



The CIO Playbook for Running VMs on Kubernetes

Redefining modern virtualization with
Portworx and Kubernetes



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As VMware licensing costs rise and infrastructure complexity grows, CIOs face mounting pressure to control spend, reduce vendor dependency, and strengthen cyber resilience without disrupting the mission-critical systems that power their enterprises.

Kubernetes has become the control plane for modern applications. Now, it is emerging as the foundation for modern virtualization. Enterprises across industries are running tens of thousands of virtual machines (VMs) on Kubernetes with Portworx® by Everpure™. What was once experimental is now operational.

This playbook outlines how CIOs can:

- Navigate virtualization cost and risk pressures
- Preserve operational continuity during modernization
- Avoid first-mover risk with proven frameworks
- Protect mission-critical workloads
- Power secure, regulated hybrid environments
- Redefine virtualization around automation, protection, and unification

Modernization does not require abandoning what works. With Portworx providing an enterprise-grade, Kubernetes-native data foundation, CIOs can modernize VMware environments with confidence, transforming virtualization from a cost center into a strategic growth lever.

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Virtualization enters a new era

The virtualization landscape is undergoing its most significant shift in decades.

Broadcom's acquisition of VMware has triggered widespread reassessment across enterprise IT organizations. Changes to licensing models, product packaging, and ecosystem relationships are forcing CIOs to reconsider long-standing assumptions about infrastructure strategy.

For many organizations, this moment represents a forced modernization event.

Some enterprises will remain on VMware, focusing on cost optimization and operational efficiency. Others are exploring alternative hypervisors or cloud migration strategies. Many are using this moment to rethink the architecture that will support the next decade of application development.

At the same time, Kubernetes has emerged as the standard platform for modern application infrastructure.

Originally designed to orchestrate containers, Kubernetes is now evolving to support VMs as well, allowing organizations to run traditional and cloud-native workloads within a unified platform.

97%

of organizations saw an increase in their VMware license cost renewal.

Voice of Kubernetes Survey 2026





Four pathways forward, and why Kubernetes stands out

CIOs evaluating their virtualization strategy today generally face four distinct pathways forward.

1 Run VMs on Kubernetes (KubeVirt)

Run VMs natively on Kubernetes while unifying data management and operations.

2 Move to the cloud

Migrate VMware workloads to managed cloud services with familiar tooling.

3 Switch virtualization providers

Adopt alternatives such as Nutanix, Hyper-V, or OpenStack.

4 Stay with VMware

Maintain the current stack and absorb operational and financial shifts.

Each pathway has merit. The right choice depends on factors such as cost sensitivity, modernization priorities, risk tolerance, and long-term architectural goals.

However, many CIOs are increasingly evaluating whether a Kubernetes-based platform can address multiple strategic objectives simultaneously—modernization, consolidation, and flexibility.

69%

of organizations are proactively reducing their VMware usage.

Voice of Kubernetes Survey 2026

Virtualization is being redefined, not replaced

For nearly three decades, virtualization has been synonymous with enterprise stability. It standardized compute infrastructure, improved hardware utilization, and enabled the rapid expansion of digital services.

Today, however, virtualization sits at the center of multiple strategic pressures.

- Licensing and cost changes
- Vendor consolidation
- Board-level cyber resilience expectations
- AI-driven infrastructure demands

Virtualization is no longer simply an infrastructure layer. It has become a strategic platform decision.

Kubernetes already underpins most modern application development. Increasingly, organizations are evaluating whether it should also serve as the control plane for VMs.

Rather than replacing virtualization, Kubernetes has the potential to evolve it—bringing VMs and containers together within a single operational framework.

“By 2029, 35% of all enterprise applications will run in containers, an increase from less than 15% in 2023.”

Gartner





Modern virtualization requires an enterprise data platform

Running VMs on Kubernetes introduces a new operational model. Compute orchestration becomes unified, but the success of the platform ultimately depends on how data is managed.

Running and scaling enterprise VMs has always depended on robust storage and data management capabilities, especially for Tier 0 and Tier 1 applications. Those expectations do not disappear in Kubernetes environments. In fact, they become even more important as organizations consolidate VMs and containers onto a shared platform.

To support VMs on Kubernetes, the underlying storage and data platform must provide several critical capabilities.

Core capabilities

Consistent performance for VM workloads

VMs often support latency-sensitive applications and databases. Storage must deliver predictable performance for VM-only workloads and mixed VM and container workloads.

Application-aware backup and recovery

Enterprise environments require coordinated snapshots and restores that protect entire applications while providing granularity to take volume and file-level backups when required.

