

▶ VMware vSphere® 5 Administration *INSTANT REFERENCE*

- Quick & Easy Lookup
- Real-World Solutions
- Answers on the Spot



SYBEX | SERIOUS SKILLS.

VMware vSphere® 5

Administration

Instant Reference

VMware vSphere® 5

Administration

Instant Reference

Christopher Kusek

Van V. Van Noy

Andy Daniel



John Wiley & Sons, Inc.

Acquisitions Editor: Agatha Kim
Development Editor: Stef Jones
Technical Editor: Jason Boche
Production Editor: Christine O'Connor
Copy Editor: Alexa Murphy
Editorial Manager: Pete Gaughan
Production Manager: Tim Tate
Vice President and Executive Group Publisher: Richard Swadley
Vice President and Publisher: Neil Edde
Book Designer: Chris Gillespie, Happenstance Type-O-Rama
Proofreaders: Paul Sagan and Sheilah Ledwidge, Word One New York
Indexer: Robert Swanson
Project Coordinator, Cover: Katherine Crocker
Cover Designer: Ryan Sneed

Copyright © 2012 by John Wiley & Sons, Inc., Indianapolis, Indiana

Chapters 1, 5, 11, and 12 and the Appendix are published courtesy of EMC Corporation

Published simultaneously in Canada

ISBN: 978-1-118-02443-0

ISBN: 978-1-118-22200-3 (ebk.)

ISBN: 978-1-118-23578-2 (ebk.)

ISBN: 978-1-118-25263-5 (ebk.)

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at <http://www.wiley.com/go/permissions>.

Limit of Liability/Disclaimer of Warranty: The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation warranties of fitness for a particular purpose. No warranty may be created or extended by sales or promotional materials. The advice and strategies contained herein may not be suitable for every situation. This work is sold with the understanding that the publisher is not engaged in rendering legal, accounting, or other professional services. If professional assistance is required, the services of a competent professional person should be sought. Neither the publisher nor the author shall be liable for damages arising herefrom. The fact that an organization or Web site is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Web site may provide or recommendations it may make. Further, readers should be aware that Internet Web sites listed in this work may have changed or disappeared between when this work was written and when it is read.

For general information on our other products and services or to obtain technical support, please contact our Customer Care Department within the U.S. at (877) 762-2974, outside the U.S. at (317) 572-3993 or fax (317) 572-4002.

Wiley publishes in a variety of print and electronic formats and by print-on-demand. Some material included with standard print versions of this book may not be included in e-books or in print-on-demand. If this book refers to media such as a CD or DVD that is not included in the version you purchased, you may download this material at <http://booksupport.wiley.com>. For more information about Wiley products, visit www.wiley.com.

Library of Congress Control Number: 2011940391

TRADEMARKS: Wiley, the Wiley logo, and the Sybex logo are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates, in the United States and other countries, and may not be used without written permission. VMware vSphere is a registered trademark of VMware, Inc. All other trademarks are the property of their respective owners. John Wiley & Sons, Inc. is not associated with any product or vendor mentioned in this book.

10 9 8 7 6 5 4 3 2 1

Dear Reader,

Thank you for choosing *VMware vSphere 5 Administration Instant Reference*. This book is part of a family of premium-quality Sybex books, all of which are written by outstanding authors who combine practical experience with a gift for teaching.

Sybex was founded in 1976. More than 30 years later, we're still committed to producing consistently exceptional books. With each of our titles, we're working hard to set a new standard for the industry. From the paper we print on, to the authors we work with, our goal is to bring you the best books available.

I hope you see all that reflected in these pages. I'd be very interested to hear your comments and get your feedback on how we're doing. Feel free to let me know what you think about this or any other Sybex book by sending me an email at nedde@wiley.com. If you think you've found a technical error in this book, please visit <http://sybex.custhelp.com>. Customer feedback is critical to our efforts at Sybex.

Best regards,

A handwritten signature in black ink, appearing to read 'Neil Edde', with a stylized, cursive script.

