



WHITE PAPER

Powering high-performance applications with Aerospike on IBM Cloud

EXECUTIVE SUMMARY

Cognitive enterprises demand large data systems which are high-performance driven, both for transaction abilities and real-time decision-making.

Consider businesses where cognitive architectures play a critical role in understanding data, making decisions in real-time and performing transactions all at the same time, creating huge impact on the value for businesses, including AdTech, Retail & eCommerce, Financial Services & Technology, and Telcos.

Cognitive architectures require large amounts of data to be stored and processed on the edge, and the ability to power AI/ML/DL systems for real-time decision-making. To support that, you must ensure your infrastructure follows key requirements, such as:

- Infrastructure that can scale up and out, with a compelling total cost of ownership (TCO)
- High-performance databases to accommodate large volumes of data
- Processing power equivalent to the level of performance required
- A network capable of connecting distributed data stores with low latency



Aerospike NoSQL database on IBM Cloud bare metal servers

With Aerospike Database running on the latest IBM Cloud bare metal servers powered by Intel Xeon, we uncovered a solution that provides businesses with fast, flexible infrastructure to meet the constant demands of cognitive architecture and business transformation, yet at a lower TCO.

Aerospike provides a high-performance database with strong consistency, pushing the limits of flash storage, processors and networks. Aerospike running on IBM Cloud bare metal servers elevates your infrastructure's capabilities to harness data-intensive workloads.

In a recent Cloud Qualification Process done by [YCSB \(Yahoo! Cloud Serving Benchmark\)](#) – a process that takes instance types (CPU, Memory, Disk and Networking) and certifies its capabilities of a certain operational level as an overall metric – we discovered the following results when integrating Aerospike NoSQL Database on IBM Cloud bare metal instances:

| | Client Transactions/s ⁺ | 95 th Percentile (ms) | 99 th Percentile (ms) | Object Size (bytes) | Object Count | Disk Size | Cost ⁺⁺ |
|---|------------------------------------|----------------------------------|----------------------------------|---------------------|--------------|-----------|--------------------|
| Xeon E3 1270v3 1Gbps | 130,000 | 3.4 | 5.5 | 500 | 240,000,000 | 1.2TB | \$0.576/hr |
| Xeon E3 1270v3 1Gbps | 30,000 | 3.0 | 4.6 | 3,000 | 240,000,000 | /s | \$0.576/hr |
| 2x Xeon E5 2620v4 10Gbps | 222,000 | 1.7 | 3.2 | 500 | 240,000,000 | 1.2TB | \$1.54/hr |
| 2x Xeon E5 2620v4 10Gbps ⁺⁺⁺ | 100,000 | 3.4 | 3.4 | 3,000 | 240,000,000 | 1.2TB | \$1.54/hr |

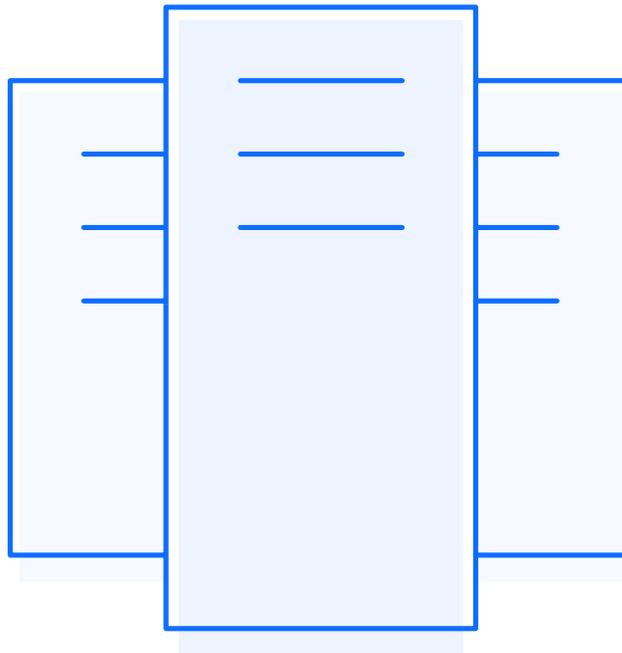
Aerospike NoSQL database on IBM Cloud bare metal servers *(continued)*

All the tested SSDs were persistent, proving that not only does Aerospike and IBM Cloud bare metal servers provide top performance, but persistent performance as well. The performance test also proved that with 100k + client transactions – 100k reads and 50k writes – and a write consolidation of 1M/500 bytes equaling 2000, IBM Cloud has effectively 25 writes, and 100k IOPs minimum from the Intel SSDs used in testing. With these results factored in, the cost and performance is favored with IBM Cloud bare metal instances, amongst other cloud providers.

