

Power Your Kubernetes Applications with Object Storage

Take your Kubernetes Knowledge to the Next Level!



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Housekeeping

1. Ask Questions in Q and A window, chat in Chat Window
2. Online Poll – we'd love your inputs
3. Stay until the end - \$200 Gift Card
4. We are recording – Slides and Replay will be shared via email
5. Register for Learning labs at KubeCampus.io



Agenda

1. Kubernetes Environment Challenges
2. Understanding Kubernetes Object Storage
3. Object Storage Benefits
4. Kasten and Scality – a powerful solution
5. Real World Use Cases and Demo
6. Summary – Object Storage Best Practices
7. Resources
8. Q and A
9. Gift Card Drawing

Audience Poll

Kubernetes Usage

Enterprise Kubernetes Data Protection Challenges

74%

of organizations think traditional and container-based applications can be backed up the same way¹
(Spoiler, they can not!)

85%

of companies have experienced at least 1 ransomware attack in the past year²

93%

of organizations think multi-cloud support for container backup is important¹

75%

of organizations indicate a skill shortage in their Kubernetes backup and recovery teams¹

¹ ESG Measuring the Current State and Momentum in the Market for K8s Protection

² 2023 Veeam Data Protection Trends Report

K8s production demands **more** than just **backup**



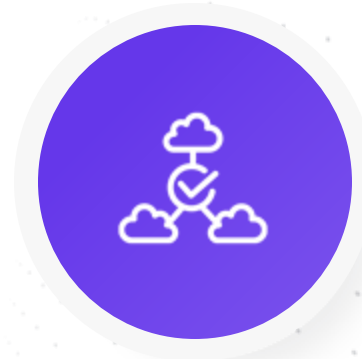
Data Recovery

Reliable backups restored
in-place or for
Disaster Recovery



Data Security

Encryption, access control,
auditing, and
Ransomware Protection



Data Freedom

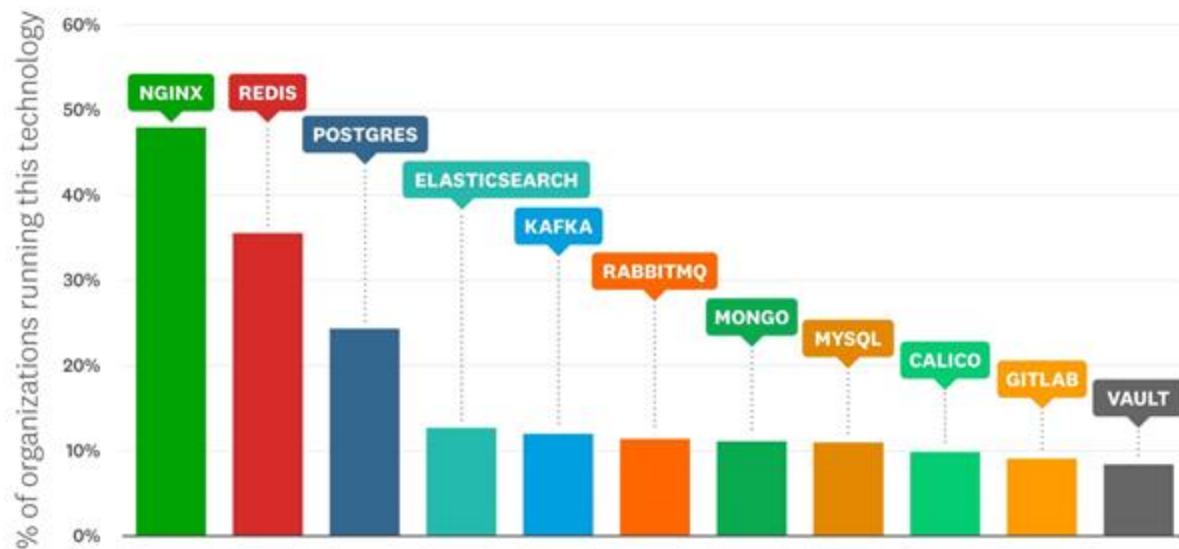
Move workloads across
distributions, clouds, and infra
with **Application Mobility**

