



Instructor Led Training Course Catalog

Software-Defined Edge

July 2024

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VeloCloud

VMware VeloCloud SASE, secured by Symantec, with VMware VeloCloud SD-WAN as a fundamental building block, brings cloud-delivered networking, security, AIOps, and compute to support ubiquitous access for branch and remote workers as well as digital transformation at the edge.

VMware VeloCloud SD-WAN enables enterprises to securely support application growth, network agility, and simplified branch implementations while delivering high-performance, reliable branch access to cloud services, private data centers, SaaS-based and edge-native enterprise applications. Cloud-native by design, VMware VeloCloud SD-WAN and other SASE services are delivered via a global network of VMware Edge PoPs™, either self-managed or as a managed service.

Learn how to design, deploy, and manage VeloCloud SD-WAN, by attending one of the classes offered by Broadcom Education.

SD-WAN Deploy and Manage V4.x

Course Code: SDE000001

Course Description

This two-day, hands-on training course provides you with the knowledge, skills, and tools to achieve competency in deploying and managing the VMware SD-WAN by VeloCloud® environment. In this course, you are introduced to workflows of various software-defined WAN constructs along with several operational tools that help you deploy and manage VMware SD-WAN by VeloCloud.

Delivery Method

Instructor-Led

Duration

Two Days

Course Objectives

- Discuss the SD-WAN architecture and platform deployment model options
- Identify and describe the SD-WAN solution components
- Explain the interaction between the SD-WAN Edge, Orchestrator, and Gateway components
- Describe the SD-WAN Software-Defined Networking (SDN) approach, traffic, and network flows
- Explore SD-WAN core features and evaluate how these dramatically improve operational automation
- Use SD-WAN features to perform simple, agile, and secure SD-WAN operations
- Simplify branch infrastructure by inserting network services on the branch edge, in the cloud, or in the regional and enterprise data centers

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

- Extensive knowledge of routing and switching
- Good understanding of TCP/IP services and protocols
- Knowledge and working experience of computer networking, including: Switching and routing technologies (L2-L3), and Network and application delivery services (L4-L7)
- Basic understanding of IaaS, SaaS, and public and private cloud
- The VMware Certified Professional – Network Virtualization (2020) certification is recommended.

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives

Module 2: Introduction to VMware SD-WAN Solution

- Revisit the traditional WAN technology, WAN topologies and downsides
- Explain the challenges solved by Secure Access Service Edge (SASE) and use cases
- List the components of the VMware SASE™ solution
- Describe the VMware SD-WAN solution and list its capabilities logistics

Module 3: VMware SD-WAN Components and Architecture

- Understand the architecture of the VMware SDWAN solution and list all its components
- Explain the function of VMware SD-WAN Edges, Hub, Gateways, controllers, and Orchestrator
- Explain how the components of the VMware SDWAN solution interact with each other

Module 4: Using VMware SD-WAN Orchestrator

- Describe key attributes of the VMware SD-WAN Orchestrator
- List primary features of the VMware SD-WAN Orchestrator
- Navigate the main menus of the VMware SD-WAN Orchestrator portal

Module 5: Deploy and Configure VMware SD-WAN

- Understand the deployment process of VMware SD-WAN components like VMware SD-WAN Edges, Hubs, Gateways, and more
- Understand the workflow of the VMware SD-WAN configuration
- List the optional network services that are supported by VMware and the steps to configure the same
- Understand the profiles and their application in the VMware SD-WAN infrastructure
- Describe the VMware SD-WAN Edge activation process

Module 6: Path and Traffic Management

- List the routing options supported by VMware SDWAN: Static, BGP, OSPF
- Understand the Dynamic Multipath Optimization (DMPO) feature and its advantages
- Explain the Quality of Service and its configuration to manage traffic

Module 7: Securing VMware SD-WAN Environment

- Explain various options available to secure VMware SD-WAN environments
- Understand the firewall capabilities and configuration

Module 8: Monitoring, Maintenance, and Troubleshooting

- List and understand the various features available to monitor the VMware SD-WAN infrastructure
- List and understand the various options available to troubleshoot and investigate issues in VMware SDWAN

SD-WAN Design and Deploy V3.x

Course Code: SDE000002

Course Description

Customers demand a scalable, secure, and manageable VMware SD-WAN™ by VeloCloud®. To deliver a successful solution you must understand VMware SD-WAN architecture, know how the features can solve customer use cases, and be able to design a VMware SD-WAN that can be easily deployed, managed, and expanded.

Delivery Method

Instructor-Led

Duration

Three Days

Course Objectives

- Explain VMware SD-WAN architecture
- Outline VMware SD-WAN key components
- Discuss various Managed Service Provider (MSP) use cases and deployment options
- Deploy VMware SD-WAN Gateway, and VMware SD-WAN Edge
- Manage VMware SD-WAN Cloud VPN
- Design VMware SD-WAN for performance and scalability
- Configure the Partner Gateway handoff

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

- Deep understanding of routing and switching technologies
- Deep understanding of security solutions, including VPN technologies
- Completion of the VMware SD-WAN VTSP Accreditation
- Completion of the VMware SD-WAN by VeloCloud: Deploy and Manage course

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives

Module 2: Architecture and Core Features

- Evaluate the current state of the enterprise WAN and limitations for growth
- Describe the key components and features of the VMware SD-WAN architecture
- Explain VMware SD-WAN component placement and interactions between components
- List VMware SD-WAN core value differentiators
- Describe VMware SD-WAN core features
- Evaluate the effect of VMware SD-WAN differentiators on a SD-WAN site deployment

Module 3: VMware SD-WAN MSP use Cases, Deployment Models, and License Models

- Compare VMware SD-WAN use cases
- List VMware SD-WAN deployment models
- Describe each VMware SD-WAN license model

