



vSphere Kubernetes Service: Design, Deploy and Operate

VXO 41

Course Overview

This five-day course provides you with the knowledge, skills, and abilities to design, configure, and operationally manage VMware vSphere® Kubernetes Service (VKS) within VMware Cloud Foundation® (VCF) environments. The course begins with a foundational review of Kubernetes concepts, including container architecture, networking, CNI plug-ins, Helm, and Istio Service Mesh. You will then develop a comprehensive understanding of vSphere Supervisor architecture, authorization, and enablement options including deployments with NSX VPC, VDS, Foundation Load Balancer, and Avi Load Balancer integrations. The course covers vSphere Namespace and Zone configuration, VM Service deployment models, vSphere Pods, and extensible services available on the Supervisor.

Course Objectives

By the end of the course, you should be able to meet the following objectives:

- Describe core Kubernetes concepts including architecture, networking, storage, CNI plug-ins, and Istio Service Mesh.
- Describe vSphere Supervisor architecture, authorization model, and its role in delivering VKS, VM Service, vSphere Pods, and extensible services within a VCF environment.
- Identify the supported Supervisor networking topologies, load-balancing options, and zone deployment models, and enable Supervisor using the appropriate configuration for your environment.
- Configure and manage vSphere Namespaces and Zones, and deploy virtual machines using VM Service and containerized workloads using vSphere Pods.
- Deploy and manage VKS clusters, including multi-zone topologies, CNI selection, networking and storage configurations, and core and standard package management.
- Secure VKS clusters using Pod Security Admission and VMware vDefend micro-segmentation.
- Monitor and manage the lifecycle of vSphere Supervisor and VKS clusters using VCF Operations, VCF Automation, and VKS Cluster Management for centralized visibility and policy enforcement.
- Configure multi-tenancy in VCF by setting up organizations, projects, and namespaces, and consume VCF cloud services through VCF Automation, VCF CLI, and Fleet Depot Service.

Target Audience

Solution Architects, Cloud Administrator, Platform Engineers, VI Administrator, System Administrators, Consultants and Support Engineers.

Prerequisites

This course has the following prerequisites:

- Working experience and knowledge of Kubernetes, VMware Cloud Foundation, VMware vSphere, VMware NSX, and vSAN
- Completion of vSphere Kubernetes Service: Configure and Consume [V9.1] course

Course Modules

1. Course Introduction

- Describe the course objectives, outline, and typographical conventions

2. Kubernetes Overview

- Describe the difference between containers and virtual machines
- Describe Docker workflow, including the build, ship, and run processes
- Identify the key components of a Kubernetes architecture
- Describe different Kubernetes objects and their purposes
- Explain Volumes and persistent storage mechanisms in Kubernetes
- Explain Kubernetes networking
- Describe Antrea, Calico, and Multus CNI plug-ins
- Describe Istio Service Mesh
- Explain Helm Package Manager

3. VCF Cloud Services Overview

- Explain the core concepts and components of vSphere Supervisor
- Explain the services available within vSphere Supervisor
- Identify how vSphere Supervisor supports VKS, VM Service, and extensible services

4. vSphere Supervisor Deployment Models

- Identify the vSphere Supervisor networking and load-balancing options
- Describe vSphere Supervisor deployment model with NSX VPC networking
- Outline vSphere Supervisor deployment model with VDS and Foundation Load Balancer
- Outline vSphere Supervisor deployment model with NSX and Avi Load Balancer
- Outline vSphere Supervisor deployment model with VDS and Avi Load Balancer

5. VCF Cloud Services Enablement Options

- Describe the workflow for deploying a vSphere Supervisor with NSX VPC and NSX Load Balancer
- Explain how to connect to the vSphere Supervisor using the VCF CLI
- Describe the integration of Avi Load Balancer with VCF
- Explain the workflow for deploying a vSphere Supervisor with VDS and the Foundation Load Balancer

6. Configuring and Managing vSphere Namespaces and Zones

- Explain the steps to create a vSphere Namespace on the vSphere Supervisor
- Explain the steps to set Resource and Object Limits to a vSphere Namespace
- Outline the procedure to add a vSphere cluster as a vSphere Zone to a Supervisor

- Describe the required steps to associate a vSphere Zone with a vSphere Namespace
- Explain the concept of Namespace Mapping within a multi-cluster vSphere Zone architecture

7. VM Service and vSphere Pods in vSphere Supervisor

- Differentiate between traditional VMs and API-driven declarative VMs
- Explain the architecture and features of VM Service
- Describe VM Service fast deploy and the available modes
- Explain the VM creation workflow with VM Service
- Outline the steps to create a vSphere Namespace and configure resource limits

