In this era of mobile banking, phone-based shopping, connected cars, and the Internet of things, you can drive rapid digital transformation by exploiting the power of containers and Kubernetes. Your custom applications can embody your company’s innovations to light up your customers’ lives and disrupt the business of your competitors.

Custom applications generate revenue, heighten brand identity, promote interaction with your business, and create exquisite customer experiences. In this context, three technologies advance your applications. With their lightweight packaging and portability, containers accelerate software development. Microservices give your applications the modular architecture they need to change on a dime and scale on demand. And Kubernetes orchestrates containerized applications to automate their deployment and management.

Kubernetes, however, is but one layer in a complete stack charged with putting containers into production at enterprise scale. To meet the demands of enterprise operations without creating yet another IT silo, the stack requires networking, security, storage, maintenance, sustainability, monitoring, and manageable infrastructure.

VMware® Enterprise PKS radically simplifies the deployment and operation of Kubernetes clusters to make it easy to securely run containers at scale on VMware vSphere®. Because VMware Enterprise PKS integrates with VMware infrastructure and tools, you can manage both your traditional applications and modern applications. This common, centralized management plane preempts silos and eases the management of containerized applications so you can disrupt the competition’s business without disrupting your own.

Simplicity

Simplicity is at the heart of VMware Enterprise PKS. Because of its tight integration with vSphere and its use of BOSH to hide the complexity of managing Kubernetes, the architecture of VMware Enterprise PKS simplifies the deployment and operation of Kubernetes clusters.

Two parts of this architecture endow VMware Enterprise PKS with simplicity: The VMware Enterprise PKS control plane and BOSH. The control plane gives you a self-service API interface to deploy Kubernetes clusters on-demand and to manage their life cycles. The API of the control plane submits requests to BOSH, which automates the creation and deletion of Kubernetes clusters.

In addition, the simplicity of VMware Enterprise PKS combines with the inherent simplicity of containers to ease the maintenance and updating of containerized applications and the Kubernetes clusters in which they run.

Security

Containerized applications demand full-stack security. Threats and security risks exist throughout a cloud native stack, and containers, like any other computer technology, are subject to a variety of attack vectors. Orchestration systems without adequate protection add an additional layer of risk—risk that is embedded in complex, rapidly evolving technology.

Without being able to integrate containers with your existing security systems and your data center, trying to fulfill the security requirements of containerized
Applications and orchestration systems would lead you to build custom security components or integrations at great risk and expense.

VMware Enterprise PKS helps secure containers throughout the stack by providing a unified policy layer for VMs and Kubernetes pods. VMware Enterprise PKS scans container images for vulnerabilities and signs known images as trusted. VMware Enterprise PKS connects to your established authentication and access control systems like Active Directory and LDAP. VMware Enterprise PKS integrates with monitoring and logging tools like Wavefront® by VMware®. And by working with NSX, VMware Enterprise PKS lets you apply micro-segmentation to secure containerized applications.

Avoiding IT Silos

Multiple infrastructure silos result in the duplication of teams, tooling, and processes. Rather than driving focused innovation on a single platform, teams can end up reinventing the wheel.

Building a cloud native stack from scratch is likely to create another IT silo—a silo with the dual distinction of being expensive and complex. Another silo would detract from the mission of IT, which is under pressure to increase agility, accelerate time to market for new apps and services, rapidly adopt new services, and manage costs—all without increasing complexity and risk. These are several of the key objectives propelling the adoption of cloud native technology. There is a certain irony here: If you implement a cloud native stack that creates additional silos, you can undermine the very benefits of cloud native technology.

VMware Enterprise PKS implements a cloud native stack on top of your existing VMware infrastructure. It does not create another IT silo. Instead, you can manage containerized applications in much the same way and with many of the same VMware tools, such as VMware vRealize® Suite, that you use to manage traditional applications.

It all continues to take place on a single platform, a single environment. Thus, with VMware Enterprise PKS, you get consistent infrastructure and consistent operations across the stack instead of another silo.
Leveraging Your Existing Investment in vSphere
Putting in place scalable, flexible infrastructure that fosters the development and deployment of cloud native applications can be complex, difficult, and costly. The fast track to cost-effectively adopt containers is to transform your existing virtualized infrastructure into a flexible, scalable, modernized data center capable of deploying cloud native applications as well as continuing to host traditional apps.

