

Robert Schmidt and Dane Charlton

# VCA-DCV

## VMware® Certified Associate-Data Center Virtualization on vSphere STUDY GUIDE

EXAM VCAD-510

Covers 100% of exam objectives, including identifying and explaining the concept of data center virtualization, differentiating vSphere storage technologies, applying VMware data center virtualization solutions to common business challenges, and much more...

Includes interactive online learning environment and study tools with:

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# VCA-DCV

## VMware® Certified Associate-Data Center Virtualization on vSphere

### Study Guide



**Robert Schmidt**

**Dane Charlton**



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*Robert would like to dedicate this book to his wife and three daughters for putting up with him while he was locked in the basement writing it.*

*Dane would like to dedicate this book to his loving wife and best friend and to thank her for being there for him.*

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## About the Authors

**Robert Schmidt** holds the following certifications: Microsoft Certified Systems Engineer (MCSE), CompTIA Linux+, Novell Certified Network Administrator (CNA), VMware Certified Administrator (VCA), and VMware Certified Professional (VCP 2.5, 3, 4, 5). In the past, he has held the Certified Information Systems Security Professional (CISSP) and the Cisco Certified Network Administrator (CCNA) certifications.

Robert has over 20 years of experience working with information technology and has spent the last 10 years specializing in virtualization. He has been heavily involved in several large virtualization initiatives and continues to work in the Cleveland, Ohio area. He has been married for 19 years and has three daughters.

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Dane has over 25 years of experience working with information technology for small and large companies. For the last 15 years, he's been supporting virtualization efforts along with large messaging environments in Akron, Ohio. Dane has been married for 15 years and has three children and eight grandchildren.

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# Introduction

Welcome to the *VCA-DCV: VMware Certified Associate-Data Center Virtualization on vSphere Study Guide* for exam VCAD510. The purpose of this book is to help you prepare for the VCA-DCV exam by becoming familiar with the challenges that businesses face and the tools and technologies that are provided by VMware to help meet those challenges. Even though the book is primarily designed to help with the VCA-DCV, we hope it will also help administrators better understand some of the tools they could be using to make their lives easier as well as gain better insight into the tools that they are using.

We (the authors, Dane Charlton and Robert Schmidt) have extensive backgrounds in information technology and specialize in managing and maintaining large virtual environments. Together we have over 45 years of technology experience that we hope to share in this book.

The book contains all of the information you need to pass the VCA-DCV exam. It also includes notes and warnings to help reduce issues you may be experiencing in your own environment. By studying for and passing this exam, you will gain insight that will make you more valuable in your current position and more likely to get recognized and promoted.

In the remainder of this section, we will present some of the facts about the exam, give some commonsense tips for taking the exam, and review the process for registering.

## Exam Facts

Here are some facts for the VCA-DCV: VMware Certified Associate-Data Center Virtualization on vSphere Exam, VCAD510:

- The VCA-DCV exam is administered by Pearson VUE but is taken from home over the Internet.
- There are 50 multiple-choice questions.
- The passing score is 300 out of 500.
- There is a time limit of 75 minutes for the exam.
- There is a short survey before the exam begins (taking the survey does not use any of the available 75 minutes).
- If you do not pass the exam, you can retake it as many times as you want; no waiting period is required.

## **Tips for Taking the VCA-DCV Exam**

Here are some general tips for improving the odds on your certification exam:

- Read each question carefully. Although the test is not written to be confusing, at times the obvious choice is not the correct choice.
- Make sure you answer each question. Any unanswered questions are considered wrong, so you are better off making an educated guess than leaving a question unanswered.
- If you are unsure of the correct answer for a question, use a process of elimination to remove any obviously incorrect answers first. Once you have eliminated the obviously incorrect answers, take an educated guess from the remaining answers.
- If you are unsure about a question, select the answer you think is most likely to be correct, mark it for review,

and come back to it at a later time.

