



India's Ecommerce Powerhouse Snapdeal Sees Immediate Payoff with Aerospike

Dynamic pricing, high availability and responsiveness for 20,000 sellers

Result

- In-memory Aerospike database maintains sub-millisecond latency on Amazon Elastic Compute Cloud (EC2) while managing 100 million-plus objects stored in DRAM to support real-time dynamic pricing.
- Predictable low latency with 95-99% of transactions completing within 10 milliseconds—essential for enabling a responsive customer experience.
- Aerospike's highly efficient use of resources enables Snapdeal to cost effectively deploy in Amazon EC2.
- Full replication across the Amazon EC2 servers ensures business continuity.
- Aerospike's ability to work out of the box enabled Snapdeal to use Aerospike Client APIs and get up and running in days and nearly eliminate the need for maintenance.



The Indian e-commerce market is expected to grow to \$200 billion by 2026, a leap from the \$38.5 billion recorded in 2017. One of the leaders is Snapdeal, which empowers sellers across the country to provide consumers with a fully responsive and intuitive online shopping experience through an advanced platform that merges logistics subsystems with cutting-edge online and mobile payment models. The platform has a wide range of products from thousands of national, international and regional brands. Snapdeal.com now has a network of more than 20,000 sellers, serving 20 million-plus. Powering this platform is the Aerospike database. By harnessing the real-time big data processing capabilities of Aerospike, Snapdeal provides consumers with the up-to-the moment updates about product

availability, pricing, and seller ratings to help make buying decisions informed and convenient.

The Demands of Dynamic Updates

Snapdeal's business and platform model is anchored by an innovative system enabling sellers to list their products, manage inventory and make pricing changes in real time while shoppers can review and rate sellers on issues such as shipping, delivery and returns.

But challenges on how to maintain their platform's real-time performance as the business scaled up 200 times in arose. Sellers need to push their updates in real-time, and consumers demand a highly responsive online experience. With every page click, Snapdeal combines the updates from shoppers and sellers to display the most relevant products, as well as rankings for all the sellers that are offering the product by price, delivery time, and customer satisfaction.

Growing Pains

To support its inventory and pricing system, Snapdeal initially deployed MongoDB NoSQL database servers with data in DRAM as a cache in front of MySQL. The Snapdeal application used write-through techniques to update information first in MySQL and then in MongoDB, and it processed reads from MongoDB. However, as the business scaled and more sellers made price adjustments on more products, the MongoDB response times shot up from 5 milliseconds to over a second compromising the consumers' shopping experience and leading to lost revenue opportunities. Worse, price changes were not always reflected in real-time.

“We were up and running with Aerospike in a matter of days. It was extremely easy. There has been no need for maintenance with the Aerospike database; it just works out of the box.”

Snapdeal Vice President of Engineering

Why Aerospike

Snapdeal wanted a technology solution that could affordably scale as the business expanded. Notably, operational efficiencies directly impact profits. It would require a high-throughput, low-latency system that could scale from 2 million to 150 million records, from 10,000 to 30,000 reads per second and from 30 to 500 writes per second. It also was seeking a technology solution that could affordably scale as the business expanded and did not want to use an expensive clustered relational database management system (RDBMS).

For Snapdeal, the Aerospike in-memory NoSQL database provided several advantages over others. Most of the systems reviewed by Snapdeal engineers failed to meet at least one of the criteria:

- The existing MongoDB solution lacked predictable response times under high write loads, sharding was complex, and hardware requirements for scaling were cost prohibitive.
- Clustered RDBMS databases and the Terracotta BigMemory Max caching technology were too expensive.
- Redis did not have server-side distribution mechanism at that point of time.
- Amazon Memcache and Amazon DynamoDB did not deliver predictable low latency.
- Couchbase replicas could only be used as backup copies, not to distribute load. Moreover, it required twice the number of servers as Aerospike for the same throughput.

Aerospike performed with predictable low latency with 95-99% of transactions completing within 10 milliseconds—essential for enabling a responsive customer experience. Second, Aerospike had the highest throughput. Third, Aerospike delivered the highest price/performance—offering the lowest cost solution in terms of both hardware requirements and ease of operations.

Today with Aerospike

Today, Snapdeal's advanced marketplace platform, which is written in Java, includes sub-systems for order and catalog management, inventory and pricing management, fulfillment center management, shipping, delivery and tracking management and TrustPay, a buyer-seller protection platform.

The Java-based Snapdeal inventory and pricing management system uses Aerospike to provide predictable sub-millisecond responses while managing 100 million-plus objects stored in DRAM. The data stored includes seller and product IDs, inventory, seller rankings and pricing attributes. Product and price changes are made to both Aerospike and MySQL while seller rankings and product details are read from Aerospike. The implementation runs on Linux servers on the Amazon Elastic Compute Cloud (EC2), and it takes advantage of Amazon Elastic Block Store (EBS) for persistent block-level cloud storage.

Since implementing Aerospike, Snapdeal has seen greater efficiency, better throughput, and a better customer experience and results overall.

“With our past database, whenever there was a search in concurrent price updates from many services, we saw degradation in the buyer experience. Now with Aerospike, we can push through huge price changes while maintaining the same response time experience on the buyer’s side—even with millions of buyers. That has been the biggest advantage.”

Snapdeal Vice President of Engineering

About Aerospike



AEROSPIKE

Aerospike is trusted by leading enterprises around the world to help them confidently deploy mission critical, strategic operational applications that make digital transformation possible. Our enterprise-grade database is deployable anywhere, delivers unmatched uptime, predictable performance, and exceptionally low TCO. Aerospike has customer deployments that have run for years with no service disruption, handling hundreds of terabytes of data, supporting trillions of transactions per month, with sub-millisecond latency. Aerospike customers include Adobe, Airtel, FlipKart, Kayak, Nielsen, Nokia, and Snap.

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