COMMVAULT

SOLUTION BRIEF

Accelerate your containers journey with Commvault® software, Metallic™ BaaS, and distributed storage

With hybrid cloud-native, software-defined storage and complete data protection – fully integrated with Kubernetes (K8s) via CSI – Commvault provides the most comprehensive and flexible portfolio of solutions for containers. Store, protect, and migrate your Kubernetes applications wherever they live across hybrid multi-cloud environments.

Containers, here to stay

There is no doubt that containers have become the orchestrator of choice for application modernization and digital transformation initiatives. Containers are lightweight, faster and more programmable than virtual machines, and can be quickly created/deleted using automation to accelerate application development. Despite these advantages, data and infrastructure challenges persist specifically around storage provisioning, protection, and container workload migration across multi-cloud and on-premises locations.

By 2025, more than 85% of global organizations will be running containerized applications in production, which is a significant increase from fewer than 35% in 2019.[1]

Challenges

Containers were designed to be ephemeral or stateless, meaning the data in a container is not stored (or persistent) after the container is shut down, deleted, or stops working. Stateless containers allow applications to be quickly scaled for a specific task, which enabled DevOps teams to build web-scale applications that could adapt at the speed of cloud growth (e.g., Pokemon GO).

Once DevOps engineers had the ability to create their own containers, the migration of stateful applications into containers began, and so did the protection problem. Stateful applications in K8s require proper storage and data management throughout the entire application lifecycle. And while containers are multi-cloud by nature, data is not making it challenging for the IT and DevOps teams to manage the infrastructure and data together in a cohesive manner. Therefore, businesses need a way to easily migrate/replicate and protect data in their container ecosystem to recover container-based applications across their environment.

The question is, how do you enable simple self-service storage provisioning of persistent storage for your DevOps teams while still protecting all data types (containers and non-containers) as you migrate to a container environment?

Additionally, while creating and launching an individual container is easy, managing containers can become challenging at scale. Many organizations have hundreds, if not thousands of containers in their environment, so how do you manage containers at scale?

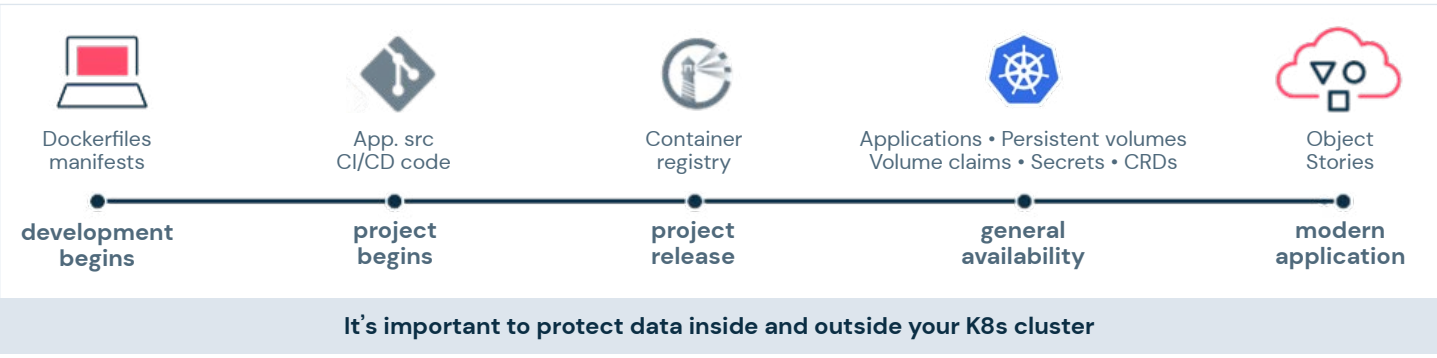
1 CTO's Guide to Containers and Kubernetes — Answering the Top 10 FAQs, Published 27 July 2020 - ID G00726809

Seamless integration with Kubernetes

That's where K8s comes in. It has emerged as the de-facto standard for container orchestration and — through the CSI driver — provides persistent storage capabilities for containerized workloads across hybrid multi-cloud environments. The Container Storage Interface (CSI) standardizes persistent volume workflows across different K8s platforms and storage technologies. Using CSI, K8s developers can dynamically provision storage, expand capacity, schedule snapshots, and recover persistent volumes using array-specific capabilities.

