



Clifton Leonard  
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# Mastering Microsoft® Exchange Server 2016

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Published simultaneously in Canada

ISBN: 978-1-119-23205-6  
ISBN: 978-1-119-23208-7 (ebk.)  
ISBN: 978-1-119-23207-0 (ebk.)

Manufactured in the United States of America

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**Library of Congress Control Number: 2016946244**

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10987654321

This book is dedicated to my loving, gorgeous wife, Marie, and to my incredible inspirations Pierce, Treyden, Gabrielle, Cheyenne, Taylor, Zoe, and Talon. Thank you for enduring all my late nights and continuously encouraging me through this journey. I love you all!

—Clifton Leonard

I'd like to thank my wife, Lindsay; my son, Jack; and my daughter, Leah, for the unending support and David Elfassy for reaching out to me to get involved with this project—thank you! Finally, I'd like to thank the original Exchange “super team”—Larry, Mike, Carl, George, Dennis, and the Chicago crew—you guys helped me elevate my game.

—Brian Svidergol

I dedicate this book to my parents who unwittingly put me on the path to working with technology by indulging me in my youth. Who knew buying a Commodore VIC-20 would get it all started? I am thankful for that and your support in many other ways over the years.

—Byron Wright

To my loving family who always supports me.

—Vladimir Meloski

# Acknowledgments

Thank you once again, Microsoft, for a great release of Exchange Server. This is now the eighth major release of the well-known premier messaging system. In this release, we can see the effort and ingenuity come together in solving customer problems to create a truly superior product. Congratulations!

As the team that is working on this book completes the final steps required to send it to the printer, I continue to bring some real-world expertise into the content. I have deployed several Exchange Server 2016 infrastructures to date, but this product is so vast and so broad that I continue to find design options, best practices, and architecture recommendations on a daily basis. I'm pretty sure that I will be updating the content up to the last minute!

When I was approached to take on this book, several months before Exchange Server 2016 was about to release to manufacturing, my reaction was, "What about David and Jim?" David Elfassy authored the previous edition and has been an invaluable contributor to the Microsoft, and more specifically Exchange Server, community. Prior to David, Jim McBee authored three previous editions of this book and has been the pillar of the *Mastering Exchange Server* series. I consider it to be a true honor to take over for David Elfassy and Jim McBee as the lead author for this book, and I hope that this edition has adequately followed through on their traditions.

Throughout the book, we have tried to keep the tone and language similar to what was used in the previous editions of this book, so if you are familiar with both of these men's writing style, you should find comfort in these pages. In addition, we have removed some of the introductory technical information from previous editions, to reflect the depth of initial experience of the readers.

Taking on the responsibility of a 816-plus-page manual is no simple task and not one that can be undertaken by only one person. Along the way, I have invited several contributors to this effort. Their knowledge and expertise have added incredible value to this book. Having written anywhere from several paragraphs to complete chapters, Brian Svidergol, Byron Wright, and Vladimir Meloski are Exchange Server gurus who have provided key content for this book. These men are well respected within the Exchange Server community and are authors of Microsoft Official Curriculum, including Exchange Server 2016. They have been great contributions to this effort. Thank you!

There is also a man who has kept us all honest and has been the gatekeeper for technical accuracy in this book, and he has helped revise a couple of chapters more substantially. Joseph Nguyen agreed to take on the responsibility of technical reviewer for this book and has done a formidable job. I consider it an honor to have worked with him! Joseph, thank you!

The great folks at Wiley have been patient beyond belief when it comes to deadlines, content, and outline changes as well as our ever-changing list of contributors. They include acquisitions editor Ken Brown, developmental editor Kelly Talbot, and production editor Athiyappan Lalith Kumar.

And a special acknowledgment to those in my daily life, my father, DC Leonard; my mother, Lynette Leonard; my sister, Jaena Poppe; and my brothers, Jerry, Adam, and Jeff: thank you for always being supportive of all my endeavors.

—Clifton Leonard

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# Introduction

Thank you for purchasing (or considering the purchase of) *Mastering Exchange Server 2016*; this is the latest in a series of Mastering Exchange Server books that have helped thousands of readers to better understand Microsoft's excellent messaging system. Along the way, we hope that this series of books has made you a better administrator and allowed you to support your organizations to the best of your abilities.

When we started planning the outline of this book more than a year before its release, Exchange Server 2016 appeared to be simply a minor series of improvements over Exchange Server 2013. Of course, the further we explored the product, the more we found that was not the case. Many of the improvements in Exchange Server 2016 were major improvements (such as Outlook on the web) and sometimes even complete rewrites (such as in the case of the Client Access services role) of how the product worked previously.

