# PEARSON IT CERTIFICATION





Practice Tests



Flash Cards





# **Cert Guide**

Advance your IT career with hands-on learning

# VCP-DCV for vSphere 8.x



# VCP-DCV for vSphere 8.x Cert Guide

### **Companion Website and Pearson Test Prep Access Code**

Access interactive study tools on this book's companion website, including practice test software, review exercises, Key Term flash card application, a study planner, and more!

To access the companion website, simply follow these steps:

- 1. Go to www.pearsonitcertification.com/register.
- 2. Enter the print book ISBN: 9780138169886.
- 3. Answer the security question to validate your purchase.
- 4. Go to your account page.
- 5. Click on the Registered Products tab.
- 6. Under the book listing, click on the Access Bonus Content link.

When you register your book, your Pearson Test Prep practice test access code will automatically be populated with the book listing under the Registered Products tab. You will need this code to access the practice test that comes with this book. You can redeem the code at **PearsonTestPrep.com**. Simply choose Pearson IT Certification as your product group and log into the site with the same credentials you used to register your book. Click the **Activate New Product** button and enter the access code. More detailed instructions on how to redeem your access code for both the online and desktop versions can be found on the companion website.

If you have any issues accessing the companion website or obtaining your Pearson Test Prep practice test access code, you can contact our support team by going to **pearsonitp.echelp.org**.

# VCP-DCV for vSphere 8.x Cert Guide

# **Table of Contents**

Cover

Title Page

Copyright Page

Contents at a Glance

Contents

Introduction

Part I: vSphere Architecture, Integration, and Requirements

Chapter 1: vSphere Overview, Components, and Requirements

Do I Know This Already? Quiz

Foundation Topics

vSphere Components and Editions

vSphere Components

Editions and Licenses

### vCenter Server Topology

Single Sign-On (SSO) Domain

Enhanced Linked Mode

vCenter HA

### Infrastructure Requirements

Compute and System Requirements

Storage Requirements

**Network Requirements** 

Infrastructure Services

### Other Requirements

Additional Requirements

vSphere Replication Requirements



vCenter High Availability Requirements

SDDC Requirements

### VMware Cloud vs. VMware Virtualization

Server Virtualization

**VMware SDDC** 

vCloud Suite and Private Clouds

VCF and Hybrid Clouds

VMC on AWS

VMware vCloud Director

**Cloud Automation** 

**Exam Preparation Tasks** 

Review All the Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Answer Review Questions** 

### Chapter 2: Storage Infrastructure

Do I Know This Already? Quiz

**Foundation Topics** 

### Storage Models and Datastore Types

How Virtual Machines Access Storage

Storage Virtualization: The Traditional Model

Software-Defined Storage Models

**Datastore Types** 

Storage in vSphere with Kubernetes

VMware NVMe

### vSAN Concepts

vSAN Characteristics

vSAN Terminology

What Is New in vSAN 7.0 and Newer

vSAN Deployment Options

vSAN Limitations

vSAN Space Efficiency



vSAN Encryption

vSAN File Service

vSAN Requirements

Other vSAN Considerations

### vSphere Storage Integration

**VASA** 

VAAI

Virtual Volumes (vVols)

### Storage Multipathing and Failover

Multipathing Overview

Pluggable Storage Architecture (PSA)

### Storage Policies

Storage Policy Based Management (SPBM)

Virtual Disk Types

vSAN-Specific Storage Policies

### Storage DRS (SDRS)

Initial Placement and Ongoing Balancing

Space Utilization Load Balancing

I/O Latency Load Balancing

SDRS Automation Level

SDRS Thresholds and Behavior

SDRS Recommendations

Anti-affinity Rules

**Datastore Cluster Requirements** 

NIOC, SIOC, and SDRS

### **Exam Preparation Tasks**

Review All Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 3: Network Infrastructure

