

Bridging the gap between legacy VMs and cloud-native banking

Run the bank, change the bank: Breaking the infrastructure divide

A defining challenge for technology executives in the financial services sector is the high-pressure mandate to scale AI while simultaneously simplifying the existing technology estate. CIOs must navigate fragmented architectures that increase infrastructure costs and weigh down AI adoption. This process creates a strategic paradox: innovate to win market share, modernize existing architectures to simplify the technology landscape.

The result is a fragmented infrastructure model: current applications locked in traditional virtual machines (VMs), and emerging AI/ML workloads demanding the cloud-native agility of Kubernetes. Maintaining separate configurations for these environments creates duplicated tooling, fragmented security policies, inconsistent disaster recovery postures, and rising operational overhead. This fragmentation is both inefficient and risky. This challenge is particularly critical in always-on banking workflows such as real-time payments processing, where latency, uptime, and data consistency across environments directly affect transaction integrity and regulatory compliance.

The Digital Operational Resilience Act (DORA) and other regulatory mandates require financial institutions to demonstrate consistent governance, disaster recovery, and portability across cloud environments. Traditional VM-based architectures were never designed for the distributed cloud world in which banks now operate.

Wholesale and drastic modernization efforts are unrealistic for banking. Many systems cannot be rewritten, and AI initiatives depend on data that still resides within traditional VM-based platforms.

Banks must find a way to progressively modernize without destabilizing critical systems.

The joint Red Hat® and Portworx solution addresses this structural challenge by allowing VMs and containers to operate equally on a unified technology platform. This approach reduces infrastructure isolation, strengthens resiliency, and establishes a consistent enterprise data layer capable of supporting both existing and more innovative workloads.

Converging VMs and containers

For financial institutions, modernization cannot come at the expense of stability or security. Core banking systems, payment engines, credit scoring platforms, trading applications, and risk models often run on VM-based architectures that have been hardened over decades. These workloads are revenue-critical, regulator-audited, and intolerant of disruption.

AI-driven fraud detection, real-time personalization, liquidity analytics, and regulatory reporting initiatives are being built in containers. These newer workloads demand elasticity, automation, and cloud-native deployment patterns.

Running environments separately creates operational and governance friction with:

- ▶ **Unified operations:** Red Hat allows you to run VMs alongside containers on the same Red Hat OpenShift® platform. This unified operation eliminates the need for 2 separate infrastructure architectures (e.g., VMware and Kubernetes). It reduces infrastructure sprawl, license costs, and training requirements, and it simplifies audit and compliance reporting.
- ▶ **Persistent storage:** Portworx provides a single, unified data management layer that serves both VMs and containers. Whether it is managing a high-throughput SQL database supporting payments in a VM or a vector database powering AI models in a container, Portworx ensures consistent performance, encryption, snapshots, and policy-based resiliency.
- ▶ **AI inclusivity:** AI models are only as effective as the data that feeds them. By co-locating traditional data-source VMs with containerized AI training models on a unified technology platform, banks reduce latency, simplify governance, and create a security-focused, low-friction data pathway between systems supporting operational workloads.

Overcoming cloud complexity

As banks move toward hybrid and multicloud strategies, regulatory requirements are increasingly shaping infrastructure decisions.

DORA and similar global resilience frameworks require banks to demonstrate:

- ▶ Operational continuity across failure scenarios.
- ▶ Portability between infrastructure providers.
- ▶ Clear visibility into data location and movement.
- ▶ Consistent governance and access controls across environments.

Adding a further challenge, traditional applications can be situationally locked on-premise because their storage requirements are too complex to move. AI applications are often delegated in the cloud because of specialized hardware. Data movement between these environments introduces latency, governance complexity, and audit exposure.

Infrastructure inconsistency is no longer merely an operational inefficiency; it is becoming a significant operational risk.

The solution: The Portworx Data Fabric

- ▶ **Abstracting the hardware:** Portworx creates a software-defined storage layer operating consistently across bare metal, private cloud, and public cloud environments. Whether running on-site infrastructure or cloud-native block storage such as Amazon Elastic Block Store (EBS), the data layer behaves the same, simplifying compliance documentation and audit controls. This storage layer is especially important for regulatory reporting and stress testing workflows such as

Comprehensive Capital Analysis and Review (CCAR), Basel III, and liquidity stress scenarios, which depend on consistent, auditable data access across legacy and modern environments to ensure accuracy and timely submission.

- ▶ **Application and data portability:** Portworx allows for a graduated migration approach for stateful applications (e.g., an in-place, credit-scoring VM from a datacenter to the cloud which feeds an AI model) with minimal downtime and without rebuilding applications. This approach is particularly critical for customer-facing digital banking platforms, where mobile and online applications must scale dynamically, maintain high availability across regions, and interact with core systems regardless of where those components reside. This flexibility also reduces vendor concentration risk and supports infrastructure diversification strategies.
- ▶ **Data sovereignty and governance:** Manage the data lifecycle of both existing and operationally innovative AI applications with a unified dashboard. Portworx allows institutions to define replication and placement policies aligned with geographic and jurisdictional requirements. Data can be kept within defined regions while still participating in a unified operational model. Encryption, role-based access control (RBAC), and policy-based management remain consistent across environments.

By creating a consistent data fabric across hybrid and multicloud deployments, Red Hat OpenShift and Portworx help banks satisfy regulatory resilience mandates while reducing operational complexity, turning compliance from a constraint into an architectural advantage.

