WHITEPAPER

Unify VMs and Containers

Trends, Challenges, and Solutions

Introduction

The past few years have seen a rapid increase in the adoption of containers and Kubernetes as the app development platform of the future. In fact, according to Gartner, 1 in 3 enterprise applications will run in containers by 2029. But what about the remaining enterprise applications? What about VM-based applications?

Two major trends have emerged over the past 12 months that have caused enterprises to consider the benefits and drawbacks of moving from a traditional virtualization stack to a modern virtualization architecture.

Release of KubeVirt 1.0: The release of KubeVirt 1.0 in June 2023 has provided a technology pathway that enables running Virtual Machines on Kubernetes. This approach opens the door for enterprises to consolidate to a single app development platform and run and operate Virtual Machines and Containers side by side from a single application platform. With the backing of Red Hat, the market now has an enterprise-grade KubeVirt-based offering, Red Hat OpenShift Virtualization (OSV), that brings modern app development to the virtualization world.

Broadcom acquisition of VMware: Broadcom's acquisition of VMware has created a level of uncertainty in the market and across enterprises as they look to make long-term platform decisions. With changes in the licensing and operating model, enterprises are looking for flexibility in their virtualization approach to mitigate the uncertainty, risk, and cost pressure being felt in the C-Suite. In fact, according to Gartner "through 2028 disruption in the server virtualization market will result in more than 60% of enterprises accelerating their public cloud migrations and exploring revirtualization of virtual workloads" while Forrester predicts that in 2024, "Twenty percent of VMware enterprise customers will escape the VMware stack."

Three Key Challenges

As we talk to customers across the globe, there are three key challenges we hear as they navigate their application modernization journey:

1   **Cost Pressures:** Customers are facing cost pressure across their application development stack. The shift from perpetual license to subscription models, as seen with some providers, coupled with price hikes, has led to an overnight spike in annual operating costs for development platforms.

2   **Platform Risk:** Industry consolidation coupled with the pending 'end of life' for existing technologies like Red Hat Virtualization (RHEV) has introduced significant platform risk and uncertainty for the C-Suite. With major platform investments happening many years in advance, leaders today are looking for technology options that provide flexibility and certainty to reduce long-term risk.

3   **Operational Overhead:** Running and supporting two different application development platforms introduces a significant amount of operational risk, toil, and technical debt. This has led many IT executives to begin looking for options that deliver consistency across their entire application development stack, with nearly 86% of respondents to a recent report citing their desire to unify containers and VMs workloads on a single infrastructure platform.

A Solution for Application Modernization

Portworx is uniquely positioned to serve as a key technology platform for enterprises as they embark on their application modernization journey. With Portworx, customers benefit from a single storage and data management platform that can support both VMs and containers running on any Kubernetes platform. This enables customers to realize the benefits of Kubernetes without having to containerize their long-standing VM-based applications. Instead Portworx offers customers a migration pathway to modern application development by leveraging KubeVirt, while maintaining many of the key storage features VMware admins have come to expect – including, but not limited to, live migration, synchronous DR, and VM backup and restore.

Portworx Provides VM and VM Disk Mobility

Using a Portworx ReadWriteMany (RWX) volume with a replication factor higher than one allows for Live Migration of virtual machines, which is the equivalent to vMotion in VMware vSphere.

Use the PX-Migrate feature to cold-migrate virtual machine disks between KubeVirt-enabled or Red Hat OpenShift Virtualization clusters along with all of the Kubernetes objects associated with the virtual machine.

In the case that you have an application that is a hybrid mix of virtual machines and containers, you can snapshot and migrate the entire application and all associated disks between clusters for mobility and migration purposes.