+ As measured from the client, 50/50 read/update averaging under 1ms

++ Price in SJC01/SJC04, at time of writing. System, RAM, Networking and Disk are all separate billable items, shows as a combined sum. Servers were on monthly provisioning, with hourly costs extrapolated using 30-day months.

+++ SSD Device overloaded and testing was terminated early. Testing proceeded at a faster pace than the device was capable of while still able to maintain latency profile. This caused defragmentation to fall behind and exhausted free blocks, therefore Aerospike Server entered into stop-writes. Read more about stop-writes and how it relates to defragmentation.



IBM Cloud bare metal servers benefits overview

IBM Cloud bare metal servers running on the latest Intel Xeon Gold and Intel Xeon Silver Scalable processors feed your workloads, for impressive “per core” performance, faster memory and advanced reliability. The key valuable features of IBM Cloud bare metal servers include:

- **A single-tenant environment**, therefore dedicated to you, providing total flexibility/customization and control.
- **High computing power** – you can choose from single process 4-core architectures to quad-processor 12-core architectures, and up to 3TB RAM
- **On-demand & tailored for your needs** – every workload is different. Some require custom configurations, others can easily run on fixed configuration bare metal servers. IBM Cloud provides no long-term contracts and monthly/hourly options, with outbound bandwidth included (monthly).
- **Customizable RAM, SSD** – Your choice of a processor that best meets your performance needs. Upgrade from the base configuration to fine tune the hardware for your workload.
- **Local storage range** – Up to 36 drives per server, and 800GB to 3.8TB SSDs.

Note: The Cloud Qualification results above were on Xeon v3 and v4 systems, but we also offer customers the latest Skylake and Kaby Lake processors on IBM Cloud bare metal servers.

IBM Cloud bare metal servers – providing real world solutions



Ad Tech

Ad Tech is the software and tools that helps businesses deliver and analyze their digital advertising efforts. IBM Cloud bare metal servers used for ad tech gives you the ability to process requests faster. Since flexibility and future proofing are critical for ad tech solutions, premium performance and consistency from the cloud is imperative. Therefore, IBM provides:

- High-performance bare metal servers for speed, power and control of your data
- Pay-as-you-go bandwidth by Akamai & IBM Cloud
- Low latency with load balancers – improve uptime, minimize latency with load balancers
- The ability to be make smarter decisions with machine learning and AI capabilities.



Financial Services & Technology

Build secure and engaging financial solutions that integrate existing IT with IBM Cloud bare metal servers. You can transform your customers' digital experiences in the cloud by mirroring on-premises environments, and accelerating statistical sampling techniques. Key advantages include:

- Increase agility with our bare metal single-tenant and private cloud environments
- Intel TXT built into the bare metal servers so you can meet your privacy, regulatory compliance, data sovereignty and reliability needs



Retail & eCommerce

Choose IBM Cloud bare metal options, plus robust services for IoT, mobile and DevOps, to accelerate development and testing of your applications.

Conclusion

Experience low total cost of ownership, high availability and uptime, and optimized scalability with Aerospike on IBM Cloud. Aerospike's No SQL database is built for real-time systems of engagement, ultimately simplifying and streamlining real-time analytics without compromising technical requirements. Your business's performance, availability and security are fully ensured before you delve into real-time analytics of your big data.

The powerful combination of Aerospike with IBM Cloud's unmatched technology and 60 data centers worldwide, gives you a seamless network and full management and automation of your servers, storage and security. Now, you can meet the performance demands of your business with flexibility and speed.

To learn more about IBM Cloud bare metal servers, visit ibm.com/cloud/bare-metal-servers

