

Nathan Winters, Neil Johnson, and Nicolas Blank

Microsoft®

# Exchange Server 2013

Design, Deploy, and Deliver an  
**Enterprise Messaging Solution**



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# **Microsoft<sup>®</sup> Exchange Server 2013**

**Design, Deploy, and Deliver  
an Enterprise Messaging  
Solution**

**Nathan Winters**

**Neil Johnson**

**Nicolas Blank**





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Best regards,

A handwritten signature in black ink, appearing to read 'Neil Edde', written in a cursive style.

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

To my wife, Elizabeth: You have supported, loved, and inspired me through so many challenges. Who would have thought having said “never again” after my first book that I would now have completed two more!

—Nathan Winters

I dedicate this book to the special ladies in my life: to my wife, Mandy, for standing by me while I sacrificed time to make this book happen, and to my daughters, Anna and Lisa. I would also like to thank God for the gift of communication that makes writing a book of this nature possible.

—Nicolas Blank

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throughout the book. As someone with huge experience in the Exchange world, he also provided useful guidance and thoughts on the project as a whole.

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—*Nathan Winters*

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—*Neil Johnson*

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—*Nicolas Blank*

# About the Authors



**Nathan Winters** has worked in IT since graduating from the Royal College of Music (RCM) in 2003, where he studied the clarinet! His first job was at the RCM, migrating from Exchange 5.5 and Windows NT4 to Exchange and Windows Server 2003. Nathan has since worked in a variety of roles for Microsoft partners, including consultancy and practice management. He now works for Microsoft UK as a presales technical specialist. Throughout 2012 and 2013, Nathan has been a regular speaker at industry conferences, such as TechEd and Exchange Connections, both in Europe and in the United States. Before joining Microsoft, Nathan was active in the UK technical community, running the Exchange user group (MMMUG) and writing numerous articles for *Windows IT Pro* magazine and the [MSEExchange.org](http://MSEExchange.org) website, among others. He was awarded the distinction of Microsoft MVP between 2006 and 2011. In addition to this book, Nathan has recently completed *Mastering Microsoft Lync Server 2013*, also published by Sybex/Wiley. On the rare occasions when he is not working, he enjoys wildlife photography and badminton.



**Nicolas Blank** is a messaging architect, author, and speaker focused on all things Exchange at NB Consult in South Africa. With over 14 years of experience with Exchange, Nicolas consults with customers on cloud-based and on-premises Exchange projects, as well as companies building Exchange-focused products. Nicolas currently holds the status of Microsoft Certified Master, Exchange 2010 and Office 365, and has received the Microsoft MVP award for Microsoft Exchange every year since 2007. Nicolas blogs regularly on Exchange and messaging topics at [blankmanblog.com](http://blankmanblog.com) as well as tweeting as [@nicolasblank](https://twitter.com/nicolasblank).



**Neil Johnson** has worked in IT since leaving Derby University, where he studied engineering. Initially, he worked with Novell Netware and Unix but then quickly moved on to Windows NT and Exchange Server. Neil worked in a number of roles, including third-line support, field engineer, technical design authority, and systems analyst before joining Microsoft in 2006. Since joining Microsoft, Neil has led some of the largest and most complex Exchange

deployments in the United Kingdom. He can often be found speaking at Microsoft internal and public events about Exchange or Exchange Online, and he is also an instructor with the rank of Microsoft Certified Solutions Master: Messaging. Neil writes for the Microsoft Exchange Team Blog (EHLO) and maintains both the Jetstress Field Guide and Exchange Client Network Bandwidth Calculator. Neil has a passion for motorsport and is a lifelong Williams F1 team supporter. In his limited spare time, Neil is a keen photographer and loves to explore the national forest woodlands in the midlands where he lives with his son, Leo, and partner, Liz.