High availability and disaster recovery

VM workloads must remain available during node failures and support automated recovery across clusters or availability zones, with near-zero data loss for mission-critical workloads.

Policy-driven data governance

Administrators must be able to enforce security and governance policies for placement, encryption, replication, and lifecycle management.

Unified data management across workloads

VMs and containers should share a consistent storage and protection model and set of workflows rather than relying on separate tooling and separate teams.

Without these capabilities, organizations risk recreating the very silos they are trying to eliminate. Modern virtualization is not just about orchestrating workloads. It is about **managing data consistently across them.**

Backup, disaster recovery, and high availability are the most critical capabilities to retain on a new virtualization platform.

Voice of Kubernetes Survey 2026

CSI standardizes the connection

Kubernetes relies on the open source Container Storage Interface (CSI) to connect storage systems to applications. While CSI simplifies integration, on its own it was never designed to manage data at the level enterprise workloads require.

As organizations begin running VMs on Kubernetes, this gap becomes increasingly clear.

What CSI was designed to do

- Attach storage to workloads
- Mount volumes within Kubernetes
- Expose basic lifecycle operations

What CSI was not designed to do

- Optimize performance across workloads
- Coordinate resiliency across clusters
- Manage application-level data services

These aren't CSI failures—they're scope limits.

To support enterprise workloads, organizations must move beyond CSI and adopt a container-native data platform that delivers performance, resiliency, and lifecycle management—capabilities provided by solutions like Portworx.



We cover what matters.

Blue Cross Blue Shield of Alabama encountered these limitations firsthand with a storage vendor CSI driver that could not keep pace with Kubernetes. By adopting Portworx, the team was able to remove those constraints and accelerate their modernization journey.

[Learn More](#)



CSI plug-ins can start the journey, not finish it

Most organizations begin their Kubernetes journey with the open source CSI specification, using it to connect storage to containerized workloads. As requirements grow, many extend this foundation with vendor-supported CSI plug-ins tied to their existing storage infrastructure.

However, as they scale to support enterprise workloads—including VMs—these approaches quickly reach their limits. What starts as basic storage integration must evolve into a platform capable of delivering performance, resilience, automation, and consistent operations across environments.



This progression reflects a shift from connecting storage to managing data as a strategic platform capability.



1. CSI specification (foundation)

**Basic storage connectivity,
but limited operational capability**

- Provides a standardized way to attach storage to Kubernetes
- Focuses on infrastructure integration, not application needs
- Lacks built-in capabilities for resilience, performance, or governance



2. Vendor-supported CSI plug-ins

**Incremental improvements,
but still constrained by infrastructure**

- Extends existing storage systems into Kubernetes environments
- Adds limited capabilities tied to specific vendor architectures
- Reinforces silos across environments and limits portability



3. Container-native storage

**Purpose-built for operating modern
applications at scale**

- Introduces application-aware data management
- Enables automation and self-service for platform teams
- Delivers consistent operations across hybrid and multicloud environments



4. Portworx

**Enterprise data platform
for VMs and containers**

- Unifies data services across VMs and containers
- Provides built-in resilience, security, and governance
- Enables true portability across any Kubernetes and any storage

Portworx: Leading Kubernetes data management platform

Running VMs on Kubernetes requires more than basic CSI storage integration. It requires a data platform designed for modern infrastructure—one that understands applications, scales with Kubernetes, and works consistently across environments.



