

Aerospike Multi-site Clustering

Highlights

Clusters across Geographical Regions

In a multi-site clustering configuration, the nodes comprising a single Aerospike cluster are distributed across geographically distributed sites. These sites may be on different coasts or even different continents. The choice of cloud vendor in any given region may be limited, Aerospike Multi-Site Clustering works across cloud vendors enabling intercloud deployments.

Always Correct and Always Available

Aerospike Multi-Site Clustering supports strong immediate data consistency and with a single Aerospike cluster deployed across multiple geographic regions, a highly resilient solution supporting automated failovers without loss of data or transactional consistency is enabled.

Conflict Avoidance versus Conflict Resolution

Conflicts simply cannot occur. Transactional consistency is achieved through synchronous replication of the writes to all sites within the cluster and the receipt of verification in a two-phase manner.

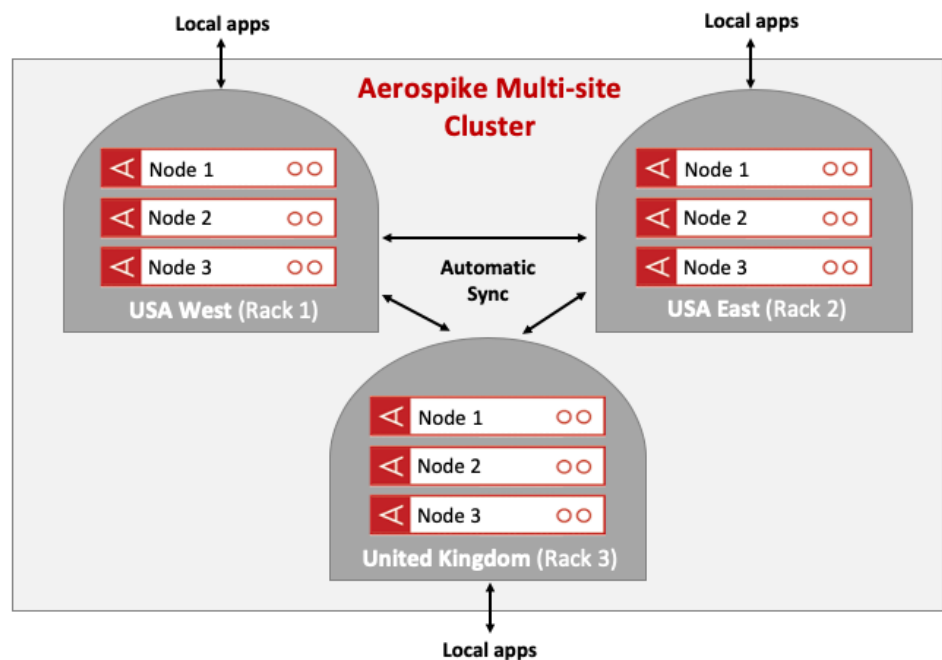
Low Latency Global Transactional Systems

Sub-millisecond reads with optimal latency for strongly consistent writes. The additional latency for writes is solely a function of the network speed and geographic distance.

Overview

Aerospike Multi-site Clustering supports always-on, strongly consistent, globally distributed transactions at scale. With linearizable isolation, writes are never lost. Our Multi-site Clustering provides a true real-time Active-Active solution for global companies.

Using this functionality, clusters may span multiple sites, including geographically distributed data centers and cloud regions, with the always-on, speed at scale characteristics you expect from Aerospike. Truly global and transactionally accurate payment systems, real-time inventory tracking, online gaming, and other use cases can now be provided with the speed and resiliency of Aerospike Database 5. Enterprises can now have accurate pictures of their global supply chain status and market portfolios with local presence and availability across multiple regions.



Sample Aerospike Cluster Deployed Across Three Data Centers.

Key Features

Strong Immediate Data Consistency - Aerospike Multi-Site Clustering brings the proven Jepsen validated Strong Consistency of the Aerospike Database to deployments across multiple sites. This capability allows you to have immediate consistency even across sites provided by a heterogeneous set of cloud vendors. A commit-to-device may be performed at every phase to further enhance transactional durability.

No Data Loss - With rack awareness and Strong Consistency, a single Aerospike cluster can be deployed across multiple geographically separated data centers with high resiliency, automated failovers, and no loss of data.

Synchronous Active-Active Configuration - Aerospike Multi-Site Clustering is an Active-Active configuration where data is updated synchronously across the cluster providing a consistent data set. Applications can access the same updated records in real-time in different geographical regions.

Strongest possible SLAs - Aerospike Multi-Site Clustering supports sub-millisecond reads and optimal writes of strongly consistent transactions. The speed of writes is dependent on network speed and geographical distance between the sites.

