**Section 1:** Configure and Administer vSphere 6.x Security

**+ Objective 1.1:** Configure and Administer Role-based Access Control

Knowledge

* Compare and contrast propagated and explicit permission assignments
* View/Sort/Export user and group lists
* Add/Modify/Remove permissions for users and groups on vCenter Server inventory objects
* Determine how permissions are applied and inherited in vCenter Server
* Create/Clone/Edit vCenter Server Roles
* Configure VMware Directory Service
* Apply a role to a User/Group and to an object or group of objects
* Change permission validation settings
* Determine the appropriate set of privileges for common tasks in vCenter Server
* Compare and contrast default system/sample roles
* Determine the correct permissions needed to integrate vCenter Server with other VMware products

**+ Objective 1.2:** Secure ESXi, vCenter Server, and vSphere Virtual Machines

Knowledge

* Harden virtual machine access
	+ Control VMware Tools installation
	+ Control VM data access
	+ Configure virtual machine security policies
* Harden a virtual machine against Denial-of-Service attacks
	+ Control VM-VM communications
	+ Control VM device connections
	+ Configure network security policies
* Harden ESXi Hosts
	+ Enable/Configure/Disable services in the ESXi firewall
	+ Change default account access
	+ Add an ESXi Host to a directory service
	+ Apply permissions to ESXi Hosts using Host Profiles
	+ Enable Lockdown Mode
	+ Control access to hosts (DCUI/Shell/SSH/MOB)
* Harden vCenter Server
	+ Control datastore browser access
	+ Create/Manage vCenter Server Security Certificates
	+ Control MOB access
	+ Change default account access
	+ Restrict administrative privileges
* Understand the implications of securing a vSphere environment

**+ Objective 1.3:** Enable SSO and Active Directory Integration

Knowledge

* Describe SSO architecture and components
* Differentiate available authentication methods with VMware vCenter
* Perform a multi-site SSO installation
* Configure/Manage Active Directory Authentication
* Configure/Manage Platform Services Controller (PSC)
* Configure/Manage VMware Certificate Authority (VMCA)
* Enable/Disable Single Sign-On (SSO) Users
* Upgrade a single/multi-site SSO installation
* Configure SSO policies
* Add/Edit/Remove SSO identity sources
* Add an ESXi Host to an AD domain

**+ Section 2:** Configure and Administer Advanced vSphere 6.x Networking

**+Objective 2.1:** Configure Advanced Policies/Features and Verify Network Virtualization Implementation

Knowledge

* Create/Delete a vSphere Distributed Switch
* Add/Remove ESXi Hosts from a vSphere Distributed Switch
* Add/Configure/Remove dvPort groups
* Add/Remove uplink adapters to dvUplink groups
* Configure vSphere Distributed Switch general and dvPort group settings
* Create/Configure/Remove virtual adapters
* Migrate virtual machines to/from a vSphere Distributed Switch
* Configure LACP on vDS given design parameters
* Describe vDS Security Polices/Settings
* Configure dvPort group blocking policies
* Configure load balancing and failover policies
* Configure VLAN/PVLAN settings for VMs given communication requirements
* Configure traffic shaping policies
* Enable TCP Segmentation Offload support for a virtual machine
* Enable Jumbo Frames support on appropriate components
* Recognize behavior of vDS Auto-Rollback
* Configure vDS across multiple vCenter Servers to support [Long Distance vMotion]
* Compare and contrast vSphere Distributed Switch (vDS) capabilities

**+Objective 2.2:** Configure Network I/O Control (NIOC)

* Define NIOC
* Explain NIOC capabilities
* Configure NIOC shares/limits based on VM requirements
* Explain the behaviour of a given NIOC setting
* Determine Network I/O Control requirements
* Differentiate Network I/O Control capabilities
* Enable/Disable Network I/O Control
* Monitor Network I/O Control

**+ Section 3:** Configure and Administer Advanced vSphere 6.x Storage

**+ Objective 3.1:** Manage vSphere Storage Virtualization

* Discover new storage LUNs
* Configure iSCSI/ LUNs as ESXi boot devices
* Create an NFS share for use with vSphere
* Enable/Configure/Disable vCenter Server storage filters
* Configure/Edit hardware/dependent hardware initiators
* Enable/Disable software iSCSI initiator
* Configure/Edit software iSCSI initiator settings
* Configure iSCSI port binding
* Enable/Configure/Disable iSCSI CHAP
* Determine use cases for fiber channel zoning
* Compare and contrast array thin provisioning and virtual disk thin provisioning

