



VMware vSphere Essentials

A Practical Approach to vSphere
Deployment and Management

—
Luciano Patrão

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and Management**

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VMware vSphere Essentials: A Practical Approach to vSphere Deployment and Management

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Dedication.

To my wonderful son, whose autism has made me a better parent and a better person. This book is dedicated to you in the hope that one day you will understand and be able to read its contents.

Your strength, resilience, and unwavering spirit have taught me the true meaning of determination and perseverance. Through your challenges and triumphs, you have shown me the beauty of embracing differences and the limitless possibilities that exist within each individual.

As I wrote these words, I kept hoping that one day you would be able to read them and learn from them. I believe in your ability to get past your challenges and do amazing things in the future.

No matter where your journey takes you, know that I am here to cheer you on and celebrate every milestone along the way. You are my beloved son, and I am forever grateful to have you in my life. This dedication is a testament to the depth of my love and belief in you.

May this dedication serve as a poignant reminder of my endless love and unwavering support, not only for you, my dear child, but for all parents who courageously face the unique challenges of raising a child with autism. May it stand as a symbol of solidarity and empathy for all those who navigate the intricate path of parenting in the context of autism.

Your unwavering dedication, resilience, and unconditional love in the face of these challenges deserve the utmost admiration. Together, let us find strength, solace, and unity as we embrace the extraordinary journey of parenthood, hand in hand with autism.

Autism should not be seen as a tragedy; rather, the lack of understanding and awareness truly holds tragedy. It is high time that we strive to comprehend, embrace, and offer unwavering support to individuals on the autism spectrum, witnessing their incredible journey of overcoming challenges and unleashing their exceptional potential.

Special dedication to my father:

*You should be here watching and living this.
Your memory and your impact on my life
will forever be cherished. I miss you...*

*With all my love and dedication,
a beloved father and a son.*

Table of Contents

- About the Authorxix**
- About the Technical Reviewersxxi**
- Acknowledgmentsxxiii**
- Introductionxxv**

- Chapter 1: Understanding Virtualization 1**
 - 1.1 Benefits of Virtualization 1
 - 1.2 Types of Virtualization3
 - 1.3 Hypervisors5
 - 1.4 Summary.....6

- Chapter 2: VMware and vSphere Overview9**
 - 2.1 What Is VMware9
 - 2.2 What Is vSphere 10
 - 2.3 Key Features and Benefits of vSphere 11
 - 2.3.1 Key Features..... 11
 - 2.3.2 Key Benefits 13
 - 2.4 VMware Glossary 15
 - 2.5 Summary..... 18

- Chapter 3: System Requirements and Licensing 19**
 - 3.1 Hardware Requirements 19
 - 3.2 Storage Requirements 21

TABLE OF CONTENTS

- 3.3 Software Requirements 23
- 3.4 Licenses Requirements..... 27
- 3.5 Summary..... 30
- Chapter 4: Deploying a vSphere Environment 31**
- 4.1 Deployment Considerations 31
- 4.2 Hardware Configuration 33
- 4.3 Prepare and Install vSphere..... 35
 - 4.3.1 Install vSphere 7 on an Unsupported CPU 54
 - 4.3.2 Connect to the vSphere Web Client Host 56
- 4.4 What Is a Virtual Nested Environment? 57
- 4.5 Configure a Nested Environment 59
 - 4.5.1 Create the Nested Environment..... 60
 - 4.5.2 Create a VM for Nested ESXi 61
- 4.6 Summary..... 67
- Chapter 5: vSphere Networking..... 69**
- 5.1 vSphere Virtual Network 69
- 5.2 What Are Port Groups? 71
- 5.3 What Is a VMkernel? 74
- 5.4 vSphere Network Redundancy..... 75
- 5.5 Summary..... 81
- Chapter 6: vSphere Datastores 83**
- 6.1 vSphere System Boot Device Partitions..... 83
- 6.2 ESXi 7.0 System Storage Links 85
- 6.3 What Is a vSphere Datastore? 87
- 6.4 How to Create a Datastore 88
- 6.5 Summary..... 93

