

## REPORT REPRINT

# Pivotal, VMware and Google come together on containers

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12 SEPTEMBER 2017

The three companies have partnered for Pivotal Container Service, but how much will it appeal to an enterprise audience demanding support for hybrid infrastructure that includes other clouds?

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Pivotal, VMware and Google have teamed to provide Pivotal Container Service (PKS, with a 'K' to denote Kubernetes), a commercial offering of Kubo, Pivotal's integration of Kubernetes container management and orchestration with the more established Cloud Foundry BOSH automation software. PKS is intended to run on-premises or private cloud with VMware as well as Google's public cloud. The software will be generally available later this year and is integrated with VMware infrastructure including NSX networking as well as Google Cloud Platform Service Broker for data and analytics capabilities.

All three companies gain some strategic benefit from the partnership and offering. However, it is primarily a response to enterprise customers demanding support for containerized applications and container management and orchestration software, primarily Kubernetes; integration of public cloud (Google) and on-premises environments (VMware) for hybrid cloud use cases that effectively match workloads and infrastructures; and distributed applications that are portable across hybrid infrastructure.

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## THE 451 TAKE

All three vendors get closer to supporting a combination of on-premises and cloud containers as a service (CaaS), which, according to a recent survey of 201 enterprise IT decision-makers at container-using organizations, is what most companies want now. However, the collaboration and PKS service is limited, at least for now, to Google's public cloud and much of the traction in today's enterprise cloud market involves Amazon Web Services and Microsoft Azure, so the appeal may likewise be limited among enterprise customers demanding support for hybrid infrastructure that includes these other key clouds.

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## CONTEXT

Pivotal has always viewed and talked about containers as a big part of developer productivity, but also as abstracted components that are an implementation detail in production. Two years ago, this may have kept Pivotal out of many enterprise container discussions and considerations, but today, it is increasingly what the market demands, given the complexity, training and other challenges around container technology such as Docker and Kubernetes, as well as the desire to focus on applications rather than infrastructure. With PKS, Pivotal also gains more level footing with chief rival Red Hat in supporting Kubernetes, a distributed application orchestrator increasingly in demand and often deemed future-proof by enterprises.

With its container strategy, VMware deserves credit for an increased contribution to and participation in open source software. Through the addition of several key individuals and projects – such as Admiral container management, Harbor container registry, Lightwave identity and access management, and Photon container-based cloud infrastructure – VMware is demonstrating how far it has come in terms of open source software. This also helps to solidify its position as a leading vendor in containers, even though it is typically viewed as the incumbent opponent of containers. Through PKS, VMware better supports on-premises implementations of its software in enterprise use cases that also involve Cloud Foundry, Kubernetes and Google's public cloud.

While not as extensive as rival Amazon's public-private-on premises partnership with VMware, Google gains deeper support for hybrid infrastructure that involves public and private cloud infrastructure as well as on-premises deployment – all of which are critical in today's hybrid deployments according to our research.

## PRODUCTS

The vendors behind PKS indicate containers have continued traction in the market, with enterprises focused on not only net-new, cloud-native applications, but also modernization of applications by repackaging them in containers. Enterprise customers are also very interested in flexibility, not only in frameworks and tools, but also in the on-premises, public and private cloud infrastructures and combinations they can use. PKS targets the challenges associated with using software such as Kubernetes across different infrastructure, including lack of production-readiness for security, compliance or other reasons; lack of skills and talent; and lack of operational tools that tie it all together.

PKS is an effort to provide a container service that, through abstraction, automation and integration with the Cloud Foundry BOSH software, makes Kubernetes operational. The vendors backing PKS say a number of customers have tried to roll their own software stack using Kubernetes, but are left unable to effectively troubleshoot the deployment and operate it at scale. Optional VMware integration in PKS means the service runs on vSphere and VMware Cloud Foundation and features deep integration with NSX network virtualization. Its backers also highlight the enterprise-readiness of PKS that includes security, multi-tenancy, high availability (HA) and operational tools, as well as the ability to centrally manage both VMs and containers. Google's participation means data and analytics capabilities are also baked in with Google Cloud Platform Service Broker. PKS is also centered on abstracting and simplifying use of Kubernetes with easier installation, automated cluster deployment, fault tolerance, monitoring, logging and analytics.

