vmware EDUCATION SERVICES

VMware Certified Professional 6.5 – Data Center Virtualization Exam

Exam Preparation Guide

Exam Code: 2V0-622
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Disclaimer:
This preparation guide is intended to provide information about the objectives covered by this exam, as well as related resources. The material contained within this guide is not intended to guarantee that a passing score will be achieved on the exam. VMware recommends that a candidate thoroughly understands the objectives indicated in this guide and utilizes the resources recommended in this guide to gain that understanding.

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1 The Exam

1.1 Purpose of Exam

The VMware Data Center Virtualization (6.5) Exam (2V0-622) tests candidates on their skills and abilities to install, configure, and manage vCenter Server, ESXi hosts, and virtual machines using the appropriate VMware tools. Successful candidates demonstrate mastery of these skills and abilities.

1.2 Intended Audience

A minimally qualified candidate (MQC) achieving the VMware Certified Professional 6 in Data Center Virtualization has approximately six months' experience working with a vSphere implementation, and more than 1 year of IT industry experience, and is capable of installing, configuring, monitoring, and managing a vSphere solution. The candidate is also capable of deploying and configuring vSphere storage, networking, security, and compute resources as well as creating and administering vSphere virtual machines. Candidates should have basic knowledge of optimizing, securing, and troubleshooting for all components of the implementation. A given solution may include any or all of these products:

- vCenter Server Standard
- ESXi Enterprise Plus
- vRealize Log Insight
- VMware Virtual SAN

2 Objectives covered in the VMware VCP6.5 - Data Center Virtualization Exam

Prior to taking this exam, candidates should understand each of the following objectives. Each objective is listed below:

Section 1 - Configure and Administer vSphere 6.x Security

Objective 1.1 – Configure and Administer Role-based Access Control

- ☐ 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 Identity Sources
- ☐ 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 and vCenter Server

- ☐ Configure Encrypted vMotion
- ☐ Describe Secure Boot
- ☐ 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 –Configure and Enable SSO and Identity Sources

- ☐ Describe PSC architecture and components
- ☐ Differentiate available authentication methods with VMware vCenter
- ☐ Perform a multi-site PSC installation
- ☐ Configure/Manage Identity Sources
- ☐ Configure/Manage Platform Services Controller (PSC)
- ☐ Configure/Manage VMware Certificate Authority (VMCA)
- ☐ Enable/Disable Single Sign-On (SSO) Users
- ☐ Upgrade a single/complex PSC installation
- ☐ Configure SSO policies
- ☐ Add an ESXi host to an AD domain
- ☐ Configure and Manage KMS for VM Encryption

Objective 1.4 – Secure vSphere Virtual Machines

- ☐ Enable/Disable Virtual Machine Encryption
- ☐ Describe Secure Boot
- ☐ 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
- ☐ Configure encrypted vMotion

Section 2 – Configure and Administer vSphere 6.x Networking

Objective 2.1 – Configure policies/features and verify vSphere networking

- ☐ 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 vCenters to support [Long Distance vMotion]
- ☐ Compare and contrast vSphere Distributed Switch (vDS) capabilities
- ☐ Configure multiple VMkernel Default Gateways
- ☐ Configure ERSPAN
- ☐ Create and configure custom TCP/IP Stacks
- ☐ Configure Netflow

Objective 2.2 – Configure Network I/O control (NIOC)

- ☐ Explain NIOC capabilities
- ☐ Configure NIOC shares/limits based on VM requirements
- ☐ Explain the behavior 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 vSphere 6.x Storage

Objective 3.1 – Manage vSphere Integration with Physical Storage

- ☐ Perform NFS v3 and v4.1 configurations
- ☐ Discover new storage LUNs
- ☐ Configure FC/iSCSI/FCoE LUNs as ESXi boot devices
- ☐ Mount 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 Software-Defined Storage

- ☐ Create vSAN cluster
- ☐ Create disk groups
- ☐ Monitor vSAN
- ☐ Describe vVOLs
- ☐ Understand a vSAN iSCSI target
- ☐ Explain vSAN and vVOL architectural components
- ☐ Determine the role of storage providers in vSAN
- ☐ Determine the role of storage providers in vVOLs
- ☐ Explain vSAN failure domains functionality
- ☐ Configure/Manage VMware vSAN
- ☐ Create/Modify VMware Virtual Volumes (vVOLs)
- ☐ Configure Storage Policies
- ☐ Enable/Disable vSAN Fault Domains
- ☐ Create Virtual Volumes given the workload and availability requirements
- ☐ Collect vSAN Observer output
- ☐ Create storage policies appropriate for given workloads and availability requirements
- ☐ Configure vVOLs Protocol Endpoints

Objective 3.3 – Configure vSphere Storage Multipathing and Failover

- ☐ Explain common multi-pathing components
- ☐ Differentiate APD and PDL states
- ☐ 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 multipathing policies
- ☐ Configure Storage Policies including vSphere Storage APIs for Storage Awareness
- ☐ Locate failover events in the UI