Do I Know This Already? Quiz



### **Foundation Topics**

### Networking Terms and Concepts

Traditional Networking Terminology

Virtual NICs

Virtual Switch Concepts

**VLANs** 

### vSphere Standard Switch (vSS)

MTU

vSS Network Policies

**NIC Teaming Policies** 

**Network Security Policies** 

Traffic Shaping Policy

**VLAN Policies** 

### vSphere Distributed Switch (vDS)

Distributed Port Groups

**Uplink Port Groups** 

vSS and vDS Comparison

vDS Network Policies

Inbound Traffic Shaping

Port-Blocking Policies

Load-Based NIC Teaming

Resource Allocation Policy

NetFlow and Monitoring Policy

Traffic Filtering and Marking Policy

### vDS Settings and Features

Private VLANs

Data CenterLevel Management

Network Offloads Compatibility

Port State Monitoring

Port State with vMotion

Port Mirroring

Port Binding and Allocation

LACP Support



vDS Health Check

### Other vSphere Networking Features

Multicast Filtering Mode

Discovery Protocol

TCP Segmentation Offload

DirectPath I/O

Single Root I/O Virtualization (SR-IOV)

VMkernel Networking and TCP/IP Stacks

**Exam Preparation Tasks** 

Review All Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 4: Clusters and High Availability

Do I Know This Already? Quiz

**Foundation Topics** 

### Cluster Concepts and Overview

vSphere Cluster Services (vCLS)

Enhanced vMotion Compatibility (EVC)

vSAN Services

### Distributed Resource Scheduler (DRS)

Recent DRS Enhancements

**DRS Rules** 

**DRS Migration Sensitivity** 

Resource Pools

### vSphere High Availability (HA)

vSphere HA Requirements

vSphere HA Response to Failures

Heartbeats

vSphere HA Admission Control

vSphere HA Advanced Options

Virtual Machine Settings



VM Component Protection (VMCP)

Virtual Machine and Application Monitoring

vSphere HA Best Practices

Proactive HA

### Other Resource Management and Availability Features

Predictive DRS

Distributed Power Management (DPM)

Fault Tolerance (FT)

vCenter Server High Availability

VMware Service Lifecyle Manager

**Exam Preparation Tasks** 

Review All Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 5: vCenter Server Features and Virtual Machines

Do I Know This Already? Quiz

Foundation Topics

vCenter Server and vSphere

vSphere Managed Inventory Objects

Host Profiles

Content Libraries

### Virtual Machine File Structure

Configuration File

Virtual Disk Files

**Snapshot Files** 

### Virtual Machine Snapshots

**Snapshot Use Cases** 

What a Snapshot Preserves

Parent Snapshots

**Snapshot Behavior** 

Limitations



### Virtual Machine Settings

VM Hardware/Compatibility

Virtual Disk Provisioning

**VMware Tools** 

Virtual Machine Options

Virtual Machine Advanced Settings

### Virtual Machine Migration

Migrating Virtual Machines

vMotion Details

Storage vMotion Details

### Virtual Machine Cloning

Clones

Rapid Provisioning with Templates

Instant Clones

**Exam Preparation Tasks** 

Review All Key Topics

Complete Tables and Lists from Memory

**Define Key Terms** 

**Review Questions** 

### Chapter 6: VMware Product Integration

Do I Know This Already? Quiz

**Foundation Topics** 

vSphere Add-ons

vSphere with Tanzu

vSphere+

vCenter Converter

VMware vSphere Replication

VMware SkyLine

### Aria Suite

Aria Operations

Aria for Logs

Aria Automation



Aria Orchestrator

Aria Operations for Networks

### Desktop and Application Virtualization

VMware Horizon

App Volumes

### Replication and Disaster Recovery

vSphere Replication

Site Recovery Manager (SRM)

### Private, Public, and Hybrid Clouds

VMware Cloud Foundation (VCF)

VMware Hybrid Cloud Extension (HCX)