As Kubernetes has matured

Stateful applications are common



Top Technologies Running on Containers



Source: Datadog

Understanding Object Storage in Kubernetes



kubernetes

- Using external object storage systems to manage and store data, such as files and other unstructured data, in a Kubernetes cluster.
- Object storage solutions are typically used to handle data that doesn't fit neatly into the container model, such as images, videos, backups, logs, and other large files.
- Organize data as objects rather than a hierarchical file structure.
 - Each object typically consists of the data itself, metadata, and a unique identifier. Object storage systems are highly scalable, distributed, and designed for durability and availability.

Understanding Object Storage

Object storage:

- Key-value store
- Flat structure - only Buckets and Objects
- Metadata included with object and is extensible
- Scalable - No limits
- Secure - IAM - Object Lock
- Built for the internet
- Feature rich
- Versioning - Keep x previous versions
- Object lock - Lock data for a set period of time
- Lifecycle Policies - Expiration and Transition



Benefits of Object Storage

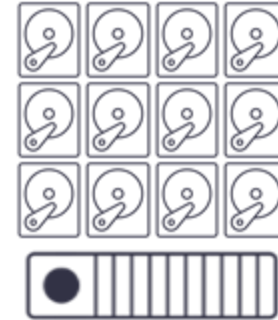
Scalability: Object storage systems are designed to scale effortlessly as your data storage needs grow.

- Add drives to existing nodes
- Add nodes with drives
- Mix drive sizes as higher capacity drives become available

Start small and grow with the service take-up
From 10'sTB to 100PB's in the same namespace

Data Durability: Object storage platforms provide high levels of data durability (up to 14x 9's) by

- Erasure Coding
- Replication
- Multi-site distribution



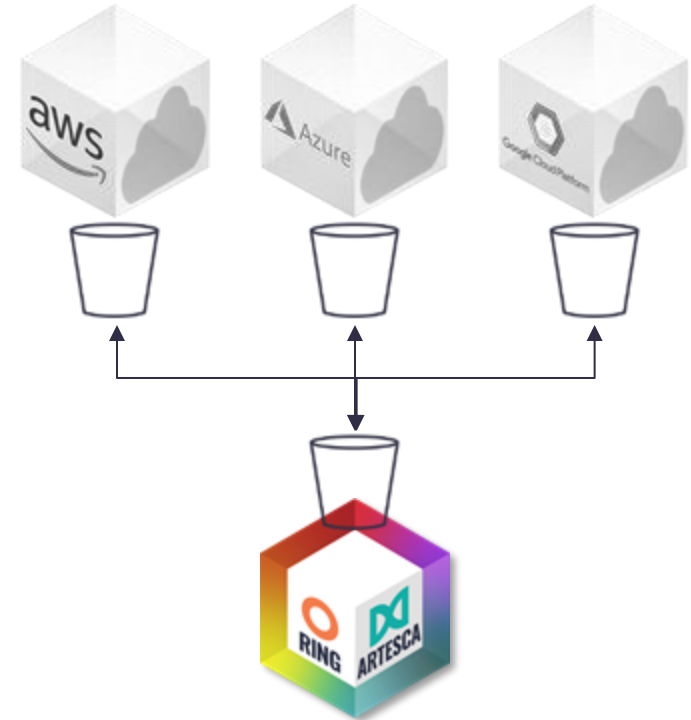
Scale-up
with drives



Scale-out with servers

Benefits of Object Storage

- **Simplified Data Management:** Managing large volumes of data directly within containers can be complex. Object storage systems offer efficient methods for organizing and accessing data, reducing the intricacies of data management tasks.
- **Multi-Cloud and Hybrid Cloud Scenarios:** Object storage solutions can be easily integrated across various cloud providers and on-premises environments.
- **Unstructured Data:** Object storage excels at storing unstructured data like images, videos, backups, and logs. This data lends itself to streaming workloads. Kubernetes workloads can access and process this data efficiently when integrated with object storage.



