

# Higher Scalability at Lower Cost for Real-Time, Big Data Applications

**Open source Aerospike\* NoSQL Database supports up to 2.5 million transactions per second using just one server node based on the Intel® Xeon® processor E5-2600 v3 family and the Intel® Solid-State Drive Data Center Family.**

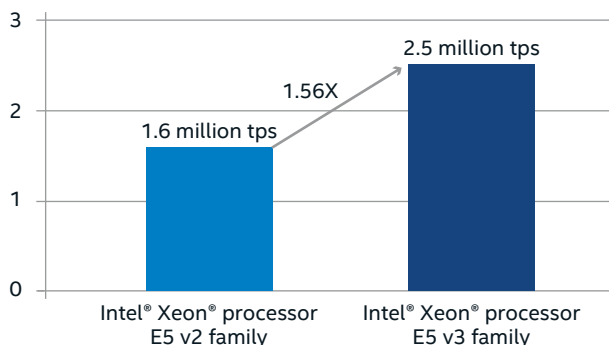
“Aerospike\* was purpose-built with a highly parallelized architecture to support real-time, big-data-driven applications that cost-effectively scale up and out. The Intel® Xeon® processor E5 v3 family and Intel® Solid-State Drive Data Center Family enable Aerospike to deliver a next-generation NoSQL database solution with unmatched price/performance.”

– Brian Bulkowski, Founder & CTO, Aerospike

Businesses across almost every sector are achieving transformative business value through the use of in-memory computing and real-time, data-driven applications. From real-time bidding engines and personalized online experiences to fraud prevention and network traffic analysis, companies are delivering higher value to consumers, reducing risk, and optimizing operations. These and many other modern applications have one thing in common: they require an ultra-fast database that can support millions of users and massive data sets.

The Aerospike\* NoSQL database, an operational Key Value Store, meets this need by delivering an unprecedented combination of speed, scale, and reliability on servers powered by Intel® Xeon® processors and configured with the Intel® Solid-State Drive Data Center Family (Intel® SSD). Benchmark tests performed by Aerospike and Intel engineers demonstrate that Aerospike, running on a single two-socket server powered by the Intel® Xeon® processor E5 v3 family, can support up to 2.5 million transactions per second (tps) with 99 percent of transactions completing in less than one millisecond.<sup>1</sup>

**Scalable performance per server for Aerospike\* NoSQL Database**  
(million transactions/sec)



Servers powered by the Intel® Xeon® processor E5 v3 family deliver up to 56 percent higher performance for Aerospike versus previous-generation servers, supporting up to 2.5 million transactions per second on a single two-socket server.

## Speed and Reliability at Any Scale

Aerospike is built from the ground up to scale up and out, so you can cluster any number of Intel Xeon processor-based servers to address your latency, throughput, and data requirements. Automatic data replication and failover across the cluster—and across racks and data centers—provide a solid foundation for supporting critical, real-time business processes with high reliability and uninterrupted uptime.

Aerospike delivers real-time performance at scale by taking advantage of multicore processors, fast memory, and solid-state drives. That makes the Intel Xeon processor E5 v3 product family ideal for Aerospike. With up to 36 cores, 72 threads, and 90 MB of cache per two-socket server, and support for high-speed DDR4 memory, these processors deliver up to 56 percent higher performance for Aerospike versus servers based on the prior-generation Intel Xeon processor E5 v2 family.<sup>1</sup>

## Higher Scalability at Lower Cost for Real-Time, Big Data Applications

### Ready for Your Big, Fast Data

You can scale data capacity by adding more memory to your servers or more servers to your cluster, but Aerospike and Intel offer a much more cost-effective approach. Since Aerospike is highly optimized for flash storage, you can scale data capacity by tens of terabytes per server node using Intel SSDs, at a fraction of the cost of adding more server memory.<sup>2</sup>