High Availability and Resiliency - Aerospike provides high availability and a demonstrated uptime of five 9s, enabled by its cluster management and smart client technology. Synchronous replication of data across the cluster provides a globally consistent view of data. Aerospike Multi-Site Clustering provides a data management solution that can survive the loss of an entire site with no loss of data and continue to operate without human intervention.

Conflict Avoidance, Not Conflict Resolution - with synchronous data replication and strong consistency, conflict detection and resolution is not required. In a failure scenario, Aerospike automatically transfers the management of write operations to another available data center, so application requests can still be processed. This is accomplished in a way that conflicting writes won't occur and committed writes won't be lost during site failures and when the cluster is subsequently restored to a fully healthy state.

Immediate Failover - Aerospike utilizes automated cluster failure detection based on its internal roster and heartbeat mechanism. On failure of a cluster node or the network, Aerospike quickly recovers and reforms the cluster. Clients automatically connect to the new formation. The entire process is automated without any human Intervention or additional application code.

Benefits

Meets the Transaction Requirements of the Always-on Global Business

Global digital businesses require an always-on, always current, and transactionally accurate view of their business that can be delivered at the scale of global workloads. Accuracy in payments, inventory, users, and financials is expected by customers, employees, and partners. Aerospike Multi-Site Clustering gives you all of this on commodity hardware deployed in private, public, hybrid, or intercloud environments.

Powering Real-time Businesses

Customer expectations and the rise of machine-to-machine business processes require the highest levels of database performance with the highest possible availability. Aerospike's Multi-Site Clustering can power low latency globally distributed transactional applications with strong consistency, speed, and scale. Utilizing these applications, users can access a global transactionally accurate and real-time view of the business, which allows them to provide better customer experiences, grow revenue, and increase profit. In the traditional global transactional system, it took hours to complete transactions like payments, correct views of global inventory were often out of date but now transactions can be reflected in the moment of modern business. This provides clear differentiation and delivers a competitive advantage.

Low Total Cost of Ownership

Aerospike lowers TCO by leveraging its patented Hybrid Memory Architecture™ and dynamic cluster management, which delivers exceptional performance using a much smaller server footprint than competing solutions. This highly efficient architecture also benefits multi-site cluster configurations and allows a lower TCO than other active / active alternatives. Especially in comparison with traditional SQL based global transactional systems, Aerospike's TCO advantages are even more obvious because the traditional systems require even more proprietary hardware to achieve the same level of performance. All of this means that the per-transaction cost for using Aerospike Multi-Site Clustering will be an order of magnitude lower than what it is today. This in turn enables enterprises to deliver and expand their business to meet the increasing demands of scale and speed without sacrificing correctness, time to market, or increasing application level complexity.

Use Cases

Economic globalization and ever-changing client demands have forced companies to compete and collaborate in ways that were once unthinkable. As a result, modern transactional applications are stressing existing IT infrastructures well beyond their design points. Aerospike's Multi-Site Clustering with support for strong, immediate data consistency across multiple data centers (or cloud regions) in a manner that provides fast local reads and keeps write latencies within a few hundred milliseconds addresses the needs of applications such as the following where legacy solutions fall short:

- Global Instant Payment Systems
 - Trade Settlements
- Global Supply Chain Management
- Currency Exchanges
- Parcel Tracking
- Smart Contracts

Global Instant Payment System Case Study

Currently, Aerospike Multi-Site Clustering is deployed by the European Central Bank to support the TARGET Instant Payment Settlement (TIPS) service. TIPS enables individuals and firms in various European locations to transfer money between each other within seconds, regardless of the time of day. The TIPS applications requires a highly resilient, geographically distributed database platform with strong consistency and reasonable runtime performance to meet their target service level agreements (SLAs).

About Aerospike

Aerospike is the global leader in next-generation, real-time NoSQL data solutions for any scale. Aerospike enterprises overcome seemingly impossible data bottlenecks to compete and win with a fraction of the infrastructure complexity and cost of legacy NoSQL databases. Aerospike's patented Hybrid Memory Architecture™ delivers an unbreakable competitive advantage by unlocking the full potential of modern hardware, delivering previously unimaginable value from vast amounts of data at the edge, to the core and in the cloud. Aerospike empowers customers to instantly fight fraud; dramatically increase shopping cart size; deploy global digital payment networks; and deliver instant, one-to-one personalization for millions of customers. Aerospike customers include Airtel, Banca d'Italia, Nielsen, PayPal, Snap, Verizon Media and Wayfair. The company is headquartered in Mountain View, Calif., with additional locations in London; Bengaluru, India; and Tel Aviv, Israel.

©2020 Aerospike, Inc. All rights reserved. Aerospike and the Aerospike logo are trademarks or registered trademarks of Aerospike. All other names and trademarks are for identification purposes and are the property of their respective owners.