WHITEPAPER

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Enterprise Data Cloud:

7 Ways Portworx Enterprise and Pure FlashArray Accelerate Data Management for Containers

The Enterprise Data Cloud is a new storage and data management cloud architecture that enables enterprises to unify data across their estate into a virtualized cloud, governed by an intelligent control plane.

If you're running your enterprise data cloud with Kubernetes on Pure FlashArray with the CSI driver, you're already investing in speed, efficiency, and reliability. But without a Kubernetes-native data management platform, you're only halfway there.

Portworx Enterprise unlocks the full potential of FlashArray for modern apps - bringing automation, replication, security, and performance tuning directly into your container applications and workflows.

There are seven ways this combination works in lockstep to deliver storage that's agile, resilient, and optimized for Kubernetes.

1 Cloud-Drive Elasticity

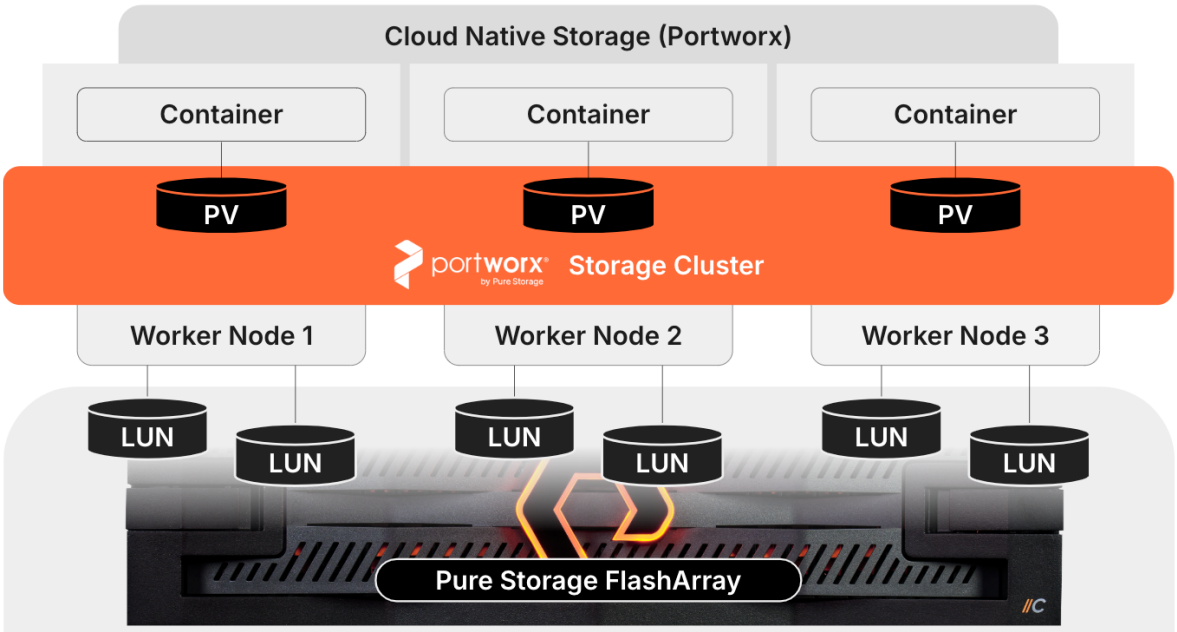
Portworx Enterprise brings cloud-drive elasticity to Kubernetes by automatically provisioning and attaching FlashArray-backed volumes as new nodes join the cluster. This seamless integration simplifies operations and accelerates delivery for platform teams by providing:

- Just-in-time volume allocation with intelligent, topology-aware placement
- Automated scaling of storage pools in response to workload demands
- Cloud-like agility and responsiveness for your on-premises environment

When infrastructure changes - such as node failures, maintenance events, or scaling actions - Portworx automatically detects the shift and remaps storage volumes to healthy nodes. This ensures continuous availability without manual intervention, reducing the risk of downtime and enabling truly self-healing infrastructure.

By embedding automation directly into the Kubernetes control plane, Portworx turns FlashArray into a programmable, Kubernetes-native storage fabric. It eliminates the need for manual iSCSI/NFS configuration by automating volume provisioning via the FlashArray API. This provides better operations efficiencies and better SLAs for applications. Platform teams can eliminate complexity, reduce operational toil, and deliver the developer-friendly agility of cloud - while benefiting from the performance, resilience, and cost-efficiency of FlashArray.

You can dive deeper into how PX Cloud Drives work **in the Portworx docs.**



2 Automated Capacity Management - with Guardrails

As workloads grow, so do storage demands - and managing that growth manually can quickly become a burden. Portworx Autopilot delivers intelligent, policy-driven automation that ensures your storage scales seamlessly with your applications, without ever spiraling out of control.