VMware Cloud (VMC) on AWS

Azure VMware Solution

### Networking and Security

NSX

**Exam Preparation Tasks** 

Review All Key Topics

Complete Tables and Lists from Memory

**Define Key Terms** 

**Review Questions** 

### Chapter 7: vSphere Security

Do I Know This Already? Quiz

**Foundation Topics** 

vSphere Certificates

vSphere Certificates Overview

Certificate Requirements

ESXi Host Certificates

### vSphere Permissions

Authentication and Authorization

Inventory Hierarchy and Objects

Privileges and Roles

Permissions



**Global Permissions** 

Best Practices for Roles and Permissions

Required Privileges for Common Tasks

How Permissions Are Applied by vCenter Server

### ESXi and vCenter Server Security

**Built-in Security Features** 

Security Profiles

ESXi Password Hardening

Joining an ESXi Host to a Directory Service

vSphere Authentication Proxy

ESXi Host Access

Control MOB Access

ESXi Secure Boot and TPM

vSphere Trust Authority (vTA)

vCenter Server Security

### vSphere Network Security

Firewalls

Segmentation and Isolation

Internet Protocol Security

### Virtual Machine Security

Virtual Machine Hardening Best Practices

Configuring UEFI Boot

Disabling Unexposed Features

Other Common Settings

Virtual Machine Risk Profiles

Protecting Virtual Machines Against Denial-of-Service Attacks

Controlling VM Device Connections

Virtual Machine Encryption

Encrypted vSphere vMotion

Virtual Trusted Platform Module (vTPM)

Virtual Intel Software Guard Extension (vSGX)

### Available Add-on Security

Compliance Using VMware Aria Operations



VMware NSX

**Exam Preparation Tasks** 

Review All the Key Topics

Complete Tables and Lists from Memory

**Define Key Terms** 

**Review Questions** 

# Part II: vSphere Installation/Configuration

### Chapter 8: vSphere Installation

Do I Know This Already? Quiz

**Foundation Topics** 

Installing ESXi Hosts

Installing ESXi Interactively

Scripted ESXi Installation

Using Auto Deploy

### Deploying vCenter Server Components

vCenter Server Database

Platform Services Controller (PSC)

vCenter Server Appliance

Configuring and Managing VMware Certificate Authority (VMCA)

### Configuring Single Sign-On (SSO)

SSO and Identity Sources Overview

Adding, Editing, and Removing SSO Identity Sources

Adding an Active Directory Identity Source

Adding an LDAP Authentication Source

Enabling and Disabling Single Sign-On (SSO) Users

Configuring SSO Policies

Configuring Identity Federation

### Initial vSphere Configuration

Implementing vSphere Client

Implementing VMware vSphere Lifecycle Manager

Configuring the vCenter Server Inventory



**Using Host Profiles** 

**VMware Tools** 

ESXi Configuration Settings

Advanced ESXi Host Options

**Exam Preparation Tasks** 

Review All the Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 9: Configuring and Managing Virtual Networks

Do I Know This Already? Quiz

**Foundation Topics** 

vSphere Standard Switches (vSS)

Creating and Configuring vSphere Standard Switches

Creating and Configuring Standard Port Groups

### vSphere Distributed Switches (vDS)

Creating and Configuring vSphere Distributed Switches

Creating and Configuring Distributed Port Groups

### VMkernel Networking

Configuring and Managing VMkernel Adapters

Configuring TCP/IP Stacks

### Configuring and Managing Networking Features

Configuring Network I/O Control (NIOC)

Creating a Network Resource Pool

Using Private VLANs

Using DirectPath I/O

Single Root I/O Virtualization (SR-IOV)

Configuring and Managing Port Mirroring

Configuring and Managing Link Aggregation Groups (LAGs)