Module 4: Zero Touch Provisioning

- Provision VMware SD-WAN Edges
- Describe the workflow of a VMware SD-WAN Edge activation.
- Provision a VMware SD-WAN Virtual Edge on VMware ESXi™

Module 5: VMware SD-WAN Cloud VPN

- Configure the VMware SD-WAN Cloud VPN
- Consider the availability settings when deploying a Cloud VPN
- Describe the packet flow in a Cloud VPN

Module 6: Routing and Branch Design

- Control SD-WAN overlay and underlay route advertisement
- Overlay flow control
- Describe best practices when designing VMware SD-WAN with BGP
- Evaluate branch design options

Module 7: VMware SD-WAN Security

- Explain VMware SD-WAN security architecture
- Describe VMware SD-WAN Edge security capabilities

Module 8: High Availability Designs

- Distinguish between Standard and Enhanced High Availability (HA) and Virtual Router Redundancy Protocol (VRRP)

Module 9: Designing for Performance and Scale

- List the SD-WAN factors that influence scalability and performance
- Describe VMware SD-WAN Edge Clustering

Module 10: Standing up a Partner Gateway

- Describe VMware SD-WAN Gateway functionality and roles
- Provision a VMware SD-WAN Gateway from VMware SD-WAN Orchestrator
- Demonstrate the procedure to install a VMware SD-WAN Gateway on ESXi
- Describe how BGP works together with a Partner Gateway hand-off

Module 11: MSP Operations and Version Management

- Identify the appropriate documentation
- Demonstrate account management
- Describe the VMware SD-WAN upgrade sequence
- Demonstrate a VMware SD-WAN Edge and VMware SD-WAN Gateway upgrade

SD-WAN for Service Providers V4.x

Course Code: SDE000003

Course Description

This three-day, hands-on training course provides you with the advanced knowledge, skills, and tools to achieve competency in operating and troubleshooting the VMware SD-WAN™ environment for service providers.

In this course, you focus on deploying and managing VMware SD-WAN for a service provider, including troubleshooting common issues.

Delivery Method

Instructor-Led

Duration

Three Days

Course Objectives

- Describe how VMware SASE™ solves security challenges for distributed enterprises
- Identify where VMware SD-WAN fits in the VMware SASE framework
- Describe the process for validating the installation of VMware SD-WAN Orchestrator and Gateway in a service provider environment
- Describe the features for monitoring and maintaining a VMware SD-WAN installation
- Evaluate the security and certificate operations for managing a VMware SD-WAN installation
- Describe VMware SD-WAN Edge licensing and license types, and the features of VMware Edge Network Intelligence™
- Recognize VMware SD-WAN network monitoring tools for generating reports, events, and alerts
- Recognize the remote diagnostic actions available on VMware SD-WAN Orchestrator
- Troubleshoot VMware SD-WAN Orchestrator and Gateway common issues

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

- You should have completed the following course:
- VMware SD-WAN: Deploy and Manage
- Good understanding of SD-WAN architectures
- Experience of Linux servers, especially Ubuntu
- Knowledge of computer networking
- Experience with routing, switching technologies, and security solutions, including VPN technologies
- The VMware SD-WAN VTSP accreditation is recommended.

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives

Module 2: VMware SD-WAN Installation for Service Providers

- Describe security challenges for distributed enterprises
- Describe the VMware SASE solution for securing distributed enterprises
- Describe VMware deployment models for service providers
- Explain how VMware SD-WAN can help to transform MPLS networks to service-ready networks
- Identify resource requirements for installing VMware SD-WAN Orchestrator and Gateways
- Describe the procedure for installing VMware SD-WAN Orchestrator
- Describe the process for provisioning VMware SD-WAN Orchestrator
- Identify the external service dependencies for VMware SD-WAN Orchestrator
- Recognize disaster recovery options for SD-WAN Orchestrator
- Describe the disaster recovery workflow for VMware SD-WAN Orchestrator
- Identify the requirements and the procedures for installing VMware SD-WAN Gateway instances
- Describe the procedure for installing VMware SD-WAN Gateway instances on ESXi hosts
- identify Data Plane Development Kit support for gateway performance
- Describe the VMware SD-WAN Gateway deployment modes for service providers
- Configure and assign a VMware SD-WAN Gateway for a service provider

Module 3: VMware SD-WAN Monitoring and Maintenance

- Describe VMware SD-WAN Orchestrator system health-monitoring features, process-monitoring features, storage-monitoring features, and database-monitoring features
- Describe the VMware SD-WAN Orchestrator upgrade process
- Describe the VMware SD-WAN Orchestrator backup and data archival processes
- Describe the VMware SD-WAN Orchestrator process to expand database disks
- Describe the VMware SD-WAN Orchestrator system metrics for monitoring

Describe how systems metrics are collected for monitoring VMware SD-WAN Orchestrator

- Describe VMware SD-WAN Gateway additions and removals
- Describe the VMware SD-WAN Gateway upgrade and validation processes

Module 4: VMware SD-WAN Security and Edge Licensing

- Describe the VMware SD-WAN PKI security infrastructure
- Recognize VMware SD-WAN PKI authentication modes
- Describe VMware SD-WAN certificate operations
- Describe the VMware SD-WAN PKI certificate authentication configuration, and VMware SD-WAN PKI configuration process
- Compare operator and partner logins
- Describe the VMware SD-WAN self-signed certificate authority process
- Describe VMware SD-WAN certificate authority renewal and revocation
- Describe the VMware SD-WAN intermediate certificate authority

Telco Cloud

VMware by Broadcom is continuously enhancing its telco cloud offerings across all areas of the telco network – including core, edge and RAN – to help customers achieve their long-term strategic 5G vision and immediate 4G business goals. Telco Cloud Portfolio includes solutions from Infrastructure to Operations for Network Core, EDGE and RAN. Telco Cloud Operations, Telco Cloud Automation, Telco Cloud Infrastructure.