PKS, which currently has 5-10 pilot customers, is intended for both enterprises and service providers interested in CaaS. The new service will be made available in Q4 with pricing to be announced at that time. PKS will be available from Pivotal, VMware and Dell EMC, which also have a joint go-to market strategy on the software, including global services.

## STRATEGY

Pivotal and Google launched Project Kubo earlier this year as an integration of Kubernetes container management and orchestration software with the Cloud Foundry BOSH automation software to provide a uniform way to instantiate, deploy and manage Kubernetes clusters with HA. Kubo allows users to deploy Kubernetes clusters using BOSH, an open source toolchain for deployment, release engineering, monitoring and lifecycle management of distributed systems. Other Kubo capabilities include self-healing VMs, elastic scaling for clusters, rolling upgrades of Kubernetes, HA and multi-zone support. BOSH is primarily used today to build out the Cloud Foundry Elastic Runtime.

For its part, VMware has taken a two-pronged approach to supporting containers for its customers. For those already running applications on vSphere, it is generally an easier path to use vSphere Integrated Containers (VIC). For customers more aggressively pursuing a cloud-native strategy, VMware is positioning PKS with Kubernetes as the orchestration engine. VIC represents VMs running as containers, so developers get containers while enterprise IT operations teams get trusted monitoring, logging, networking and other tools they need to run in production. With container-based compute, networking and storage components along with a controller component, PKS represents a more dramatic move to containers with features and capabilities such as pod-level networking, persistent data volume support, multi-master HA support and private registry with RBAC/LDAP services. A critical part of VMware's container strategy is based on open source software components that are incorporated into VIC and PKS. This includes Admiral container management, Harbor container registry, Lightwave identity and access management and the Photon OS.

Google gets a better hybrid infrastructure story out of PKS, which is supported both on-premises and in Google's cloud. The effort also further solidifies Kubernetes, which originated and is still primarily supported by Google, as the leading container management and orchestration software in the industry.

## COMPETITION

Pivotal Container Service is certainly not among the first Kubernetes-based container services in the market. A number of established and newer players have already made their bets on Kubernetes, such as Huawei, IBM, Microsoft and Red Hat, as well as Apcera, Apprenda, CoreOS, Containership and Heptio. PKS, which is unique in its support for vanilla Kubernetes, is a way for Pivotal to catch up to chief rival Red Hat, which has been aggressively integrating and supporting Kubernetes with its OpenShift PaaS since 2015. As another top CaaS option for enterprises, the container services from Amazon and Microsoft Azure also represent PKS competition.

Competition for PKS also includes Docker, which is clearly in the crosshairs of the effort given the PKS focus on container applications, container management and orchestration and the modernization of applications using containers. Docker shares these priorities and while its open source Docker container software is a part of most Kubernetes deployments, it still faces monetization and competitive challenges in container management and orchestration and CaaS. Other CaaS vendors are also competitors for PKS, including Cloud 66, DigitalOcean, Samsung's Joyent and Shippable.

Other container management and orchestration software and providers also represent competition for PKS. This includes Docker with Swarm, HashiCorp with Nomad, Mesosphere with its DCOS and Rancher Labs.

## SWOT ANALYSIS

### STRENGTHS

PKS represents the software and collaboration of Pivotal, VMware and Google – all of which play prominent roles in today's enterprise environments that include VMs and containers deployed in on-premises and cloud infrastructure.

### WEAKNESSES

While supportive of on-premises and cloud hybrid infrastructure deployments, PKS is supported for now only on Google's public cloud, so its enterprise appeal may be limited without similar support for Amazon Web Services or Microsoft Azure.

### OPPORTUNITIES

The idea of abstracting Docker and Kubernetes has become more appealing as enterprises have begun confronting complexity, training and other challenges of this emergent container software.

### THREATS

The more established CaaS providers and the other major public cloud vendors represent competition for PKS. Although it may be fading, there is also a perception that use of containers means moving away from VMware with some resistance among enterprise architects and practitioners.