Resilience for the continuously operating bank

In financial services, downtime is a regulatory event, a reputational risk, and a potential systemic threat, associated with a monetary consequence. Core banking systems, payment and trading platforms, and fraud detection engines must operate continuously under all conditions.

Regulators increasingly require institutions to demonstrate disaster recovery (DR) plans in addition to provable operational resilience when subjected to stress scenarios. Under DORA and other global frameworks, banks must validate that critical services can withstand localized failures, infrastructure outages, and even regional disruptions.

When VMs and containers run on a unified platform, resilient architecture must be designed deliberately to limit blast radius and preserve service continuity.

Red Hat and Portworx mitigate this resilience through a set of deep defensive capabilities:

- ▶ **High availability for legacy and modern deployments:** Portworx provides block-level, synchronous replication across nodes and failure domains. If a node hosting a critical transaction VM or a real-time AI fraud-detection container fails, the workload is automatically restarted on another node with the data already present, eliminating recovery lag and preventing data loss. This process supports zero recovery point objective (RPO) protection for campus-level failures and ensures continuity for revenue-critical systems.
- ▶ **Granular DR:** Unlike current architectures that require entire clusters or environments to fail over together, Portworx enables namespace-level and workload-specific failover. This feature reduces operational risk by isolating incidents rather than triggering broad infrastructure events. For regional outages, asynchronous replication enables rapid failover with low RPO and low recovery time objective (RTO), supporting compliance with geographic recovery requirements.

- ▶ **Unified backup and DR:** Instead of using one tool for VM backups and another for Kubernetes, Portworx provides cohesive, policy-based backup and recovery for both VMs and containers, simplifying governance while ensuring consistent encryption, immutability, and recovery testing.

In a continuously operating bank environment, resilience must extend across both conventional systems and modern AI-driven services. By unifying compute and data protection under a single platform, Red Hat and Portworx reduce systemic risk while strengthening regulatory posture and transparency, allowing institutions to innovate without compromising stability.

The financial and operational effect: A strategic total cost of ownership shift

Within financial institutions, infrastructure decisions are no longer evaluated solely on technical merit. These decisions are assessed on cost predictability, risk exposure, operational efficiency, and regulatory sustainability.

Maintaining fragmented virtualization and container stacks is inefficient and compounds financial and operational risk.

From dual architecture to converged efficiency

Traditional environments often include:

- ▶ VMware for current VMs.
- ▶ Kubernetes for modern applications.
- ▶ Separate storage platforms.
- ▶ Separate backup tools.
- ▶ Separate DR orchestration.
- ▶ Separate operational teams.

This duplication amplifies:

- ▶ Escalating license costs.
- ▶ Increased training and certification expenses.
- ▶ Overlapping operational headcount.
- ▶ Fragmented security controls.
- ▶ Higher audit complexity.

By converging VMs and containers onto Red Hat OpenShift with Portworx as the unified data layer, banks shift from duplicated infrastructure to a consolidated operating model.

Feature	Fragmented way (old)	Unified (Red Hat and Portworx)
Footprint	Dual architectures (VMware and Kubernetes)	Single converged architecture
Data management	Isolated storage per platform	Unified data fabric across environments
Security	Inconsistent policies across VMs and containers	Uniform RBAC and encryption
Backup and DR	VM tools and Kubernetes tools	Single policy-driven system
AI readiness	Complex integration with current data	Native, low-latency data access

Costs of maintaining operational processes versus embracing innovation

Fragmented infrastructure forces institutions to fund 2 parallel investment tracks:

- ▶ One maintains established systems
- ▶ The other delivers innovation and competitive advantage

A unified technology platform reduces the cost of maintaining present systems while accelerating innovation. Key financial outcomes:

- ▶ Reduced licensing exposure from in-place virtualization platforms
- ▶ Lower operational overhead through unified lifecycle management
- ▶ Decreased downtime risk (and associated regulatory penalties)
- ▶ Improved asset use across compute and storage
- ▶ Faster deployment cycles for revenue-generating services

Risk-adjusted return on investment (ROI)

In regulated financial environments, the true ROI is cost savings combined with the reduction of operational and regulatory risk. Consolidation reduces:

- ▶ Vendor concentration exposure
- ▶ Compliance complexity
- ▶ Cross-environment failure propagation
- ▶ Data egress and duplication costs

The result is a platform that simultaneously lowers the total cost of ownership (TCO) and increases resiliency, allowing banks to reduce operational expenditures and accelerate innovation.

Find out more:

▶ Accelerate modern virtualization with Red Hat and Portworx

Discover how Portworx and Red Hat OpenShift provide enterprises with a smarter approach to modern virtualization to simplify management, scale on demand, and save costs.

[Read the overview](#)¹

▶ Embracing Modern Virtualization - Insights from Portworx & Red Hat

Discover how Portworx and Red Hat close the gap between traditional VMs and modern cloud-native development, providing a path to innovation and modernization.

[Watch the webinar](#)²

About Portworx

Portworx by Pure Storage is the leading Kubernetes data management platform, enabling enterprises to run mission-critical applications, databases, and AI workloads at scale. Portworx automates, protects, and unifies data management across hybrid and multi-cloud environments, delivering enterprise resilience, performance, and operational efficiency.

1 Red Hat. [“Accelerate modern virtualization with Red Hat and Portworx.”](#) 30 July 2025.

2 Red Hat. [“Embracing Modern Virtualization - Insights from Portworx & Red Hat.”](#) 20 Feb 2025.



About Red Hat

Red Hat is the world’s leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. [A trusted adviser to the Fortune 500](#), Red Hat provides [award-winning](#) support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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