Objective 3.4 – Perform VMFS and NFS configurations and upgrades

- ☐ Perform VMFS v5 and v6 configurations
- ☐ Describe VAAI primitives for block devices and NAS
- ☐ Differentiate VMware file system technologies
- ☐ Migrate from VMFS5 to VMFS6
- ☐ Differentiate Physical Mode RDMs and Virtual Mode RDMs
- ☐ Create a Virtual/Physical Mode RDM
- ☐ Differentiate NFS 3.x and 4.1 capabilities
- ☐ Compare and contrast VMFS and NFS datastore properties
- ☐ Configure Bus Sharing
- ☐ Configure Multi-writer locking
- ☐ Connect an NFS 4.1 datastore using Kerberos
- ☐ Create/Rename/Delete/Unmount VMFS datastores
- ☐ Mount/Unmount an NFS datastore
- ☐ Extend/Expand VMFS datastores
- ☐ Place a VMFS datastore in Maintenance Mode
- ☐ Select the Preferred Path/Disable a Path to a VMFS datastore
- ☐ Enable/Disable vStorage API for Array Integration (VAAI)
- ☐ Determine a proper use case for multiple VMFS/NFS datastores

Objective 3.5 – Set up and Configure Storage I/O Control (SIOC)

- ☐ Describe the benefits of SIOC
- ☐ Enable and configure SIOC
- ☐ Configure/Manage SIOC
- ☐ Monitor SIOC
- ☐ Differentiate between SIOC and Dynamic Queue Depth Throttling features
- ☐ Determine a proper use case for SIOC
- ☐ Compare and contrast the effects of I/O contention in environments with and without SIOC
- ☐ Understand SIOC metrics for Datastore Clusters and Storage DRS

Section 4 – Upgrade a vSphere Deployment to 6.x

Objective 4.1 – Perform ESXi Host and Virtual Machine Upgrades

- ☐ Configure download source(s)
- ☐ Set up UMDS to set up download repository
- ☐ Import ESXi images
- ☐ Create Baselines and/or Baseline groups
- ☐ Attach Baselines to vSphere objects
- ☐ Scan vSphere objects

- ☐ Stage Patches and 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 (Windows)

- ☐ Compare the methods of upgrading vCenter Server
- ☐ Backup vCenter Server database, configuration and certificate datastore
- ☐ Perform update as prescribed
- ☐ Upgrade vCenter Server
- ☐ Determine the upgrade compatibility of an environment
- ☐ Determine correct order of steps to upgrade a vSphere implementation

Objective 4.3 – Perform vCenter Server migration to VCSA

- ☐ Migrate to vCSA
- ☐ Understand the migration paths to the vCSA

Section 5 – Administer and Manage vSphere 6.x Resources

Objective 5.1 –Configure Multilevel Resource Pools

- ☐ 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
- ☐ Create/Remove a Resource Pool
- ☐ Add/Remove virtual machines from a Resource Pool
- ☐ Determine appropriate shares, reservations and limits for hierarchical Resource Pools

Objective 5.2 – Configure vSphere DRS and Storage DRS Clusters

- ☐ Add/remove Host DRS Group
- ☐ Add/remove virtual machine DRS Group
- ☐ Manage DRS affinity/anti-affinity rules
- ☐ Configure the proper DRS automation level based on a set of business requirements
- ☐ Explain how DRS affinity rules effect virtual machine placement
- ☐ Understand Network DRS
- ☐ Differentiate load balancing policies
- ☐ Describe Predictive DRS

Section 6 – Back up and Recover a vSphere Deployment

Objective 6.1 – Configure and Administer vCenter Appliance Backup/Restore

- ☐ Configure vCSA File-based Backup and Restore
- ☐ Define supported backup targets

Objective 6.2 – Configure and Administer vCenter Data Protection

- ☐ Deploy VDP Application Agents
- ☐ Differentiate VMware Data Protection capabilities
- ☐ 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

Objective 6.3 – Configure vSphere Replication

- ☐ Compare and contrast vSphere Replication compression methods
- ☐ Configure recovery point objective (RPO) for a protected virtual machine
- ☐ Manage snapshots on recovered virtual machines
- ☐ 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 and ESXi Hosts

- ☐ Understand VCSA monitoring tool
- ☐ Monitor status of the vCenter Server services
- ☐ 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 appropriate commands for troubleshooting
- ☐ Troubleshoot common issues, including:
    - vCenter Server services
    - Identity Sources
    - vCenter Server connectivity

- Virtual machine resource contention, configuration and operation
- Platform Services Controller (PSC)
- Problems with installation
- VMware Tools installation
- Fault Tolerant network latency
- KMS connectivity
- vCenter Certification Authority

Objective 7.2 – Troubleshoot vSphere Storage and Networking

- ☐ Identify and isolate network and storage resource contention and latency issues
- ☐ Verify network and storage configuration
- ☐ Verify that 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 and Migrations

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

Objective 7.4 – Troubleshoot Virtual Machines

- ☐ Monitor CPU and memory usage
- ☐ 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
- ☐ 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 Customize ESXi Hosts