Broadcom Education courses will help support your Telco Cloud investment, ensuring your employees gain the necessary skills to Install configure and manage your deployment.

VMware Telco Cloud Platform: Install, Configure, Manage V2.0

Course Code: SDE000007

Course Description

This three-day, hands-on training course provides you with the advanced knowledge, skills, and tools to achieve competency in operating and troubleshooting the VMware Telco Cloud Platform™ environment. In this course, you are introduced to the VMware Telco Cloud Platform infrastructure, deployment options, and procedures. You also deploy Kubernetes clusters and understand the detailed configuration settings of management and workload clusters. You onboard and instantiate network functions and network services using hands-on lab exercises. In addition, you are presented with various types of technical problems in VMware Telco Cloud Platform, which you will identify, analyze, and solve through a systematic troubleshooting process.

Delivery Method

Instructor-Led

Duration

Three days

Course Objectives

Upon completion of this course, you will be able to:

- List VMware Telco Cloud Platform layered architecture and deployment procedures
- Describe the VMware Telco Cloud Platform virtual infrastructure requirements
- List the use cases of VMware vSphere® and VMware vCenter Server®
- Describe the VMware Telco Cloud Platform networking and storage requirements
- Describe the architecture of VMware Tanzu™ Standard for Telco
- Configure management and workload clusters for containers as a service functionality
- Instantiate network services and network functions
- Enumerate troubleshooting concepts and Day 2 operations for VMware Telco Cloud Platform

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

- Telco Cloud Automation Fundamentals course
- Telco Cloud Platform Fundamentals course
- Good understanding of VMware products like vSphere, VMware NSX®, VMware vSAN™, VMware Tanzu™ Kubernetes Grid™, and VMware vCloud Director®
- Knowledge of and working experience with network functions virtualization, including:
- ETSI NFV framework, virtualized network functions, and related Interfaces
- Kubernetes, Helm, cloud-native network functions, CSI, and CNI

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives

Module 2: VMware Telco Cloud Platform Overview

- Describe the architecture of VMware Telco Cloud Platform
- Describe the key functions of VMware Telco Cloud Platform
- List the benefits of VMware Telco Cloud Platform
- Describe the VMware Telco Cloud Automation architecture
- Describe the VMware Telco Cloud Automation control plane architecture
- List VMware Telco Cloud Automation deployment options
- Describe the vSphere architecture
- List the key VMware components that are part of vSphere
- Describe the key use cases for vSphere

Module 3: VMware Telco Cloud Platform Infrastructure

- Describe the key capabilities of vSphere and vCenter Server
- List the use cases of vSphere and vCenter Server
- Describe the requirements for infrastructure
- Describe the process of deploying VMs
- List the benefits of VM templates and libraries
- List the requirements of VMware Telco Cloud Platform on vSphere
- Describe the networking options of vSphere
- Describe the key networking use cases
- Describe requirements of VMware Telco Cloud Platform for networking
- Describe the storage options of vSphere
- Describe the key storage use cases
- Describe requirements of VMware Telco Cloud Platform for storage

Module 4: Tanzu Kubernetes Grid and Supporting Containers as a Service

- Describe the role of containers in VMware Telco Cloud Platform
- Describe the benefits and challenges of containers
- List the various container use cases
- Describe the Kubernetes architecture
- List the role of nodes and clusters
- Describe the supporting components of Kubernetes
- Describe Kubernetes compared to Tanzu Kubernetes Grid
- List the key features of Tanzu Kubernetes Grid
- Describe the architecture of Tanzu Kubernetes Grid
- List the steps to integrate a container-based virtual infrastructure
- Describe supporting technologies like Cluster API
- Describe key concepts like late binding

Module 5: Supporting Virtualized Network Functions

- Describe the types of network functions
- List the type of descriptors
- Describe the requirements of a VNF descriptor
- Describe the key vSphere operations for VNFs
- Describe the key VNF use cases
- List the role of vSphere in VNF instantiation
- Outline VM onboarding requirements
- Describe the VNF requirements for onboarding
- List the steps to onboard a VNF
- Describe VNF life cycle management
- Describe key life cycle management operations

Module 6: Supporting Cloud-native Network Functions

- Describe the special requirements of containers on network functions
- List the type of descriptors for containers
- Describe the requirements of a CNF descriptor
- Describe the role of Harbor
- Explain how to list the contents of a Harbor platform
- List the steps to interface with a Harbor platform
- Describe container onboarding requirements for Harbor
- Describe the CNF requirements for onboarding
- List the steps to onboard a CNF
- Describe CNF life cycle management
- Describe key life cycle management operations

Module 7: VMware Telco Cloud Platform Troubleshooting

- Identify the features of the VMware Telco Cloud Platform dashboards
- List the components of the VMware Telco Cloud Platform dashboards
- Explain the features of fault management in VMware Telco Cloud Platform
- Describe the use of fault management in VMware Telco Cloud Platform for network functions
- Describe the use of performance management in VMware Telco Cloud Platform for network functions
- Describe the use of logs in VMware Telco Cloud Platform
- Troubleshoot using VMware Telco Cloud Platform logs
- List the key CLI tools that can be used for Troubleshooting
- List the steps to identify common network function deployment problems
- Examine key troubleshooting scenarios

VMware Telco Cloud Automation Install Configure Manage V2.2

Course Code: SDE000008

Course Description

This five-day, hands-on training course provides you with the advanced knowledge, skills, and tools to achieve competency in operating and troubleshooting the VMware Telco Cloud Automation environment. In this course, you are introduced to VMware Telco Cloud Automation infrastructure settings, deployment options and procedures. You will explore containers as a service and understand the workflow details of partner integration processes. You will learn about infrastructure automation and its importance in VMware Telco Cloud Automation. You will onboard and instantiate network functions and network services using hands-on lab exercises.