- Get a good night's sleep the night before the exam. This will help you be more alert and think more clearly during the exam.
- Before scheduling the exam, review the Exam Blueprint to make sure you understand each of the objectives and review any you are unsure of:

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## Exam Registration

You must take the following steps to register for the VCA-DCV exam:

1. Using a browser, navigate to the VCA-DCV web page:  
[https://mylearn.vmware.com/mgrReg/plan.cfm?plan=41162&ui=www\\_cert](https://mylearn.vmware.com/mgrReg/plan.cfm?plan=41162&ui=www_cert)
2. Click the Request Exam Authorization option. If you do not have a mylearn account, you will be prompted to create one.
3. Once your authorization for the exam is confirmed, you will be presented with your first name, last name, and candidate ID.
4. Go to the Pearson VUE website ([www.pearsonvue.com](http://www.pearsonvue.com)). Select the For Test Takers option and then input **VMware** as your program.
5. Select VCA-DCV and enter your first name, last name, and candidate ID.
6. Once you have registered for the exam, keep an eye out for an email with a link to the exam. You will have three days from registering to follow this link and take the exam.

VMware requires certification candidates to accept the terms of a nondisclosure agreement before taking certification exams.

## **Who Should Read This Book?**

This book is intended for individuals who want to earn their VCA-DCV: VMware Certified Associate-Data Center Virtualization on vSphere certification. It would also be useful for any VMware administrators who would like to have an introduction to VMware technologies that they may not use on a day-to-day basis in their current positions.

## **What's Inside?**

Here is a glance at what's in each chapter:

**Chapter 1: Intro to Virtualization** Introduces some of the basic concepts of VMware virtualization.

**Chapter 2: VMware Solutions** Shows the types of challenges that businesses face and some of the VMware tools that can help them meet these challenges.

**Chapter 3: vSphere Core Components** Introduces core technologies that the VMware virtualization suite comprises.

**Chapter 4: Storage in a VMware Environment** Introduces you to the types of storage that exist in a virtual environment and the tools for managing this storage.

**Chapter 5: Networking in a VMware Environment** Covers the types of networking technologies that are used in virtual environments and how to use VMware tools to manage them.

**Chapter 6: Business Challenges Meet VMware Solutions** Presents real-world scenarios of issues that

businesses face and discusses the VMware technologies and products that can be used to mitigate these challenges.

## **What's Included with the Book**

This book includes many helpful items intended to prepare you for the VCA-DCV: VMware Certified Associate-Data Center Virtualization on vSphere certification.

**Assessment Test** The Assessment Test at the conclusion of the book's introduction can be used to quickly evaluate where you are with VMware virtualization products. This test should be taken prior to beginning your work in this book, and it should help you identify areas in which you are either strong or weak. Note that these questions are purposely more simple than the types of questions you may see on the exams.

**Objective Map and Opening List of Objectives** At the start of this book is a detailed exam objective map showing you where each of the exam objectives is covered in this book. In addition, each chapter opens with a list of the exam objectives it covers. Use these to see exactly where each of the exam topics is covered.

**Exam Essentials** The end of each chapter provides a brief overview of the concepts covered in the chapter. We recommend reading through these sections carefully to check your recollection of each topic and returning to any sections of the chapter you're not confident about having mastered.

**Chapter Review Questions** Each chapter includes review questions. The material for these questions is pulled directly from information that was provided in the chapter. These questions are based on the exam objectives, and they are similar in difficulty to items you might receive on the VMware VCA-DCV exam.



## Interactive Online Learning Environment and Test Bank

The interactive online learning environment that accompanies *VCA-DCV: VMware Certified Associate—Data Center Virtualization on vSphere Study Guide* for exam VCAD510 provides a test bank with study tools to help you prepare for the certification exam and increase your chances of passing it the first time! The test bank includes the following:

**Sample Tests** All of the questions in this book are provided: the **Assessment Test**, which you'll find at the end of this introduction, and the **Chapter Tests** that include the Review Questions at the end of each chapter. In addition, there are two **Practice Exams**. Use these questions to test your knowledge of the Study Guide material. The online test bank runs on multiple devices.

**Flashcards** Questions are provided in digital flashcard format (a question followed by a single correct answer). You can use the flashcards to reinforce your learning and provide last-minute test prep before the exam.

**Other Study Tools** A glossary of key terms from this book is available as a fully searchable PDF.



Go to <http://sybextestbanks.wiley.com> to register and gain access to this interactive online learning environment and test bank with study tools.