**+ Objective 3.2:** Configure vSphere Storage Multi-pathing and Failover

Knowledge

* Explain common multi-pathing components
* Differentiate APD and PDL states
* Given a scenario, compare and contrast Active Optimized vs. Active non-Optimized port group states
* Explain features of Pluggable Storage Architecture (PSA)
* Understand the effects of a given claim rule on multipathing and failover
* Explain the function of claim rule elements:
	+ Vendor
	+ Model
	+ Device ID
	+ SATP
	+ PSP
* Change the Path Selection Policy using the UI
* Determine required claim rule elements to change the default PSP
* Determine the effect of changing PSP on Multipathing and failover
* Determine the effects of changing SATP on relevant device behavior
* Configure/Manage Storage Load Balancing
* Differentiate available Storage Load Balancing options
* Differentiate available Storage Multi-pathing Policies
* Configure Storage Policies
* Locate failover events in the UI

**+ Objective 3.5:** Setup and Configure Storage I/O Control

Knowledge

* Describe the benefits of SIOC
* Enable and configure SIOC
* Configure/Manage SIOC
* Monitor SIOC
* Differentiate between SIOC and Dynamic Queue Depth Throttling features
* Given a scenario, determine a proper use case for SIOC
* Compare and contrast the effects of I/O contention in environments with and without SIOC

**+ Section 4:** Upgrade a vSphere Deployment to 6.x

**+ Objective 4.1:** Perform ESXi Host and Virtual Machine Upgrades

Knowledge

* Configure download source(s)
* Setup UMDS to setup download repository
* Import ESXi images
* Create Baselines and/or Baseline groups
* Attach Baselines to vSphere objects
* Scan vSphere objects
* Stage patches & Extensions
* Remediate an object
* Upgrade a vSphere Distributed Switch
* Upgrade VMware Tools
* Upgrade Virtual Machine hardware
* Upgrade an ESXi Host using vCenter Update Manager
* Stage multiple ESXi Host upgrades
* Align appropriate baselines with target inventory objects.

**+ Objective 4.2:** Perform vCenter Server Upgrades

Knowledge

* Compare the methods of upgrading vCenter Server
* Backup vCenter Server database, configuration and certificate datastore
* Perform update as prescribed for Appliance or Installable
* Upgrade vCenter Server Appliance (vCSA)
* Given a scenario, determine the upgrade compatibility of an environment
* Determine correct order of steps to upgrade a vSphere implementation

**+ Section 5:** Administer and Manage vSphere 6.x Resources

**+ Objective 5.1:** Configure Advanced/Multilevel Resource Pools

Knowledge

* Determine the effect of the Expandable Reservation parameter on resource allocation
* Create a resource pool hierarchical structure
* Configure custom resource pool attributes
* Determine how resource pools apply to vApps
* Describe vFlash architecture
* Create/Remove a Resource Pool
* Add/Remove virtual machines from a Resource Pool
* Create/Delete vFlash Resource Pool
* Assign vFlash resources to VMDKs
* Given a scenario, determine appropriate shares, reservations and limits for hierarchical Resource Pools

**+ Section 6:** Backup and Recover a vSphere Deployment

**+ Objective 6.1:** Configure and Administer a vSphere Backups/Restore/Replication Solution

Knowledge

* Compare and contrast vSphere Replication compression methods
* Differentiate VMware Data Protection capabilities
* Configure recovery point objective (RPO) for a protected virtual machine
* Explain VMware Data Protection sizing guidelines
* Create/Delete/Consolidate virtual machine snapshots
* Install and Configure VMware Data Protection
* Create a backup job with VMware Data Protection
* Backup/Restore a virtual machine with VMware Data Protection
* Install/Configure/Upgrade vSphere Replication
* Configure VMware Certificate Authority (VMCA) integration with vSphere Replication
* Configure vSphere Replication for Single/Multiple VMs
* Recover a VM using vSphere Replication
* Perform a failback operation using vSphere Replication
* Deploy a pair of vSphere Replication virtual appliances

**+ Section 7:** Troubleshoot a vSphere Deployment

**+ Objective 7.1:** Troubleshoot vCenter Server, ESXi Hosts, and Virtual Machines

Knowledge

* Monitor status of the vCenter Server service
* Perform basic maintenance of a vCenter Server database
* Monitor status of ESXi management agents
* Determine ESXi Host stability issues and gather diagnostics information
* Monitor ESXi system health
* Locate and analyze vCenter Server and ESXi logs
* Determine the appropriate Command Line Interface (CLI) command for a given troubleshooting task
* Troubleshoot common issues, including:
	+ vCenter Server service
	+ SSO
	+ vCenter Server connectivity
	+ Virtual machine resource contention, configuration and operation
	+ Platform Services Controller (PSC)
	+ Problems with installation
	+ VMware Tools installation
	+ Fault Tolerant network latency

**+ Objective 7.2:** Troubleshoot vSphere Storage and Network Issues

Knowledge

* Identify and isolate network and storage resource contention and latency issues
* Monitor networking and storage resources using vROps alerts and all badges
* Verify network and storage configuration
* Verify a given virtual machine is configured with the correct network resources
* Monitor/Troubleshoot Storage Distributed Resource Scheduler (SDRS) issues
* Recognize the impact of network and storage I/O control configurations
* Recognize a connectivity issue caused by a VLAN/PVLAN
* Troubleshoot common issues with:
	+ Storage and network
	+ Virtual switch and port group configuration
	+ Physical network adapter configuration
	+ VMFS metadata consistency