Neil Edde
Vice President and Publisher
Sybex, an Imprint of Wiley

*To my wife Courtney, who provides me endless inspiration
and whom I can always count on to have limitless
patience when my head is in the clouds.*

—Andy

*I dedicate this book to my son Alexander and
my godson Erehwon. They are the future of technology
and will be the recipients of all of the gifts we imbue
within the clouds from here and forever.*

—Christopher

*I dedicate this book to my wife Laurie and my two
kids Henry and Avabella. They are the reason I get
up every day and push myself to do more and
be better than the day before.*

—Van

Acknowledgments

I'd like to thank all those at Wiley for the opportunity to participate in the writing of this book. Agatha Kim and Stef Jones, thank you for your patience as I struggled to squeeze yet another item into my schedule. Many thanks to my coauthors, Christopher Kusek and Van V. Van Noy, for their dedication to this project, and to Jason Boche for his keen eye on the technical details. I'd like to thank all of my colleagues and customers with whom I've had the pleasure of "breaking stuff" (and fixing some, too) over the years. A very special thanks to Charlie Gautreaux. Without you, my words would not be here. I'd also like to thank my family. First, my parents, who have always taught by example. It is their tireless work ethic that I mimicked from an early age that has taken me far. Finally, my wife, Courtney, who always has patience for "just a few more minutes," and who never fails to encourage my ambition. I can't imagine success without you by my side.

—Andy

No man is an island (except for the Isle of Man) and this book would not have been possible without everyone involved! I'd like to thank the team at Wiley for making this book a reality—especially Agatha Kim, Stef Jones and Christine O'Connor. To my coauthors Van V. Van Noy and Andy Daniel, you guys were a blast to work with, and your candid natures will take you great distances. I personally want to thank John Troyer, a rock star in his own right and well deserving of all thanks he receives. Without Joseph D'Angelo, I'd never have gotten through the legal wrangling of internal protocol! My contribution to this book would have never been possible if not for the motivation and inspiration given to me by Shanley Kane: you helped drive me towards great things. It goes without saying, but the vExpert community was a great source of inspiration and perspective to help produce a book that is technically accurate and current. I'd like to thank those Starbucks baristas and staff who tolerated me writing while sipping on vanilla red rooibos tea and wearing cat ears. I am also grateful for my family and my son Alexander, who understood that sometimes I needed to focus on my writing and could tolerate this dedication. And last but not least, I'd like to thank the VMware community. Without your dedication to

using and making these technologies better, we wouldn't have a reason to write books to help spread the good word of virtualization. You are truly our future and the reason we write what we do, whether in blogs, books, or tweets. Keep inspiring us to do better and keeping us honest to improve ourselves.

—Christopher

I would like to first thank Wiley for inviting me to be part of this project—it's been quite the adventure. I am truly honored. Thanks to Christopher Kusek and Andy Daniel for all of their hard work and time on their parts of the book. I know you are as proud of this book as I am. Thanks to Agatha Kim, Stef Jones, and Christine O'Connor. You were a tremendous help to me along the way. I would also like to thank Jason Boche for making sure that everything is technically accurate. Without John Troyer and Matt Graybiel from VMware, I would not have been able to be part of this book. Finally, I want to thank my family. My father, Bill, for taking care of things around the house that I was too busy to get to. My mother, Fran, for reading through drafts of chapters, ensuring that everything made sense and was stated clearly. And finally and most importantly, thanks to my wife and kids for the time missed over the past six months. Thank you for always allowing me to pursue my passions.

—Van

About the Authors

Andy Daniel is a Senior IT Engineer at TIAA-CREF, specializing in virtualization, networking, and IP-based storage area networks. He is VCAP-DCA #29, and before joining TIAA-CREF, he worked as a Senior VMware Consultant where he architected and provided pre-sales support for VMware solutions utilizing Cisco UCS servers, Nexus 1k, 2k, 5k switches, and NetApp FAS storage systems. Andy has designed, implemented, and managed multisite, multitenant virtual environments and large multisite VMware SRM-protected vSphere deployments. He's an avid blogger at his site, vnephos.com, and is leader of the Richmond, Virginia VMware User Group.