In addition, this course teaches life cycle management workflows as well as several types of technical problems in VMware Telco Cloud Automation, which you will identify, analyze, and solve through a systematic process.

Delivery Method

Instructor-Led

Duration

Five Days

Course Objectives

Upon completion of this course, you will be able to:

- List VMware Telco Cloud Automation deployment options and procedures
- Define Infrastructure Automation and describe infrastructure deployment
- Describe the VMware Telco Cloud Automation infrastructure settings
- Configure containers as a service functionality
- Describe partner integration options and procedures
- Instantiate network services and network functions
- Describe the authorization model of VMware Telco Cloud Automation
- Define platform life cycle management (LCM) for VMware Telco Cloud Automation
- Enumerate troubleshooting concepts and day two operations for VMware Telco Cloud Automation
- Describe the use of APIs within VMware Telco Cloud Automation
- List examples of how VMware Telco Cloud Automation can be used in a CI/CD environment

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

You should have completed the following course:

- VMware Telco Cloud Automation Fundamentals

Learners will need to understand the following concepts and/or require hands-on experience with:

- VMware products like VMware vSphere®, VMware NSX®, VMware vSAN™, TKG, and VMware vCloud Director®
- Working experience of network functions virtualization, including:
- ETSI NFV framework, virtualized network functions, and related Interfaces
- Kubernetes, Helm, cloud-native network functions, and CNI

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives
- Describing the role of the Authorization Server
- Configuring the Authorization Server

Module 2: VMware Telco Cloud Automation Installation

- Describe day zero operations for VMware Telco Cloud Automation
- Describe the VMware Telco Cloud Automation architecture
- List the steps to perform VMware Telco Cloud Automation deployment
- List the steps to perform VMware Telco Cloud Automation control plane integration
- Describe VMware Telco Cloud Automation control plane scaling
- Describe the requirements for other applications such as vRealize Orchestrator and Harbor
- Describe where, when, and how to use VMware Telco Cloud Automation tagging

Module 3: Day 1 Operations: Infrastructure Automation

- Describe infrastructure automation
- List the use cases of infrastructure automation
- List the benefits of infrastructure automation
- Describe the infrastructure requirements of infrastructure automation
- Describe the infrastructure automation domains
- List the steps to deploy an infrastructure using infrastructure automation

Module 4: Day 1 Operations: Infrastructure Settings

- Describe the VMware Telco Cloud Automation infrastructure options
- Describe VMware Telco Cloud Automation infrastructure requirements
- Outline the role of virtual infrastructure and VMware Telco Cloud Automation
- Identify the benefits of public and private infrastructures
- List the steps to integrate a VM-based virtual infrastructure
- List the steps to integrate a container-based virtual infrastructure
- Describe private infrastructure requirements

Module 5: Day 1 Operations: CaaS

- Define containers as a service (CaaS)
- Challenges of CNF deployment without automation
- Kubernetes and Tanzu Kubernetes Grid architectures
- List steps to create a Kubernetes cluster template
- The process for deploying node pools and groups
- List the steps to support anti-affinity of workload cluster nodes
- Describe cluster monitoring
- List CaaS scale options

Module 6: Day 1 Operations: Partner Integration

- Describe partner integration and the types of partners
- Describe Harbor and the various Harbor platforms
- List the steps to interface with a Harbor platform
- Compare and contrast specialized VNF managers (S-VNFMs) and generic VNF managers (G-VNFMs)
- Explain how to add an S-VNFM
- Define S-VNFM use cases
- List the benefits and challenges of using Airgap

Module 7: Day 1 Operations: Network Functions and Network Services

- The roles of network services and network functions
- List the types of descriptors
- Describe the role of TOSCA
- Describe the role of onboarding
- List the steps to onboard network functions and network services
- Examine the results of the onboarding process
- List the steps to instantiate network functions and network services
- Examine the results of the instantiation process

Module 8: Day 2 Operations: Authorization Model

- Resources that can be accessed in vSphere
- Define the role of a vCenter Server system in credential management
- Define the role of Keycloak in credential management
- Describe the procedures to create, delete, and modify rules using vCenter Server
- Control and verify access to vSphere resources
- List the roles in VMware Telco Cloud Automation
- Explain the tasks and list the levels of permissions needed in VMware Telco Cloud Automation
- List all the permissions and filters that can be implemented in VMware Telco Cloud Automation

Module 9: Day 2 Operations: Life Cycle Management

- Explain the life cycle stages in VMware Telco Cloud Automation control plane
- Explain the life cycle stages in VMware Telco Cloud Automation
- Define an upgrade schedule
- Apply an upgrade schedule for life cycle management of the VMware Telco Cloud Automation control plane
- Apply an upgrade schedule for life cycle management in VMware Telco Cloud Automation
- Describe network function and network service life cycle management events
- Execute network function and network service healing
- Perform network function and network service termination

Module 10: Day 2 Operations: Troubleshooting

- List the components of the VMware Telco Cloud Automation dashboard
- Explain the features of fault management in VMware Telco Cloud Automation
- Explain the features of performance management in VMware Telco Cloud Automation
- Describe the use of fault management of VMware Telco Cloud Automation for VNFs and CNFs
- Describe the use of performance management of VMware Telco Cloud Automation for VNFs and CNFs
- Describe the use of CCLI for troubleshooting
- Define the procedures to integrate vRealize Operations Manager with VMware Telco Cloud Automation
- Describe how to use vRealize Operations

Module 11: Day Two Operations: API Management

- Define the VMware Telco Cloud Automation API
- Explain the API architecture
- Describe VMware Telco Cloud Automation API use cases
- Describe how to request security tokens for implementation
- Explain how to implement commands through external systems using APIs

Module 12: Day Two Operations: Continuous Integration and Continuous Delivery

- Describe continuous integration and continuous delivery (CICD)
- List the benefits and challenges of CICD
- Describe how VMware Telco Cloud Automation can be used in a CICD environment
- Explore VMware Telco Cloud Automation CICD example

VMware Telco Cloud Day 2 Operate and Scale V2.x

Course Code: SDE000009

Course Description

This five-day, hands-on training course provides the knowledge to operate and scale VMware Telco Cloud version 2.x products in a Telco cloud provider environment. In this course, you are exposed to the entire VMware Telco Cloud portfolio, and the tools and methodologies available to ensure they operate effectively. In addition, you are presented with various scenarios where you will be guided through the process of identifying, analyzing, and formulating solutions to performance and other problems.