Another challenge then presented itself. The market penetration of Exchange Server 2013 was fairly dominant, but we found that many organizations still run Exchange Server 2010. Therefore, we needed to explain the differences for not only Exchange Server 2013 administrators but also for the Exchange Server 2010 administrators. On the other hand, Exchange Server 2003 reached end-of-life on April 8, 2014. As a result, Microsoft no longer provides security updates, offers free or paid support options, nor provides updated online content such as KB articles for Exchange Server 2003. Organizations with Exchange Server 2003 deployed after April 8, 2014, are responsible for their own support of the product and accept the risk associated with the deployment.

We took a step back and looked at the previous editions of the book to figure out how much of the previous material was still relevant. Some of the material from the Exchange Server 2013 book is still relevant but needed updating. Some required completely rewriting chapters to cover new technologies introduced in Exchange Server 2016 or technologies that have since taken on more importance in deployments and management. We faced the challenge of explaining two management interfaces, Exchange Management Shell and Exchange Admin Center, as well as describing the new roles and features.

We started working with the Exchange Server 2016 code more than a year before we expected to release the book. Much of the book was written using the RTM code that was first made available in October 2015, but as we continued writing the book, we made updates based on changes introduced in Cumulative Update 1 (March 2016). So, you can safely assume when reading this



book that it is based on the latest bits of Exchange Server 2016 that released in late summer 2016. In writing this book, we had a few goals for the book and the knowledge we wanted to impart to the reader:

- ◆ We wanted to provide an appropriate context for the role of messaging services in an organization, outlining the primary skills required by an Exchange Server administrator.
- ◆ We wanted the reader to feel comfortable when approaching an Exchange Server environment of any size. The content in this book can assist administrators of small companies with only one server, as well as administrators who handle large Exchange Server farms.
- ◆ We wanted the skills and tasks covered in this book to be applicable to 80 percent of all organizations running Exchange Server.
- ◆ We wanted the book to educate not only “new to product” administrators but also those “new to version” administrators who are upgrading from a previous version.
- ◆ We wanted the book to familiarize administrators with Office 365 environments and the implementation of hybrid coexistence with on-premises Exchange Server deployments.
- ◆ We wanted to provide familiar references for administrators of previous versions, ensuring that Exchange Server 2010 and 2013 administrators can easily find equivalent solutions in Exchange Server 2016.

Microsoft listened to the advice of many of its customers, its internal consultants at Microsoft Consulting Services (MCS), Microsoft Certified Systems Engineers (MCSEs), Most Valuable Professionals (MVPs), Microsoft Certified Solutions Masters (MCSMs), and Microsoft Certified Trainers (MCTs) to find out what was missing from earlier versions of the product and what organizations’ needs were. Much of this work started even before Exchange Server 2016 was released.

## Major Changes in Exchange Server 2016

This book covers the many changes in Exchange Server 2016 in detail, but we thought we would give you a little sample of what is to come in the chapters. As you can imagine, the changes are once again significant, considering the tremendous effort that Microsoft sinks into the Exchange Server line of products. Exchange Server is a significant generator of revenue for Microsoft and is also a foundational service for Office 365. Microsoft has every reason to continue improving this most impressive market leader of email and collaboration services.

The primary changes in Exchange Server 2016 since the latest release (Exchange Server 2013) have come in the following areas:

- ◆ Client access services have been integrated into the Mailbox server role, and the Client Access server role has been removed.
- ◆ Outlook Web App is now known as Outlook on the web, is optimized for tablets, and provides platform-specific experiences for smart phones.

- ◆ MAPI over HTTP is now the default protocol that Outlook uses to communicate with Exchange, which allows a higher level of visibility of transport errors and enhanced recoverability.
- ◆ With SharePoint Server 2016, you can enable Outlook on the web users to link to and share documents stored in OneDrive for Business in an on-premises SharePoint server instead of attaching a file to the message.
- ◆ The Hybrid Configuration Wizard (HCW) is provided as a download to support changes in the Office 365 service and to provide a more stable deployment and consistent experience.
- ◆ Significant enhancements for Data Loss Prevention (DLP) have been added. With a DLP policy and mail flow rules, you can identify, monitor, and protect 80 different types of sensitive information.
- ◆ Public folder integration into the In-Place eDiscovery and Hold workflow enable you to search public folders in your organization and configure an In-Place Hold on public folders.
- ◆ A new eDiscovery search tool, called Compliance Search, provides improved scaling and performance capabilities so you can search very large numbers of mailboxes in a single search.

Of course, many more changes have been introduced in Exchange Server 2016, but the preceding list stands out to us as the most noteworthy improvements. Chapter 2, “Introducing the Changes in Exchange Server 2016,” contains an exhaustive list of all significant changes, as well as changes since specific versions of Exchange Server (for example, Exchange Server 2010 and Exchange Server 2013).

