

DEPLOY MODERN APPS WITH KUBERNETES AS A SERVICE

Cut Costs and Control Access
with VMware Cloud PKS

Digital transformation, the Internet of things, the growing popularity of public clouds, the proliferation of mobile devices, the rise of big data, and other seismic technological changes are pressuring businesses to develop and deploy custom applications faster than ever.

Container technology sets you on course to become a flexible, agile digital enterprise capable of accelerating the delivery of innovative, disruptive software. Containers package an application and its dependencies into a distributable image that can run almost anywhere, streamlining development and deployment. Kubernetes is a system that orchestrates containerized applications to manage and automate resource utilization, failure handling, availability, and scalability.

THE KUBERNETES ADVANTAGE

- Ease and expedite application deployment.
- Decouple apps from machines for portability and flexibility.
- Easily modify, extend, and redeploy applications without affecting other workloads.
- Elegantly handle system faults and machine failures through automation and high availability.
- Automate scalability for your containerized applications.

BENEFITS OF KUBERNETES AS A SERVICE

- Get instant, always-on access to Kubernetes.
- Avoid the overhead and complexity of implementing, securing, operating, and maintaining Kubernetes.
- Keep developers focused on building apps instead of wrangling infrastructure.
- Simplify and streamline the use of Kubernetes for orchestration, scheduling, high availability, and scalability.

Accelerate Software Development and Deployment

Kubernetes uses its architecture and capabilities to manage containerized applications in a distributed cluster. The results help fulfill the business promise of digital transformation:

- Kubernetes makes it easier and cheaper to run applications in public, private, or hybrid clouds.
- Kubernetes accelerates application development and deployment.
- Kubernetes increases agility, flexibility, and the ability to adapt to change.

The complexity of installing, securing, maintaining, and monitoring Kubernetes, however, requires deep knowledge of private clouds, new skill sets, operational know-how, and hard-won experience with rapidly evolving technology.

Exploit Kubernetes as a Service

Kubernetes as a service (KaaS) makes the transformational power of Kubernetes instantly available to developers. KaaS lets you exploit the power and benefits of orchestration without the overhead of deploying, securing, operating, and maintaining Kubernetes. By using a managed Kubernetes service, you get always-on Kubernetes access to schedule and orchestrate containerized applications without the burden of managing infrastructure.

VMWARE CLOUD PKS AT A GLANCE

VMware® Cloud PKS delivers Kubernetes as a managed service so you can deploy, orchestrate, and scale containerized applications without the burden of implementing, operating, and maintaining Kubernetes. VMware Cloud PKS runs natively on multiple AWS regions with support for Azure in the future.

VMware Cloud PKS includes two vital components that make it uniquely suited to securely and cost-effectively run enterprise applications in the cloud:

- Global security policies for granular access control
- Cost-conscious clusters with pre-deployment automated sizing and post-deployment responsive sizing

VMware Cloud PKS also includes the following key features:

- Easy and simple to use
- High availability
- Turnkey access to cloud services and application building blocks, such as AWS Greengrass and AWS IoT
- One-click upgrades with no downtime

Control Access and Costs with VMware Cloud PKS

VMware Cloud PKS puts Kubernetes at your fingertips. A multi-cloud ready service with identity and usage-based billing that is integrated with [VMware Cloud™ Services](#), VMware Cloud PKS makes it simple and easy to deploy Kubernetes clusters with two distinctive advantages:

- VMware Smart Cluster™ automatically optimizes their size during creation and then, after deployment, dynamically resizes them to adjust to changes in demand
- Security policies control access at a granular level

The constant optimization of cluster size minimizes costs while maximizing performance. The policy framework, meanwhile, can limit access at the level of a cluster or namespace for granular security. VMware Cloud PKS also provides a monitoring framework that is compatible with Wavefront® by VMware® for real-time visibility into the operations and performance of containerized applications and Kubernetes clusters.

VMware Cloud PKS Architecture

The highly available architecture of VMware Cloud PKS includes a multitenant environment that aligns projects with your enterprise’s organizational structure. Clusters exist in regions, and a region can be used by one or more organizations. Amazon Web Services provides the underlying, transparent infrastructure on which the Kubernetes clusters run, which enables you to integrate with AWS cloud services and other application building blocks. The following diagram depicts how a global access policy framework encompasses the entire service.