Chapter 7: Virtual Machines	95
7.1 Virtual Machine Files.....	95
7.2 What Is VM Virtual Hardware (vHW)?	98
7.3 What Is VMware Tools?	99
7.4 How to Create a Virtual Machine.....	100
7.5 Summary.....	111
Chapter 8: VMware vCenter.....	113
8.1 What Is VMware vCenter?	113
8.2 vCenter Licenses.....	116
8.3 Install vCenter	117
8.4 What Is the vCenter Server Single Sign-On Domain?	129
8.5 Summary.....	129
Chapter 9: vCenter Server Appliance Management Interface (VAMI).....	131
9.1 Tasks That Can Be Accomplished Using VAMI.....	132
9.2 How to Access VAMI.....	133
9.3 How to Change the vCenter IP Address.....	136
9.4 Summary.....	140
Chapter 10: Datacenters and Clusters.....	141
10.1 What Is a vCenter Datacenter?.....	141
10.1.1 Create a vCenter Datacenter	142
10.2 What Is a vCenter Cluster?.....	142
10.2.1 Create a Cluster	143
10.3 Add Your ESXi Host to vCenter	144
10.4 Quick Tips for Managing Hosts in vCenter Server.....	148
10.4.1 Put a Host in Maintenance Mode.....	148
10.4.2 Disconnect and Reconnect a Host.....	149

TABLE OF CONTENTS

- 10.4.3 Relocate a Host 150
- 10.4.4 Remove a Host from the vCenter Server 150
- 10.4.5 Reboot or Shut Down an ESXi Host 151
- 10.5 What Is vSphere Cluster Services? 152
- 10.6 Summary..... 153
- Chapter 11: vCenter Datastores..... 155**
- 11.1 Datastore Types..... 155
 - 11.1.1 VMFS Datastores 156
 - 11.1.2 NFS Datastores..... 157
- 11.2 Configure iSCSI Datastores 157
 - 11.2.1 IQN..... 158
 - 11.2.2 CHAP..... 159
 - 11.2.3 iSCSI VMkernel 160
 - 11.2.4 Network Port Binding 161
- 11.3 Create an iSCSI VMkernel 164
- 11.4 Configure NFS Datastores..... 179
- 11.5 Create vSwitch and VMkernel for NFS 184
- 11.6 Create an NFS VMkernel 188
- 11.7 Create VFMS Datastores (iSCSI)..... 194
- 11.8 Create NFS Datastores..... 201
- 11.9 Summary..... 207
- Chapter 12: Managing Datastores 209**
- 12.1 Delete a VMFS Datastore 209
- 12.2 Resize a VMFS Datastore 212
- 12.3 NFS Troubleshooting 216
- 12.4 Summary..... 219

Chapter 13: vSphere Storage Policies and Encryption	221
13.1 Understanding vSphere Storage Policies.....	222
13.2 Storage Policy - Storage I/O.....	223
13.3 Create a Storage I/O Control	224
13.4 Storage Policy - Encryption.....	226
13.5 Create a Storage Policy - Encryption	227
13.6 VM Storage Policy for Host-Based Data Services	228
13.7 Create VM Storage Policy for Host-Based Data Services.....	229
13.8 Apply VM Storage Policy to VMs.....	238
13.8.1 What Is a Key Provider?.....	240
13.9 Add an Encryption Key Provider.....	241
13.10 Summary.....	247
Chapter 14: vSphere Distributed Switch	249
14.1 What Is vSphere Distributed Switch?.....	251
14.2 vSphere Distributed Switch Main Features.....	252
14.2.1 Back Up and Restore vDS Network Configuration	252
14.2.2 Link Aggregation Control Protocol Support	254
14.2.3 Inbound Traffic Shaping.....	255
14.2.4 Port Binding and Port Allocation.....	257
14.2.5 Port Mirror	258
14.2.6 VM Port Blocking	259
14.2.7 Health Check	260
14.2.8 Network Resource Pools	261
14.2.9 Private VLANs	262
14.2.10 NetFlow	265
14.2.11 vDS Tags and Custom Attributes.....	266