# Introduction

This book came about after several conversations among the authors that focused on the common problems we found in discussing Exchange architecture with clients. We all felt that while Exchange is a very mature product, many people, from small in-house shops to the largest consultancies, often fall into similar traps when designing, deploying, and delivering a new Exchange-based messaging platform. To this end, we wanted to capture our conversations and experiences with customers and share them more widely in the hope of helping others avoid the common pitfalls we've seen.

## **Who Should Read This Book**

This book is aimed at those among you who are going to be, or are, working closely with Exchange in a design and deployment capacity. You could be working for an in-house IT department as the messaging lead or as part of the messaging team. You could equally be a consultant working for one of the myriad of Microsoft partners who specialize in Exchange. That doesn't necessarily mean that you have to consider yourself an Exchange specialist, however. The point of this book is to help you get it right when you come to run your Exchange project. We appreciate that you won't necessarily be doing this day in and day out, because we all know that IT departments do a messaging upgrade every two to five years. A secondary audience is the architect community: those of you who are supervising the Exchange project as a program of work but are not necessarily involved in every day-to-day aspect.

# What You Will Learn

Instead of focusing, as so many books do, on the “click Next” type guidance, we felt it was far more important to teach how to think about an Exchange project. Of course, we have plenty of technical material in the book, and we've made a point to call out where to find more, whether it's on TechNet or on third-party sites. Likewise, we have called on colleagues in the Exchange product group on many occasions to help us give not only the view from the field but also the thought processes behind the creation of Exchange; that is, how it was envisioned.

# What's Inside?

This book is very straightforward in structure. In essence, it was conceived as a series of essays on the topics outlined. As such, is it not necessary to read the book from cover to cover, though some may find that useful. We have tried to lay things out in a manner that would make the most sense.

**Chapter 1: Business, Functional, and Technical Requirements** The goal of this chapter is to help you address and answer questions from the people around you in the form of a common language. *Requirements* are essential for implementing Exchange 2013 successfully. Exchange brings a huge number of features to the table. How do you choose which features to implement and how specifically should they be implemented? The answer is requirements!

**Chapter 2: Exchange Design Fundamentals** In Chapter 1, we introduce requirements elicitation as we grapple with the nuances of the different types of requirements and how to distill those into a readable form. In this chapter, our goal is to transform those requirements into design decisions. We examine the



structure of the design document and delve into the content that goes into each section, which includes a discussion of sizing Exchange. We cover the concept that a good design document is not a purely technical record, nor is it purely a business- or project-based one. A well-written design document is intended for many audiences, from the technical implementers on various teams right up to the CEO.

**Chapter 3: Exchange Architectural Concepts** The aim of this chapter is to define the concepts upon which Exchange is built and then to extrapolate those concepts into the design choices that have resulted in the Exchange 2013 version. If you are a messaging consultant or administrator faced with upgrading from an earlier version of Exchange, then the history section in this chapter will help you address the architectural changes and features required to guide your customer through an upgrade to Exchange 2013. Knowing which features have changed, which have been discontinued, and which have been deemphasized is a critical skill for messaging administrators and consultants. We walk through each of the major functional areas of Exchange 2013 to get you up to speed with the latest in Exchange best practice.

**Chapter 4: Defining a Highly Available Messaging Solution** When eliciting requirements, desired availability is often one of the first topics to be raised. This chapter first seeks to define high availability (HA). We then look at which components help provide an HA solution before getting into depth about the configuration-related and operational practices required to ensure a high level of uptime.

**Chapter 5: Designing a Successful Exchange Storage Solution** Over the last 16 years, the adoption of Microsoft Exchange Server, which began in earnest

with Exchange 5.5, has expanded dramatically. Email has become a pervasive application, and it is now a primary communication medium for most organizations. Over this time, Exchange storage has also undergone an evolution. Back in 1996, the focus was primarily on making the best use of costly hard disk capacity. In recent years, however, the focus has shifted toward being able to make use of larger and, most significantly, cheaper disks. This chapter covers the history of Exchange storage and then examines how to approach Exchange storage design in Exchange Server 2013, including the data you will need, the tools that are available, and how to validate the solution that you propose.