## How to Use This Book

If you want a solid foundation for preparing for VCA-DCV exam VCAD510, then look no further. We've spent a lot of time putting together this book with the sole intention of helping you to pass the exam!

This book is loaded with valuable information. You'll get the most out of your study time if you follow this approach:

1. Take the assessment test immediately following this introduction. (The answers are at the end of the test, but no peeking!) It's OK if you don't know any of the answers—that's what this book is for. Carefully read over the explanations for any question you get wrong, and make note of the chapters where that material is covered.
2. Study each chapter carefully, making sure you fully understand the information and the exam objectives listed at the beginning of each one. Again, pay extra-close attention to any chapter that includes material covered in questions you missed on the assessment test.
3. Answer all the review questions related to each chapter. Specifically, note any questions that confuse you, and study the corresponding sections of the book again. And don't just skim these questions—make sure you understand each answer completely.
4. Test yourself using all the electronic flashcards. This is a brand-new and updated flashcard program to help you prepare for the latest VCA-DCV exam, and it is a really great study tool.

Learning every bit of the material in this book is going to require that you apply yourself with a good measure of discipline, so try to set aside the same time period every day to study, and select a comfortable and quiet place to do so. If you work hard, you will be surprised at how quickly you learn this material. If you follow the steps listed here and study with the review questions, practice exams, and electronic flashcards, you will increase your chances of passing the exam.

## **How to Contact Sybex**

Sybex strives to keep you supplied with the latest tools and information that you need for your work. Please check the website at <http://sybextestbanks.wiley.com>.

You can contact Robert Schmidt by email at [rschmidt1300@yahoo.com](mailto:rschmidt1300@yahoo.com).

You can contact Dane Charlton by email at [charles.twin@gmail.com](mailto:charles.twin@gmail.com).

## **VCAD510 Exam Objectives**

<b>Objective</b>	<b>Chapter</b>
<b>Section 1—Explain Data Center Virtualization Concepts and How They Solve Typical Business Challenges</b>	
<p>Objective 1.1—Identify and Explain the Concept of Data Center Virtualization</p> <ul style="list-style-type: none"> <li>▪ Explain data center virtualization</li> <li>▪ Differentiate physical and virtual data center components</li> <li>▪ Identify data center virtualization benefits</li> </ul>	1
<p>Objective 1.2—Identify Common Business Challenges Addressed By VMware Solutions</p> <ul style="list-style-type: none"> <li>▪ Identify common availability challenges</li> <li>▪ Identify common management challenges</li> <li>▪ Identify common scalability challenges</li> <li>▪ Identify common optimization challenges</li> </ul>	2
<b>Section 2—Identify, Explain, and Differentiate vSphere Technologies</b>	
<p>Objective 2.1—Identify vSphere Core Components</p> <ul style="list-style-type: none"> <li>▪ Explain the concept and capabilities of a virtual machine</li> <li>▪ Identify the purpose of ESXi and vCenter Server</li> <li>▪ Differentiate VMware migration technologies</li> </ul>	3

<ul style="list-style-type: none"> <li>▪ Differentiate VMware availability technologies</li> <li>▪ Explain the concepts of clusters and resource pools</li> <li>▪ Identify and explain common VMware data center products</li> </ul>	
<p>Objective 2.2—Differentiate vSphere Storage Technologies</p> <ul style="list-style-type: none"> <li>▪ Differentiate physical and virtual storage</li> <li>▪ Explain the use of shared storage in a vSphere implementation</li> <li>▪ Differentiate VMFS and NFS datastores</li> <li>▪ Explain thin provisioning</li> <li>▪ Differentiate VMware disaster-recovery/disaster-tolerance technologies</li> <li>▪ Identify capabilities of Storage I/O Control</li> <li>▪ Identify capabilities of Storage DRS</li> <li>▪ Explain VMware virtual storage technologies</li> </ul>	4
<p>Objective 2.3—Differentiate vSphere Networking Technologies</p> <ul style="list-style-type: none"> <li>▪ Differentiate physical and virtual networking</li> <li>▪ Differentiate VMware virtual switch technologies</li> <li>▪ Identify VMware virtual switch components</li> <li>▪ Identify common virtual switch policies</li> <li>▪ Identify capabilities of Network I/O Control</li> </ul>	5

