

Run and manage Aerospike clusters on Kubernetes

To deliver superior digital experiences, a new set of technology requirements has emerged. Kubernetes has become the de facto standard as enterprises try to juggle multiple siloed clouds, highly distributed apps, numerous databases, and many pieces of interconnected infrastructure. Automation is essential to operate, and helping to address these challenges are Operators, a method of deploying and managing Kubernetes applications.

Run and manage Aerospike distributed clusters everywhere

The Aerospike Kubernetes Operator delivers cloud portability and automates operational best practices for deploying and managing the Aerospike database. It unburdens organizations from the complexity of infrastructure operations and empowers them to manage Aerospike clusters and data with maximum flexibility. It automates the management of common Aerospike database tasks such as the configuration, provisioning, scaling, and recovery of Aerospike clusters, thereby reducing the complexity of manual deployment and lifecycle management.

Highlights

- **Easily manage Aerospike clusters on Kubernetes:** Automatically deploy and operate multi-node clusters.
- **Reduce operational complexity:** with automated upgrade/downgrade and other configuration changes.
- **Deploy operational best practices for DevOps efficiency:** Easily coordinate a large number of clusters.
- **Certified OpenShift Operator:** Aerospike meets Red Hat standards of interoperability, security and life cycle management when deployed on Red Hat OpenShift.
- **Implement a cloud-agnostic hybrid cloud deployment strategy:** Supports Kubernetes 1.16+, Amazon Elastic Kubernetes Service (EKS), Google Kubernetes Engine (GKE), and Microsoft Azure Kubernetes Service (AKS).

Key Features

Cluster Provisioning

The Operator takes care of provisioning nodes according to your exact requirements.

Multiple Clusters and XDR

Single k8s namespace or in multiple k8s namespaces.

Persistent Storage Volumes

Define for each node in your cluster to allow pods to be recovered.

Cluster Monitoring

With Prometheus exporter.

Backup and Auto-recovery

Detect node failures and use object store as a backup target.

Warm Restarts

Restart the Aerospike service without deleting pods for cluster changes.

Network and Load Balancing

Discover Aerospike externally, use host networking, and configure DNS policy.

Transport Layer Security

Map secrets to each container within a pod. Feed client certificates to the operator.

Automatic Scalability

Scale your cluster up or down by changing a simple configuration parameter.

Upgrade Cluster

New versions upgrades/ downgrades.

Configurations

Manage updates with the Operator.

TLS Support

Client certificate authentication.

Rack Awareness

Support for high availability provisioning clusters across availability zones.

OLM support

Install, manage and upgrade the Aerospike Kubernetes Operator 2.0 with Operator Lifecycle Manager (OLM).

RedHat OpenShift Container Platform

Certified on with RHOS Container Platform.

Helm Charts support

Easily set up the Aerospike Kubernetes Operator and deploy Aerospike clusters with Helm charts.

Simplify running your Aerospike clusters

Automate database provisioning, scaling and maintenance. Abstract away the complexities of high availability and zero-downtime upgrades with native Kubernetes.



Deploy - multi-node clusters by writing a small configuration and pushing it to Kubernetes



Recover - automatically from node failures



Scale - clusters up or down as your application workload changes



Balance - load between racks or zones



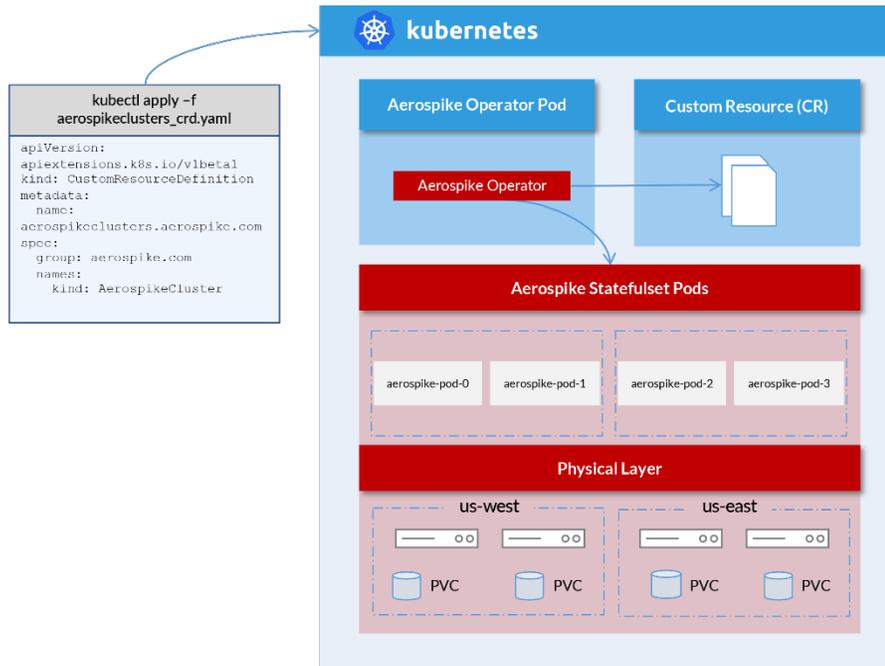
Upgrade - automatically to new versions of Aerospike Enterprise



Manage - cluster configurations to your specifications

High-level architecture

The Aerospike Kubernetes Operator has a custom controller, written in Go, that allows us to embed specific lifecycle management logic to effectively manage the state of an Aerospike cluster. It does so by managing a Custom Resource Definition (CRD) to extend the Kubernetes API for Aerospike clusters. Regular maintenance to the Aerospike cluster deployment and lifecycle management are performed by updating an Aerospike cluster Custom Resource (CR).



The Aerospike Operator is deployed with StatefulSet and operates as a headless service to handle the DNS resolution of pods in the deployment.

A layered approach is taken to orchestration which allows the Aerospike Operator to manage Aerospike Cluster tasks outside of the Aerospike deployment.

Kubernetes StatefulSets is a workload API object that is used to manage stateful applications. It manages the deployment and scaling of a set of Pods and provides guarantees about the ordering and uniqueness of these Pods (e.g., as unique addressable identities).

An Aerospike node resides on a pod that is hosted on a different VM or physical server.

Deployment options

Avoid vendor lock-in with a cloud-agnostic application deployment and management platform that enables developers to migrate freely between clouds.

In Public Cloud

- Amazon Elastic Kubernetes Service (EKS)
- Google Kubernetes Engine (GKE)
- Microsoft Azure Kubernetes Service (AKS)

In Data Centers and Private Cloud

- Supports Kubernetes 1.16, 1.17, 1.18, 1.20, 1.21, 1.22
- Supports Red Hat OpenShift Container Platform 4.6, 4.7, 4.8

Supports Aerospike Enterprise 4.6 and later

www.aerospike.com/products/kubernetes-operator/

About Aerospike

The Aerospike Real-time Data Platform enables organizations to act instantly across billions of transactions while reducing server footprint by up to 80 percent. The Aerospike multi-cloud platform powers real-time applications with predictable sub-millisecond performance from terabytes to petabytes of data with five nines uptime with globally distributed, strongly consistent data. Applications built on the Aerospike Real-time Data Platform fight fraud, provide recommendations that dramatically increase shopping cart size, enable global digital payments, and deliver hyper-personalized user experiences to tens of millions of customers. Customers such as Airtel, Experian, Nielsen, PayPal, Snap, Wayfair and Yahoo rely on Aerospike as their data foundation for the future. Headquartered in Mountain View, California, the company also has offices in London, Bangalore and Tel Aviv.

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