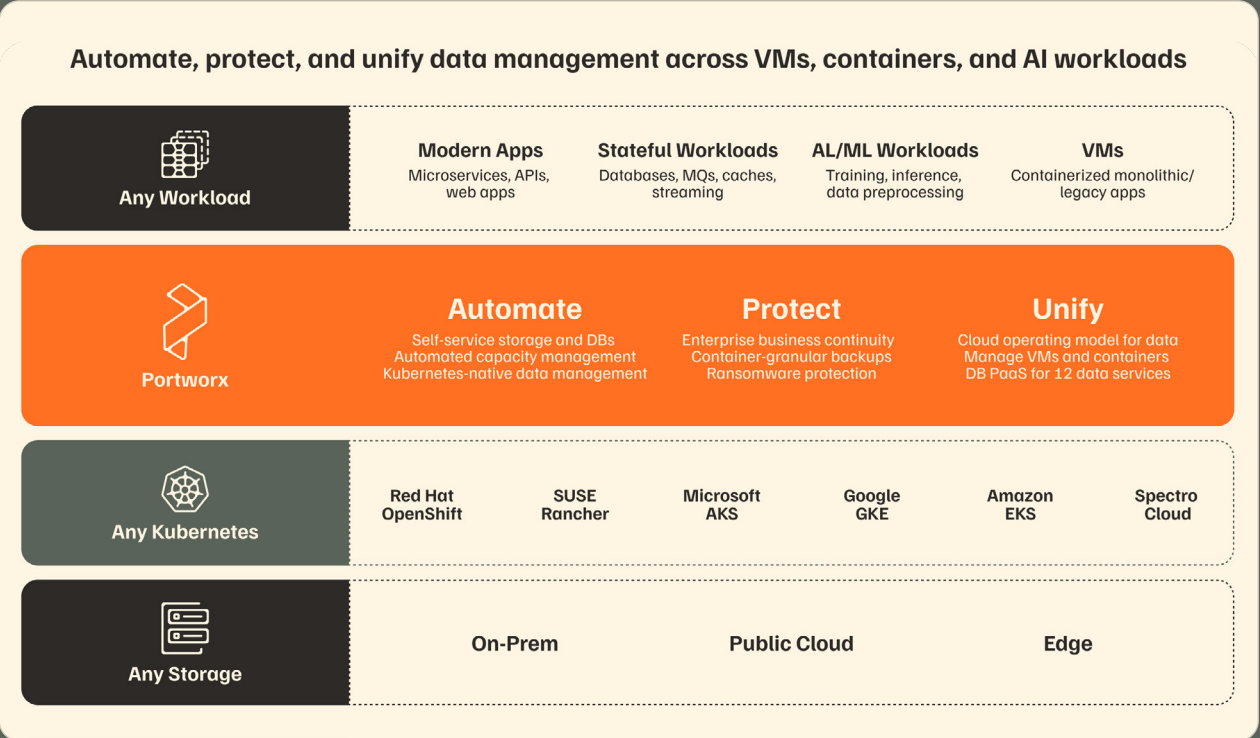
Portworx by Everpure delivers a unified Kubernetes data platform that allows organizations to run **any workload—containers, databases, AI/ML workloads, and VMs—on a single data platform.**

Built specifically for Kubernetes environments, Portworx provides consistent data services across any Kubernetes distribution and across on-premises, cloud, and edge infrastructure.

Rather than stitching together multiple storage tools and CSI integrations, organizations gain a platform that:

- **Automates** data management for modern applications
- **Protects** mission-critical workloads with enterprise resilience
- **Unifies** data services for VMs, containers, and AI workloads across on-premises and hybrid deployments

This unified approach allows platform teams to standardize data operations across their entire application landscape regardless of infrastructure.



Portworx for modern virtualization

Running VMs on Kubernetes requires more than orchestration—it requires a storage data platform that can deliver the same reliability, performance, and protection enterprises expect from traditional virtualization environments.



Portworx extends Kubernetes with the enterprise-grade data services required to run mission-critical VM workloads alongside modern applications on any Kubernetes platform and back-end storage.



1. Performance and scale

Deliver predictable performance for business-critical workloads

- Support demanding, latency-sensitive applications.
- Scale infrastructure without introducing operational bottlenecks.
- Maintain consistent performance across VMs and containers.



2. Resilience and continuity

Protect applications and ensure uninterrupted operations

- Align recovery capabilities to business-critical workloads.
- Reduce the risk of downtime across environments.
- Maintain continuity across clusters, regions, and clouds.



3. Operational efficiency

Simplify how virtual infrastructure is managed and operated

- Reduce manual processes through automation and policy.
- Streamline operations across VMs and containers.
- Empower platform teams to operate at scale with fewer resources.



4. Ecosystem

Operate within an open, flexible, and future-ready platform

- Integrates with leading Kubernetes platforms, including Red Hat OpenShift and SUSE Rancher.
- Supports consistent operations across on-premises, public cloud, and hybrid environments.
- Enables choice across infrastructure and vendors while avoiding long-term lock-in.

Portworx makes KubeVirt enterprise-ready

Portworx brings familiar VM storage workflows and architectures to VMware administrators moving to Kubernetes. This allows organizations to modernize their virtualization platform without introducing new operational complexity—preserving existing processes while gaining the benefits of a Kubernetes-based infrastructure.