Christopher Kusek is the Global Virtualization Lead for EMC, where he leads a global team of Cloud and Virtualization Professionals. Personally, he has a hardened focus on Virtualization, Applications, Security, and Cloud, both from an overarching strategic standpoint as a technology evangelist, as well as a practical and tactical standpoint with a direct focus on customers. Christopher is founder of multiple user groups and maintains an active role within the technical communities, both locally and globally. Working with x86 Virtualization going back to VMware's roots, Christopher also has been actively involved with Citrix and Microsoft Virtualization solutions over the past 15 years. Recognized as a VMware vExpert, Christopher maintains an active profile on both where Virtualization is from a here-and-now strategy but also looking forward years in advance to the future of IT. Two common misconceptions are that Christopher doesn't sleep and that he is a cat. Only one of those statements is correct. Maintaining an industry active social profile, Christopher is also an official EMC Blogger posting on EMC and Industry at his blog, PKGuild.com, and has heavy interaction within social media and Twitter via @CXI. A frequent presenter at conferences, he is comfortable leading the vision from high with the executives while also earning the respect of the troops deep in the trenches.

Van V. Van Noy has worked for over 16 years with a variety of different operating systems, including more than six years experience working with

VMware in an enterprise IT environment. He is currently a Systems Engineer for one of the nation's largest department store chains and consults for other businesses during his free time. In 2009 and 2010, Van was awarded VMware's vExpert Award for his work in Arkansas promoting VMware. Van is the chair of the Central Arkansas VMware User Group and continues to promote VMware whenever possible.

Contents

Introduction

xvii

Part I: Building a VMware vSphere Environment **1**

Chapter 1: Introduction to vSphere **3**

Understand the Legacy Features of vSphere	5
vMotion	5
VMware Cluster	7
Distributed Resource Scheduler	7
High Availability	8
VMware vCenter Converter	9
VMware vSphere Update Manager	10
64-Bit	11
VMware Capacity Planner	11
Host Profiles	11
vCenter Linked Mode	12
Distributed Power Management	12
Enhanced vMotion Compatibility	12
VMware Data Recovery	13
vSphere Client	13
VMkernel Protection	14
Virtual Disk Thin Provisioning	14
VMware DCUI	15
vSphere Web Client	15
Understand the New Features of vSphere	16
Enhancements in Storage	16
Storage DRS	16
Enhancements in VMFS-5	16
Enhancements in Storage vMotion	17
Virtual Machine Scalability	17
vCenter Improvements	18
Fault Tolerance	18
Networking Enhancements	19
VMware vShield 5 Suite	19

Chapter 2: Installing and Configuring ESXi **21**

Prepare for Installation	22
Install ESXi	24
Install ESXi Manually	26
Automate ESXi Installation	29

Configure Post-Install Options	34
Configure ESXi from the Console	35
Install the vSphere Client	38
Configure ESXi from within the vSphere Client	39
Chapter 3: Installing and Configuring vCenter Server	51
Prepare for Installation	52
Identify Hardware Requirements	53
Identify Operating System Requirements for vCenter Server and vSphere Client	53
Identify Database Requirements	55
Identify Networking Requirements	56
Identify Authentication Requirements	58
Install a Database	58
Create a vCenter Database in Microsoft SQL Server 2008 R2	58
Create a vCenter Database in Oracle	61
Prepare and Install vCenter Server	63
Prepare for Installation	64
Install vCenter Server	65
Deploy a vCenter Server Appliance	69
Configure a vCenter Server Appliance	73
Install Additional Components	78
Install vSphere Client	85
Configure vCenter Server	86
Connect to vCenter Server	86
Install Plug-Ins in vSphere Client	87
Configure Advanced vCenter Server Settings	89
Create a Datacenter	90
Add a Cluster	91
Add a Host	100
Chapter 4: Understanding Licensing	103
Become Familiar with VMware Licensing	104
Review the Versions of vSphere	106
Review the Licensing Method in vSphere	110
Manage Licenses	111
Install Licenses	111
Assign Licenses	114
Unassign and Remove Licenses	118
Change Licenses Assigned to Assets	120
Install Licenses for Legacy Hosts	121
Review Installed Licenses	124
View Licenses by Product	125
View Licenses by License Key	126
View Licenses by Asset	127