## **How This Book Is Organized**

This book consists of 25 chapters, divided into five broad parts. As you proceed through the book, you’ll move from general concepts to increasingly detailed descriptions of hands-on implementation.

This book won’t work well for practitioners of the time-worn ritual of chapter hopping. Although some readers may benefit from reading one or two chapters, we recommend that you read most of the book in order. Even if you have experience as an Exchange Server administrator, we recommend that you do not skip any chapter, because they all provide new information since the previous iterations of Exchange Server. Only if you already have considerable experience with these products should you jump to the chapter that discusses in detail the information for which you are looking.

If you are like most administrators, though, you like to get your hands on the software and actually see things working. Having a working system also helps many people as they read a book or learn about a new piece of software because this lets them test new skills as they learn them. If this sounds like you, then start with Chapter 7, “Exchange Server 2016 Quick

Start Guide.” This chapter will take you briefly through some of the things you need to know to get Exchange Server running, but not in a lot of detail. As long as you’re not planning to put your quickie server into production immediately, there should be no harm done. Before you put it into production, though, we strongly suggest that you explore other parts of this book. Following is a guide to what’s in each chapter.

## **Part 1: Exchange Fundamentals**

This part of the book focuses on concepts and features of Microsoft’s Windows Server 2012 R2, Exchange Server 2016, and some of the fundamentals of operating a modern client/server email system.

Chapter 1, “Putting Exchange Server 2016 in Context,” is for those administrators who have been handed an Exchange Server organization but who have never managed a previous version of Exchange Server or even another mail system. This will give you some of the basic information and background to help you get started managing Exchange Server and, hopefully, provide a little history and perspective.

Chapter 2, “Introducing the Changes in Exchange Server 2016,” introduces the new features of Exchange Server 2016 as contrasted with previous versions.

Chapter 3, “Understanding Availability, Recovery, and Compliance,” helps even experienced administrators navigate some of the new hurdles that Exchange Server administrators must overcome, including providing better system availability, site resiliency, backup and restoration plans, and legal compliance. This chapter does *not* cover database availability groups in detail; instead, that information is covered in Chapter 20, “Creating and Managing Database Availability Groups.”

Chapter 4, “Virtualizing Exchange Server 2016,” helps you decide whether you should virtualize some percentage of your servers, as many organizations are doing.

Chapter 5, “Introduction to PowerShell and the Exchange Management Shell,” focuses on and uses examples of features that are enabled in PowerShell through the Exchange Server 2016 management extensions for PowerShell. All administrators should have at least a basic familiarity with the Exchange Management Shell extensions for PowerShell even if you rarely use them.

Chapter 6, “Understanding the Exchange Autodiscover Process,” helps you to come up to speed on the inner workings of the magic voodoo that is Autodiscover, a feature that greatly simplifies the configuration of both internal and external clients.

## **Part 2: Getting Exchange Server Running**

This section of the book is devoted to topics related to meeting the prerequisites for Exchange Server and getting Exchange Server installed correctly the first time. While installing Exchange Server correctly is not rocket science, getting everything right the first time will greatly simplify your deployment.

Chapter 7, “Exchange Server 2016 Quick Start Guide,” is where everyone likes to jump right in and install the software. This chapter will help you quickly get a single server up and

running for your test and lab environment. While you should not deploy an entire enterprise based on the content of this one chapter, it will help you get started quickly.

Chapter 8, “Understanding Server Roles and Configurations,” covers the primary services that run on the Exchange Server: mailbox services, transport services, and client access services.

Chapter 9, “Exchange Server 2016 Requirements,” guides you through the requirements (pertaining to Windows Server, Active Directory, and previous versions of Exchange Server) that you must meet in order to successfully deploy Exchange Server 2016.

Chapter 10, “Installing Exchange Server 2016,” takes you through both the graphical user interface and the command-line setup for installing Exchange Server 2016.

Chapter 11, “Upgrades and Migrations to Exchange Server 2016 or Office 365,” helps you decide on the right migration or transition approach for your organization. It recommends steps to take to upgrade your organization from Exchange Server 2010 or 2013 to Exchange Server 2016 or to Office 365. Also included in this chapter are recommendations for migration phases and hybrid coexistence with Office 365.

### **Part 3: Recipient Administration**

Recipient administration generally ends up being the most time-consuming portion of Exchange Server administration. Recipient administration includes creating and managing mailboxes, managing mail groups, creating and managing contacts, and administering public folders.

Chapter 12, “Management Permissions and Role-Based Access Control,” introduces one of the most powerful features of Exchange Server 2016, Role-Based Access Control, which enables extremely detailed delegation of permissions for all Exchange Server administrative tasks. This feature will be of great value to large organizations.