Benefit/feature	VMware capability	KubeVirt virtualization capability	Portworx for modern virtualization
Automate			
Application availability	vSphere HA	Deployment/services	Deployment/services
Application deployment	VMware templates	Pod deployments	Pod deployments
Application resource utilization	Resource pools/limits	Kube scheduler, requests/limits	Kube scheduler, requests/limits
Data availability	Shared storage or vSAN FTT	X	Portworx replication factors/dynamic pools
Storage quality of service	VMware storage I/O control	X	Portworx application I/O control
Protect			
Regional disaster recovery	VMware Site Recovery Manager	X	Portworx AsyncDR
Zero-RPO disaster recovery	VMware Metro Storage Cluster	X	Portworx SyncDR
Encryption	Volume encryption	X	Portworx encryption
Data protection	Partner-delivered	Partner solution	Advanced backup and snapshotting
Unify			
Storage infrastructure	VASA/VAAI/SPBM/vVols	Storage classes, CSI provisioner	Storage classes, CSI provisioner
Application portability	vMotion	Delete/redeploy with load-balanced apps	Live migration
Data portability	Storage vMotion	X	Advanced storage migration
Automatic storage tiering	Storage DRS	X	Storage rebalancing
Capacity management	Thin provisioning	X	Thin provisioning/Portworx Autopilot
Kubernetes-aware array support	Any	Partner/bolt-on solutions	Any block or cloud storage

The business impact of running VMs on Kubernetes

Modernizing virtualization isn't just a technology decision—it's an opportunity to simplify operations, reduce infrastructure complexity, and improve long-term cost control.

Running VMs on Kubernetes with Portworx allows organizations to consolidate platforms, automate operations, and build a foundation for future workloads.

- 1 Lower total cost of ownership** with a unified operational model and set of workflows for running VMs and containers.
- 2 Avoid storage, cloud, and platform vendor lock-in** with VM data portability across on-premises and public cloud environments.
- 3 Eliminate CSI scaling and Day 2 challenges** with Kubernetes-native, software-defined storage.
- 4 Prevent app outages** with built-in VM resilience including backup, encryption, and automated disaster recovery.

“By moving our VM estate from VMware to Kubernetes with KubeVirt and Portworx, we reduced licensing costs and unified VMs and containers on a single platform. The result is faster delivery for our developers and a more scalable foundation for modern workloads.

John Chau, VP of Engineering Infrastructure and Shared Services, Everpure



SiriusXM modernizes virtualization without missing a beat

SiriusXM needed to modernize its virtualization platform without disrupting the services relied on by millions of listeners. Like many enterprises, the company was operating separate platforms for VMs and containers, increasing operational complexity and infrastructure costs.

By adopting Red Hat OpenShift Virtualization with Portworx by Everpure, SiriusXM built a unified platform capable of running both VMs and cloud-native workloads across hybrid environments—all while maintaining the reliability required for mission-critical services.

Results

- **Consolidated platforms** for running VMs and containers
- **Faster environment provisioning** for development teams
- **Hybrid-cloud flexibility** across on-premises and cloud infrastructure
- **Seamless migration of production VMs with no service disruption**



“ [Portworx and Red Hat OpenShift] hit all the marks—
low cost of ownership, works on-prem, in the cloud, or at the edge.
It's an integrated ecosystem, and from a storage point of view, it just fits.”

Nate Mason, Director of Platform Operations, SiriusXM

40–55%

lower VM costs

Everpure reimagines virtualization at scale

At Everpure, we set out to modernize our virtualization platform in response to rising costs, increasing platform fragmentation, and the need to support modern application and AI workloads. Like many enterprises, we were operating separate environments for VMs, containers, and infrastructure—driving operational complexity and inefficiency.

By adopting Kubernetes with KubeVirt and Portworx, we built a unified platform capable of running both VMs and cloud-native workloads on a single control plane, all while maintaining the performance, resilience, and operational consistency required for enterprise applications.

Results

- Consolidated VMs and containers onto a single platform
- Reduced reliance on traditional virtualization infrastructure
- Accelerated developer productivity through self-service infrastructure
- Enabled a scalable foundation for modern and AI-driven workloads

20,000+ VM

cores migrated off VMware in Q1 2026

300 VMs

migrated per day



Next steps

As virtualization enters a new era, CIOs must move from evaluation to action. The following resources offer practical guidance to assess options, validate approaches, and build a modern virtualization platform with Kubernetes and Portworx.

- Learn more about [virtualization solutions](#).
- Read the [analyst report](#) on building a modern virtualization platform.

Supporting information

- [Modern virtualization infrastructure with Red Hat and Portworx](#)
- [Virtualization at a Crossroads: Building a Modern Virtualization Platform](#)
- [Beyond CSI: The Portworx Storage Architecture Built for Real World Kubernetes Workloads](#)

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