Objective 8.1 – Configure Auto Deploy for ESXi Hosts

- ☐ Describe the components and architecture of an Auto Deploy environment
- ☐ Implement Host Profiles with an Auto Deploy of an ESXi host
- ☐ Install and configure Auto Deploy
- ☐ Deploy multiple ESXi hosts using Auto Deploy
- ☐ Explain the Auto Deploy deployment model needed to meet a business requirement

Objective 8.2 – Create and Deploy Host Profiles

- ☐ 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

Section 9 – Configure and Administer vSphere and vCenter Availability Solutions

Objective 9.1 – Configure vSphere HA Cluster Features

- ☐ Modify vSphere HA cluster settings
- ☐ Configure a network for use with HA heartbeats
- ☐ Apply an admission control policy for HA
- ☐ Enable/disable 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 vSAN cluster
- ☐ Explain how vSphere HA communicates with Distributed Resource Scheduler and Distributed Power Management

Objective 9.2 – Configure vCenter Server Appliance (VCSA) HA

- ☐ Enable and Configure vCSA HA
- ☐ Understand and describe the architecture of vCSA HA

Section 10 – Administer and Manage vSphere Virtual Machines

Objective 10.1 – Create and Manage vSphere Virtual Machines and Templates

- ☐ Determine how using a shared USB device impacts the environment
- ☐ Configure virtual machines for vGPUs, DirectPath I/O and SR-IOV
- ☐ Configure virtual machines for multicore vCPUs
- ☐ Differentiate virtual machine configuration settings
- ☐ Interpret virtual machine configuration files (.vmx) settings
- ☐ Enable/disable advanced virtual machine settings

Objective 10.2 – Create and Manage a Content Library

- ☐ Publish a content catalog
- ☐ Subscribe to a published catalog
- ☐ Determine which privileges are required to globally manage a content catalog
- ☐ Compare the functionality of Automatic sync and On-Demand sync
- ☐ Configure Content Library to work across sites
- ☐ Configure Content Library authentication
- ☐ Set/configure Content Library roles
- ☐ Add/remove Content Libraries

Objective 10.3 – Objective 10.3 is no longer covered in the exam content.

Objective 10.4 – Consolidate Physical Workloads using VMware vCenter Converter

- ☐ 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
- ☐ Determine which virtual disk format to use

3 Tools and References

The tools and references listed below were used to help write the exam items, and can be used to help prepare for the exam. All links were valid at the time of publication, but are subject to change. The tools listed contains information relevant to each respective objective. All objectives may also be referenced in other product documentation not specifically highlighted below. The candidate should be familiar with all relevant product documentation or have an equivalent skill set.

	1.1	1.2	1.3	1.4	2.1	2.2	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	5.1	5.2	6.1	6.2	6.3	7.1	7.2	7.3
vSphere Security	✓			✓																		
VMware Tools User Guide		✓		✓																		
Modify Default Expiry Time		✓																				
ESXi and vCenter Server 6.5 Documentation		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
What's new in VMware vSphere 6.5		✓		✓	✓				✓	✓						✓						
Beacon probing					✓																	
ESXi and vCenter Server 6.0 Documentation								✓		✓								✓				
VMware vSphere Hypervisor												✓										
Backing up and restoring ESXi configuration												✓										
VMware vSphere Flash Read Cache															✓							
Using ESXi Shell																				✓		
Enabling trivia logging in VMware vCenter Server																				✓		

	1.1	1.2	1.3	1.4	2.1	2.2	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	5.1	5.2	6.1	6.2	6.3	7.1	7.2	7.3
Stopping, starting, or restarting service in vCenter Server																				✓		
Using the pktcap-uw tool																					✓	
Collect diagnostic information																						✓

	7.4	7.5	8.1	8.2	9.1	9.2	10.1	10.2	10.4
ESXi and vCenter Server 6.5 Documentation	✓	✓	✓	✓	✓	✓	✓	✓	
Virtual machines appear as invalid or orphaned	✓								
vMotion failure	✓								
vSphere and vSphere with Operations Management				✓					
VMware Host Profiles: Technical Overview				✓					
What's New in vSphere 6.5: Host and Resource Management				✓	✓				
Stopping, starting, or restarting service in vCenter Server						✓			
VMware vCenter Converter Standalone User's Guide									✓

	7.4	7.5	8.1	8.2	9.1	9.2	10.1	10.2	10.4
Best practices for using and troubleshooting VMware Converter									✓

3.1 Practice Exam

Please be advised that the pass score for the practice exam is unrelated to the pass score for the actual exam.

The practice exam is located at http://www.vmwarecertificationmarketplace.com/VMware-Certified-Professional-6-5-p/mu_vcp6.5_dcv_p.htm

3.2 VCP Community

VMware provides an online community for VCP candidates. This community contains valuable information from other candidates and senior VCPs, and is moderated by VMware certification staff. The community is located here: VMware Certified Professional Community

3.3 Test Driving a VMware vSphere environment

VMware provides Hands-On Labs for VMware vSphere technologies. These labs provide an environment where you can work with the products covered in this exam. The labs can be accessed here: https://my.vmware.com/web/vmware/evalcenter?p=vsphere-hol.