Chapter 5: Upgrading to vSphere 5	129
Prepare for the Upgrade	130
Upgrade vCenter Server	132
Upgrade to vCenter Server 5.0 on the Same System	133
Upgrade to vCenter Server 5.0 on a Different System	134
Install vCenter Server Appliance	135
Perform Postupgrade Tasks	136
Upgrade ESX/ESXi Hosts	139
Upgrade ESX/ESXi Using vCenter Update Manager	140
Perform a Manual In-Place Upgrade	144
Upgrade with a Fresh ESX/ESXi Installation	144
Perform Postupgrade Tasks	145
Upgrade VMware Tools	145
Upgrade Virtual Machine Hardware	146
Part II: Configuring Your vSphere Environment	149
Chapter 6: Creating and Managing Virtual Networking	151
Understand the Basics	153
Work with Virtual Switches	153
Understand Network Services	154
Use NIC Teaming	154
Configure VLANs	155
Use VLAN Tagging	155
View Networking Configuration and Network Adapter Information	156
Network with vSwitches	157
Set Up NIC Teaming on the Management Network	157
Assign Static IP Addresses for the Management Network	159
Create a vSwitch for Virtual Machine Networking	159
Network with vSphere Distributed Switches	163
Configure a vSphere Distributed Switch	164
Add Hosts and Adapters to a vDS	167
Edit General and Advanced vDS Settings	168
Manage Physical and Virtual Network Adapters	168
Migrate Existing Virtual Adapters into vDS	171
Add a dvPort Group	173
Edit a dvPort Group	174
Create a Private VLAN	175
Migrate VMs to a vDS	176
Understand Advanced Networking	178
Customize MAC Addresses	178
Create VMkernel Ports for Software iSCSI	179
Troubleshoot Using the Command Line	182
Enable Cisco Discovery Protocol	184
Enable IPv6	185

Chapter 7: Configuring and Managing Storage	187
Become Familiar with Storage Concepts	188
Learn the Basics of Storage in vSphere	188
Learn the Types of Supported Storage	191
Learn the Benefits of Remote Storage	192
Guidelines for Implementing Storage	195
Configure Fibre Channel SAN Storage	196
Connect Fibre Channel Storage to an ESXi Host	197
Manage Fibre Channel Storage on an ESXi Host	198
Configure NPIV for Virtual Machines	202
Configure iSCSI SAN Storage	205
Become Familiar with ESXi iSCSI SAN Requirements	205
Configure Hardware iSCSI Initiators if Present	206
Configure Software iSCSI Initiators	206
Configure NFS Storage	223
Configure NFS Storage with ESXI	223
Chapter 8: High Availability and Business Continuity	229
Minimize Planned Downtime	230
Configure and Use vMotion	230
Migrate Virtual Disks with Storage vMotion	236
Protect Against Host Failure	237
Set Up vSphere High Availability	237
Set Up vSphere Fault Tolerance	243
Guard Against VM Failure	249
Chapter 9: Managing Virtual Machines	253
Create Virtual Machines	254
Create a New Virtual Machine	255
Clone an Existing Virtual Machine	259
Deploy a Virtual Machine from a Template	262
Create a Template	263
Modify Virtual Machines	266
Reconfigure the Hardware of a Virtual Machine	267
Add Hardware to a Virtual Machine	271
Remove Hardware from a Virtual Machine	276
Manage Virtual Machine Hardware Versions	276
Determine the Virtual Machine Hardware Version	277
Upgrade Virtual Machine Hardware	279
Perform Other Virtual Machine	
Management Tasks	279
Change the Virtual Machine Power State	280
Work with Virtual Machine Snapshots	281
Install or Upgrade the VMware Tools	284

Chapter 10: Importing and Exporting Virtual Machines	287
Understand the Migration Process	288
Understand the Types of Migrations	288
Review the Components in a Migration	289
Perform a Physical-to-Virtual Migration	290
Perform a Hot Migration	291
Perform a Cold Migration	293
Clean Up After a Migration	295
Troubleshoot Physical-to-Virtual Migrations	296
Perform a Virtual-to-Virtual Migration	297
Migrate to or from a Different VMware Platform	298
Migrate from a Competing Product	302
Use a Virtual-to-Virtual Migration for Reconfiguration	302
Troubleshoot Virtual-to-Virtual Migrations	305
Import an Open Virtualization Format Template	306
Understand OVF Templates	306
Deploy an OVF Template	307
Chapter 11: Configuring Security	311
Configure vCenter Server Access Control	312
Understand vCenter Server's Predefined Roles	312
Customize Roles	314
Manage Permissions	317
Secure vCenter Server	319
Harden the vCenter Server Computer	319
Remove Default Administrative Access to vCenter Server	320
Secure Your ESXi and ESXi Hosts	321
Control Network Access to the Management Network	321
Isolate the Management Network	323
Delete Unnecessary Local Accounts	324
Understand Lockdown Mode	325
Secure Your Virtual Machines	325
Configure Virtual Machine Isolation	326
Harden the Guest Operating System	328
Chapter 12: Managing Resources and Performance	329
Understand Resource Allocation	330
Allocate Resources to Virtual Machines	331
Allocate Resources in the VM Configuration	331
Guarantee Resources with Reservations	333
Constrain Resource Usage with Limits	335
Control Resource Allocation Using Shares	338