**Section 3—Correlate VMware Data Center Virtualization Solutions with Specific Business Challenges**

Objective 3.1—Apply VMware Data Center Virtualization Solutions to Common Business Challenges

2, 6

- Apply VMware data center virtualization technologies to resolve common availability challenges
- Apply VMware data center virtualization technologies to resolve common management challenges
- Apply VMware data center virtualization technologies to resolve common optimization challenges
- Apply VMware data center virtualization technologies to resolve common scalability challenges
- Differentiate SMB and enterprise challenges and solutions

# Assessment Test

1. Which VMware technology can be used to migrate a virtual machine from one ESXi host to a different ESXi host?
  - A. Distributed Resource Scheduler (DRS)
  - B. Storage vMotion (svMotion)
  - C. vMotion
  - D. vSphere Replication
2. What challenges are resolved by leveraging vSphere? (Choose two.)
  - A. Office politics
  - B. Reducing power consumption
  - C. Reducing the number of physical devices
  - D. Generating revenue
3. You support all of the Windows servers in your company. However, there are only six servers in the entire organization. Two of the six servers run a critical application that must be up at all times. You decide to use VMware software to gain the benefits of virtualization. What VMware solution do you suggest to the application owner to address the uptime requirement?
  - A. vCenter high availability (HA)
  - B. vSphere Site Recovery Manager (SRM)
  - C. vSphere Data Protection
  - D. Fault tolerance (FT)

4. Mike is an administrator for a large corporation that has two main corporate offices and several branch offices spread across the country. The corporate offices use a number of VMware technologies that require the use of shared storage on the ESXi hosts. Purchasing new shared storage arrays for all the branch offices would be cost-prohibitive. Which of the following VMware technologies could be used to allow the branch offices to have shared storage without the additional cost of adding new storage arrays?
  - A. Memory ballooning
  - B. vFlash
  - C. vSphere Storage Appliance (VSA)
  - D. vSphere Replication
5. Which of the following is not a disadvantage of using local storage in a VMware environment?
  - A. vMotion does not work for virtual machines stored on local disks.
  - B. Local storage can be relatively expensive when compared to other storage types like Fibre Channel.
  - C. High availability (HA) cannot be used for virtual machines stored on local storage.
  - D. Local storage cannot be configured as a raw device mapping (RDM).
6. What VMware technology can you use to segment network traffic by creating multiple resource pools on a single network uplink?
  - A. Virtual switch
  - B. vCenter
  - C. Network I/O Control



- D. vMotion
7. Which one of the following is an example of a scalability challenge?
    - A. Ability to use features that require shared storage at branch offices
    - B. Compliance monitoring of the environment
    - C. Hardware failures
    - D. Reclaiming unused storage that has been allocated to servers
  8. IT management around the world is putting pressure on IT departments to do what? (Choose two.)
    - A. Reduce operating cost
    - B. Increase the number of physical servers
    - C. Improve system availability
    - D. Increase the complexity of the data center
  9. An application owner is running clustering software that will restart his protected applications on another server if the server they are running on fails. What is a VMware solution that can protect a virtual server from long outages due to hardware failures?
    - A. Virtual SAN
    - B. High availability (HA)
    - C. VMware Distributed Resource Scheduler (DRS)
    - D. vSphere Site Recovery Manager
  10. Bill is an administrator at Cheap Guy Corp. He has an ESXi host that currently has the maximum amount of memory that it will hold but is still experiencing memory caching to disk. There is no money in the budget for a new server until next year but there is a relatively small

amount of money available. Which of the following VMware technologies can help Bill mitigate the memory issues he is having until he can get a new server in the next fiscal year?