TABLE OF CONTENTS

- 14.3 vSphere Distributed Switch Requirements 266
- 14.4 Create and Configure a vSphere Distributed Switch..... 268
- 14.5 Summary..... 279
- Chapter 15: Advanced Configuration with vSphere Distributed Switch.....281**
- 15.1 Use VLANs in vSphere Distributed Switch..... 281
- 15.2 Migrate from a Standard vSwitch to vSphere Distributed Switch 284
- 15.3 Summary..... 297
- Chapter 16: Configuring LACP in vSphere Distributed Switch.....299**
- 16.1 What Is Link Aggregation Control Protocol (LACP) 299
- 16.2 Requirements and Limitations of LACP in vSphere..... 303
- 16.3 Configure LACP in vSphere Distributed Switch..... 306
- 16.4 Migrate vDS VMkernel Network to vDS LACP 318
- 16.5 Summary..... 328
- Chapter 17: vSphere Advanced Features.....329**
- 17.1 vSphere vMotion 329
 - 17.1.1 How Do Live Migrations Work?..... 330
 - 17.1.2 Create a vMotion VMkernel Network..... 333
 - 17.1.3 Encrypted Migration with vMotion 340
- 17.2 vSphere Distributed Resource Scheduler 342
 - 17.2.1 How DRS Works..... 342
 - 17.2.2 Create a Cluster DRS 342
 - 17.2.3 Power Management Options for DRS 347
- 17.3 Summary..... 349
- Chapter 18: vSphere Cluster Services (vCLS)351**
- 18.1 What Is vCLS? 351
 - 18.1.1 What is vCLS Retreat Mode 353

18.2 How vCLS Works	353
18.2.1 Architecture Fundamentals	355
18.3 Move vSphere vCLS VMs Datastore	356
18.4 Create an Anti-Affinity Rule for vCLS VMs.....	358
18.5 Summary.....	360
Chapter 19: vSphere High Availability (HA)	361
19.1 What Is vSphere HA?.....	361
19.2 How Does vSphere HA Work?	362
19.3 Types of vSphere HA Host Failure Scenarios	363
19.3.1 Host Failure	363
19.3.2 Host Isolation.....	364
19.3.3 Host Partition.....	365
19.4 How to Enable vSphere HA	366
19.5 vSphere HA Feature Details	367
19.5.1 Failures and Responses	367
19.5.2 Admission Control.....	376
19.5.3 Heartbeat Datastores.....	384
19.5.4 Advanced Options	385
19.6 Summary.....	387
Chapter 20: vSphere Proactive HA.....	389
20.1 What Is vSphere Proactive HA?.....	389
20.2 How Does Proactive HA Work?.....	390
20.3 How to Configure Proactive HA.....	391
20.4 The Difference Between Proactive HA and DRS.....	394
20.5 Summary.....	395

TABLE OF CONTENTS

- Chapter 21: vSphere Fault Tolerance.....397**
 - 21.1 What Is vSphere Fault Tolerance? 397
 - 21.2 How Does vSphere Fault Tolerance Work?..... 398
 - 21.3 vSphere Fault Tolerance Restrictions..... 400
 - 21.4 vSphere Fault Tolerance Requirements 403
 - 21.5 Configure vSphere Fault Tolerance 405
 - 21.6 Pros and Cons of vSphere Fault Tolerance..... 415
 - 21.6.1 Pros of vSphere Fault Tolerance 415
 - 21.6.2 Cons of vSphere Fault Tolerance 416
 - 21.7 Summary..... 417
- Chapter 22: Virtual Machine Snapshots419**
 - 22.1 What Are Virtual Machine Snapshots? 419
 - 22.2 Snapshot Files 421
 - 22.2.1 Delta Disk Files..... 421
 - 22.2.2 Flat Files 422
 - 22.2.3 Database Files 423
 - 22.2.4 Memory Files..... 423
 - 22.3 How Snapshots Work 424
 - 22.4 Creating and Managing Snapshots 426
 - 22.4.1 Create a Snapshot 427
 - 22.4.2 Delete a Snapshot 429
 - 22.4.3 Revert to a Snapshot..... 430
 - 22.4.4 Consolidate Disks 432
 - 22.4.5 Delete All Snapshots..... 434
 - 22.4.6 Consolidate Disks vs. Delete All Disks..... 435
 - 22.5 Snapshot Best Practices 438