Platform teams can define simple rules to govern how and when storage expands:

- "If volume usage exceeds 85%, increase capacity by 25%"
- "If storage pool utilization exceeds 70%, add more capacity from FlashArray"

These policies are applied at the cluster level and enforced automatically. Behind the scenes, Autopilot works natively with FlashArray APIs to provision new volumes, resize existing ones, and reallocate resources - no CSI translation layers or manual intervention required.

The result: hands-off storage elasticity with guardrails. Autopilot ensures that storage keeps pace with workload demands, while giving platform teams full control over how growth is triggered, sized, and constrained. You get the benefits of automation, without the risk of runaway infrastructure.

See real examples in the **Portworx Autopilot documentation.**

3 Smarter High Availability with Built-in Efficiency

Portworx Enterprise delivers Kubernetes-native synchronous replication to keep data highly available across node, rack, or zone failures - all fully orchestrated through the Kubernetes control plane. This built-in automation ensures continuous access to data without manual intervention, giving platform teams a reliable, application-aware foundation for high availability.

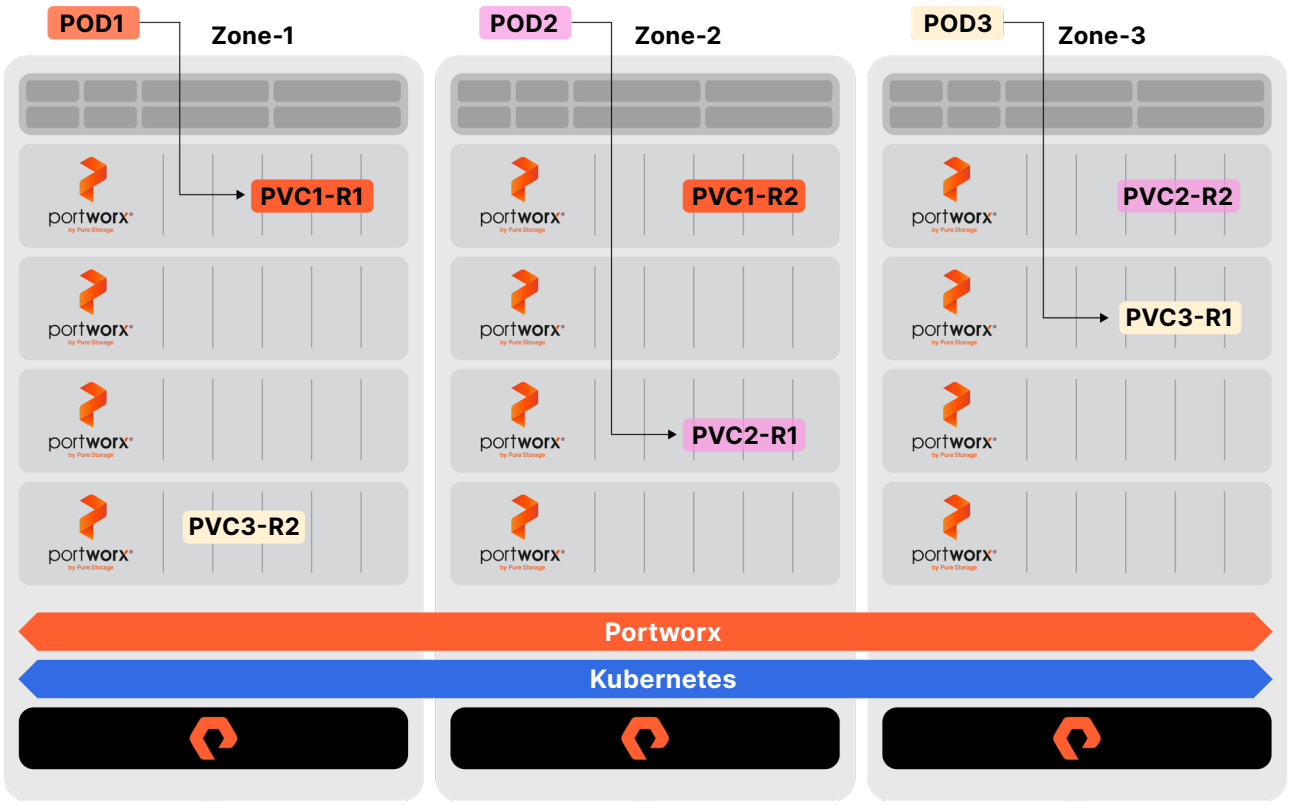
Replicated volumes are intelligently distributed across failure domains, ensuring workloads stay online even during infrastructure disruptions. When paired with FlashArray, this replication becomes not only resilient but highly efficient. Replicating on the same FlashArray provides seamless access during node failures while taking full advantage of Pure's inline deduplication and compression to minimize storage footprint.