The Intel® SSD DC P3700 Series is currently the highest rated PCIe MLC SSD for Aerospike, based on the Aerospike Certification Tool for SSD benchmarking ([http://www.aerospike.com/docs/operations/plan/ssd/ssd\\_certification.html](http://www.aerospike.com/docs/operations/plan/ssd/ssd_certification.html)). These SSDs fit into standard server PCIe slots and provide up to 2 terabytes of storage per drive. They also deliver breakthrough performance, up to six times the throughput of previous-generation Intel SSDs.<sup>3</sup>

Aerospike and Intel conducted tests to verify performance and throughput using multiple Intel SSDs. The test server was powered by a previous-generation Intel Xeon processor E5-2600 v2 and configured with four 800 GB Intel SSD DC P3700 Series drives. The server successfully supported up to 500,000 tps utilizing the SSDs as the database storage engine memory in place of DRAM<sup>4</sup>. (Intel and Aerospike expect to show even higher throughput in upcoming tests using the Intel Xeon processor E5 v3 family with multiple Intel SSDs. For more information as it becomes available, visit [www.aerospike.com/category/blog/](http://www.aerospike.com/category/blog/)).



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Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

<sup>1</sup> Source: Aerospike testing at Intel Labs, August 2014. The Aerospike Java benchmark tool simulates communications for 10 million online or mobile application users accessing a database of 50 million records and 100 bytes per record. A mix of 95 percent database reads to 5 percent database reads provided a realistic simulation of web-like traffic to the database. Peak throughput was recorded when 99 percent of transactions completed within one microsecond. Baseline Configuration and Benchmark Score: Cluster of four Intel production servers, each with 2 x Intel® Xeon® processor E5-2697 v2 (2.7 GHz), 64GB DDR3 @ 1600 MHz memory, Intel® DC P3700 SSD, 10 GbE Intel Ethernet, Aerospike v3.3.9, Red Hat Enterprise Linux 6.5. Score: 1.6 million transactions per second (Mtps). New Configuration and Benchmark Score: Cluster of four Intel pre-production servers, each with 2 x Intel® Xeon® processor E5-2697 v3 (2.6 GHz), 64GB DDR4 @ 2133 MHz memory, Intel® DC P3700 SSD, 10 GbE Intel Ethernet, Aerospike v3.3.9, Red Hat Enterprise Linux 6.5. Score: 2.5 Mtps.

<sup>2</sup> Source: Based on typical online pricing as of August 27, 2014, Dynamic Random Access Memory (DRAM) sells for approximately three times the cost per terabyte of the Intel Data Center Solid-State Drive Family for PCIe.

<sup>3</sup> Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

<sup>4</sup> Source: Intel internal testing, August 2014, using the Aerospike Java benchmark tool. Server configuration: Dell rack mounted server (Dell R720) with 2 x Intel E5-2690 V2 (3 GHz), 128GB DDR3 memory, 4 x 800 GB Intel® Data Center SSD Product Family for PCIe, Red Hat 6.5 with kernel 3.1.5.

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Need even more data capacity for your high performance NoSQL architecture? Scale up and scale out with larger capacity Intel DC P3700 SSDs. With the Intel Xeon processor E5-2600 v3 family and the right mix of server memory, Intel SSDs, and clustering, you can tailor your Aerospike implementation to deliver the right balance of performance, throughput, data capacity, and cost for your real-time applications.

### Get Started Today

Big data is changing the way companies compete. With Aerospike and Intel, you can make your move to transformative real-time, big data driven applications more easily and with better cost models. You can start small, prove value, and then expand your data platform almost without limit as your needs grow.

### Learn More

- Aerospike NoSQL Database: [www.aerospike.com/](http://www.aerospike.com/)
- Intel Xeon processor E5 v3 family: [www.intel.com/content/www/us/en/processors/xeon/xeon-processor-e5-family.html](http://www.intel.com/content/www/us/en/processors/xeon/xeon-processor-e5-family.html)
- Intel DC P3700 Solid State Drives Series: [www.intel.com/content/www/us/en/solid-state-drives/intel-ssd-dc-family-for-pcie.html](http://www.intel.com/content/www/us/en/solid-state-drives/intel-ssd-dc-family-for-pcie.html)