22.6 Impact on VM Performance and Storage Performance.....	440
22.6.1 Impact on VM Performance	440
22.6.2 Impact on Storage Performance.....	442
22.7 Identifying and Resolving Snapshot Issues.....	443
22.7.1 Orphaned Snapshots	443
22.7.2 Datastore Space Depletion	444
22.7.3 Performance Dips	444
22.7.4 Failed Snapshot Operations.....	444
22.7.5 Backup Software Clashes.....	445
22.7.6 Misconfigured Alarms and Notifications.....	445
22.8 Summary.....	445
Chapter 23: Enhanced vMotion Compatibility (EVC) Mode	447
23.1 What Is EVC Mode and Its Purpose?	447
23.2 EVC Mode Benefits and Limitations	448
23.2.1 EVC Mode Benefits	449
23.2.2 EVC Mode Limitations.....	450
23.3 EVC Mode Requirements.....	451
23.4 Enabling and Configuring EVC Mode.....	453
23.4.1 Enabling Enhanced vMotion Compatibility	457
23.5 Best Practices and Considerations for EVC Mode.....	459
23.6 Summary.....	461
Chapter 24: Host Profiles in vSphere.....	463
24.1 What Are Host Profiles?.....	463
24.2 Benefits of Using Host Profiles.....	464
24.3 Creating and Applying Host Profiles.....	466
24.4 Applying a Host Profile to an ESXi Host or Cluster	472

TABLE OF CONTENTS

24.5 Troubleshooting and Editing Host Profiles	479
24.5.1 Disable and Reapply	481
24.5.2 If You Use iSCSI or Fibre Channel	485
24.5.3 Troubleshoot Why the NFS Server Is Unreachable.....	486
24.6 Importing and Exporting Host Profiles	488
24.7 Host Profiles Integration with Auto Deploy.....	488
24.8 Summary.....	492
Chapter 25: VMware Hot Add and Hot Plug	493
25.1 Capabilities and Benefits of Hot Add and Hot Plug	494
25.1.1 Capabilities of Hot Add and Hot Plug	495
25.1.2 Benefits of Hot Add and Hot Plug	495
25.2 How to Use Hot Plug with Your vCPU and vRAM	496
25.3 Restrictions When Using Hot Add/Hot Plug	497
25.3.1 What Is NUMA?.....	497
25.3.2 Restrictions when using NUMA	500
25.3.3 Best Practices for Using Hot Add/Hot Plug with vNUMA.....	502
25.4 Enabling and Configure Hot Add/Hot Plug.....	503
25.5 Security Considerations for Hot Add/Hot Plug.....	506
25.6 Summary.....	508
Chapter 26: Direct Path I/O Passthrough	511
26.1 What Is Direct Path I/O Passthrough?	512
26.1.1 Understanding Direct Path I/O Passthrough	513
26.1.2 Importance of Direct Path I/O Passthrough in High-Speed Environments.....	514
26.1.3 Direct Path I/O Passthrough Hardware Considerations	515
26.2 Requirements and Recommendations for Using Direct Path I/O Passthrough	515
26.2.1 Requirements for Using Direct Path I/O Passthrough.....	516

26.2.2 Recommendations for Using Direct Path I/O Passthrough	517
26.3 Impact on a VM Performance and Security Risks	519
26.4 Benefits, Use Cases, and Limitations of Direct Path I/O Passthrough.....	523
26.4.1 Benefits	524
26.4.2 Use Cases	524
26.4.3 Limitations.....	525
26.5 Enabling and Configuring Direct Path I/O Passthrough.....	526
26.6 Enabling Direct Path I/O Passthrough	529
26.7 Enabling and Configuring SR-IOV Passthrough.....	533
26.8 Summary.....	538
Chapter 27: Add a USB Device to vSphere.....	541
27.1 Enable USB Devices in the ESXi Host.....	542
27.2 Adding a USB Device to vSphere with vMotion Support	544
27.3 Summary.....	545
Chapter 28: How to Reset the vCenter Root Password	547
28.1 Reset the Root Password	547
28.2 Reset the Root Password	549
28.3 Change the Root Password	550
28.4 Summary.....	551
Chapter 29: vCenter Update/Upgrade	553
29.1 Automatic Online vCenter Update	554
29.2 Manual Offline vCenter Update	559
29.3 Automatic Offline vCenter Update.....	564
29.4 Automatic vCenter Upgrade	565
29.5 Summary.....	571