Use Resource Pools	341
Create a Resource Pool	342
Control CPU Allocation with a Resource Pool	343
Control Memory Allocation with a Resource Pool	348
Monitor Performance	348
Identify a Resource-Constrained ESXi Host	348
Identify a Resource-Constrained Virtual Machine	350
<i>Index</i>	355

Introduction

For those of us who have been working in the virtualization industry since its earliest days, it's hard to imagine what datacenters were like without virtualization. Still, there are some organizations that have yet to adopt virtualization within their datacenter. With the release of VMware vSphere 5, VMware's flagship enterprise-class virtualization solution, VMware aims to change that reality.

However, even though virtualization has many benefits—not the least of which include reducing your hardware footprint, enabling faster server provisioning, and simplifying disaster recovery—some people feel that virtualization also has a steep learning curve. IT professionals who want to become more familiar with virtualization need to learn about terms like vMotion, vSphere Distributed Switch, vSphere Fault Tolerance, and VMkernel interfaces. All these new terms and new technologies can seem confusing to someone not familiar with how all the pieces fit together.

In addition, virtualization sometimes forces IT professionals to think differently about how to solve old challenges. The “traditional” way of doing things often isn't the best way of handling something after you've virtualized your datacenter.

This book is intended to help address these concerns. For administrators who might be new to virtualization, this book explains how virtualization works, what the components are, and how these components fit together—in a hands-on, how-to approach. We believe this approach will help new vSphere administrators get up to speed quickly.

For administrators who are familiar with previous versions of VMware's virtualization product suite but not VMware vSphere 5, this book will fill in the gaps through the step-by-step review of vSphere's new features and functionality—such as vSphere Web Client Server.

While this book isn't an in-depth, highly technical view of VMware vSphere—that's what you'll find in *Mastering VMware vSphere 5*, also from Sybex—it is a comprehensive reference guide for finding information quickly, just when you need it. We hope that it will earn its place on your reference bookshelf as a book to which you can return when you need a little extra guidance on how something works or how to perform a task within VMware vSphere.

What Is Covered in This Book

This book is written as a blend of explanatory text and “cookbook-style” recipes that are intended to help administrators become more familiar with installing, configuring, managing, and monitoring a virtual environment using the VMware vSphere product suite. We start by introducing the vSphere product suite and all of its great features. After introducing all the bells and whistles, this book details how to install the product, including considerations and steps you should take to upgrade to VMware vSphere 5. After showing you how to install vSphere, we move on to configuring VMware vSphere to meet your specific needs. This includes configuring VMware vSphere’s extensive networking and storage functionality. Next, the book moves into virtual machine creation and management, importing and exporting virtual machines, security, and finally monitoring and resource management.

You can read this book from cover to cover to gain an understanding of the vSphere product suite in preparation for a new virtual environment, but you might find it more useful as a reference work to which you can refer when you’re stuck and can’t remember exactly how something works. If you’re an IT professional who is new to virtualization with VMware vSphere, this book is intended to help you hit the ground running.

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

Chapter 1: Introduction to vSphere Chapter 1 takes a look at the features of VMware vSphere 5. This includes vSphere’s “legacy” features—those features that were also present in earlier versions of VMware’s enterprise virtualization products—as well as the new features specific to VMware vSphere 5. This feature overview should provide you with some idea of how VMware vSphere can address business problems.

Chapter 2: Installing and Configuring ESXi VMware ESXi is the foundation of the vSphere product suite, and Chapter 2 provides information on how to install and configure VMware ESXi.

Chapter 3: Installing and Configuring vCenter Server Many of the advanced features within the VMware vSphere product suite are only present when you also have vCenter Server, the management server for VMware ESXi. Chapter 3 describes how to install and configure vCenter Server and vCenter Server Appliance to manage your ESXi hosts and your virtual machines.