Portworx Provides VM High Availability

If a Kubernetes worker node goes down unexpectedly, using Portworx volumes with a replication factor higher than one ensures that the Kubernetes scheduler can restart any VMs which were on the failed node on a surviving node, similar to the cluster HA functionality in a VMware vSphere cluster.
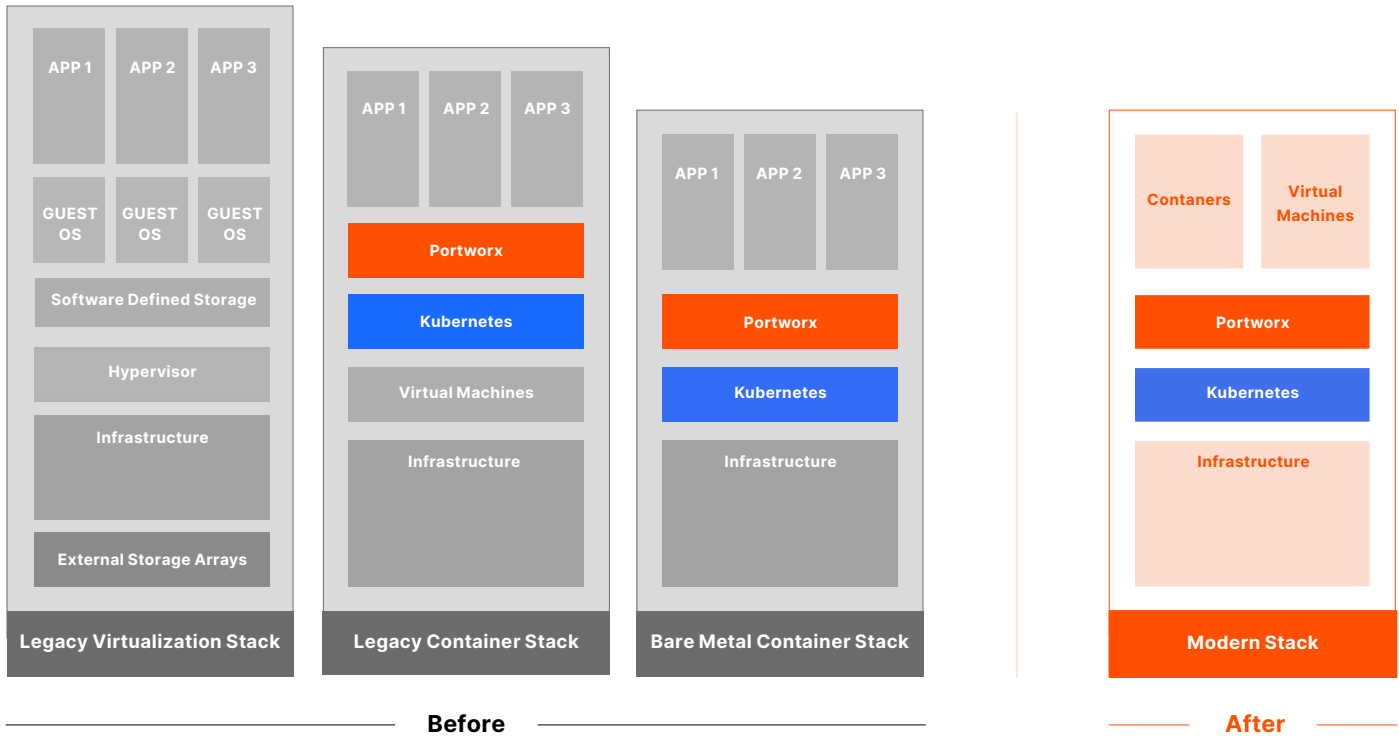
Portworx Provides Flexible Disaster Recovery, Business Continuity, and Data Protection

Async PX-DR can provide asynchronous replication of your virtual machines to any other KubeVirt-enabled Kubernetes cluster or Red Hat OpenShift Virtualization cluster across the globe, providing down to a 15-minute RPO.

Sync PX-DR can provide a zero RPO solution for synchronous replication of your virtual machines within a metro distance as long as you have less than 10ms of latency between the sites, and uses a stretched Portworx cluster across the two sites.

Portworx Backup provides flexible backup and restore options for your virtual machines to adhere to your organizational data protection policies, and supports object-lock S3 targets to provide ransomware protection.

| Legacy Virtualization Stack | Legacy Container Stack | Bare Metal Container Stack | Modern Stack |

Before — **After**

Customer Example

The embrace of KubeVirt in the enterprise is no longer just a discussion for boardrooms and architecture diagrams, instead it has become the reality for many customers. Just last month, a major media company faced many of the challenges outlined in this blog – cost pressure on their existing virtualization infrastructure, EOL for their RHEV infrastructure, and uncertainty about their future application development platform. By leveraging Portworx and Red Hat OpenShift, this customer was able to not only gain an immediate pathway for migrating their traditional virtualization and RHEV applications, but they also now have an application development platform that is future-proofed to support both the VM-based applications of today and the containerized applications of tomorrow.

Next Steps

https://portworx.com/modern-virtualization/