Delivery Method

Instructor-Led

Duration

Five Days

Course Objectives

Upon completion of this course, you will be able to:

- List the operational challenges for rolling out and operating telco services including 5G
- Describe the role of the ETSI NFV architectural framework in delivering network functions
- Identify the role of VMware Telco Cloud products in supporting telco services
- The role of VMware technologies such as vSphere, NSX, and Tanzu etc. in implementing telco services
- Outline the role of native tools and other VMware monitoring tools such as VMware vRealize Operations™, VMware vRealize Network Insight, and VMware vRealize Log Insight in maintaining network services
- Choose the VMware Telco Cloud products that meet your application requirements
- Deploy and implement a solution architecture using VMware Telco Cloud products
- Identify the tools and remediation pathways for maintaining the availability and performance of your applications and infrastructure using VMware Telco Cloud and vRealize Suite products
- Scale your VMware Telco Cloud products to meet operational requirements
- Optimize the operation of VMware Telco Cloud products to ensure SLAs are met

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

You should have completed one of the following:

- VMware Telco Cloud Automation: Install, Configure, Manage [V1.8]
- VMware Telco Cloud Service Assurance: Install, Configure, Manage [V2.0]
- VMware Telco Cloud Infrastructure: Install, Configure, Manage [V2.0]
- VMware Telco Cloud Platform: Install, Configure, Manage [V2.0]

Learners will need to understand the following

- TCP/IP services, protocols, containers and VMware Tanzu Kubernetes Grid
- Linux command line

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives

Module 2: Overview of Network Transformation

- Reviews the technologies that enable modern service provider networks
- Outlines characteristics of modern service provider networks in meeting customer application needs
- Reviews ETSI NFV architectural framework
- Describes network function management and how they are packaged

Module 3: Service Delivery with VMware Telco Cloud

- Outlines the components of the VMware Telco Cloud portfolio
- Reviews the role each VMware Telco Cloud product plays in delivering telco services
- Specifies the dependencies each product has on underlying technologies

Module 4: Supporting Service Delivery with VMware Telco Cloud

- Reviews the products that implements the virtualization, management, platform, and orchestration layers
- Outlines the role played by other VMware products such as NSX in delivering cloud services
- Outlines opensource integration options with VMware Telco Cloud products

Module 5: Securing VMware Telco Cloud

- Reviews security threats that affect telco services
- Identifies the critical telco assets that are prone to exploitation
- Outlines best practice for securing VMware Telco Cloud products and underlying technology
- Provides overview of appropriate security controls for VMware Telco Cloud products

Module 6: Service Provisioning with VMware Telco Cloud

- Reviews tools and methodologies used to gather requirements
- Outlines how to assess cloud-native capabilities
- Specifies how to document findings
- Lists security vulnerabilities with Helm
- Reviews VMware's Customer Engagement process
- Outlines capture of infrastructure requirements from TCA

Module 7: Designing a VMware Telco Cloud Solution

- Describes appropriate deployment topologies
- Contrasts pros and cons of design choices
- Identifies how a design choice might be affected by other factors such as NSX and TKG deployment, or data center architecture
- Outlines typical scenarios where specific products align with identified requirements
- Reviews designing for availability
- Explains how to create a design aligns with best practice
- Specifies monitoring options

Module 8: Implementing VMware Telco Cloud Products

- Reviews deployment options for VMware products
- Reviews integration of new products with existing ones
- Specifies post-installation tasks
- Provides overview of monitoring tools such as vRealize Operations and vRealize Operations Network Insight
- Outlines addition of new products as data sources in monitoring tools

Module 9: VMware Telco Cloud Maintenance

- Outlines typical administrative tasks in ensuring services are maintained
- Reviews native and other VMware performance monitoring tools
- Specifies how to enable and Manage network slices using VMware Telco Cloud Automation
- Provides overview of workload lifecycle management

Module 10: VMware Telco Cloud Troubleshooting

- Reviews the troubleshooting tools available
- Outlines use of tools to gather useful data
- Outlines how event correlation can be used to isolate problems
- Specifies a methodology to determine the root cause of a problem
- Outlines steps to identify and resolve a problem
- Reviews scenarios where known problems are isolated and resolution steps identified

Module 11: Scaling VMware Telco Cloud Products

- Outlines how to assess if operations are impacted by lack of resources now or in the future
- Reviews performance optimization options
- Identifies implications for other products if you scale VMware Telco Cloud products
- Reviews VMware sizing guidelines

VMware Telco Cloud Service Assurance: Install Configure Manage V2.0

Course Code: SDE000010

Course Description

This three-day, hands-on training course provides the knowledge, skills, and tools to achieve competency in installing, configuring, and managing the VMware Telco Cloud Service Assurance environment. In this course, you are introduced to the installation methods of VMware Telco Cloud Service Assurance™ across various supported platforms and troubleshooting tools that help you install, manage, and troubleshoot your VMware Telco Cloud Service Assurance environment. In addition, you are presented with various types of configuration options, which you will identify, analyze, and navigate through as you explore the UI and configurable options of the product.