8. Services in vSphere Supervisor

- Explain the architecture of VKS and its key features
- Explain the VKS Cluster topology with vSphere Zones
- Identify networking and load-balancing options for VKS clusters
- Explain storage policy configurations for VKS clusters
- Outline the VKS Core and Standard packages
- Describe the integrated backup and restore solution
- Identify the extensible services you can run on top of vSphere Supervisor

9. Architecting VKS for Scale and Security

- Explain VKS cluster sizing considerations, performance and scalability limits
- Explain Kubernetes pod scheduling, priority, and preemption
- Explain the VKS Cluster Autoscaler and node scaling operations
- Explain the Horizontal Pod Autoscaler (HPA) and workload scaling
- Explain Pod Security Admission (PSA) in VKS
- Explain distributed firewall policies and east-west traffic protection with VMware vDefend

10. Monitoring and Lifecycle Management of vSphere Supervisor

- Describe how vSphere Supervisor monitoring works
- Explain monitoring of vSphere Supervisor from VCF Operations
- Explain the vSphere Supervisor update options
- Outline the steps to configure a Subscribed Content Library for Supervisor Images
- Outline the steps for updating the vSphere Supervisor
- Explain the process of registering a Supervisor Service to vCenter Server
- Explain the process of installing a Supervisor Service to vCenter Server
- Explain the process of upgrading a Supervisor Service to vCenter Server
- Explain the process of deactivating a Supervisor Service to vCenter Server
- Outline the backup and restore methods for vSphere Supervisor

11. Multi-Tenancy in VCF

- Describe Multi-Tenancy in VCF
- Explain the VCF Private Cloud experience for each persona
- Explain the relationship between vSphere Supervisor instances, Regions, and Zones

- Describe the different types of Organizations in VCF Automation
- Outline the steps to create an Organization
- Explain the steps to create Content Libraries
- Describe how to set up Projects and Namespaces within an Organization
- Describe the integration of Avi Load Balancer with VCF Automation
- Explain the Provider Managed Service Engine Groups
- Explain the Organization Managed Service Engine Groups
- Describe container service in VCF Automation

12. Consuming VCF Cloud Services

- Explain the purpose and architecture of Fleet Depot Service for unified content distribution
- Describe how building an extensible ecosystem enables organizations to deploy cloud-native applications with integrated services
- Outline the steps for deploying Argo CD service on Supervisor for GitOps continuous delivery
- Outline the deployment and management of Virtual Machines using VCF Automation
- Describe the deployment and management of VKS Clusters through VCF Automation
- Describe management of Harbor image repositories via projects
- Explain the steps for deploying and consuming container-based applications using VCF Automation

13. Deploying Workloads on VKS Clusters using Helm

- Describe the application deployment workflow using Helm
- Explain how Docker images and Helm charts are managed in OCI registry on Harbor
- Outline the steps for deploying an application using Helm
- Outline the steps for upgrading an application using Helm
- Outline the steps for rolling back an application using Helm

14. VKS Cluster Customization

- Explain network provider options for configuring multiple networks on a VKS cluster
- Outline the steps for adding multiple networks on VKS cluster
- Outline the steps for creating multi-NIC pods in VKS cluster
- Outline the CNI selection options when creating a VKS cluster
- Explain VKS Cluster provisioning with VKS Networking Addons
- Describe the requirement of applying AppArmor and TuneD profiles on VKS cluster nodes

15. VKS Cluster Management and Monitoring

- Describe how VKS Cluster monitoring works
- Explain monitoring of VKS Cluster from VCF Operations and VCF Automation
- Explain how VKS cluster management enables platform engineers to manage VKS clusters at scale
- Describe how VKS cluster management delivers centralized visibility across the entire VKS cluster fleet
- Explain how consistent policies are enforced across clusters through VKS cluster management
- Explain how VKS clusters can be backed up using VKS cluster management
- Describe how VKS standard packages are deployed and managed through VKS cluster management

16. VKS Cluster Day-2 Operations

- Describe the process of enabling data protection in VKS cluster management
- Outline different backup methods available for VKS
- Describe the backup and restore workflow
- Describe the steps to manage standard packages using VKS Cluster Management
- Describe the steps to install cert-manager, Harbor, and Istio
- Explain the process of upgrading from Tanzu Kubernetes Cluster (TKC) to Cluster API
- Outline the upgrade paths supported by VKS
- Explain the process for upgrading the VKS version
- Outline the steps to update a VKS cluster using the VCF CLI

17. Troubleshooting VKS

- Describe the process of vSphere Supervisor activation
- Identify and troubleshoot ETCD issues
- List the ways to access vSphere Supervisor and identify the key vSphere Supervisor log files
- Identify the key Custom Resources created during VKS cluster deployment
- Explain the key Components and Operators involved in the VKS cluster deployment process
- Identify and troubleshoot the various phases of VKS cluster deployment
- Recognize common log patterns generated during VKS cluster deployment

Contact

If you have questions or need help registering for this course, click [here](#).