**USING AEROSPIKE AS A REAL-TIME SYSTEM OF RECORD**

**Highlights**

**Strong consistency:** Data correctness is guaranteed, no data loss nor stale reads. Commit-to-device support for enhanced durability.

**Scalability:** The All Flash and Hybrid Memory architectures allow the Aerospike database to scale to petabytes of data.

**Speed:** Low latency is maintained at high scale, allowing Aerospike customers to make better decisions in real-time.

**Superior Uptime and Availability:** Provides high availability and a demonstrated uptime of five 9s or more.

**Ease of Deployment and Management:** Integral component of an end-to-end platform which is easy to deploy and manage in the cloud or on-premise.

**Low TCO:** Fueled by a hybrid-memory architecture and compression, Aerospike provides significantly lower TCO than first-generation NoSQL and relational databases.

**Overview**

In this age of digital transformation, organizations are now required to make lightning-fast decisions powering applications like fraud detection, digital payments, ad bidding and recommendation engines. However, this cannot be accomplished with legacy data platforms as they cannot handle real-time data – let alone at scale, but it can be achieved using high-speed, extremely scalable and reliable modern data platforms. These modern data platforms consist of System of Engagement (SOE) databases that capture data from edge and near-edge devices, and System of Record (SOR) databases. SOR databases store both real-time data from the SOE database and historical data and act as a single source of truth. SOR databases, that host Real-time Analytics and Machine Learning (ML) applications also need to support real-time updates of the models used by these applications. This way the updates can be immediately synchronized with the SOEs for real-time decisioning.

In addition, SORs are also required to integrate data from legacy systems and to provide storage for petabytes of data.

**Aerospike Hyperscale Data and Analytics Platform**

Aerospike provides unmatched performance at scale for Systems of Record by utilizing an end-to-end platform (Figure 1). The platform consists of the:

1. **Aerospike Edge (SOE) Database** - Used for real-time decisioning based on local transactional data plus historical data pulled dynamically from the SOR.
2. **Aerospike Real-time System of Record (SOR) Database** - Stores transactional and historical data and pushes data as needed to the SOEs also powering ML and AI-based applications.
3. **Aerospike Query and Reporting Database** – Stores historical data primarily for reporting and visualization purposes, integrated via Aerospike Connect for Spark.
4. **Legacy Data Store** – While not an Aerospike technology, it is an important data source for the SOR, integrated via the Aerospike Connect products.

**Aerospike Edge Databases:**

Edge databases can reside in different geographic locations and are connected via high-speed data transfer with the SOR. This can be accomplished by utilizing different built-in features such as Aerospike Cross Datacenter Replication (XDR), and Aerospike Connect for Kafka.

**Aerospike Real-time SOR Database:**

The Aerospike Real-time System of Record database is the single source of truth that propagates subsets of data to the Edge databases in real-time. Data in the SOR can be available for Real-time Analytics and ML systems. The models for these systems can be updated in real-time and the model updates can be synchronized frequently with the SOE for real-time decisioning. This reduces the time for models updates from days/hours to minutes/seconds.

**Aerospike Query and Reporting Database:**

Connected via high speed data transfer with the SOR, it can store petabytes of data for reporting and visualization purposes.
Meeting Enterprise Data Management Requirements

Aerospike’s Real-time System of Record database meets millisecond response times at scales of tens of petabytes for the strictest enterprise requirements:

**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.

**Durability** - Data can be replicated asynchronously across geographies and synchronously written to nodes in a cluster and to flash storage for the highest durability.

**Scalability** - The Aerospike Hybrid Memory Architecture™ with All Flash and Hybrid Flash options allows the Aerospike database to scale to petabytes and store both transactional as well as historical data.

**Uptime and High Availability** – Aerospike provides high availability and a demonstrated uptime of five 9s or more which is made possible by a unique cluster management and intelligent client technology in addition to local/remote replication.

**Speed** – Parallel processing and our patented Hybrid Memory Architecture designed for flash storage devices uniquely unlock flash's high performance at scale.

**Real-Time Data Transfer Between SOR and SOE** – Aerospike XDR enables multiple geographically dispersed data centers to stay in sync through high performance replication.

**Enterprise-level Security** - Aerospike supports full transport encryption, authentication, access control, exception logging, as well as in-database transparent data encryption.

**Integration with Existing Data Stores and Systems** - Aerospike Connect for Spark and Kafka allow SQL databases, NoSQL databases and ML-based tools to integrate seamlessly and efficiently to other data stores and systems.

**Compression** - Aerospike's storage compression feature provides lossless compression of records written to persistent storage.

**Support for Next-generation Memory** – Aerospike is the first open database supporting the new Intel® Optane™ DC persistent memory.

**Rich Set of Deployment Options** - Aerospike can be deployed close to the edge, in data centers and in the Cloud – Google Compute Platform, Amazon Web Services, Microsoft Azure, Alibaba Cloud and others.

**Benefits**

**Better/Faster Decisions for Competitive Advantage** - Utilizing Aerospike's technology, better real-time decisions can be made since higher volumes of historical data can be combined in real-time with transactional data. Data for the decisioning process is available in milliseconds, which cannot be achieved at scale with any other single data platform.

**Ease of Deployment and Management** – As a pivotal component of an end-to-end solution, Aerospike can be easily deployed and managed in the cloud and on-premises.

**Can Replace Legacy SOR Databases** - Due to its ease of management, uptime and high availability, it can replace Cassandra, HBase and other legacy systems that are difficult to maintain and scale.

**Enables Business Growth** - Aerospike’s performance at scale means there is no need for customers to switch platforms as their data volumes grow.

**Low TCO** - Fueled by our Hybrid Memory Architecture, dynamic cluster management and compression, Aerospike provides improved performance and dramatic reduction in node count. This allows a significantly lower TCO. Signal, a Customer Identity Management provider, saved $4 million over three years by replacing their 450 node Cassandra deployment.

**Typical Use Cases**

**Financial Services and FinTech:** Edge-to-core data movement for real-time analysis for fraud prevention, risk assessment and compliance.

**e-Commerce and Retail / CPG:** Customer behavior data integration with clickstream integration plus product data for better personalization and improved customer experience.

**Telco:** Customer data integration with real-time billing plus Customer 360.

**Ad Tech:** Real-time clickstream data synchronization and integration with core data for more on-target ads.