### Managing Host Networking with vDS

Adding Hosts to a vDS

Managing Host Physical Network Adapters on a vDS



Migrating VMkernel Network Adapters to a vDS

Removing Hosts from a vDS

Migrating Virtual Machines to a vDS

Monitoring the State of Ports in a Distributed Port Group

Using the vDS Health Check

Networking Policies and Advanced Features

**Exam Preparation Tasks** 

Review All the Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

## Part III: vSphere Management and Optimization

### Chapter 10: Managing and Monitoring Clusters and Resources

Do I Know This Already? Quiz

Foundation Topics

### Creating and Configuring a vSphere Cluster

Creating a Cluster

Configuring a Cluster with Quickstart

**EVC Mode** 

### Creating and Configuring a vSphere DRS Cluster

Creating a vSphere DRS Cluster

Creating a Resource Pool

Configuring Advanced DRS Options

### Creating and Configuring a vSphere HA Cluster

Creating a vSphere HA Cluster

Configuring Advanced vSphere HA Options

Configuring vSphere HA Admission Control

Configuring VMCP

Configuring Virtual Machine and Application Monitoring

Configuring Proactive HA

Configuring vSphere Fault Tolerance

Monitoring and Managing vSphere Resources



Metrics

vSphere Client Performance Charts

Troubleshooting and Optimizing Performance

Monitoring and Managing Cluster Resources

Monitoring and Managing Resource Pool Resources

Monitoring and Managing Host Resources and Health

Monitoring and Managing Virtual Machine Resources

**ESXTOP** 

**VIMTOP** 

vCenter Server Management

### Events, Alarms, and Automated Actions

**Events** 

Viewing Events in the vSphere Client

Viewing the System Event Log

Streaming Events to a Remote Syslog Server

Alarms

Viewing and Acknowledging Triggered Alarms

Creating Alarm Definitions

Alarm Actions

Advanced Use Cases for Alarms

### Logging in vSphere

ESXi Logs

vCenter Server Logs

Uploading System Logs to VMware

Log Levels

Configuring Syslog on ESXi Hosts

vRealize Log Insight (vRLI)

### **Exam Preparation Tasks**

Review All the Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 11: Managing Storage



Do I Know This Already? Quiz

**Foundation Topics** 

Configuring and Managing vSAN

Preparing for vSAN

Creating a vSAN Cluster with Quickstart

Manually Enabling vSAN

Editing vSAN Settings

Licensing vSAN

Viewing a vSAN Datastore

Configuring vSAN and vSphere HA

Disabling vSAN

Shutting Down and Restarting vSAN

Deploying vSAN with vCenter Server

Expanding a vSAN Cluster

Working with Maintenance Mode

Managing vSAN Fault Domains

Extending a vSAN Datastore Across Two Sites

Managing Devices in a vSAN Cluster

Increasing Space Efficiency in a vSAN Cluster

Using Encryption in a vSAN Cluster

Using vSAN Policies

Viewing vSAN Storage Providers

Using vSAN File Service

### Managing Datastores

Managing VMFS Datastores

Managing Raw Device Mappings (RDMs)

Managing NFS Datastores

### Storage DRS and SIOC

Configuring and Managing Storage DRS

Configuring and Managing SIOC

### iSCSI, iSER, NVMe, and PMem

Managing iSCSI

Managing VMware NVMe



Managing PMem

### Multipathing, Storage Policies, and vVols

Managing Multipathing

Managing Storage Policies

Configuring and Managing vVols

**Exam Preparation Tasks** 

Review All the Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 12: Managing vSphere Security