TABLE OF CONTENTS

- Chapter 30: vSphere Lifecycle Manager573**
 - 30.1 Introduction to vSphere Lifecycle Manager 573
 - 30.2 Introduction to Image-Enabled Clusters 576
 - 30.3 Create an Image-Enabled Cluster 577
 - 30.3.1 Cluster Image Setup 578
 - 30.3.2 Importing Images 584
 - 30.4 Create and Manage Baselines 585
 - 30.4.1 Types of Baselines 586
 - 30.4.2 How to Create a Baseline 586
 - 30.5 Add and Remove Baselines to and from ESXi Hosts and Clusters 598
 - 30.6 Scanning and Remediation 600
 - 30.6.1 Check Compliance 602
 - 30.6.2 Stage 603
 - 30.6.3 Remediate 605
 - 30.7 Upgrade VMware Tools with vLCM 614
 - 30.8 Upgrade ESXi Hosts 615
 - 30.8.1 Upgrade Using vLCM Upgrade Baseline 616
 - 30.8.2 Upgrade Using Boot ISO 617
 - 30.8.3 Upgrade Using the Command Line 621
 - 30.8.4 Summary of ESXi Host Upgrade Options 624
 - 30.9 vSphere Lifecycle Manager Best Practices 624
 - 30.10 Troubleshooting vSphere Lifecycle Manager 627
 - 30.11 Summary 627

- Chapter 31: vSphere Backup and Disaster Recovery631**
 - 31.1 Importance of Backup and Disaster Recovery in Virtualized Environments 632
 - 31.2 vSphere Data Protection Methods and Types 634

31.3 Configuring and Managing vSphere VM Backup	636
31.3.1 BDRSuite by Vembu	636
31.3.2 Veeam Data Platform (Veeam Backup & Replication)	637
31.3.3 Hornetsecurity VM Backup	638
31.3.4 NAKIVO Backup & Replication	639
31.4 Summary	640
Chapter 32: Other VMware Products	643
32.1 VMware NSX: Network Virtualization	643
32.1.1 What NSX Does	644
32.1.2 Challenges Addressed by NSX	644
32.1.3 How NSX Works	645
32.1.4 NSX Use Cases	646
32.2 VMware vSAN: Software-Defined Storage	648
32.2.1 What vSAN Does	649
32.2.2 Key Functionalities of VMware vSAN	650
32.2.3 Challenges Addressed by VMware vSAN	651
32.2.4 How VMware vSAN Works	651
32.2.5 Use Cases for VMware vSAN	652
32.3 VMware Site Recovery Manager	654
32.3.1 What VMware SRM Does	655
32.3.2 Key Functionalities of VMware SRM	655
32.3.3 Challenges Addressed by VMware SRM	656
32.3.4 How VMware SRM Works	656
32.3.5 Use Cases for VMware SRM	657
32.4 VMware vSphere with VMware Tanzu	658
32.4.1 What vSphere with Tanzu Does	658
32.4.2 Key Functionalities of vSphere with Tanzu	659

TABLE OF CONTENTS

- 32.4.3 Challenges vSphere with Tanzu Addresses660
- 32.4.4 How vSphere with Tanzu Works660
- 32.4.5 Use Cases for vSphere with Tanzu661
- 32.5 Summary.....662
- Chapter 33: VMware Certification Overview.....663**
 - 33.1 VMware Certification Importance, Tracks, and Benefits.....665
 - 33.2 Preparing for VMware Certification Exams667
 - 33.3 Maintaining and Renewing VMware Certification669
 - 33.4 Summary.....672
- Chapter 34: Embracing the Future of Virtualization with VMware vSphere.....673**
- Index.....677**

About the Author

Luciano Patrão is a Portuguese professional who has established himself in Germany. With extensive experience in the field, he currently serves as a senior consultant and solution architect at ITQ, offering top-tier VMware infrastructure solutions and working as a PSO consultant for VMware.

Luciano has previously held notable positions as a technical project manager and technical lead in various consulting companies as a freelancer. Throughout his career, he has provided exceptional guidance and solutions to teams and clients in the areas of VMware infrastructures, backup, and data recovery.

Luciano is a VCAP-DCV Design 2023, VCP-Cloud 2023, VCP-DCV 2022, and VMware vSAN Specialist. He is also a vExpert vSAN, vExpert NSX, vExpert Cloud Provider for the last two years, vExpert Multi-Cloud 2023, vExpert for the last 8 years, and a Veeam Vanguard for the last 6 years.