Benefits of Object Storage

- **Decoupling of Storage and Compute:** Kubernetes separates storage from compute resources. Scales where necessary, protecting investment and providing a clear growth path.
- **Data Accessibility:** Object storage provides a standardized way to access and manage data across different applications and platforms. This facilitates sharing and distributing data among various parts of your application architecture.
- **Useful for All Sizes:** Object storage can provide a data store for an application or company with a few TBs of data or Service Providers with many thousands of customer and 100's PB's



Benefits of Software Defined Object Storage

Cost Control

- Based on industry standard x86 or AMD servers
- No need to buy expensive appliances, can leverage existing procurement framework to get low cost servers to build an object store
- On premise means there are no egress charges which are complex and difficult to predict
- High capacity drives lowers the cost per usable TB
- Mix use cases with multiple applications, department, customers



Integrating Object Storage into your Environment

- **Persistent Volumes (PVs) and Persistent Volume Claims (PVCs):** Kubernetes allows you to define Persistent Volumes and Persistent Volume Claims, which can be used to request and consume external storage resources, including object storage.
- **External Storage Provisioners:** These are Kubernetes-specific controllers that automate the creation of Persistent Volumes using various external storage solutions.
- **Using Object Storage APIs:** Some object storage providers offer APIs that allow you to directly interact with their storage systems from within your pods. This approach requires integrating the provider's SDK or libraries into your application code.



Audience Poll

Object Storage usage

Kasten + Scality – a powerful solution

Great Partners

Kasten

- Kasten K10 - #1 Kubernetes Data Protection
- Prime use cases
 - Backup and Recovery
 - Disaster Recovery
 - Application Mobility



Scality

- Simple and Secure on Premise S3 Storage
- Software defined storage
- From 50TB to 10's PB



What makes Kasten K10 unique?

Kubernetes Native

Built for Kubernetes,
with Kubernetes

Full Ecosystem Support

Any Cloud, any
Kubernetes, any app



Security Everywhere

Enterprise-grade
Ransomware protection

Ease of Use

Intuitive user interface,
easy to install and manage

How Kasten K10 Works



Discover

Automated discovery of your Kubernetes application



Protect

Secure your Kubernetes application and data



Restore Anywhere

Quickly and effectively restore your Kubernetes application and data

Scality Products

Reliable, Secure, Adaptive & Unbreakable

Scale-out file &
object storage
FLEXIBLE



- File and object protocols
- Stretched and replicated deployments
- Distributed data protection schema across cluster and data centers
- Minimum three nodes, 200TB
- Deploy on industry standard x86 or AMD storage servers
- Customer supplied and supported Linux operating system
- Released 2010
- Ideal for multi use case and service provider deployments
- RING to AWS S3 replication

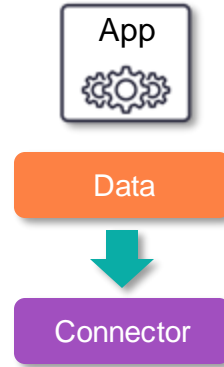


Lightweight,
cloud-native
object storage
**SIMPLE &
SECURE**

- Object protocols
- Replicated deployments
- Network and in-node data protection schema within a cluster
- Minimum single node, 50TB
- Deploy as a secure software appliance on industry standard x86 or AMD storage servers or as a virtual appliance on VMware
- OS included and managed as a software appliance
- Released 2021
- Cloud integration and metadata search included
- Replicate to ARTESCA, RING or public cloud hyperscalers

Object Storage Data Protection

- If RING is less than 12 servers, disk groups are used
- The application sends data to the connector over the front-end network
- The connector applies its data protection schema, in this example we are using 7,5
- It breaks the data into 7 chunks, each chunk is one 7th of the original data size