**Chapter 6: Management** Some of the biggest elements to consider when planning a new system are the management and operation of that system. After all, it is these elements that together form the majority of the cost of ownership. In this chapter, we focus on the management tools that are available for Exchange. In particular, we cover concepts such as Role-Based Access Control, which enables granular delegation of permissions to administrators. We also address new Exchange features, such as the move to a web-based management interface.

**Chapter 7: Exchange 2013 Hybrid Coexistence with Office 365** Exchange hybrid is the term used when an Exchange organization running in a customer or partner datacenter is connected to Microsoft's Office 365. This configuration can provide an extremely rich coexistence feature set that allows mailboxes to be hosted on-premises or in Office 365, and the end-user experience remains virtually the same. This chapter discusses why you may want to evaluate Exchange hybrid, identifies the design considerations, and provides

some tips from real-world deployments to help make sure that your Exchange hybrid project is a success.

### **Chapter 8: Designing a Secure Exchange Solution**

As a messaging consultant, you'll find that some of the most complex areas in designing a Microsoft Exchange solution are those relating to security. This chapter provides you with useful insights to prepare you for the awkward questions from your security officer and enable you to elicit the security requirements in a concise manner, thus avoiding the lengthy and soul-destroying security workshops and the spectrum of confusion that will arise from that disparity between the vision and the reality!

**Chapter 9: Compliance** This chapter takes you through the discussions that are needed about compliance. We introduce the regulations that businesses face, cover the conversations you need to have with the legal representatives from your organization, discuss the resulting policies that should be set, and then examine what Exchange functionality is available to implement those policies.

**Chapter 10: Collaborating with Exchange** Exchange is often defined as a groupware product. From the outset, it was intended to be a collaborative software suite. Although it has evolved over time, the fundamental purpose of Exchange remains to help people work better together. In this chapter, we discuss exactly what makes Exchange a collaborative product; that is, what is in the current version of Exchange that helps users collaborate right out of the box? Moreover, when you add in the full suite of Office Server products, how does this improve the end-user experience and allow users to get better value out of Exchange and its related products?

**Chapter 11: Extending Exchange** As a messaging platform, Exchange has grown over the years into a highly competent and cohesive system with a vast range of functionality. Nevertheless, that doesn't preclude the possibility of extending Exchange's functionality or leveraging it through other systems. This chapter examines the use of Exchange as a messaging platform to build upon, and it touches on where it resides within the Microsoft catalog of products. We begin by investigating the concepts and capabilities Exchange provides to developers for creating custom solutions, and we discuss the thought processes behind integrating Exchange with other Microsoft and non-Microsoft systems.

**Chapter 12: Exchange Clients** One of the reasons behind the success of Exchange Server is that it supports many client types. It is possible to connect to an Exchange mailbox from pretty much any operating system. The experience provided by clients varies so dramatically that end users may not even realize that they are using Exchange Server. This chapter addresses ways in which clients differ and how they may impact your design and deployment approach for Exchange Server 2013. We also discuss some features enhanced in Exchange 2013 that help protect your Exchange 2013 servers from rogue clients.

**Chapter 13: Planning Your Deployment** Deploying any version of Exchange for the first time can be a daunting task. Each version of Exchange has architectural considerations that are different from previous versions. Prerequisites may even change between service packs as well as best practices relating to both the deployment and operation of Exchange. This chapter will help you to understand what makes Exchange 2013 different from other versions of

Exchange, and it will help to ensure that you achieve a successful rollout.

**Chapter 14: Migrating to Exchange 2013** Exchange migrations are just like any other type of solution deployment—they require practical planning to ensure success. This chapter outlines some of the more important aspects for migration planning and some common problems that you may experience in the field.