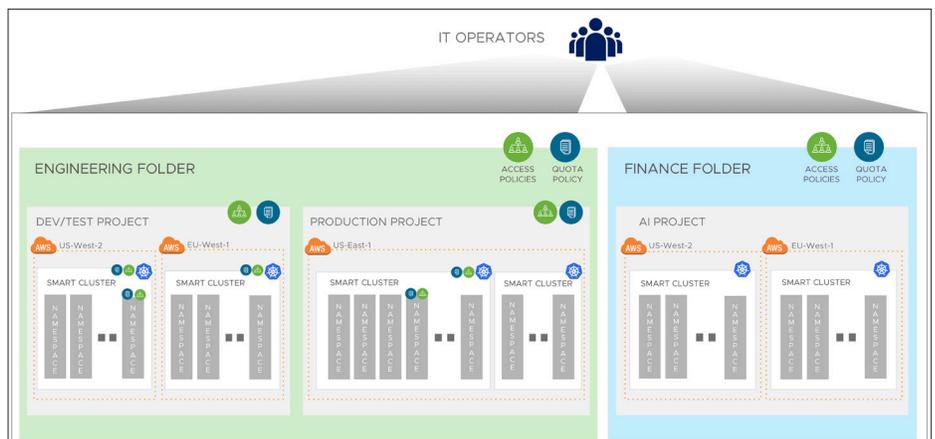


Figure 1: The architecture of VMware Cloud PKS includes global policy and monitoring frameworks that administrators can apply to organizational units, projects, clusters, and other resources.

With VMware Cloud PKS, you can quickly launch multiple Kubernetes clusters by using the Kubernetes API, the Kubernetes command-line utility, or the VMware Cloud PKS graphical user interface. VMware Cloud PKS automates the selection of instance types and cluster size.

After a cluster is started, you can manage it and the applications running in it by using the Kubernetes Dashboard. Clusters are also highly available, fault tolerant, and self-healing. Failed nodes are automatically recovered.

VMware Smart Cluster

VMware Cloud PKS automatically optimizes the size of your Kubernetes clusters during and after deployment. The clusters are not only elastic, but dynamically so: As demand fluctuates, a cluster continually resizes itself to optimize performance and to minimize cost.

Solve Hard Problems in Cluster Creation with VMware Smart Cluster

When creating a cluster for a containerized application, you face a hard problem: What size and topology should the cluster be? There are tough questions to be answered, often before you know all the answers:

- How many master nodes should you have?
- How many workers should you have?
- When should you increase or decrease the number?
- What kinds of virtual machines (VMs) should you use?
- Which combination provides the best performance-to-cost ratio?

Because AWS serves as its underlying infrastructure, VMware Cloud PKS can automate and optimize the selection of the components that will make up a cluster. You are liberated from having to specify the instance types of VMs; VMware Cloud PKS automatically selects the best fit.

Dynamically Update Cluster Sizes

After you create a cluster, VMware Cloud PKS automatically expands or shrinks the cluster to meet changes in demand, thereby controlling costs. The maximum size of the cluster, however, continues to be enforced for predictable cost control in the face of rising demand. VMware Cloud PKS excels at keeping costs low for highly elastic applications.

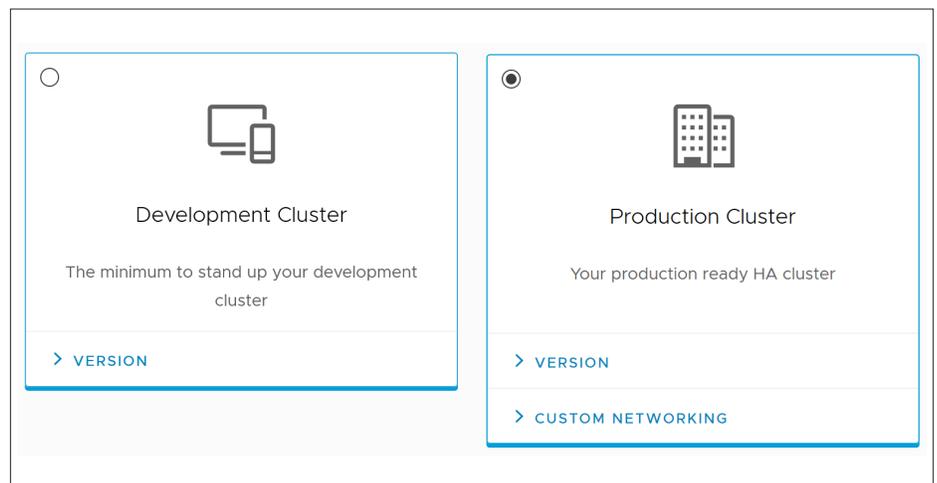


Figure 2: VMware Cloud PKS automates the selection of the size and components of clusters.

BENEFITS OF VMWARE CLOUD PKS

- Control costs with elastic clusters that dynamically adjust to changes in demand.
- Optimize performance for containerized applications with VMware Smart Cluster.
- Run containers on AWS without managing servers or clusters.
- Get seamless integration with AWS compute, storage, analytics, and services.
- Establish a multitenant hierarchy that can match your organization’s structure.
- Manage globally distributed Kubernetes clusters from a single service endpoint on consistent infrastructure.
- Maintain compatibility with the main open source Kubernetes release as well as Kubernetes platforms from VMware.
- Apply security policies to control access at a granular level.