VMware Enterprise PKS does exactly that: It turns your existing investment in vSphere and VMware vCenter® into the underlying infrastructure on which you can run containers and manage them with Kubernetes. And if you are using Active Directory or LDAP for authentication and access control, you can integrate VMware Enterprise PKS with those systems for cost-effective security.

VMware Enterprise PKS implements an architecture that fosters fluid, rapid, responsive development and deployment while still maintaining the security, performance, and cost-effectiveness of established systems.

Multicloud Portability
Containers and Kubernetes are technologies primed for portability. The packaging of containers decouples applications from machines to let developers decide where and how to deploy an app. And tools like Helm can produce a package of Kubernetes resources that are pre-configured, customized, reproducible, and manageable. The portability of containers combined with the power of Kubernetes gives you cloud independence.

VMware Enterprise PKS supports portability by exposing native Kubernetes, implementing a common operating model, maintaining constant compatibility with Google Kubernetes Engine, and being a certified Kubernetes distribution.
VMware Enterprise PKS exposes Kubernetes in its native form without adding layers of abstraction or proprietary extensions, which lets developers use the native Kubernetes CLI and API.

VMware Enterprise PKS can be deployed by using Pivotal Operations Manager, giving you a common operating model to implement VMware Enterprise PKS across multiple IaaS abstractions like vSphere and Google Cloud Platform. The operational capabilities of VMware Enterprise PKS give you the visibility, automation, and security to properly operate containerized applications not only on premises but also across multiple cloud environments.

VMware Enterprise PKS also maintains constant compatibility with Google Kubernetes Engine (GKE) to ensure that developers get the latest stable Kubernetes release, features, and tools.

VMware Enterprise PKS is certified by the Cloud Native Computing Foundation (CNCF) through its Kubernetes Software Conformance Certification program. This certification lets you run applications with the confidence that the Kubernetes deployment has passed CNCF test suites and is compliant with the community’s specification. As more organizations adopt Kubernetes, a certified Kubernetes product like VMware Enterprise PKS ensures portability and interoperability across public, private, and hybrid clouds.

**Manageability**

VMware Enterprise PKS combines with several other technologies to deliver a full cloud native stack that lets you manage container images, Kubernetes clusters, container networking, and the underlying infrastructure with ease.

Harbor is an open-source container registry that is included with VMware Enterprise PKS to manage container images. Harbor securely stores container images in a private registry on premises, scans the images for vulnerabilities, and signs them as trusted.

BOSH is integrated with VMware Enterprise PKS to simplify the management of Kubernetes. BOSH packages, versions, and deploys Kubernetes in a consistent, reproducible way to save time and manual work. When BOSH deploys a Kubernetes cluster, each core component of the Kubernetes control plane is instantiated as a virtual machine instance. BOSH monitors the health of the Kubernetes control plane and repairs faulty virtual machines without manual intervention. BOSH automates the process of patching, upgrading, decommissioning, and redeploying Kubernetes.

VMware NSX automates container networking in Kubernetes. You can quickly deploy virtual networks with micro-segmentation—networks that can be easily managed with operational tools and troubleshooting utilities like Traceflow.

When PKS uses vSphere to provide the underlying infrastructure for Kubernetes, you can manage the infrastructure by using proven VMware technologies like vCenter. Monitoring for system components, containers, and Kubernetes clusters is handled by vRealize Suite and Wavefront by VMware.
TOP REASONS TO DEPLOY CONTAINERS ON VMWARE
vSPHERE WITH VMWARE ENTERPRISE PKS

Integrated Storage Options for Data Persistence
VMware Enterprise PKS integrates with VMware vSAN to extend scalable, software-defined, persistent storage to containerized applications running on Kubernetes. By setting vSphere as the cloud provider for Kubernetes, you can create persistent volumes and specify storage classes. Tapping vSAN for persistent storage eliminates the need to find and connect to a storage solution for your stateful containerized application.

![Diagram showing VMWare Enterprise PKS stack](image)

Figure 3: VMware Enterprise PKS delivers a complete cloud native stack on VMware vSphere.

Conclusion
The simplicity, capabilities, life-cycle management, and automation of VMware Enterprise PKS gives you a secure full-stack solution that saves time, work, and money.

LEARN MORE ABOUT
VMWARE ENTERPRISE PKS
To learn how VMware helps customers run and manage cloud native applications, visit: cloud.vmware.com