- A. Hot add
  - B. Thin provisioning
  - C. vFlash
  - D. vSphere Storage Appliance (VSA)
11. Which of the following disk provision types performs disk zeroing as production writes are occurring? (Choose all that apply.)
- A. Thick provision eager zeroed
  - B. Thick provision lazy zeroed
  - C. Thin provision
  - D. Both B and C
12. Which one of these is not a feature of a distributed virtual switch?
- A. Private VLANs
  - B. Hypervisor
  - C. Network vMotion
  - D. Link aggregation
13. Which one of the following would be considered an example of an availability challenge?
- A. Failed application upgrades
  - B. Load balancing server workloads
  - C. Locating performance-based bottlenecks
  - D. Reducing power usage whenever possible

14. What types of devices can you virtualize? (Choose all that apply.)
- A. Switches
  - B. Uninterruptable power supplies
  - C. Physical servers
  - D. Routers
15. You are brought in to design a virtualization solution for a small company. The company has about 30 physical servers that utilize an average of 10 percent CPU and 20 percent of the memory. After explaining that one of the benefits of virtualization is higher hardware utilization, you are asked what VMware product can monitor virtual machine resources to make sure they are configured most efficiently. What product do you suggest?
- A. High availability (HA)
  - B. Virtual SAN
  - C. vSphere Data Protection
  - D. vCenter Operations Manager (vCOPS)
16. Ken is a system administrator for a large accounting firm with many servers. He is concerned that their standard method of backing up and restoring physical servers may not be the best option for backing up and restoring his virtual machines. Which VMware technology would you recommend that Ken use to back up and restore his virtual servers?
- A. Fault tolerance (FT)
  - B. High availability (HA)
  - C. vSphere Data Protection
  - D. vSphere Replication

17. During which of the following operations can the disk provisioning of a drive be set?
  - A. Adding a new drive to an existing virtual machine
  - B. When an existing virtual machine is cloned
  - C. When using Storage vMotion (svMotion)
  - D. All of the above
18. What is the one thing required to connect a virtual machine to a virtual switch?
  - A. Storage adapter
  - B. Enterprise license
  - C. vCenter Server
  - D. Port group
19. Which one of the following would be considered an example of an optimization challenge?
  - A. Compliance monitoring of the environment
  - B. Hardware failures
  - C. Locating performance-based bottlenecks
  - D. The ability to quickly deploy new servers
20. Which hardware devices need to be directly accessed by virtual machines?
  - A. Network cards
  - B. Storage infrastructure
  - C. Memory
  - D. None of the above
21. You are having an argument with a coworker about the advantages and disadvantages of a hosted hypervisor. What is the biggest reason to use a hosted hypervisor?

- A. A hosted hypervisor does not need to run on top of an OS.
  - B. A hosted hypervisor allows access to hardware that may not be accessible by a bare-metal hypervisor.
  - C. A hosted hypervisor is much smaller.
  - D. A hosted hypervisor is faster than a bare-metal hypervisor.
22. The Windows Server Support Team at a medium-sized company needs to upgrade a number of their Windows 2008 R2 virtual servers from 8 GB of memory to 12 GB of memory. Because these are production servers, they cannot be taken down during the day and any outages need to be scheduled in the middle of the night. The team has asked whether these upgrades can be performed without taking the virtual servers down, so they can be upgraded at a more reasonable time. Which of the following VMware technologies would allow the upgrades to be performed without a server outage?
- A. High availability (HA)
  - B. Hot add
  - C. Snapshots
  - D. vSphere Replication
23. Which of the following best describes the vSphere Storage Appliance (VSA)?
- A. A VMware technology that can be used to aggregate unused disks on ESXi hosts and use them as shared storage
  - B. A VMware disaster-recovery solution that can restore an entire datacenter with the pressing of a few buttons

- C. A VMware technology that allows storage arrays to be separated into different performance classes depending on the characteristics of the storage array
  - D. A VMware technology that load balances virtual machine storage demand across storage arrays to remove the problem of hot spots, whereby one storage array is overused while others go underused
24. You work for a large company that is implementing traffic shaping on the network. You are requested to implement traffic-shaping policies on all outbound virtual machine traffic. What do you need to implement this?
- A. Standard virtual switch
  - B. Distributed virtual switch
  - C. Multiple port groups defined on a distributed switch
  - D. Multiple network uplinks on a switch
25. Which of the following best describes vSphere Replication?
- A. A hardware-independent solution to replicate a virtual machine or group of virtual machines to another site
  - B. A VMware backup solution that allows virtual machines to be easily backed up and restored
  - C. A VMware solution that allows two virtual machines to act together for zero downtime in the event one of them fails
  - D. A VMware solution that allows a virtual machine to restart on a different host if the host it is running on fails
26. What is the role of the hypervisor on a physical host?