Chapter 13, “Basics of Recipient Management,” introduces you to some concepts you should consider before you start creating users, including how email addresses are generated and how recipients should be configured.

Chapter 14, “Managing Mailboxes and Mailbox Content,” is at the core of most Exchange Server administrators’ jobs since the mailboxes represent the direct customer (the end user). This chapter introduces the concepts of managing mailboxes, mailbox data (such as personal archives), and mailbox data retention.

Chapter 15, “Managing Mail-Enabled Groups, Mail Users, and Mail Contacts,” covers management of these objects, including creating them, assigning email addresses, securing groups, and allowing for self-service management of groups, and it offers guidelines for creating contacts.

Chapter 16, “Managing Resource Mailboxes,” discusses a key task for most messaging administrators. A resource can be either a room (such as a conference room) or a piece of equipment (such as an overhead projector). Exchange Server 2016 makes it easy to allow users to view the availability of resources and request the use of these resources from within Outlook or Outlook on the web.

Chapter 17, “Managing Modern Public Folders,” introduces you to the new public folder storage and management features in Exchange Server 2016. Although public folders are being deemphasized in many organizations, other organizations still have massive quantities of data stored in them. Microsoft has reinvented public folders in this latest release of Exchange Server.

Chapter 18, “Managing Archiving and Compliance,” covers not only the overall concepts of archiving and how the rest of the industry handles archiving but also the exciting archival and retention features.

## **Part 4: Server Administration**

Although recipient administration is important, administrators must not forget their responsibilities to properly set up the Exchange server and maintain it. This section helps introduce you to the configuration tasks and maintenance necessary for some of the Exchange Server 2016 services as well as safely connecting your organization to the Internet.

Chapter 19, “Creating and Managing Mailbox Databases,” helps familiarize you with the changes in Exchange Server 2016 with respect to mailbox database, storage, and basic sizing requirements. Many exciting changes have been made to support large databases and to allow Exchange Server to scale to support more simultaneous users.

Chapter 20, “Creating and Managing Database Availability Groups,” is a key chapter in this book that will affect all administrators from small to large organizations. Exchange Server 2016 relies heavily on Windows Failover Clustering for its site resilience and high availability functionalities. This chapter covers the implementation and management of high availability solutions.

Chapter 21, “Understanding the Client Access Services,” introduces you to the critical client access services and the related components running on the Mailbox server.

Chapter 22, “Managing Connectivity with Transport Services,” brings you up to speed on the Transport services that run with the mailbox and client access services. This chapter discusses mail flow and the transport pipeline in detail.

Chapter 23, “Managing Transport, Data Loss Prevention, and Journaling Rules,” shows you how to implement a feature set that was first introduced in Exchange Server 2007 but has since been greatly improved: the transport rule feature. This chapter also discusses message journaling and Data Loss Prevention policies.

## **Part 5: Troubleshooting and Operating**

Troubleshooting and keeping a proper eye on your Exchange servers’ health are often neglected tasks. You may not look at your Exchange servers until there is an actual problem. In this part, we discuss some tips and tools that will help you proactively manage your Exchange Server environment, ensuring that you can track down problems as well as restore any potential lost data.

Chapter 24, “Troubleshooting Exchange Server 2016,” introduces you not only to troubleshooting the various components of Exchange Server 2016 but also to good troubleshooting techniques. This chapter also includes a discussion of some of the Exchange Server 2016 built-in tools, such as the Exchange Management Shell test cmdlets and the Remote Connectivity Analyzer.

Chapter 25, “Backing Up and Restoring Exchange Server,” includes discussions on developing a backup plan for your Exchange Server 2016 servers as well as how to implement appropriate backup solutions for Exchange Server configuration, databases, logs, and any other relevant information.

## Conventions Used in This Book

We use the code-continuation character on PowerShell commands to indicate that the line of text is part of a previous command line.

Many of the screen captures in this book have been taken from lab and test environments. However, sometimes you will see screen captures that came from an actual working environment. We have obscured any information that would identify those environments.

Any examples that include IP addresses have had the IP addresses changed to private IP addresses even if we are referring to Internet addresses.

Remember, Exchange Server is designed to help your organization do what it does better, more efficiently, and with greater productivity. Have fun, be productive, and prosper!

## The Mastering Series

The *Mastering* series from Sybex provides outstanding instruction for readers with intermediate and advanced skills, in the form of top-notch training and development for those already working in their field and clear, serious education for those aspiring to become pros. Every *Mastering* book includes the following:

- ◆ Real-World Scenarios, ranging from case studies to interviews, that show how the tool, technique, or knowledge presented is applied in actual practice
- ◆ Skill-based instruction, with chapters organized around real tasks rather than abstract concepts or subjects
- ◆ Self-review test questions, so you can be certain you’re equipped to do the job right

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