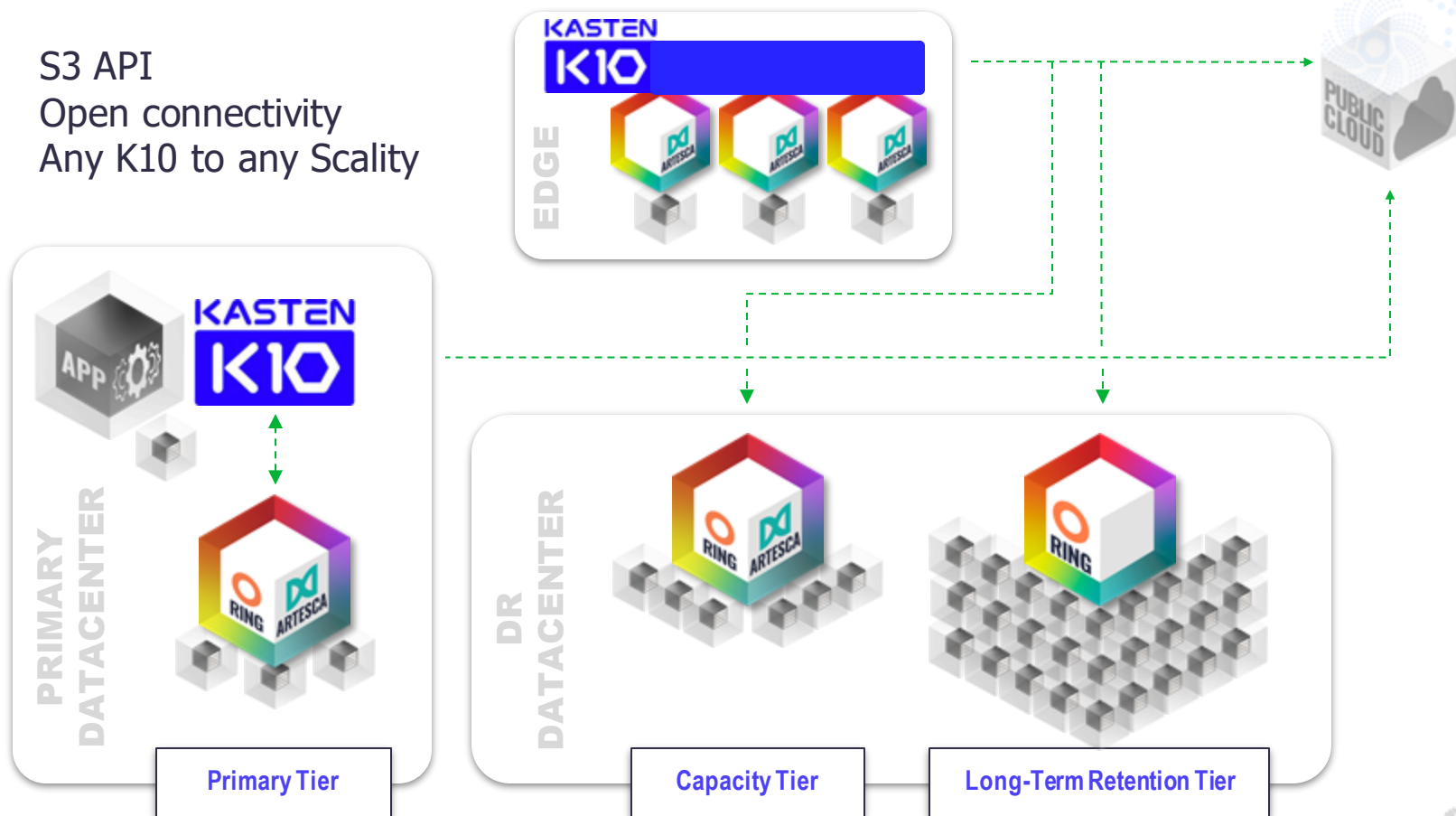


- It also creates 5 parity chunks of the same size as the data chunks
- The data and parity chunks are randomly distributed to the server's disk groups
- RING can tolerate the simultaneous loss of any 5 chunks (data or parity) and still be able to read
- ~~data~~ In this instance the hardware equates to one full site (two servers) plus another disk group



Architecture – how we work together

- S3 API
- Open connectivity
- Any K10 to any Scality



Customer Use Case



Scality and Kasten provide solutions to a wide range of companies in many industries

