The VMware vSphere Master Deep-Dive Training Program

Curated VMware Learning Program From Zero to Hero

Module-01

Deep-Dive into Virtualization Basics

- What is Virtualization? Why Virtualization
- Deep-Dive into Virtualization and benefits of Virtualization techniques
- Server, network, and storage virtualization concepts
- Architectural difference between Fully, Para and Hardware Assisted Virtualization
- Overview of VMware products based on Server Virtualization techniques
- Architectural difference between Type1 and Type2 Hypervisor
- Overview of VMware Software Defined Datacenter
- Where vSphere fits into the cloud architecture

Module-02

Deep-Dive into VMware ESX and ESXi Architecture

- Understanding VMware ESX Architecture and Its Limitations
- Understanding VMware ESXi Architecture and Its benefits
- Analyzing differences between ESX and ESXi Architecture
- Competitive analysis between ESXi and Hyper-V Architecture
- Understanding Microkernel and Monolithic kernel Architecture
- Understanding ESXi Partitioning layout and significance of each partition
- Understanding ESXi Dual boot bank implementation and how it works

Module-03

Installing, Configuring and Managing ESXi using DCUI interface

- Understanding ESXi Installation and its booting process
- Understanding ESXi licensing and various license editions
- Getting familiar with ESXi DCUI interface for Administration
- Configuring and Managing Host Networking using DCUI
- Configuring and Managing Host Level Configuration using DCUI
- Enabling ESXi Shell and SSH interface for Troubleshooting
- Accessing and Managing ESXi Host using Host Client

Module-04

Deep-Dive into Virtual Machine Architecture and Its components

- Understanding Virtual Machine creation and Its core benefits
- Comparative study between Virtual and Physical Machines
- Understanding Virtual Machine Architecture and Its key properties
- Understanding VMX, VMDK, VMSS, NVRAM, VSWP, LOG and other VM files
- Understanding Lazy Zero, Eager Zero and Thin Provisioned disk
- Analysis performance differences between Lazy, Eager and Thin Provisioned Disks
- Understanding Virtual Machine Hardware and Its Hardware versions
- Understanding VMware Tools and Why do we need it in every VM
- Performing Hot/Add Removal of Virtual Machine Hardware

Module-05

Deep-Dive into Virtual Machine Snapshot Operations

- What is Snapshot and why do we need it
- Why Virtual Machine Snapshot is not a backup technology
- How Virtual Machine Snapshot works and Its performance implications
- Understanding Virtual Machine Snapshot Chaining Process
- Understanding VMSD, VMSN and DELTA VMDK files and its significance
- Advantages and Disadvantages of VM snapshots
- Create, Manage, Consolidate and Restore VM snapshots
- Best Practices of Virtual Machine Snapshots
- Design consideration of Virtual Machine Snapshots

Module-06

Deep-Dive into vCenter Server Architecture and Its Core Components

- Deep-Dive into vCenter Server and PSC architecture
- Discussing ESXi and vCenter Server Communication
- Understanding VPXA, VPXD and HOSTD daemon and how it interacts
- Understanding vCenter Single Sign On Process and its basic workflow
- Understanding vCenter Server and PSC deployment options
- Installing vCenter Server Appliance with Embedded PSC
- Comparative study of Windows based and Linux based vCenter Server
- Add data center, organizational objects, and hosts to vCenter
- Configuring and Monitor vCenter Server Appliance
- Understanding vSphere HTML5 Client and Web Client Interfaces
- Protecting vCenter Server using vCenter Server High Availability feature
- Backup and Restoring vCenter Server Appliance using VAMI interface

Module-07

Virtual Machine Bulk Deployment and Management

- Understanding VMware Cloning, Templating and OVF deployment mechanism
- Deploying and Managing Virtual Machine using Hot and Cold Cloning
- Deploying and Managing Virtual Machine using Standard template Mechanism
- Deploying and Managing Virtual Machine using OVF template Mechanism
- Difference between Hot and Cold cloning mechanism for VM deployment
- Difference between Standard and OVF template mechanism for VM deployment
- Creating and Managing VMs using vAPPs

Module-08

Deep-Dive into VMware vSphere Networking and Its Architecture

- What is Virtual Networking and Why Do we need it
- Comparison between Physical vs Virtual Networking
- Understanding Virtual Switch vs Physical switch
- Demystifying vNIC, vmnic, vmknic, vPort, Portgroups
- Demystifying VMXNET2, VMXNET3, E1000 and E1000E drivers
- Supported and Unsupported Packet Flow and I/O Path in vSphere Networking
- Discussing vSphere Standard Switch Limitations and its Drawbacks
- Understanding vSphere Distributed Switch and Its Advantages over vSS
- Identifying various types of traffic handling in vSphere and their implementation