Delivery Method

Instructor-Led

Duration

Three Days

Course Objectives

Upon completion of this course, you will be able to:

- Deploy VMware Telco Cloud Service Assurance
- Manage VMware Telco Cloud Service Assurance to satisfy Telco cloud provider needs
- Discuss configurable options for VMware Telco Cloud Service Assurance
- Identify and configure different data sources which are used with VMware Telco Cloud Service Assurance
- Configure different collectors in VMware Telco Cloud Service Assurance
- Identify the Root Cause Analysis options with VMware Telco Cloud Service Assurance
- Discuss data collection in VMware Telco Cloud Service Assurance
- Explain root cause analysis in VMware Telco Cloud Service Assurance
- Navigate through the logs for troubleshooting

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

Learners should have completed the following courses:

- VMware Telco Cloud Service Operations (TCOps) Fundamentals 2020
- VMware Telco Cloud Operations v1.1

Learners will also need to understand the following concepts and/or require hands-on experience with:

- TCP/IP services and protocols
- TCP/IP networking, containers and VMware Tanzu Kubernetes Grid
- Linux command line

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives

Module 2: Introduction to VMware Telco Cloud Service Assurance

- Features of VMware Telco Cloud Service Assurance
- VMware Telco Cloud Service Assurance capabilities
- Discuss the use cases of VMware Telco Cloud Service Assurance
- VMware Telco Cloud Service Assurance components in delivering service assurance
- List the architecture components of VMware Telco Cloud Service Assurance

Module 3: Deploying VMware Telco Cloud Service Assurance

- Explain different deployment options and deployment methods of VMware Telco Cloud Service Assurance
- Discuss different phases in deploying VMware Telco Cloud Service Assurance
- Different footprints available for HA based and non-HA based installation of VMware Telco Cloud Service Assurance
- Describe the Smarts components of VMware Telco Cloud Service Assurance
- Deploy VMware Telco Cloud Service Assurance

Module 4: User Access Control

- Features Role-based Access Control (RBAC)
- Outline the role of Keycloak in implementing RBAC in VMware Telco Cloud Service Assurance
- Configure user federation in Keycloak
- Use the VMware Telco Cloud Service Assurance UI to manage RBAC
- Create policies in VMware Telco Cloud Service Assurance that align with job roles

Module 5: Services and User Interface Configurations

- Describe the core services on a TCSA cluster
- The Global Manager or Service Assurance Manager (SAM), IP Domain Manager, Server Manager (ESM)
- VMware Telco Cloud Service Assurance UI Overview
- Discuss 5G integration options in VMware Telco Cloud Service Assurance
- Explain Working with Notifications
- Explain Viewing and configuring Topologies
- Describe Topology Explorer
- Explain Collecting Troubleshooting Information
- Discuss Custom models
- Describe how compute resources are provided to VMware Telco Cloud Service Assurance
- Describe how storage is provided to VMware Telco Cloud Service Assurance
- Configure and manage VMware Telco Cloud Service Assurance
- Discuss configurable options for VMware Telco Cloud Service Assurance

Module 6: Day 1 and Day 2 Operations

- Identify different data sources to be used with VMware Telco Cloud Service Assurance
- Configure different collectors with VMware Telco Cloud Service Assurance
- Describe Alarms and Thresholds
- Demonstrate how to configure alarms with VMware Telco Cloud Service Assurance
- Explain how to setup thresholds and timelines in VMware Telco Cloud Service Assurance

Module 7: Logs and Troubleshooting

- Identify the installation logs of VMware Telco Cloud Service Assurance
- List Smarts installation logs and the Kubernetes CLI commands that are used for troubleshooting
- Troubleshooting containerized services
- Discuss monitoring services

VMware Telco Cloud Infrastructure Install Configure Manage V2.0

Course Code: SDE000012

Course Description

This five-day, hands-on training course provides you with the advanced knowledge, skills, and tools to achieve competency in operating and troubleshooting the VMware Telco Cloud Infrastructure environment. In this course, you are introduced to VMware Cloud Director™ as a virtualized infrastructure manager. You will examine ETSI NFV requirements, deployment options, and procedures. You will also deploy virtualized network functions and understand their detailed configuration settings. You will learn how to support organizations as well as set up networking and security using hands-on lab exercises. In addition, you are presented with various types of technical problems in VMware Cloud Director, which you will identify, analyze, and solve through a systematic troubleshooting process.

Delivery Method

Instructor-Led

Duration

Five Days

Course Objectives

Upon completion of this course, you will be able to:

- Describe the VMware Telco Cloud Infrastructure™ architecture
- Describe the VMware Cloud Director architecture
- List the infrastructure requirements of ETSI NFV
- Describe the VMware Cloud Director architecture as Virtualized Infrastructure Manager (VIM)
- Describe the options associated with VMware cloud providers
- Explain how organizations are supported in VMware Cloud Director
- Describe the security model in VMware Cloud Director
- Configure key networking elements of VMware Cloud Director
- Manage and monitor resources in VMware Cloud Director
- Enumerate troubleshooting concepts and Day 2 operations using VMware Cloud Director

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment.

