lost opportunities or lost customers."

Bill Marcum
VP Engg,
Federated Media Publishing

AEROSPIKE

rocket fuel for big data apps™

"Aerospike is a key piece of infrastructure in the middle of our ad delivery flow, so its performance and reliability impact the business."

Bill Marcum
VP Engg,
Federated Media Publishing

RESULTS

- Provides Web-scale key-value store for more than **180 million monthly ad impressions** across 145,000 sites.
- Predictably meets Federated Media Publishing's need for **sub-millisecond latency** to ensure optimal ad-server performance.
- Enables **business continuity** through a star topology for simultaneously replicating the same data to all five data centers.
- Enables **100% uptime** through automatic rebalancing and fault-tolerance, which ensure that there is no degradation to performance or availability.
- Supports cost-effective use of industry-standard server hardware and a **hybrid architecture** combining the speed of RAM and reliability of flash via the native flash Aerospike database.

COMPANY PROFILE

Website: www.federatedmedia.net
Industry: Online advertising
HQ: San Francisco, CA; New York, NY; Boulder, CO

GOAL

Deliver an integrated supply-side platform for leading ad-distribution service



databases for their ability to handle high volumes of data and respond in milliseconds.

"We were looking for a NoSQL type solution and key-value store that would enable us to collect information at our main data center, look at the logged data, and then distribute it out to remote ad-serving pods," Mr. Marcum recalled. "And we needed this to happen as quickly as possible—within 125 milliseconds or less."

Cross-Data Center Replication Drives Database Decision

Federated Media Publishing narrowed its NoSQL choices to a few different vendors. The company then began a series of evaluations focused on the request response time, ease of use, and replication between the data center and advertising pods. While Aerospike demonstrated sub-millisecond latency and the ability to process queries consistently within 5 milliseconds, Federated Media Publishing's replication requirements initially provided an obstacle.

"Aerospike delivered the speed and reliability we were looking for, but it only offered a ring topology for replication. What we wanted was a star topology, so our main data center could replicate the same data to all the other servers," said Nick Verbeck, software architect at Federated Media Publishing. "However, once we shared that information with Aerospike, the team said they would develop the star topology for us, and in just six weeks they delivered. That's a pretty big project, but Aerospike was able to move quickly in response to a customer's needs."

With star topology replication on hand, FMPN began a proof of concept (POC) with the Aerospike database, testing speed, scale, replication and reliability.

"We talked a lot with the Aerospike team about how the database was designed to be self-automated and self-tuning, so we were taking servers down to see if clusters stayed up," Mr. Verbeck reported.

"With Aerospike, if servers go down, the system realizes it, and they come back up. It's very easy to deploy. The lack of need to manage the database is very attractive."

Nick Verbeck
Software Architect,
Federated Media Publishing

Sub-Millisecond Latency Means More Ads Served

Federated Media Publishing has consolidated its cloud-based pods into five hosted data centers, including the company's main data center. Aerospike clusters at each of these data centers run Intel-based servers using the Linux operating system. Each cluster manages 50 billion objects and holds 30GB to 40GB of data; cross data center replication across the five data centers ensures continuity.

Growing with Aerospike

Looking ahead, Federated Media Publishing plans to take advantage of Aerospike's flash-optimized storage for solid-state drives (SSDs), which provides a cost-effective alternative to in-memory solutions.

"As we continue to grow, we want to limit the number of servers we need per cluster," Mr. Verbeck explains. With Aerospike's flash-optimized approach to SSDs, we can get more memory with fewer servers, and that will mean fewer servers to manage."

Mr. Verbeck adds, **"Our experiences with the support team give us confidence that Aerospike will be there to help as we expand our business. With Aerospike, we feel like we have a partner in our success."**

