Hybrid & Multi-Cloud Architecture Mastery in AWS

Course Number: WA3586

Duration: 5 days

Course Description

This AWS training provides a deep dive into advanced data center architectures, hybrid and multi-cloud strategies, and Infrastructure as Code (IaC) fundamentals. Participants explore VMware's role in modern cloud environments, integration with AWS, migration strategies, and best practices for designing resilient and scalable infrastructure. Hands-on exercises will reinforce key concepts, enabling participants to apply what they learn in real-world scenarios. The course culminates in a half-day capstone project, where participants design and implement a hybrid cloud architecture using VMware Cloud on AWS, NSX networking, and Terraform. They simulate real-world challenges, including configuring hybrid connectivity, automating infrastructure deployment with IaC, and executing a disaster recovery plan. This hands-on project ensures that participants leave with practical experience in multi-cloud architecture design and implementation.

Skills Gained

- Understand the evolution and architecture of modern data centers
- Explore VMware Cloud on AWS and its integration strategies
- Learn hybrid and multi-cloud design principles for scalability and resilience
- Master Infrastructure as Code (IaC) techniques using Terraform
- Gain hands-on experience with networking, storage, and security configurations

Who Can Benefit

- Cloud architects and engineers looking to deepen their understanding of VMware and AWS integration

- IT professionals responsible for managing hybrid and multi-cloud environments
- DevOps and SRE teams aiming to implement Infrastructure as Code (IaC)
- Solution architects and technical decision-makers evaluating cloud migration and disaster recovery strategies

Course Details

Evolution of the Data Center and Path to VMConAWS

- Modern Data Center Design Architecture
- Evolution of Data Center Architecture
- Examine VMware vSphere Growth in the Data Center
- VMware NSX Network Overlay Virtualization and VSAN
- VMware Cloud on AWS

VMware vSphere Virtualization

- Introduction to vSphere
- Benefits of Using Virtual Machines
- Recognize VMware Cloud Foundation (VCF)
- vSphere 7.0/8.0/9.0 Architecture and Components
- vCenter Server Introduction
- Advanced vSphere Features

VMware NSX Network Overlay Virtualization

- Introduction to NSX and Illustrate NSX Architecture
- Describe NSX Components
- Explain NSX Networking
- Identify NSX Security
- Analyze NSX Design Principles

Key objectives of VSAN Storage

- About VSAN
- VSAN Storage in VMware Cloud on AWS
- VSAN Deduplication and Compression
- About Virtual Machine Storage Policies
- Availability Attributes for VSAN VM Storage Policies

VMware VMConAWS

- Design and Operational Structure
- Preparing AWS Infrastructure for VMConAWS
- VCenter Server Access in VMConAWS
- High Availability in VMConAWS and vSphere
- About vSphere DRS
- Networking in VMware Cloud on AWS
- Security Feature Firewalls on NSX
- Storage on VMware Cloud on AWS
- External Storage on a SDDC for VMs

Introduction to AWS Outposts:

- What are AWS Outposts? Use cases and benefits
- Outposts architecture and components
- Deployment models and considerations
- Hands-on (if possible): Console walkthrough or simulated Outposts environment.

Introduction to Hybrid-Connectivity Options:

- VPN connections: Site-to-site and client VPN
- Direct Connect: Dedicated network connection to AWS
- Transit Gateway: Simplifying complex network topologies
- Choosing the right connectivity option based on requirements (bandwidth, latency, security)
- Hands-on: Configuring a basic VPN connection (simulated or using a sandbox environment)

Introduction to Migration Strategies

- The 6 R's of migration: Rehost, Replatform, Refactor, Repurchase, Retain, Retire
- Assessing application compatibility and dependencies
- Migration planning and execution best practices
- Tools and services for migration (AWS Migration Hub, Server Migration Service)
- Hands-on: Simple migration exercise (e.g., migrating a VM)

Disaster Recovery:

- Disaster recovery concepts and terminology (RTO, RPO)
- Disaster recovery strategies: Backup and restore, pilot light, warm standby, active-active
- VMware Site Recovery Manager (SRM): Automating disaster recovery

- Integrating with AWS for disaster recovery
- Hands-on: Simulating a failover scenario (if time and resources allow)

VMware vSphere Design:

- vSphere design best practices
- Resource management and capacity planning
- High availability and fault tolerance
- Security considerations in vSphere design
- Performance optimization techniques

Hybrid cloud architectures with AWS

- Extending on-premises data centers to AWS
- Implementing hybrid DNS with Route 53
- Data replication and synchronization strategies

Multi-cloud strategies (AWS-centric approaches)

- Designing for cloud portability
- Implementing multi-cloud management and governance
- Cost optimization across multiple cloud providers

Overview of OpenShift and OpenStack in multi-cloud scenarios

- Red Hat OpenShift architecture and deployment models
- OpenStack components and services
- Integrating OpenShift and OpenStack with AWS services

Introduction to Infrastructure as Code

- Benefits and challenges of IaC
- Declarative vs. imperative approaches
- Version control and collaboration for infrastructure code
- CloudFormation vs Terraform
- Introduction to Terraform
- Infrastructure as Code Overview
- Holistic Overview
- IaC vs Scripting

Terraform Basics - Getting Started

- Terraform CLI

- Terraform Project Structure
- Terraform Workflow: Plan, Apply, Destroy
- Terraform HCL Configuration Files
- Resources - Introduction
- Providers - Introduction
- Provisioning Infrastructure using Terraform
- Using Terraform Provider Documentation

Getting Started with Terraform and AWS

- Creating and managing AWS resources using Terraform
- State files and out-of-band changes - reality check

Project Tasks

Phase 1: Architecture Design (1 Hour)

- Define a high-level architecture diagram incorporating:
- VMware Cloud on AWS integration
- Hybrid connectivity options (VPN, Direct Connect, or Transit Gateway)
- Storage strategy (VSAN vs external storage)
- Disaster recovery plan using VMware Site Recovery Manager (SRM)
- Security policies leveraging NSX

Phase 2: Hands-on Implementation (2 Hours)

Networking Setup:

- Configure a basic VPN connection or simulate hybrid connectivity to AWS

Infrastructure Deployment with Terraform:

- Write Terraform configurations to deploy a VMware Cloud on AWS SDDC.
- Define security groups and IAM roles for access control.

Storage & Compute Configuration:

- Apply storage policies for VSAN and define availability attributes.
- Deploy and configure vSphere VMs on AWS.