- Media and Entertainment - Content Delivery Network (On demand), Archive
- Service Providers and Telcos - End User Cloud services, Backup,
- Healthcare & Hospitals - PACS, VNA, Patient Management
- Financial Institutions - Splunk, Backup, Archive, Voice Recording
- Police, Defence & Justice - Digital forensics, Archive, Bodycam, Monitoring

Object Storage Demo

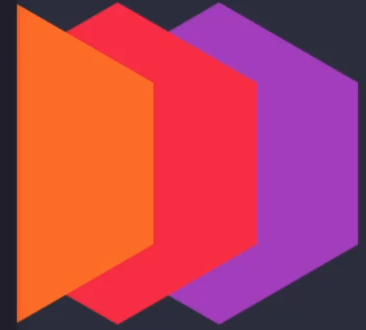
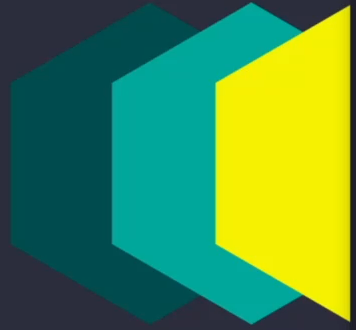


Sign in to your account

Username or email

Password

Sign In



Kasten K10 - Try it for free!

Kasten K10 Backups and Disaster Recovery

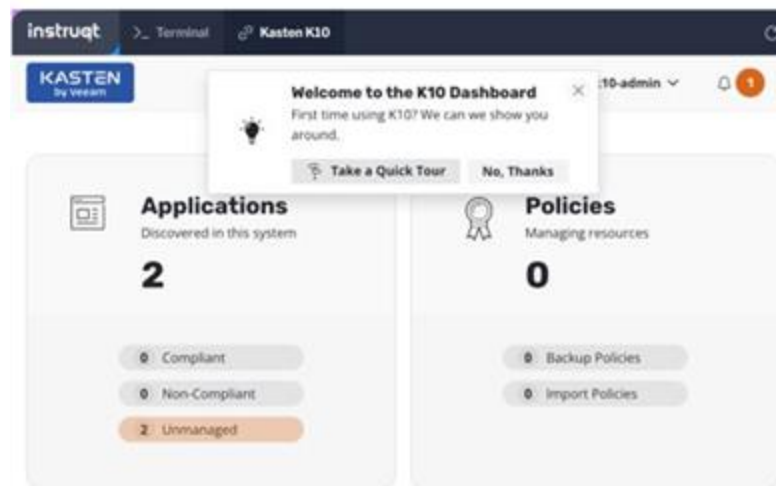
Protecting an application with K10, usually accomplished by creating a policy, requires the understanding and use of three concepts:

Snapshots and Backups: Depending on your environment and requirement, you might need just one or both of these data capture mechanisms

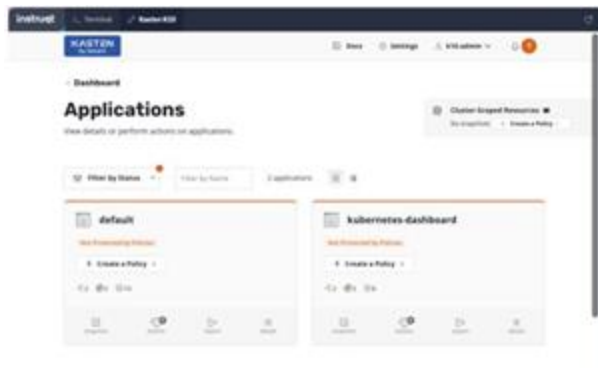
Scheduling: Specification of application capture frequency and snapshot/backup retention objectives

Selection: This defines not just which applications are protected by a policy but, whenever finer-grained control is needed, resource filtering can be used to restrict what is captured on a per-application basis