Module-09

Deep-Dive into vSphere Networking Policies for vSS

- Creating, Configuring and Managing Virtual Machine Networking
- Creating, Configuring and Managing Networking for VMkernel Traffic such as vMotion, FT, iSCSI etc..
- Deep-Dive into VLAN policies such as VGT, VST and EST and Packet walk
- Deep-Dive into NIC teaming and Failover policies
- Deep-Dive into Traffic Shaping and Security Policies
- Understanding Port ID, Mac and IP hash based teaming algorithm and its packet flow
- Best Practices of vSphere Networking

Module-10

Overview of VMware vSphere Distributed Switch

- Why do we need Distributed Switch
- What are the advantages of vDS over vSS based networking
- Understanding vSphere Distributed Switch creation
- Understanding DVPG, DVUplinks, DVPort in vDS
- Feature comparison between vSS and vDS

Module-11

Deep-Dive into Storage Technology and Its Fundamentals

- Understanding Basics of SAN, NAS and DAS Technology
- Understanding End to End Infrastructure requirements of SAN and NAS Solutions
- Understanding FC protocols and its core components
- Understanding iSCSI protocol and its core components
- Understanding difference between FCoE and iSCSI Protocol
- Understanding Storage Initiator and Target Terminology
- Understanding LUN masking vs Zoning done at Storage level
- Understanding Independent vs Dependent vs Software based HBAs
- Understanding Role and Responsibilities of Storage and VMware Admin

Module-12

Deep-Dive into VMFS and RDM based Virtual Storage

- Understanding VMFS clustering filesystem and its benefits
- Understanding VMFS file locking and SCSI reservation mechanism
- Creating and managing VMFS Datastores
- Understanding differences between VMFS-3, VMFS-5 and VMFS-6
- Dynamically growing VMFS datastore using additional Extents
- Creating and managing VMware NFS Datastores
- Understanding differences between NFSv3 and NFSv4.1
- Analyzing VMFS vs NFS Datastore use cases and implementation
- Understanding Storage Multipathing policies like MRU, FP, RR
- Understanding Active-Active and Active-Passive Storage Array
- Understanding Raw Device Mapping and Its use cases
- Creating RDM and providing Virtual Machines direct access to SAN
- Comparative study of VMFS vs RDM and its relevant use cases

Module-13

Deep-Dive into vSphere vMotion, svMotion and xvMotion

- Understanding the Use Cases of vMotion
- Understanding vMotion CPU, Storage and Network requirements
- Deep-Dive into vMotion Architecture and Its detailed workflow
- Understanding the Use Cases of Storage vMotion
- Deep-Dive into Storage vMotion Architecture and its detailed workflow
- Understanding Use Cases of Shared Nothing vMotion
- Deep-Dive into Shared Nothing vMotion and Its detailed workflow
- Performing vMotion, svMotion and xvMotion
- Discussing Best Practices of vMotion, svMotion and xvMotion
- Overview of Cross VC and Long Distance vMotion

Module-14

Deep-Dive into vSphere CPU and Memory Virtualization Techniques

- Understanding ESXi shared resources Architecture
- Understanding CPU virtualization concepts
- Understanding Socket and Core terminology in CPU world
- Understanding how VM workloads gets mapped from vCPU to pCPU
- Demystifying No of Sockets vs Core per Socket concepts
- CPU overcommittment and how it impacts VM performance
- Understanding CPU hyperthreading and NUMA architecture
- Understanding NUMA architecture and its performance implications
- Understanding Memory Virtualization Concepts
- Understanding ESXi Memory Ballooning and TPS Techniques
- Understanding ESXi Memory Compression and Swap Memory Techniques

Module-15

Deep-Dive into vSphere Resource Management and Monitoring

- Understanding CPU Shares and Limits and how it works
- Understanding Memory Reservation and how it works
- Understanding Resource Pool and Its Use Cases
- Understanding Standard and Expandable Reservation
- Understanding Resource Pool and VM level Reservations
- Understanding NETIOC and its Use Cases
- Understanding SIOC and its Use Cases

Module-16

Performance Optimization with DRS Enabled Cluster

- Understanding vSphere Clustering and Its Use Cases
- Understanding Cluster EVC mode and its Use Cases
- Understanding vSphere DRS and Its Use Cases and Requirements
- Deep-Dive into DRS Recommendation Engine Algorithm
- Configuring and Managing DRS enabled Cluster
- Understanding DRS recommendation for VM placement and Load Distribution
- Understanding DRS Affinity and Anti-Affinity Rules and its Use Cases
- Configuring DRS VM and Host Group based rules
- Understanding vSphere DPM and its Use Cases
- Interoperability between DRS and DPM enabled Cluster
- Best practices for DRS enabled Cluster