For broader protection, automatically distributing workloads and replicating across multiple FlashArrays delivers fault tolerance across availability zones or physical sites, ideal for mission-critical environments. This capability enables your Kubernetes control plane to operate in a cloud-like availability - zone model without giving up the efficiency of the data center.

Together, Portworx and FlashArray deliver:

- Continuous data availability with intelligent, Kubernetes-native replication
- Optimized storage efficiency through enterprise-grade data reduction
- Rapid recovery and resync to minimize downtime and impact

This unified approach gives platform teams a powerful advantage: enterprise-grade availability without enterprise-grade complexity. By eliminating manual failover workflows and minimizing redundant storage overhead, Portworx and FlashArray streamline day-to-day operations, reduce risk, and accelerate recovery from failure events. The result is a resilient, efficient, and scalable foundation that allows platform teams to focus on delivering services - not managing infrastructure - while confidently meeting the demands of production-grade Kubernetes environments.



Portworx ensures intelligent placement of data replica across availability zones

4 DR That Goes Beyond Storage Replication

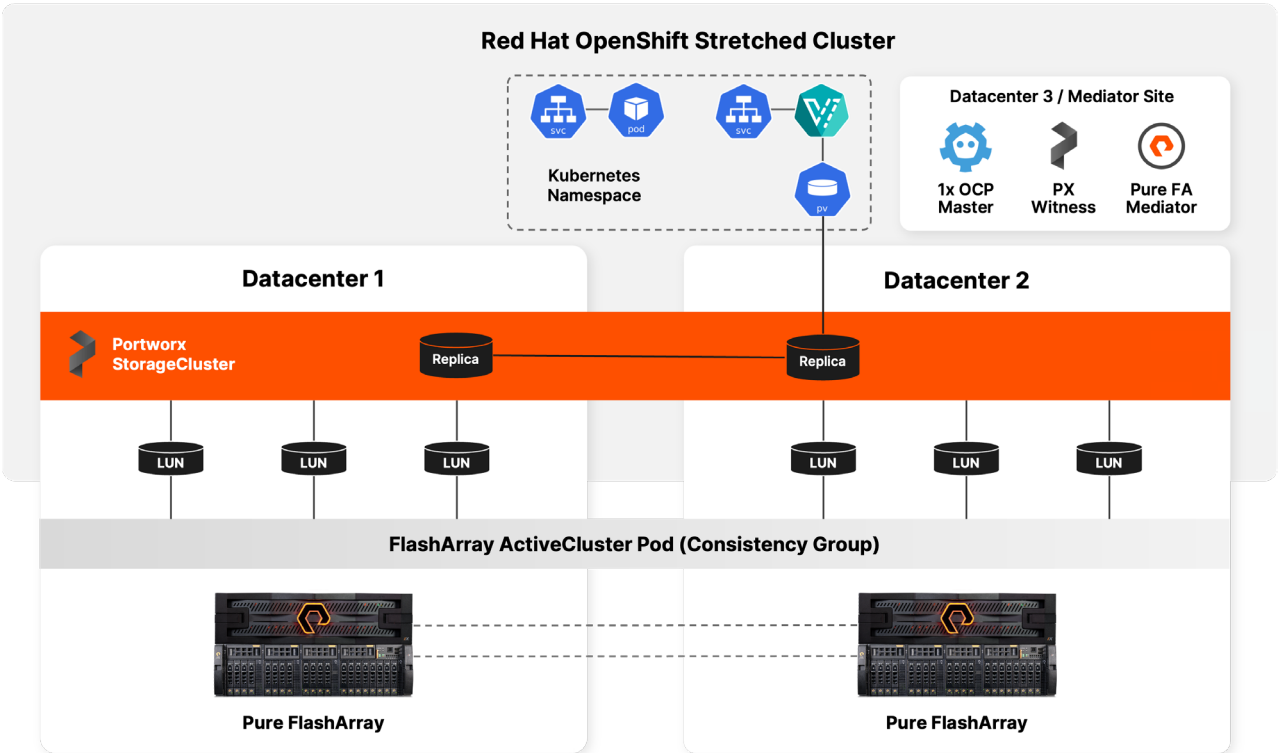
FlashArray ActiveCluster delivers zero-RPO synchronous replication between two sites - ensuring data is mirrored in real time. But in Kubernetes environments, protecting just the data isn't enough. Full recovery requires the ability to restore the entire application stack - including configurations, secrets, and dependencies.

Portworx and FlashArray work together to provide synchronous DR by enabling:

- Coordinated failover of full Kubernetes applications, not just persistent volumes
- Preservation of Kubernetes metadata, secrets, and application context
- Support for both synchronous and asynchronous replication across clusters
- Resource translation across clusters to update relevant application contexts

Together, Portworx and FlashArray provide a hands-off, zero-RPO, low-RTO, API-driven disaster recovery solution that protects both your data and your application experience - ensuring resilient stateful services with operational agility.