Prerequisites

- You should have completed the Telco Cloud Automation Fundamentals and Telco Cloud Platform Fundamentals courses.
- Good understanding of VMware products like VMware vSphere®, VMware NSX®, VMware vSAN™, and VMware Cloud Director
- Knowledge and working experience of network functions virtualization, including:
 - ETSI NFV framework, virtualized network functions, and related Interfaces
 - VMs and virtual data centers

Course Outline

Module 1: Course Introduction

- Introductions and course logistics
- Course objectives

Module 2: Day 0 Operations: VMware Telco Cloud Infrastructure Installation

- Challenges and key functions of the telco cloud
- List the benefits of the VMware Cloud Director based VMware Telco Cloud Infrastructure
- VMware Telco Cloud Infrastructure architecture
- Describe the role of VMware Cloud Director in the VMware Telco Cloud Infrastructure architecture
- List the VMware Telco Cloud Infrastructure deployment options
- Describe the VMware Cloud Director architecture
- List the key VMware components that are part of VMware Cloud Director
- Describe the key use cases for the VMware Cloud Director based VMware Telco Cloud Infrastructure

Module 3: Day 0 Operations: ETSI NFV Requirements for Cloud Platforms

- Compare physical and virtual infrastructures
- Benefits and challenges of physical infrastructure
- Types of virtual infrastructure and advantages and components of the NFV infrastructure (NFVI)
- Explain the role of network virtualization in the NFVI
- Requirements of NFVI for VMware Cloud Director
- Networking options of VMware Cloud Director
- Describe the key networking use cases
- Describe requirements of VMware Telco Cloud Automation™ for networking
- The storage options of VMware Cloud Director
- Describe the key storage use cases

Module 4: Day 1 Operations: Virtualized Infrastructure Manager (VIM) Configuration

- Basic concepts related to VMware Cloud Director
- Describe the components of the VMware Cloud Director architecture
- Basic configuration of the VMware Cloud Director architecture
- Describe virtual data centers or VDCs
- Explain the role of organization VDCs
- Describe the relationship between provider VDCs and organization VDCs
- Describe resources in VMware Cloud Director
- List the key resource organization
- Create resource pools
- How vSAN integrates with VMware Cloud Director

Module 5: Day 1 Operations: Configuring VMware Cloud Director Providers

- Describe how compute resources are provided to VMware Cloud Director
- Describe how storage resources are provided to VMware Cloud Director
- Describe provider VDC requirements and best practices
- List the requirements of creating VDCs
- Describe the VNF on-boarding process
- Create provider VDCs

Module 6: Day 1 Operations: Configuring VMware Cloud Director Organizations

- Describe VMware Cloud Director organizations
- Create VMware Cloud Director organizations
- Navigate through the VMware Cloud Director HTML5 provider portal
- VMware Cloud Director organization VDC
- Navigate through the tenant portal
- List use cases for a VMware Cloud Director organization VDC
- List the organization VDC allocation models
- Describe the types of resources that can be allocated
- How resources are allocated for an organization
- Examine the function and requirements of network pools
- Describe the network types available in VMware Cloud Director (external, organization, and vApp)
- List the organization network types
- Create and manage organization VDC networks
- Describe catalogs
- Manage an organization's catalog
- Populate, share, and publish catalogs
- Describe vApps
- Manage access to vApps and catalogs
- Modify the configuration of vApps and their virtual machines (VMs)
- Manage organization VDC networking
- Create affinity and anti-affinity rules

Module 7: Day 1 Operations: Configuring VMware Cloud Director Security

- Describe role-based access
- Create custom security roles
- Directory services in VMware Cloud Director
- Describe the role of LDAP, SAML, SSL, Kerberos, and OAuth2 with VMware Cloud Director
- Explain the use of VMware Cloud Director with SSO

Module 8: Day 1 Operations: Configuring VMware Cloud Director Networking

- List networking options in VMware Cloud Director
- Key networking use cases in VMware Cloud Director
- Use and placement of VMware NSX® Edge™ services gateways in relation to VMware Cloud Director
- Review routing with the distributed logical router and edge services gateways in combination with VMware Cloud Director
- Describe firewall management in VMware Cloud Director with edge services gateways and the distributed firewall
- An overview of VMware NSX-T™ Data Center
- Explain the architecture of NSX-T Data Center
- Describe VMware Cloud Director supported features of NSX-T Data Center
- Benefits and challenges of multisite networking
- List the requirements for multisite networking
- Benefits and challenges of networking between VDCs
- List the requirements for networking between VDCs
- Configure cross-VDC networking

Module 9: Day 2 Operations: VMware Cloud Director Resource Management and Monitoring

- Identify the key resources that need to be managed with VMware Cloud Director
- List monitoring options with VMware Cloud Director
- Explain the resource management and monitoring architecture in VMware Cloud Director
- Monitor objects from the VMware Cloud Director portal
- Features of VMware vRealize® Operations Manager™
- Integrate VMware Cloud Director with vRealize Operations Manager
- Configure VMware vRealize® Operations Management Pack for VMware Cloud Director™
- Outline the monitoring features of vRealize Operations Manager in VMware Cloud Director
- Describe the purpose of the vRealize Operations Tenant App for VMware Cloud Director
- Integrate VMware Cloud Director with the Tenant App
- Configure the Tenant App for VMware Cloud Director
- Monitor objects with the Tenant App
- List the steps to monitor VMware Cloud Director environments with vRealize Operations Manager and VMware vRealize® Log Insight™
- List the steps to review historical virtual machine metrics in VMware Cloud Director
- Examine VMware Cloud Director logs

Module 10: Day 2 Operations: VMware Cloud Director Troubleshooting

- Identify the features of the VMware Telco Cloud Automation dashboards
- List the components of the VMware Telco Cloud Automation dashboards
- Explain the features of fault management in VMware Telco Cloud Director
- Describe the use of fault management in VMware Cloud Director
- Describe the use of performance management in VMware Cloud Director
- Describe the use of logs in VMware Cloud Director
- Troubleshoot using VMware Cloud Director Outline

VMware Telco Cloud Platform for Radio Access Network V1.5

Course Code: SDE000012

Course Description

This three-day, hands-on training course provides you with the advanced knowledge, skills, and tools to achieve competency in operating and troubleshooting the VMware Telco Cloud Platform-RAN™ environment. In this course, you are introduced to the VMware Telco Cloud Platform-RAN infrastructure, deployment options, and procedures. You also deploy Kubernetes clusters and understand the detailed configuration settings of management and workload clusters. You onboard and instantiate network functions and network services using hands-on lab exercises.