As a firm believer in the power of knowledge sharing, Luciano actively writes technical content for multiple companies and owns the provirtualzone.com blog. Dedicated to virtualization, multi-cloud, storage, and backups, the blog is a platform to share insights and expertise with a broader audience.

About the Technical Reviewers



Frank Escaros-Buechsel is working as a global telco architect assisting major telecommunication providers globally to design, build, and manage consolidated IT/ICT platforms, on-board virtual network functions, and evolve existing platforms for 5G readiness.



Iwan Hoogendoorn started his IT career in 1999 as a helpdesk agent.

Soon after, Iwan started to learn Microsoft products and eventually achieved his MCP, MCSA, MCDBA, and MCSE certifications. While working as a Microsoft systems engineer, Iwan gained an excellent basis to develop additional skills and knowledge in computer networking. Networking became a passion in his life. This passion resulted in learning networking with Cisco products.

Iwan got the opportunity to work for VMware in 2016 as a senior NSX PSO consultant. In his time at VMware, he gained more knowledge on private and public clouds and the related products that VMware developed to build the Software-Defined Data Center (SDDC). After working for four years as a senior NSX PSO consultant (primarily with VMware NSX-v and

ABOUT THE TECHNICAL REVIEWERS

NSX-T), Iwan got promoted to a staff SDDC consultant focusing on the full SDDC stack, including hyperscaler offerings on the main public clouds like AWS (VMC on AWS), Microsoft (Azure VMware Solution), and Google (Google Cloud VMware Engine).

Iwan is certified on multiple VMware products, including NSX, and he is actively working together with the VMware certification program to develop network-related exams for VMware. In addition to his VMware certifications, Iwan is also AWS and TOGAF certified.

Acknowledgments

I would like to express my deepest gratitude to the readers and enthusiasts following my “VMware for Beginners” series on the BDRSuite blog. BDRSuite is the comprehensive backup and disaster recovery software from Vembu Technologies.

Over the years, the team at Vembu have given me the remarkable opportunity to write VMware content for their esteemed readers and customers. My first book may never have come out without their collaborative efforts. The unwavering support and encouragement from the team at Vembu have been instrumental in my journey as an author. Please visit <https://www.bdrsuite.com/> for more information about BDRSuite Backup & Replication.

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I want to express my heartfelt gratitude to all those who have contributed to creating *VMware vSphere Essentials: A Practical Approach to vSphere Deployment and Management*. Thank you all for being part of my first journey to write a book.

Introduction

Welcome to *VMware vSphere Essentials: A Practical Approach to vSphere Deployment and Management*. After writing a successful “VMware for Beginners” series of blog posts for Vembu Technologies, a leading vendor of backup and disaster recovery solutions, I decided to write this book. This book fills a vacuum in the market for high-quality information on this subject and offers readers a thorough introduction to VMware virtualization.

This book is written for novices and those seeking more advanced notions about vSphere. It walks you through vSphere concepts and technology. It covers vSphere infrastructure creation, maintenance, and performance for beginners and advanced users.

Presentation Approach

I take a step-by-step approach in this book to guarantee that you grasp the fundamental concepts and practical procedures required to construct and manage virtual machines in a VMware vSphere system. Together, we will explore the key components of vSphere, with details and explanations for each feature, including the hypervisor, networking, Storage, and High Availability, unraveling their intricacies and highlighting best practices.

This book provides you with the full VMware knowledge to develop, set up, and maintain vSphere environments that meet modern computing needs.

We will also focus on advanced topics, such as resource optimization, performance monitoring, advanced settings, and automation, empowering you to take your virtualization skills to the next level.

INTRODUCTION

The step-by-step instructions are designed to provide a high-level understanding and are accompanied by many screenshots illustrating the available options and recommended selections essential for accomplishing each task.

Whether you are an IT professional seeking to enhance your career prospects or an administrator looking to streamline your infrastructure, this book is your comprehensive guide to unlocking the immense potential of VMware technology.

Target Audience

This book is designed to offer to diverse individuals interested in virtualization technology, specifically VMware vSphere.