You can learn more about FlashArray's ActiveCluster **here.**



5 Multi-Tenant Isolation from Kubernetes to FlashArray

In Kubernetes environments shared by multiple teams, applications, or business units, maintaining strong tenant isolation across the stack is critical. Portworx Enterprise delivers secure, multi-layered isolation - from Kubernetes namespaces down to the physical storage layer.

Within the cluster, Portworx enforces namespace-level isolation and role-based access control (RBAC) for volume operations. Access to storage is tightly scoped by identity and context, ensuring that users and applications can only interact with the volumes and data assigned to them.

At the infrastructure level, Portworx integrates with FlashArray's Secure Multi-Tenancy (SMT) to assign each Kubernetes cluster to a dedicated SMT realm. This ensures that volumes created by the cluster are logically and operationally separated from those of other environments - giving storage administrators the guardrails they need to confidently support multi-cluster and multi-tenant use cases.

With Portworx and FlashArray working together, platform and infrastructure teams gain a unified approach to multi-tenancy - one that enforces boundaries at both the Kubernetes and storage layers, without compromising performance, agility, or control.

Read more about building **secure application workspaces.**

6 I/O Control from Kubernetes to FlashArray

Kubernetes environments are dynamic by nature - and unpredictable I/O patterns can create performance issues fast. One noisy workload can easily starve others if left unchecked. Portworx Enterprise and FlashArray provide options for customers to allow multi-layered I/O Control that keeps applications performant and infrastructure balanced.

With Portworx, platform and application teams gain fine-grained control at the Kubernetes layer:

- Per-volume profiles to define performance profiles (IOPS/Bandwidth limits or priority levels)
- Policy-based controls that allow teams to tune performance expectations per workload
- Abstraction-preserving coordination, so developers never have to interact with low-level storage details

At the same time, FlashArray enforces backend quality-of-service (QoS) and protection policies, ensuring fairness and predictability - even under pressure from thousands of concurrent I/O sources.

This dual control plane gives each team what they need:

- Developers and platform engineers can manage application performance directly
- Storage teams retain control over global resource boundaries and infrastructure health

Together, Portworx and FlashArray ensure that Kubernetes applications stay fast, fair, and fully under control - no matter how demanding the environment becomes.

Read more about **Portworx's Application I/O controls.**

7 Performance for Stateful Workloads Without Tradeoffs

Pure Storage FlashArray is known for delivering low-latency, high-throughput storage at scale. Portworx Enterprise brings that performance into your Kubernetes clusters - giving platform teams a seamless way to deliver FlashArray's power to modern, stateful applications running in containers.

With Portworx, platform and operations teams can tap into the full performance profile of NVMe-backed DirectFlash volumes, drawing on the capabilities of the underlying storage architecture. Whether you're running high-ingest data pipelines or latency-sensitive databases, you can benefit directly from FlashArray's high performance and built-in data reduction.

Beyond performance, Portworx adds Kubernetes-native data management capabilities that help teams manage state more easily and efficiently:

- Snapshots and restores for backup, test, and DR workflows
- Volume cloning to rapidly spin up dev and staging environments
- Kubernetes application-aware replication between clusters for hybrid or multi-site deployments
- Declarative storage management that aligns infrastructure with application SLAs

By bridging the gap between enterprise-grade infrastructure and cloud-native operations, Portworx makes it easy for teams to run stateful services at scale - on the fastest, most efficient storage platform available.

To understand how FlashArray achieves <1ms latency through NVMe, review the **DirectFlash Architecture Overview.**

Final Take

The Enterprise Data Cloud (EDC) is a new storage and data management architecture that enables enterprises to unify data across their estate into a virtualized cloud, governed by an intelligent control plane. As components of an EDC, Portworx Enterprise and Pure Storage FlashArray combine to deliver a unified platform for Kubernetes storage and data management - blending the best of enterprise infrastructure with the flexibility and intelligence of cloud-native operations.

FlashArray brings the performance, efficiency, and reliability that enterprise environments demand. Portworx layers on the application-awareness, automation, and orchestration that modern Kubernetes platforms require - going far beyond what CSI plugins or legacy solutions can deliver.

Together, they enable platform and infrastructure teams to build enterprise data clouds - scalable, secure, and self-managing environments with:

- Cloud-like elasticity on enterprise-grade flash storage
- Resilient, intelligent replication that works with deduplication and compression
- Disaster Recovery that goes beyond storage replication
- Application-consistent disaster recovery - not just volume mirroring
- Multi-tenant isolation and security, from Kubernetes to array
- Integrated I/O control for app-level tuning and backend fairness

Whether you're modernizing existing infrastructure or scaling out cloud-native services, Portworx and FlashArray give you the tools to run stateful applications at scale - securely, reliably, and with maximum performance.

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