Module-17

Implementing High Availability with VMware HA

- Understanding the vSphere HA Requirements and its Use Cases
- Deep-Dive into vSphere HA Architecture and its components
- Understanding vSphere HA networking and datastore heartbeat mechanism
- Understanding vSphere HA Host Isolation, Network Partitioning scenarios and VM impact
- Understanding vSphere HA Master and Slave failure scenarios and VM impact
- Configuring and Manage HA enabled Cluster
- Understanding vSphere HA Admissions Control and its Use cases
- Understanding Percent based resource and HA failover hosts policies
- Interoperability between vSphere HA and DRS enabled cluster
- Best practices for HA enabled Cluster

Module-18

Protecting Mission Critical Application with vSphere Fault Tolerance

- Understanding vSphere Fault Tolerance and its Use Cases
- Understanding Hardware requirements of vSphere FT
- Deep-Dive into vSphere FT Architecture and Its Limitations
- Understanding Primary and Secondary FT VM creation and Failover
- Configuring and Managing FT enabled Cluster
- Interoperability of vSphere FT with vSphere HA
- Simulating Host Failure scenario to validate Fault Protection
- Best practices for vSphere Fault Tolerance

Module-19

Patching and Upgrade using vSphere Update Manager

- Understanding vSphere Update Manager and its Use Cases
- Understanding VUM components and its capabilities
- Configuring vSphere Update Manager for Host Upgradation
- Understanding Fixed vs Dynamic Baseline
- Understanding Staging vs Remediation operations
- Understanding Host Maintenance Mode
- Best Practices of vSphere Update Manager

Module-20

ESXi Firewall and Security

- Understanding ESXi Lockdown Mode
- Enabling/Disabling ESXi services such as SSH, ESXi Shell
- Secure ESXi using Firewall
- Understanding Acceptance level of Host VIBs
- Customizing ESXi services from security profile

Module-21

Understanding and Using VMware Tasks, Events and Alarms

- Understanding Tasks, Events and Alarms
- Configuring user-defined Alarms
- Viewing, filtering and exporting Tasks and Events
- Adding and Managing Alarms
- Scheduling Tasks using vCenter Scheduler

Module-22

vSphere Permissions and User Management Tasks

- Understanding Authorization in vSphere
- Managing Permissions for vCenter Components
- Understanding Global Permissions
- Creating User Roles and Permissions
- Assigning Roles to User and Groups

Module-23

Basic vSphere Troubleshooting

- Troubleshooting basic Host Networking issue using DCUI
- Troubleshooting basic Host Not Responding issue using DCUI
- Troubleshooting basic issues using ESXCLI command line Interface
- Troubleshooting and Analyzing ESXi logs using DCUI interface
- Troubleshooting Virtual Machine basic power on/off issues
- Troubleshooting Virtual Machine basic connectivity issues
- Troubleshooting Virtual Machines CPU alignment issues
- Troubleshooting ESXi and vCenter Server communication issues
- Troubleshooting vCenter Server basic connectivity issues
- Troubleshooting Virtual Machine basic networking issues
- Troubleshooting basic VLAN and Teaming related issues
- Troubleshooting vSphere Networking misconfiguration issues
- Troubleshooting basic VMFS datastore connectivity issues
- Troubleshooting basic LUN discovery issues in vSphere Environment

Module-24

Basic vSphere Design Recommendations and Best Practices

- vCenter Deployment Recommendations and Best Practices
- Virtual Machine Snapshot Recommendations and Best Practices
- Virtual Machine Bulk Deployment Recommendations and Best Practices
- vSphere Networking Design Recommendations and Best Practices
- vSphere Networking Policies Recommendations and Best Practices
- vSphere Storage Deployment Recommendations and Best Practices
- vSphere vMotion and svMotion Design Recommendations and Best Practices
- vSphere Clustering Deployment Recommendations and Best Practices
- vSphere HA Design Recommendations and Best Practices
- vSphere DRS Design Recommendations and Best Practices
- vSphere FT Design Recommendations and Best Practices
- vSphere Update Manager Recommendations and Best Practices

Module-25

VMware Interview Preparation Tips and Tricks

- Discussing ESXi architecture related interview questions
- Discussing vCenter Deployment related interview questions
- Discussing Virtual Machine files and deployment related interview questions
- Discussing Virtual Machine Snapshot related interview questions
- Discussing vSphere Networking related interview questions
- Discussing vSphere Networking Policies related interview questions
- Discussing vSphere Storage related interview questions
- Discussing vSphere Clustering related interview questions
- Discussing vSphere vMotion and svMotion related interview questions
- Discussing vSphere HA related interview questions
- Discussing vSphere DRS related interview questions
- Discussing vSphere FT related interview questions
- Discussing vSphere Update Manager related interview questions.
- Discussing vSphere Security and Hardening related interview questions