**+ Objective 7.3:** Troubleshoot vSphere Upgrades

* Collect upgrade diagnostic information
* Recognize common upgrade issues with vCenter Server and vCenter Server Appliance
* Create/Locate/Analyze VMware log bundles
* Determine alternative methods to upgrade ESXi Hosts in event of failure
* Configure vCenter Server logging options

**+ Objective 7.4:** Troubleshoot and Monitor vSphere Performance

* Monitor CPU and memory usage (including vRealize OM badges and alerts)
* Identify and isolate CPU and memory contention issues
* Recognize impact of using CPU/memory limits, reservations and shares
* Describe and differentiate critical performance metrics
* Describe and differentiate common metrics, including:
	+ Memory
	+ CPU
	+ Network
	+ Storage
* Monitor performance through esxtop
* Troubleshoot Enhanced vMotion Compatibility (EVC) issues
* Troubleshoot virtual machine performance with vRealize Operations
* Compare and contrast Overview and Advanced Charts

**+ Objective 7.5:** Troubleshoot HA and DRS Configurations and Fault Tolerance

* Troubleshoot issues with:
	+ DRS workload balancing
	+ HA failover/redundancy, capacity and network configuration
	+ HA/DRS cluster configuration
	+ vMotion/Storage vMotion configuration and/or migration
	+ Fault Tolerance configuration and failover issues
* Explain the DRS Resource Distribution Graph and Target/Current Host Load Deviation
* Explain vMotion Resource Maps

**+ Section 8:** Deploy and Consolidate vSphere Data Center

**+ Objective 8.1:** Deploy ESXi Hosts Using Autodeploy

* Describe the components and architecture of an Auto Deploy environment
* Use Auto Deploy Image Builder and PowerCLI scripts
* Implement Host Profiles with an Auto Deploy of an ESXi Host
* Install and configure Auto Deploy
* Understand PowerCLI cmdlets for Auto Deploy
* Deploy multiple ESXi Hosts using Auto Deploy
* Given a scenario, explain the Auto Deploy deployment model needed to meet a business requirement

**+ Objective 8.2:** Customize Host Profile Settings

* Edit answer file to customize ESXi Host settings
* Modify and apply a storage path selection plugin (PSP) to a device using host profiles
* Modify and apply switch configurations across multiple hosts using a Host Profile
* Create/Edit/Remove a Host Profile from an ESXi Host
* Import/Export a Host Profile
* Attach and apply a Host Profile to ESXi Hosts in a cluster
* Perform compliance scanning and remediation of an ESXi Hosts and clusters using Host Profiles
* Enable or disable Host Profile components

**+ Objective 8.3:** Consolidate Physical Workloads using VMware Converter

Knowledge

* Install vCenter Converter standalone instance
* Convert physical workloads using vCenter Converter
* Modify server resources during conversion
* Interpret and correct errors during conversion
* Deploy a physical host as a virtual machine using vCenter Converter
* Collect diagnostic information during conversion operation
* Resize partitions during the conversion process
* Given a scenario, determine which virtual disk format to use

**+ Section 9:** Configure and Administer vSphere Availability Solutions

**+ Objective 9.1:** Configure Advanced vSphere HA Features

Knowledge

* Modify vSphere HA advanced cluster settings
* Configure a network for use with HA heartbeats
* Apply an admission control policy for HA
* Enable/disable advanced vSphere HA settings
* Configure different heartbeat datastores for an HA cluster
* Apply virtual machine monitoring for a cluster
* Configure Virtual Machine Component Protection (VMCP) settings
* Implement vSphere HA on a Virtual SAN cluster
* Explain how vSphere HA communicates with Distributed Resource Scheduler and Distributed Power Management

**+ Objective 9.2:** Configure Advanced vSphere DRS Features

Knowledge

* Configure VM-Host affinity/anti-affinity rules
* Configure VM-VM affinity/anti-affinity rules
* Add/remove Host DRS Group
* Add/remove virtual machine DRS Group
* Enable/disable Distributed Resource Scheduler (DRS) affinity rules
* Configure the proper Distributed Resource Scheduler (DRS) automation level based on a set of business requirements
* Explain how DRS affinity rules effect virtual machine placement

**+ Section 10:** Administer and Manage vSphere Virtual Machines

**+ Objective 10.1:** Configure Advanced vSphere Virtual Machine Settings

* Determine how using a shared USB device impacts the environment
* Configure virtual machines for multicore vCPUs
* Differentiate virtual machine configuration settings
* Interpret virtual machine configuration files (.vmx) settings
* Enable/disable advanced virtual machine settings

Duration : 40hours

Cost: 30k