Do I Know This Already? Quiz

Foundation Topics

### Configuring and Managing Authentication and Authorization

Managing SSO

Users and Groups

Privileges and Roles

Permissions

**Global Permissions** 

**Editing Permissions** 

### Configuring and Managing vSphere Certificates

Managing vSphere Client Certificates

Using Custom Certificates

Managing ESXi Certificates

### General ESXi Security Recommendations

Hardening Guidelines

Configuring ESXi Using Host Profiles

Using Scripts to Manage Host Configuration Settings

ESXi Passwords and Account Lockout

SSH and ESXi Shell Security

PCI and PCIe Devices and ESXi

Disabling the Managed Object Browser



ESXi Networking Security Recommendations

ESXi Web Proxy Settings

vSphere Auto Deploy Security Considerations

Controlling CIM Access

### Configuring and Managing ESXi Security

Configuring the ESXi Firewall

Customizing ESXi Services

Using Lockdown Mode

Managing the Acceptance Levels of Hosts and VIBs

Assigning Privileges for ESXi Hosts

Using Active Directory to Manage ESXi Users

Configuring vSphere Authentication Proxy

Configuring Smart Card Authentication for ESXi

Configuring UEFI Secure Boot for ESXi Hosts

Securing ESXi Hosts with Trusted Platform Module

Securing ESXi Log Files

### Additional Security Management

Key Management Server

Changing Permission Validation Settings

Configuring and Managing vSphere Trust Authority (vTA)

TLS 1.2

**FIPS** 

Securing Virtual Machines with Intel Software Guard Extensions (SGX)

Encrypting a Virtual Machine

**Exam Preparation Tasks** 

Review All the Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 13: Managing vSphere and vCenter Server

Do I Know This Already? Quiz

Foundation Topics



### vCenter Server Backup

Backing Up and Restoring vSphere with Tanzu

### Upgrading to vSphere 8.0

vCenter Server Data Transfer

Upgrading vCenter Server Appliance

Migrating vCenter Server for Windows to vCenter Server Appliance

Upgrading ESXi and Virtual Machines

Using Update Planner

### Using vSphere Lifecycle Manager

About VMware Update Manager

VMware Update Manager Download Service (UMDS)

Baselines and Images

ESXi Quick Boot

ESXi Firmware Updates

Hardware Compatibility Checks

**Exporting and Importing Cluster Images** 

Backup and Restore Scenarios

Upgrading Virtual Machines

### Managing ESXi Hosts

Monitoring and Managing vCenter Server

### Monitoring and Managing vCenter Server with the VAMI

Monitoring and Managing vCenter Server with the vSphere Client

Updating the vCenter Server

Managing a vCenter HA Cluster

Repointing a vCenter Server to Another Domain

### **Exam Preparation Tasks**

Review All the Key Topics

Complete Tables and Lists from Memory

Define Key Terms

**Review Questions** 

### Chapter 14: Managing Virtual Machines

Do I Know This Already? Quiz



### **Foundation Topics**

### Creating and Configuring Virtual Machines

Creating a New Virtual Machine

Powering On a VM

Opening a Console to a VM

Installing and Upgrading VMware Tools

Shutting Down a Guest

Cloning a Virtual Machine

Converting Between a VM and a Template

Deploying a Virtual Machine from a Template

Customizing the Guest OS

Deploying OVF/OVA Templates

### Managing Virtual Machines

Configuring Virtual Machine Hardware

**Editing Virtual Machine Options** 

Configuring Guest User Mappings

Editing OVF Details

Creating and Managing Virtual Machine Snapshots

Migrating Virtual Machines

### Advanced Virtual Machine Management

Managing OVF Templates

Virtualization-Based Security

Managing VMs by Using PowerCLI

Configuring VMs to Support vGPUs

Managing EVC Mode and CPU Affinity

### Content Libraries

Introduction to Content Libraries

Creating a Content Library

Publishing a Content Library

Subscribing to a Content Library

Content Library Permissions

Content Library Synchronization Options

Adding Items to a Content Library



Deploying VMs by Using a Content Library Managing VM Templates in a Content Library Exam Preparation Tasks Review All the Key Topics Complete Tables and Lists from Memory Define Key Terms **Review Questions** Chapter 15: Final Preparation **Getting Ready** Taking the Exam Appendix A: Answers to the Do I Know This Already? Quizzes and Review Questions Glossary Α В C D Ε F G Н M Ν O Ρ



Q

R

S

Т

U

٧

W

Ζ

Index

Online Elements

Appendix B: Memory Tables

Appendix C: Memory Table Answers

Appendix D: Study Planner