The book is tailored to meet the needs of the following diverse target audience:

- **Aspiring IT professionals:** This book is ideal for individuals looking to enter the IT field who want to understand virtualization technology, particularly VMware vSphere. It thoroughly introduces vSphere, beginning with the fundamentals and gradually progressing to more advanced concepts, making it a helpful resource for individuals new to virtualization.
- **System administrators:** System administrators seeking to enhance their knowledge and skills in virtualization and VMware vSphere will find this book valuable. It offers practical insights into deploying, managing, and optimizing virtualized environments, equipping system administrators with the tools needed to excel in their roles.

- **Advanced vSphere administrators:** This book serves as a valuable resource for experienced vSphere administrators looking to enhance their knowledge and delve into advanced concepts. It goes beyond the basics, providing administrators with the knowledge to optimize, troubleshoot, and fine-tune their vSphere settings.
- **IT professionals pursuing VMware certifications:** This book caters to IT professionals who are preparing for VMware certifications, such as the VMware Certified Professional - Data Center Virtualization (VCP-DCV) exams. It offers a structured approach to understanding vSphere and its advanced concepts, providing the necessary knowledge and insights to succeed in certification exams.
- **Virtualization consultants and trainers:** Virtualization consultants and trainers who provide guidance and education on VMware vSphere can utilize this book as a valuable reference. It covers various topics, from foundational knowledge to advanced techniques, serving as a comprehensive guide to support their consulting and training endeavors.
- **IT professionals transitioning to VMware:** Professionals with experience in other virtualization technologies who wish to transition to VMware vSphere will find this book invaluable. It provides a clear and structured pathway to acquire the necessary knowledge and skills to work with vSphere effectively.

INTRODUCTION

- **Technology enthusiasts and self-learners:** This book caters to individuals who have a passion for technology and a keen interest in learning about virtualization. Whether you are a self-learner or simply curious about VMware vSphere, the book's gradual learning curve and practical approach make it accessible and engaging for technology enthusiasts of various backgrounds.

No matter your expertise or familiarity with virtualization, this book offers a comprehensive guide that empowers you to understand and utilize VMware vSphere effectively. So, let's dive in and embark on this exciting virtualization adventure together!

CHAPTER 1

Understanding Virtualization

Virtualization is a revolutionary concept, abstracting away the differences between actual hardware and its digital counterparts. It allows multiple virtual machines to exist on one physical computer, using hardware abstraction and a hypervisor. This boosts efficiency, scalability, and adaptability in managing applications and environments. With various kinds of virtualization available, this technology has many advantages, such as reduced expenses, optimized resource use, and simplified administration. Consequently, virtualization has become a commonplace asset for today's IT networks.

In this chapter we will cover the basics of virtualization and look at the various types of virtualization, their benefits, and how they relate to some of the more popular hypervisors on the market.

1.1 Benefits of Virtualization

Virtualization brings many advantages. For example, organizations can reduce energy expenses and optimize existing resources by virtualizing their physical infrastructure. The simple and swift process allows flexible and agile operations to keep up with changing requirements. Furthermore, virtualization increases system protection by enabling better division

among different environments and simplifying disaster recovery processes. Generally speaking, virtualization streamlines IT deployments, data centers, and cloud computing while boosting efficiency, scalability, and administrative control.

The following are some of the more important benefits of virtualization:

- **Cost savings:** Virtualization allows one physical server to run multiple virtual machines (VMs), reducing the need for additional hardware and lowering energy costs. This translates into significant cost savings in terms of infrastructure and maintenance.
- **Improved resource utilization:** Virtualization enables better use of hardware resources by allocating them efficiently among virtual machines based on current needs. This reduces the risk of resource wastage and enhances system performance.
- **Enhanced flexibility:** With virtualization, businesses can quickly create or deploy new virtual machines as needed without worrying about physical hardware constraints. This improves IT agility, enabling organizations to respond faster to business needs.
- **Increased security:** Virtualization provides an additional layer of security by isolating virtual machines from each other and the underlying hardware, which helps prevent malware or other security threats from spreading.
- **Disaster recovery:** Virtualization makes disaster recovery more manageable by allowing virtual machines to be quickly migrated to another physical server in the case of a hardware failure. This ensures minimal downtime and faster recovery from critical failures.