Container Services

Container Services in VMware Cloud Director

VMware Cloud Director 10.2 supports Kubernetes as a first class entity, with or without the Container Service Extension (CSE). Providers can deploy vSphere 7 Tanzu Basic and Cloud Director 10.2 and deliver Kubernetes services*, or providers can utilize CSE to deliver ecosystem Kubernetes services, such as native Kubernetes. Integrated container capabilities help cloud providers address the changing application landscape, where 95% of new apps in 2020 are using containers and their growing customer base (30% CAGR) wants digital and application transformation.[1] Cloud native is the platform you need.

Tenants are able to spin up one or more standards-compliant Kubernetes 'k8s' cluster and easily scale them in and out, and upgrade them in-place. K8s clusters created by a DevOps user are made multi-tenant-safe by only consuming resources from the org virtual data center (VDC) they are deployed into.

What opportunities does it open for cloud partners?

VCD / CDs with or without CSE helps partners build a developer-ready cloud to expand their business by:

- Delivering enterprise grade, standards-based, Kubernetes Cluster services for developers

- Targeting a growing base of developers and DevOps engineers, where 58% are now the primary decision makers for selecting cloud endpoints[2]

- Complementing existing VM-based cloud services allowing co-existence (79% of businesses building cloud native apps want to move workloads between environments without refactoring[3]

Most tenants are looking for solutions that are 'developer-ready cloud' to simplify the complexity of a cloud-native strategy—i.e., suitable for their development teams to easily use while focusing on app development and not infrastructure. CSE helps partners offer this while also delivering a simple tenant consumption interface, standards-compliant Kubernetes, and a tiered service with choice of runtimes:

- Enterprise-grade VMware Tanzu Basic for vSphere*

- Upstream compatible CSE managed clusters

- Integrated container service TKGI (aka VMware PKS) managed clusters

Kubernetes is only one piece of the service stack. Cloud Providers can offer complementary services from curated catalogs, third-party vendors, or the VMware Cloud marketplace of services using App Launchpad 2.0, therefore offering a complete developer-ready cloud portfolio.

What functionality is provided?

VCD 10.2 with or without CSE delivers a number of key capabilities:

- Multi-tenant Kubernetes cluster services

- Choice of runtimes and provider defined k8s policies

- Application HA with multi-master k8s control plane and vSphere HA

- Automated NSX-T based ingress LB

- Persistent container storage leveraging extensive vSphere storage ecosystem

- Standard kubectl interface to clusters

Using VMware Cloud Director 10.2, cloud admins carve up vSphere Kubernetes capacity that is created from a host cluster, into a k8s policy for tenants to create k8s clusters in. A k8s policy encapsulates placement, sizing, infrastructure quality (big versus fast disk, for example), and available persistent volume storage classes which enable persistent volumes. Compute (memory and CPU and including count of k8s node vCPU) and storage limits may be applied to each k8s policy.

One or more k8s policies may be published (assigned) to one or more Org VCD. A k8s policy may be changed by the provider or tenant to increase or decrease resource allocation.

Tenants can create clusters of different node sizes as published to their orgVDC by the cloud provider. Kubernetes resource consumption is contained to the orgVDC's allocated compute and storage resources and isolated at the L3 network level with NSX-T. Tenant-created k8s clusters are isolated from each other administratively as well; only k8s clusters owned or shared are accessible to a VCD / CDs user, others are not.

What else is required?

To offer a modern Kubernetes container service, cloud providers need to deploy VMware Cloud Director 10.2 (or subscribe to Cloud Director service), upgrade to vSphere 7 or greater (not relevant in VMware Cloud on AWS), install VMware Tanzu Basic (vSphere add-on for Kubernetes*), or utilize the CSE plugin, and install NSX-T 3.0 or greater.

Tenants will also need visibility on performance, capacity and pricing. It is recommended that Cloud Providers use the latest vRealize Operations Tenant App (2.0 or later) to apply pricing policies and view usage of CSE created k8s clusters.

1. Cloud Transformation and Managed Services: 2020 Preview, 451 Research, February 2020
2. Evans Data Cloud Development Survey 2017
3. RightScale 2019 State of the Cloud Report from Flexera

* VMware Cloud on AWS SDDC support is required to use vSphere Tanzu Basic - check support in region

A Natural Partnership