Chapter 4: Understanding Licensing VMware vSphere 5 continues use of an integrated licensing mechanism. How to install licenses, how to assign and manage licenses, and how to review current license usage are all covered in Chapter 4.

Chapter 5: Upgrading to vSphere 5 Perhaps you already use vSphere 4 but are looking to upgrade to VMware vSphere 5. This chapter provides information on the upgrade process, including which tasks should come first, and the various methods for upgrading the different components.

Chapter 6: Creating and Managing Virtual Networking Chapter 6 provides information and procedures for creating and configuring VMware vSphere's virtual networking features. This includes vSphere Standard Switches as well as vSphere Distributed Switches.

Chapter 7: Configuring and Managing Storage Storage is an essential part of every virtualization implementation, so Chapter 7 covers the different types of storage that are supported by VMware vSphere 5 and how to configure each of them.

Chapter 8: High Availability and Business Continuity Chapter 8 discusses the different ways that administrators can configure VMware vSphere to provide high availability for virtual machines. Features like vSphere High Availability, VM failure monitoring, and vSphere Fault Tolerance are all covered.

Chapter 9: Managing Virtual Machines Managing virtual machines is a pretty broad topic, but Chapter 9 attempts to cover it by discussing the most frequently performed tasks. Tasks such as creating virtual machines, adding or removing hardware from virtual machines, managing virtual machine power state, and managing virtual hardware versions are all covered in this chapter.

Chapter 10: Importing and Exporting Virtual Machines Creating new virtual machines sometimes means converting physical systems to virtual machines. This type of migration, a physical-to-virtual migration, is one of a couple of different types of imports discussed in Chapter 10. This chapter also provides information on how to export VMs out of VMware vSphere for use with other VMware virtualization products.

Chapter 11: Configuring Security Chapter 11 covers security-related aspects of VMware vSphere, such as role-based access controls and how to harden vSphere 5.

Chapter 12: Managing Resources and Performance Chapter 12 covers the important topics of resource management and performance, two areas that are closely related. This chapter discusses how to allocate resources, how to modify resource allocation behaviors, and how to identify performance concerns related to resource allocation.

Appendix: Fundamentals of the Command-Line Interface

To help build your proficiency with command-line tasks, this online appendix focuses on navigating through the Direct Console User Interface and performing management, configuration, and troubleshooting tasks. You can find the appendix online at www.sybex.com/go/vsphere5instantref.

Who Should Buy This Book

This book is for IT professionals looking to strengthen their knowledge of constructing and managing a virtual infrastructure on VMware vSphere 5. Although the book can be helpful for those new to IT, we assume the target reader has the following:

- A basic understanding of networking architecture
- Experience working in a Microsoft Windows environment
- Experience managing the domain name system (DNS) and Dynamic Host Configuration Protocol (DHCP)
- A basic understanding of how virtualization differs from traditional physical infrastructures
- A basic understanding of hardware and software components in standard x86 and x64 computing

How to Contact the Authors

We welcome feedback from you about this book or about books you'd like to see from us in the future.

You can contact Andy Daniel by messaging @vnephos on Twitter, by writing to adaniel@vnephos.com, or by visiting his blog at <http://vnephos.com>.

You can contact Christopher Kusek by messaging @CXI on Twitter, by email to christopher.kusek@pkguild.com, or via his blog <http://pkguild.com>.

You can contact Van V. Van Noy by writing to van@triplevpc.com or by visiting his blog at <http://triplevpc.com>.

- [click Inside the Box: A Proven System of Creativity for Breakthrough Results](#)
- [Nail It then Scale It: The Entrepreneur's Guide to Creating and Managing Breakthrough Innovation here](#)
- [No Choice but Seduction \(Malory-Anderson Family, Book 9\) pdf, azw \(kindle\)](#)
- [download Challenging Optical Picture Puzzles online](#)

- <http://bestarthritiscare.com/library/Witchbreaker.pdf>
- <http://cavaldecartro.highlandagency.es/library/The-Lightning-Boys-2--More-True-Tales-from-Pilots-and-Crew-of-the-English-Electric-Lightning.pdf>
- <http://rodrigocaporal.com/library/No-Choice-but-Seduction--Malory-Anderson-Family--Book-9-.pdf>
- <http://jaythebody.com/freebooks/Challenging-Optical-Picture-Puzzles.pdf>