**Chapter 15: Operating and Monitoring Exchange Server 2013** Why monitor and report on your Exchange service? Exchange monitoring, reporting, and alerting are fundamentally about one thing—keeping your messaging infrastructure running sufficiently to meet your service availability targets. Given this fact, it often surprises us that project teams will go to great lengths designing highly available clustered solutions, with overly complex redundant components, and then assume that installing an operations-monitoring product with its out-of-box configuration will be sufficient to keep things running. This chapter takes you through what you really must do to ensure successful monitoring and operations of Exchange.

## **Hardware and Software Requirements**

You have a variety of options to test out the concepts in this book. You can go and start an Exchange deployment project—only kidding! Seriously, however, much of this book discusses concepts and thought processes rather than actual step-by-step technical procedures. Of course, those exist too. In order to immerse yourself into the actual technology, build a lab and get an Office 365 trial tenant. If you want to explore the basic functionality of Exchange, then an Office 365 tenant is one of the simplest ways to get

up and running, because this allows you to test out the vast majority of client-side functionality and much of the administrative side without the need of servers. If the actual underlying workings of Exchange are important to you, then an on-premises lab is a necessity. In this case, much can be achieved on a single, well-specified machine. For example, a lot of the lab work for this book was created on a Dell T7500 workstation with five hard drives and 24 GB of RAM—a fairly lowly specified box these days!

## How to Contact the Authors

We welcome feedback from you about this book. Obviously, it's always nice to get messages about what you liked about the book, but we also welcome suggestions for improvements that we could make in future editions. You can reach Nathan by writing to [nathan@clarinathan.co.uk](mailto:nathan@clarinathan.co.uk), Nicholas at [nicholas@nbconsult.co.za](mailto:nicholas@nbconsult.co.za), or Neil at [neil.johnson@microsoft.com](mailto:neil.johnson@microsoft.com). If you are looking for information about Nathan's future articles or would like to discuss a speaking engagement, visit Nathan's blog at [www.nathanwinters.co.uk](http://www.nathanwinters.co.uk).

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# Chapter 1

## Business, Functional, and Technical Requirements

The goal of this chapter is to help you address and answer questions from the people around you in the form of a common language. *Requirements* are essential for implementing Exchange 2013 successfully.

Exchange can be a daunting product to contemplate, with over 20 million lines of code. There are many, many features from which to choose, though some have not changed significantly between Exchange versions (address book generation, for example). Furthermore, there's a discussion of how these features are to be implemented and the entire best practices conversation, which comes with the territory. How do you choose which features to implement and which to leave behind? The answer is requirements. And how do you decide which best practice to apply? Again, the answer is requirements.

## **Building the Foundation for Requirements**

*Requirements* elicitation can sometimes be seen as boring, tedious, and overly complex. This perception can often derail this most critical part of a new project. Requirements elicitation is traditionally associated with software engineering, which implies a long list of requirements to

satisfy the discipline of creating or modifying software. With the exception of writing scripts, most administrators who wish to implement Exchange don't need to know or care about the difference between a functional and a business requirement, since they're not creating software from scratch. However, we still need to capture the essence of “why” we are taking certain actions, as well as the “what” and the “how” we are doing them.

This chapter is particularly important for the Exchange administrator or consultant who may have been tasked with installing, upgrading, or migrating to Exchange for the first time in a formal manner and who doesn't know where to start. Even if you have successfully implemented Exchange, this chapter will still be of tremendous value to you if this is the first time that you are the one documenting a design.

Requirements are the core of an Exchange project. Based on the requirements, a host of other documentation items can be affected. These may include the following:

- Vision and scope document
- The Exchange 2013 design
- Testing plan
- Migration plan
- The bill of materials required to implement Exchange
- Test case documentation
- Adjustments to the disaster recovery plan (DRP)

A good place to start is to learn how to identify and document requirements correctly and with enough detail to satisfy people from different parts of IT and within the business as a whole. A bad place to begin is by installing Exchange on the basis of a diagram only. Since we are in IT, we often start with a diagram of something and then wind up making design changes on the fly.

Documenting requirements is thus a critical part of the design process, as we will explore later in this chapter. In summary, this chapter will equip you with the tools to