Changing customer expectations and industry disruptors are driving significant investments in digital transformation initiatives across multiple industries. To compete in today’s real-time digital economy, companies must invest in the right gigabyte-to-petabyte scale data platform to enable the right decisions in the moments that matter. This is only possible by utilizing modern data architectures which support predictable performance at scale. A modern data platform consists of the following components: System of Engagement (SOE) databases that capture real-time data from edge and near-edge devices; System of Record (SOR) databases which store both the real-time data from the SOE database and historical data which acts as the single source of truth; globally distributed databases which can span across geographical regions and can process billions of records daily with no data loss; and analytic, AI, and ML databases that leverage the combined data. Overall, high-speed data transfer between these components is required as they enable real-time decisioning in the microsecond moments that matter.

### Highlights

**Powers real-time enterprise use cases**
Aerospike’s performance at scale, combined with its critical enterprise database features and integrations allows it to be utilized as a real-time System of Engagement (SOE), globally distributed database, System of Record (SOR), and machine learning Feature Store.

**At unlimited scale**
Predictable performance from gigabytes to petabytes of data. Build your real-time, mission-critical applications with peace of mind and adherence to the strictest of SLAs.

**All the time**
Five-nines uptime with globally distributed, strongly consistent data. Aerospike has customers with uptime for years on end. Avoid severity-level-one warnings and sleepless nights. Learn why our customers say, “Aerospike just works.”

**Reduce footprint, grow business**
Customers typically reduce server or cloud instance footprint by up to 80 percent even as business and data grows. Regardless of industry, regardless of the legacy NoSQL competitor, our customers vastly reduce the servers they need to manage with Aerospike positioning them for growth without headaches.

### New in Aerospike Database 6

- **Document data model** – comprehensive JSON document database capabilities.
- **Massively parallel secondary indexes** – for real-time complex SQL queries at TB/PB scale.
- **Batch processing** – for all workloads - write heavy, read heavy, and mixed.
- **FIP 140-2 compliance** – for public sector clients and high security use cases.

### Aerospike Real-Time Data Platform

Aerospike provides predictable performance up to petabyte scale, with five-nines uptime with always accurate, global, consistent data for all components of the end-to-end platform (Figure 1). The platform consists of these elements:

- **Multi-model database** – Functions as an unlimited scale Key-Value, Document, Graph or Time Series database.
- **Edge database (SOE)** – Used for real-time decisioning based on local streaming and transactional data plus historical data pulled dynamically from the SOR.
- **Global distributed database** – Using Multi-Site Clustering, the Aerospike Database can be deployed across multiple geographically separated data centers with high resiliency, automated failovers, and no loss of data.
- **Real-time system of record (SOR)** – Stores transactional and historical data and pushes data as needed to the SOEs also powering ML and AI-based applications.
- **Aerospike Cross Datacenter Replication (XDR)** – Enables multiple geographically dispersed data centers to stay in sync through high performance replication.
- **No-code integrations** – Enables companies to directly integrate the Aerospike Database Spark, Presto-Trino, Pulsar, JMS and more.
Meeting gigabyte-to-petabyte scale enterprise data management requirements

The Aerospike Real-time Data Platform, powered by the Aerospike Database 6 delivers millisecond response times at scales of gigabytes-to-petabytes for the strictest enterprise requirements:

**Predictable performance**

**Low latency and high throughput** - Multi-threaded parallel processing at the CPU combined with our patented Hybrid Memory Architecture (Figure 2) designed for flash storage devices uniquely deliver predictable high performance at scale.

**Support for next-generation memory** - Aerospike offers storage options for optimal density with high performance, starting with our patented Hybrid Memory Architecture (HMA). HMA stores indexes on DRAM and data on Flash. Aerospike HMA treats SSDs like DRAM, accessing them as raw devices at DRAM speeds with great parallelism.

Our storage engine approach has been extended to and optimized for All-Flash and persistent memory configurations, and we offer an in-memory option as well. See figure 2.

**Smart Client™ architecture** - Aerospike’s Smart Client™ architecture ensures parallel access to multiple servers in a cluster for the highest possible performance.

**Real-time data transfer between edge and core** - Aerospike XDR enables multiple geographically dispersed data centers to stay in sync through high performance replication.
Multi-model engine

Document database - New in Aerospike Database 6, Aerospike Document Data Services provides comprehensive JSON document database capabilities including the storage, processing, and querying of JSON document data in real-time and at scales that have previously been unavailable in other databases and data platforms.

Scalability - The Aerospike Hybrid Memory Architecture with All Flash and Hybrid Flash options, coupled with Dynamic Cluster Management, allows the Aerospike database to scale to petabytes and store transactional/streaming/real-time data as well as historical data.

Compression - Aerospike’s storage compression feature provides lossless compression of records written to persistent storage. Additionally, the communication between the Clients and the database is also compressed.

Rich data types - Scalar data types: Integer, Double, String, BLOB, Bytes; Collection data types: List (Ordered and non-ordered), Map (Key-Ordered, Key Value-Ordered, Unordered); Probabilistic data types: HyperLogLog, HyperMinHash; Geospatial: GeoJSON data type.