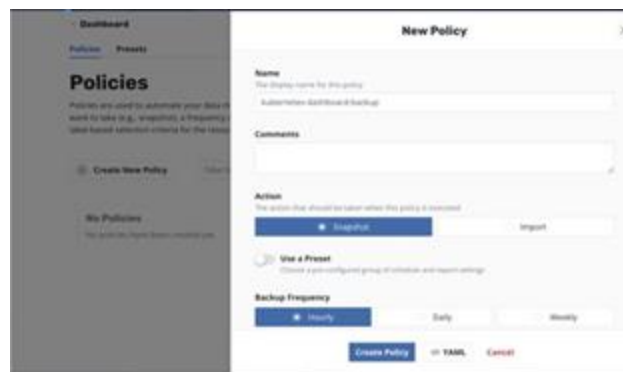
Hands-on lab



The screenshot shows the Kasten K10 dashboard interface. At the top, there's a navigation bar with 'instruqt', 'Terminal', and 'Kasten K10'. A 'KASTEN by VMware' logo is visible. A 'Welcome to the K10 Dashboard' notification is displayed, asking if the user wants to see a tour. The main content area is divided into two columns: 'Applications' and 'Policies'. The 'Applications' section shows 'Discovered in this system' with a count of '2' and buttons for 'Compliant', 'Non-Compliant', and 'Unmanaged'. The 'Policies' section shows 'Managing resources' with a count of '0' and buttons for 'Backup Policies' and 'Import Policies'.



This screenshot shows the 'Applications' section of the Kasten K10 dashboard. It features a 'Cluster Scoped Resources' header and a 'Create a Policy' button. Below, there are two application cards: 'default' and 'kubernetes-dashboard', each with its own 'Create a Policy' button. The interface includes filters for 'Filter by Name' and 'Filter by Status'.



This screenshot shows the 'New Policy' form in the Kasten K10 dashboard. The form includes fields for 'Name' (with a placeholder 'kubernetes-dashboard@backup'), 'Comments', 'Action' (with a dropdown set to 'Snapshot'), and 'Backup frequency' (with a dropdown set to 'Daily'). A 'Create Policy' button is at the bottom, along with 'Cancel' and 'YAML' options.



Best Practices

1. Let the application manage object lock and replication (CRR)
2. Check IAM policies are not over provisioned and rotate keys regularly
3. App developers, Use the functionality - Extensible Metadata - Object Lock - Transition
4. Provision capacity upgrades as soon as possible
5. Have a Backup Schedule and Strategy
6. Set and Understand your RTO and RPO
7. Recognize that Kubernetes Environments are vulnerable
8. Go Cloud Native on backup
9. Contact us for Guidance!

The background is a solid blue color. In the top-right and bottom-left corners, there are clusters of small, bright yellow dots arranged in a roughly triangular pattern, pointing towards the center of the page.

Learn More

Join us @ KubeCampus.io

Addressing community input for more Kubernetes education

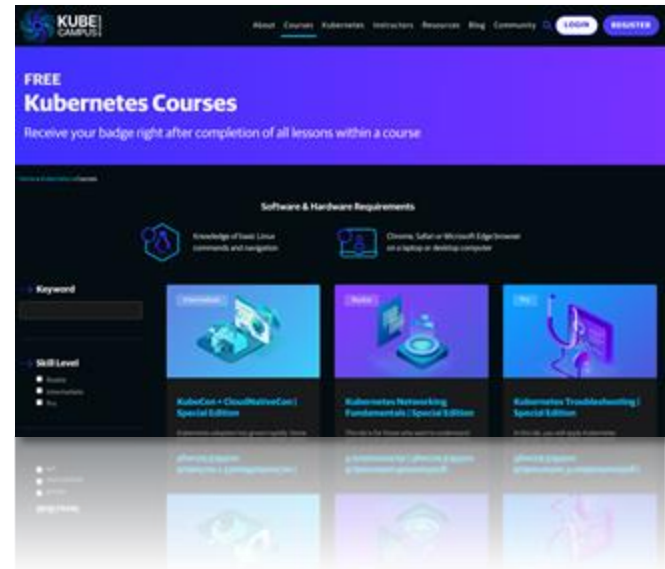
A **FREE** resource welcoming all learner levels

Self-paced, hands-on labs covering Kubernetes fundamentals, backup and DR in Kubernetes

Courses Include:

- Kubernetes Principles
- Understanding Applications in Kubernetes
- Understanding Security in Kubernetes
- Understanding DR in Kubernetes
- Kubernetes Management and Observability

Expert Kubernetes Instructors & Community Interaction



Courses

Introduction



Hardware, software and knowledge requirements

- Knowledge of Basic Linux commands and navigation
- Laptop with 4 GB of memory and 20 GB of hard drive available
- Windows 10 , Mac OS, Linux
- Chrome, Microsoft Edge, Chromium Browser, Safari

Courses Structure

- Review of concepts from pre-work including blog, ppt, VOD and Kasten K10 docs for advanced users
- Hands on lab, following specific Kubernetes commands to achieve mastery and success
- Badging and added resources awarded for each course completed

Insightful Content

Ebooks, Blog Posts, Webinars



Ebooks

- Gorilla Guides – [Getting Started](#), [Storage](#), [Security](#), [Observability](#)
- Dummies Guide

Blog Posts

- Diverse topics of interest to Kubernetes Community
 - [Application Consistency](#), [OIDC](#), [Networking](#), [Security](#), [Minikube](#)
- [Beginner](#) and [Pro](#) Journeys
- Submit yours today! Contact@KubeCampus.io

Video Recordings and Webinars

- VODs accompany each Lab
- Live Webinars on [Security](#), [Storage](#), [Application Monitoring](#) and other topics
 - Also available on demand



Try Kasten K10 for Free!



Free Kasten K10

Download Kasten K10 free and use it for up to 5 nodes, in your sandbox, on your own infrastructure or any cloud.

Download Free Kasten K10

thomas.keenan@veeam.com

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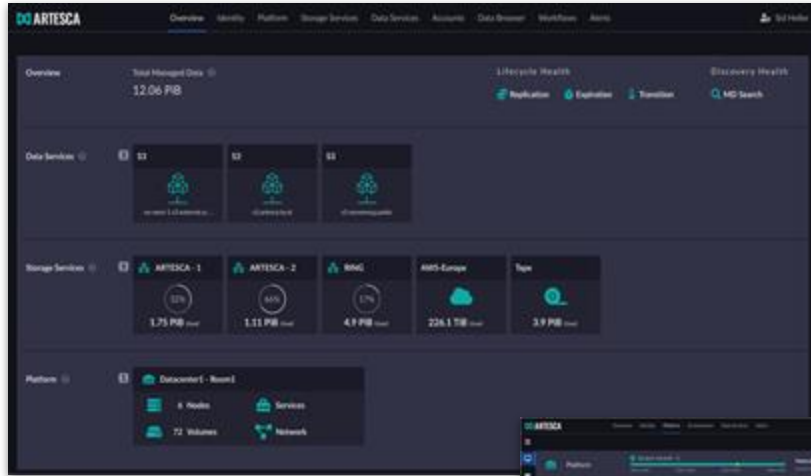
FREE DOWNLOAD NOW



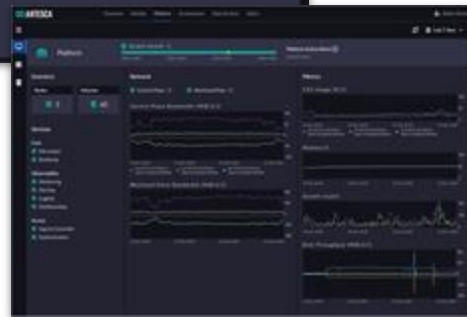
- Download Kasten K10 free
- Up to 5 nodes in your sandbox, infrastructure, or any cloud
- Go to this [link](#)

Free Trial or Demo

ARTESCA 2.0



- 90 Day free trial
- OVA for deployment on VMware vSphere 7.0+
- Connect to Kasten K10
- Store object data locally
- Connect to cloud locations
- Same software that you have seen demoed today
- Includes 'How to Deploy' Video
- Includes access to Documentation



[DEMO WEBINAR](https://www.scality.com/demo-days/)
www.scality.com/demo-days/

[DOWNLOAD ARTESCA](https://www.scality.com/try)
www.scality.com/try

Questions ?

The \$200 gift card winner is...





Thank You