In addition, you are presented with various types of technical problems in VMware Telco Cloud Platform-RAN, which you will identify, analyze, and solve through a systematic troubleshooting process.

Delivery Method

Instructor-Led

Duration

Three Days

Course Objectives

Upon completion of this course, you will be able to:

- List details of VMware Telco Cloud Platform-RAN
- List steps to deploy an infrastructure using infrastructure automation
- Explain Tanzu Kubernetes Grid and Supporting Containers as a Service
- List and describe process of onboarding and instantiating network functions
- List and describe the process of network function and platform life cycle management
- Describe VMware Telco Cloud Platform-RAN troubleshooting methods
- Describe the use of APIs within Telco Cloud Automation

Hands-On

This course includes practical hands-on exercises that enable you to test your new skills and begin to use those skills in a working environment

Prerequisites

Before taking this course, you should have completed the *Telco Cloud Automation Fundamentals* and *Telco Cloud Platform for Radio Access Network (TCP-RAN) Foundations* courses.

You should also have the following understanding or knowledge:

- VMware products like vSphere and VMware Tanzu™ Kubernetes Grid
- Working experience with network functions virtualization, including:
- ETSI NFV framework, virtualized network functions, and related Interfaces
- Kubernetes, Helm, cloud-native network functions, CSI, and CNI

Course Outline

Module 1: Course Introduction

- Introduction and course logistics
- Course objectives

Module 2: Day 0 Operations: VMware Telco Cloud Platform-RAN Overview and Installation

- Describe day 0 operations for VMware Telco Cloud Automation
- Describe the VMware Telco Cloud Automation architecture
- Describe the VMware Telco Cloud Automation control plane architecture
- List the VMware Telco Cloud Automation deployment options
- List the steps to perform VMware Telco Cloud Automation deployment
- List the steps to perform VMware Telco Cloud Automation control plane integration with vSphere
- Describe VMware Telco Cloud Automation control plane scaling
- Describe the vSphere Architecture
- List the key VMware components that are part of vSphere
- Describe the key use cases for vSphere

Module 3: Day 1 Operations: Infrastructure Automation

- Describe infrastructure automation
- List the use cases of infrastructure automation
- Describe the requirements of infrastructure automation
- Describe provisioning with and without infrastructure automation
- List the benefits of infrastructure automation
- List challenges of infrastructure automation
- Describe the infrastructure requirements of infrastructure automation
- Describe the infrastructure automation domains
- Describe the process to identify the infrastructure automation domains
- Configure an infrastructure for infrastructure automation

Module 4: Day 1 Operations: Containers as a Service

- Describe the role of containers in VMware Telco Cloud Platform-RAN
- Describe the benefits and challenges of containers
- List the various container use cases
- Describe the Kubernetes architecture
- List the role of nodes and clusters
- Describe the supporting components of Kubernetes
- Compare Kubernetes to Tanzu Kubernetes Grid
- List the key features of Tanzu Kubernetes Grid
- Describe the architecture of Tanzu Kubernetes Grid
- List the steps to create a Kubernetes cluster template
- Describe the process for deploying node pools and groups
- List the steps to instantiate a cluster
- List CaaS scale options
- List upgrade operations
- Describe how advanced features like Air Gap are supported

Module 5: Day 1 Operations: Network Functions and Network Services

- Describe the role of a network service
- Describe the types of network
- List the type of descriptors
- Describe the requirements of a descriptor
- Describe the role of TOSCA
- Describe how TOSCA is used to create descriptors
- Explore the basics of the TOSCA structure
- Examine various types of descriptors
- Describe the role of onboarding
- List the steps to onboard a virtual network function
- List the steps to onboard a cloud-native network function
- List the steps to onboard a network service
- Examine the results of the onboarding process
- Describe the role of Harbor
- Explain how to list the contents of a Harbor platform
- List the steps to interface with a Harbor platform
- List the steps to instantiate a virtual network function
- List the steps to instantiate a cloud-native network function
- Examine the results of the instantiation process
- List the steps to instantiate a network service
- Examine the results of the instantiation process

Module 6: Day 2 Operations: Platform Life Cycle Management

- Explain the life cycle stages in VMware Telco Cloud Automation control plane
- Explain the life cycle stages in VMware Telco Cloud Automation
- Define an upgrade schedule
- Define workflows
- Apply an upgrade schedule to manage the life cycle of the VMware Telco Cloud Automation control plane
- Apply an upgrade schedule to manage the life cycle of VMware Telco Cloud Automation
- Describe network function life cycle management events
- Execute healing
- Perform a termination
- Describe network service life cycle management events
- Execute network service healing
- Set up network service monitoring
- Perform a network service termination

Module 7: Day 2 Operations: Troubleshooting

- Identify the features of the VMware Telco Cloud Platform-RAN dashboards
- List the components of the VMware Telco Cloud Platform-RAN dashboards
- Explain the features of fault management in VMware Telco Cloud Platform-RAN
- Describe the use of fault management in VMware Telco Cloud Platform-RAN for network functions
- Describe the use of performance management in VMware Telco Cloud Platform-RAN for network functions
- Describe the use of logs in VMware Telco Cloud Platform-RAN
- Troubleshoot using VMware Telco Cloud Platform-RAN logs
- List the key CLI tools that can be used for troubleshooting
- List the steps to identify common network function deployment problems
- Examine key troubleshooting scenarios

Module 8: Day 2 Operations: API Management

- Define the VMware Telco Cloud Automation API
- Explain the API architecture
- Describe VMware Telco Cloud Automation API use cases
- Explain how to configure an external REST API
- Describe how to request security tokens for implementation
- Explain how to implement commands through external systems using APIs

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