Maintain High Availability with Ease

VMware Cloud PKS delivers a highly available Kubernetes service that continuously validates the health of your Kubernetes clusters and automatically remediates issues. In a Kubernetes cluster, the master and etcd nodes are configured in a three-node quorum across separate AWS availability zones with no cross-region points of failure. With a region-agnostic user interface, VMware Cloud PKS is available across most primary AWS regions so you can choose the regions in which your clusters run. Health checks monitor Kubernetes clusters and their underlying infrastructure.

Solve Access Control Problems with Global Policies

VMware Cloud PKS includes smart policies that you can apply to clusters and other managed resources, such as projects and folders. For access control, the smart policies are sets of roles that are bound to users and groups and inherited in the context of multitenancy. VMware Cloud PKS pushes the policies to Kubernetes, which applies them by using the Kubernetes model of role-based access control (RBAC).

The roles grant permissions to perform such tasks as administer, edit, or view a cluster or namespace.

Gain Access to Cloud Services

VMware Cloud PKS gives you turnkey access to public cloud services and application building blocks like Amazon Machine Learning, AWS Lambda, AWS Greengrass, and AWS IoT, as well as services that are part of VMware Cloud, such as Wavefront by VMware. As you use VMware Cloud PKS to build and deploy cloud-native applications and 12-factor apps in the VMware Cloud, you can tap into these services to, for example, analyze data from the Internet of things and create machine learning applications.

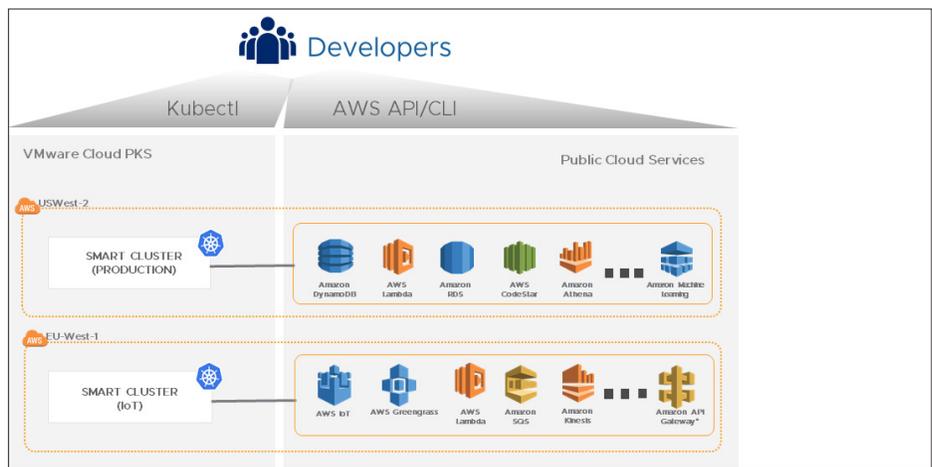


Figure 3: VMware Cloud PKS gives you turnkey access to public cloud services and application building blocks like Amazon Machine Learning, AWS Lambda, AWS Greengrass, and AWS IoT.

LEARN MORE ABOUT VMWARE CLOUD-NATIVE SOLUTIONS

- To learn how VMware helps customers build, run, and manage cloud-native applications, visit: <https://cloud.vmware.com/cloud-native-apps>.
- To find out more about VMware Cloud and VMware Cloud PKS, visit: <https://cloud.vmware.com>.

Monitor Containers with Wavefront

VMware Cloud PKS can be integrated with Wavefront by VMware to efficiently monitor containers at scale. Its dashboards give developers and DevOps near real-time visibility into the operations and performance of containerized workloads and Kubernetes clusters.

Conclusion

With VMware Cloud PKS, Kubernetes is at your service. Part of VMware Cloud Services, VMware Cloud PKS is compatible with other cloud services, such as Wavefront by VMware, to help you build, run, manage, and secure your enterprise applications.

Two key features of VMware Cloud PKS combine with high availability, ease of use, and access to other cloud services to create an enterprise KaaS solution:

- VMware Smart Cluster eases deployment and controls costs by automatically selecting the optimal size during creation and dynamically resizing after deployment to meet changes in demand.
- Security policies control access to clusters, projects, and folders by binding, with inheritance, to users and groups in the context of your multitenant organizational structure. VMware Cloud PKS pushes the policies to Kubernetes, which applies them by using the Kubernetes model of RBAC.

The result is multi-cloud ready, cost-effective, and consistent operations on secure, consistent infrastructure.