Change notification framework - Allows Aerospike servers to stream changes to other systems via Aerospike Connect components. Allows for building easy yet reliable and scalable systems for complex event processing (CEP).

Query and Search

Secondary indexes - New in Aerospike Database 6 - secondary indexes are now available at the partition level for massive parallelism and improved performance and scalability.

Aerospike Expressions - Execute operations and functions closer to the data for more efficient comparisons of values, even extending the ability to read, write, and execute complex computations as arguments in other operations.

Set indexes - Provide efficient access to a Set within an Aerospike Namespace. This feature allows fast queries of records within a Set in a petabyte-scale database.

Durability/Consistency

Durability - Data can be replicated asynchronously across geographies and synchronously written to other nodes in the cluster and to flash storage without disruption for the highest durability.

Consistency - Aerospike provides strong consistency on primary key access that has been confirmed through Jepsen test results. Data held in Aerospike is always guaranteed to be correct in all scenarios. Aerospike Multi-site Clustering brings the Jepsen validated Strong Consistency to deployments across multiple sites.

High Availability/Replication

Uptime and high availability - Aerospike provides high availability and a demonstrated uptime of five 9s or more which is made possible by our unique cluster management and intelligent client technology.

Synchronous data replication - Aerospike Multi-Site Clustering supports always-on, strongly consistent, globally distributed transactions at scale. It provides a true real-time Active-Active solution with great resiliency on WANs.

Asynchronous data replication - XDR delivers expressions-based fine-grain control of asynchronous replication of data across geographically distributed clusters. It can be used to create a global data hub, allowing to route and augment data captured at the edge to other clusters.

Enterprise Security

Encryption - Aerospike supports full transport encryption, as well as in-database transparent data encryption.

Authentication - LDAP and Kerberos authentication mechanisms are supported. Rich sets of access control options are available including ACLs.

Authorization - Aerospike provides a sophisticated role-based access control (RBAC) system.

Auditing - Aerospike can be configured to generate audit log messages on a wide variety of security events.

Centralized Secret Management option - Aerospike allows the following security items to be managed by and stored within HashiCorp Vault’s KV secrets engine:

- LDAP user credentials and TLS certificates
- XDR remote destination passwords
- Encryption-at-rest key
- Network TLS certificates and keys

Cloud Foundations

Aerospike Cloud Foundations currently supports Google Kubernetes Engine (GKE) on Google Cloud Platform (GCP) and includes a Prometheus and Grafana based Aerospike Monitoring Stack

Integrations

Integration with existing data stores and systems - for building modern data pipelines and powering highly scalable/low latency AI/ML applications. The Aerospike Connect product line is currently composed of:

- SQL Access
- Aerospike SQL Powere by Starburst
- Aerospike Connect for Spark
- Aerospike Connect for Presto-Trino

Streaming Data Connectors

- Aerospike Connect for Kafka
- Aerospike Connect for Pulsar
- Aerospike Connect for JMS
- Aerospike Connect for Event Stream Processing (ESP)

Deployment Options

In data centers and private clouds

In public cloud - Google Compute Platform, Amazon Web Services, Microsoft Azure, Alibaba Cloud and others.

Aerospike Cloud Managed Service - Aerospike experts deliver and maintain an optimized deployment of the Aerospike database in cloud environments with white glove service.
## Database Product Features

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<tr>
<td>Aerospike Client License Type - Apache v2</td>
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### Support
- Binaries - Tested & Verified
- Enterprise Production Support
- Hot Patch Availability
- Community Support

### Architecture
- **Multi-site Clustering**
- **Strong Consistency**
- **Rack Awareness**

### Storage Engine
- **All Flash**
- Intel Optane DC Persistent Memory support

### Performance
- Transactions or Queries per Second - Unlimited
- Namespaces 2 (32 max)
- Objects per Namespace per Node 2 (0.5 Trillion max)

### Security
- FIPS 140-2
- **TLS Transport Encryption**
- **Security: ACLs**
- **Data Encryption-at-Rest**
- **LDAP Authentication**

### Aerospike Connect
- **Aerospike Connect for Spark**
- **Aerospike Connect for Kafka**
- **Aerospike Connect for JMS**
- **Aerospike Connect for Pulsar**
- **Aerospike Connect for Presto-Trino**
- **Aerospike Connect for Event Stream Processing (ESP)**

1 Available with additional licensing
2 See Known Limitations for more information

For detailed discussion of Aerospike Database features and editions, please see:


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The Aerospike Real-time Data Platform enables organizations to act instantly on billions of transactions while dramatically reducing server footprint. The Aerospike platform powers real-time applications with predictable performance up to petabyte scale. Aerospike customers can instantly fight fraud, dramatically increase shopping cart size, deploy global digital payment networks, and deliver instant, one-to-one personalization for millions of customers. Customers include Airtel, Experian, European Central Bank, Nielsen, PayPal, Snap, Wayfair and Yahoo. The company is headquartered in Mountain View, Calif., with additional locations in London; Bengaluru, India; and Tel Aviv, Israel.

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