Commvault backup software, Metallic BaaS and Commvault software-defined distributed storage all integrate natively with K8s via CSI. The comprehensive support across traditional enterprise workloads and storage infrastructures enables you to store, protect, replicate, and migrate persistent data and containers across hybrid multi-cloud environments.

For Commvault backup software, containers are simply another workload to protect. Commvault was an early adopter of CSI, enabling the application-consistent protection of not only persistent K8s data, but also the other data in the application landscape, such as source code, CI/CD systems, and image registry data. Being able to protect ALL the data in your application landscape is a key differentiator for Commvault.



It's important to protect data inside and outside your K8s cluster

With Metallic VM & Kubernetes Backup, protection for containers via a SaaS-delivered model provides flexibility, scalability, and the same comprehensive protection as Commvault software, including backing up K8s apps and persistent volumes for all CNCF-certified K8s distributions. Protection is integrated with your developer workflows by auto-discovering and protecting applications by-namespace and label selector. Granularity to backup and recover YAML manifests for entire volumes means you have the flexibility to recover on your terms – all delivered without any infrastructure as a BaaS solution.

Software-defined distributed storage

With Commvault Distributed Storage, Commvault provides cloud-native, software-defined distributed storage to help in building your next generation web-scale hybrid datacenter. This storage is programmable using native K8s commands via CSI.

Not all CSI development for storage is created equal, however. Commvault extends all our enterprise capabilities through our CSI integration allowing developers to self-manage persistent volumes using their existing container workflows. Through CSI programmable objects, users can specify the attributes of their required storage resources, such as size and location, through defined policies or ad-hoc needs.

A single Commvault cluster can support multiple groups within an organization, with programmable tenant support, access control, and through the distributed way the storage platform extends across locations and K8s platforms. Each group has dedicated storage allocated to it that can be managed independently.

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Snapshots and clones

Commvault Distributed Storage provides built-in space-efficient, metadata-based, zero copy snapshots to protect containerized data. These snapshots capture a storage volume at a given point-in-time, enabling fast recovery to the last known good state in the event of a ransomware attack or human error. Given the distributed nature of the architecture, snapshots are simple, fast, and inexpensive since there is no copying of the data.

The CSI extension enables both on-demand and scheduled snapshots of stateful containerized applications. You can automate snapshots by creating a snapshot schedule for persistent volumes using the built-in scheduler of the CSI driver. Simply define your snapshot SLAs based on your compliance and application continuous delivery needs.

K8s and the CSI spec do not provide a native type for creating snapshot schedules. This is an advanced and differentiated capability enabled by the Commvault Distributed Storage CSI that is implemented as a Custom Resource Definition (CRD) within K8s.

Fast, intelligent data migration and replication

K8s cluster sprawl is real. For security and ease of development practice, it is common to see data distributed among different storage clusters. For example, Dev and Test may have separate K8s clusters, but need to be able to migrate data back and forth between the groups to work efficiently and accelerate the application development process.

Commvault Distributed Storage enables rapid and intelligent data migration (i.e., replication) via change block tracking (CBT) that leverages kernel to kernel copies for faster data transfer between clusters. This smart data migration is orchestrated through snapshots as a CRD where Commvault identifies changed blocks at the source and streams them to the target once a migration job is initiated.

When the migration or replication is complete, the replicated volumes contain the most recent point-in-time snapshot from the source. Applications can now consume this migrated data as clones, or as migrated volumes on the target.

The combination of snapshot and replication capabilities ensures your stateful applications are protected and can be recovered regardless of where they live. More importantly, all these capabilities (snapshots, clones, replication) are native programmable objects as part of the CSI, enabling the seamless integration into existing workflows.

Summary

By adopting a powerful solution for Kubernetes, enterprises can now enjoy reduced cost, increased agility, and empower DevOps teams who can harness this solution to innovate with the peace of mind their data is protected.

Commvault, Metallic and Commvault Distributed Storage can help enterprises modernize their business services with cloud-native technology that adapts to the speed and scale your customers expect. Commvault's open API integration with K8s and CSI allows enterprises to deploy applications anywhere while simultaneously protecting, migrating, and recovering their containerized workloads.

Learn more at commvault.com/containers >

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