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Technical Edit by Ed Crowley

Microsoft®
Exchange Server
2013

UNLEASHED



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Microsoft®
Exchange Server
2013

UNLEASHED

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800 East 96th Street, Indianapolis, Indiana 46240 USA

Microsoft® Exchange Server 2013 Unleashed

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About the Authors

Rand Morimoto, Ph.D., MVP, MCITP, CISSP, has been in the computer industry for more than 30 years and has authored, coauthored, or been a contributing writer for dozens of books on Windows, Security, Exchange, BizTalk, and Remote and Mobile Computing. Rand is the president of Convergent Computing, an IT-consulting firm in the San Francisco Bay area that has been one of the key early adopter program partners with Microsoft, implementing the latest Microsoft technologies, including Microsoft Windows Server 2012, System Center 2012, Windows 8, Exchange Server 2013, SharePoint 2013, Office 365, and Azure cloud services in production environments more than 18 months before the initial product releases.

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Andrew Abbate enjoys the position of principal consultant and partner at Convergent Computing. With nearly 20 years of experience in IT, Andrew's area of expertise is understanding a business's needs and translating that to process and technologies to solve real problems. Having worked with companies from the Fortune Ten to companies of 10, Andrew has a unique perspective on IT and a grasp on "big picture" consulting. Andrew has also written nine industry books on varying technologies ranging from Windows to Security to Unified Communications and contributed to several others.

Dedication

I dedicate this book to Chip and Eduardo, as you look up to your two elder siblings, look to them for guidance and support, but always remember to carve your own path that is right for you... Achieve success through hard work, dedication, and determination!

—Rand Morimoto, Ph.D., MVP, MCITP, CISSP

This book is dedicated to my many wonderful nieces and nephews including Carrie, Zachary, Sophie, Joshua, Avery, Willow, River, and Aurora. I am truly blessed to be your Uncle, and I look forward to watching you all grow and flourish!

—Michael Noel, MCITP, MVP

I dedicate this book to my wonderful wife Allison who puts up with the insanity of writing these books and to my two daughters, Maya Aviv and Zoe Carmel who are the motivation and inspiration for the work.

—Guy Yardeni, MCSE, MCITP, CISSP

I dedicate this book to my wife Sophia, light of my life. And to my children, Michelle, Megan, Zoe, Zachary, and Ian, who give meaning to my life and work.

—Chris Amaris, MCITP, MCTS, CISSP/ISSAP, CHS III

This book is dedicated to my niece and nephew Nora and William. You guys remind me that there's much more to life than technology and work. You help keep me sane and grounded.

—Andrew Abbate, MCITP

Thanks to my wife, Juliet, and my children, E.J. and Jacob, for putting up with me ignoring them more than usual during my work on this book.

—Ed Crowley, BS-EECS, MBA, MVP, MCITP

Acknowledgments

Rand Morimoto, Ph.D., MVP, MCITP, CISSP WHEW, three books in one year; when I started out with the *System Center 2012 Unleashed* book, I had no idea how much work was still ahead of me. But with the *Windows Server 2012 Unleashed* book out in the marketplace and doing great, it's nice to wrap up the year with this book on Exchange Server 2013, a VERY exciting update to the Exchange platform!

A note of THANKS to the Wave 15 product team for all your support to our early adopter clients in helping us through our beta deployments to the final release of the code! It's hard to imagine the coordination and effort it takes to get a product like Exchange Server 2013 out the door with the complexity of cross-integration with SharePoint 2013, Lync 2013, and Office 2013 along with the evolution of the underlying Windows Server 2012 operating system.

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To Kelly, Noble, Chip, and Eduardo, that's it for the year, no more book writing in the wee hours of the night and through the weekends! If you want to find me in the middle of the night, I won't be downstairs writing at the kitchen table, I'll be in that bed thing, ah, to get a full night's sleep! Remember to work hard at everything you do, as you've found so far, you can accomplish a lot when you put your mind to things!

Michael Noel, MCITP, MVP It seems so long ago that I was first introduced to Exchange Server. We were migrating 2,000 mailboxes off of a POP-based platform over to this brand-new Exchange 5.0 server running on an Alpha processor. My, how the product has changed over the years! It has evolved from a niche tool to the standard messaging platform for the vast majority of the world's organizations, and in the process has added some amazing capabilities that we in the industry could never have dreamed of. And here, over 15 years later, I'm still involved with the technology, having migrated literally over a million mailboxes to and from various versions of the product. Despite this, it is never easy to write new versions of these books, and I'm grateful to all who have helped along the way.

I'd like to especially thank lead author Rand Morimoto on this book, whom I've collaborated with on more than a dozen books over the past decade. His expertise and willingness to dig in and test different scenarios has ensured the integrity and usefulness of this volume over the years.

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Andrew Abbate, MCITP It seems like every year I tell myself "I'm not going to do a book this year" and yet each year, I'm trying to decide what to put in the acknowledgements of yet another book. At the risk of sounding like a broken record, I'd once again like to thank my coauthors for producing an excellent work and for being available to bounce ideas off of. A big thanks to the team at Pearson Education for turning another batch of my chicken scratch into a polished and professional book. And a big thanks to one of my peers, Mark Weinhardt, for having sparked my interest in Exchange many years ago. I'm also obligated under the terms of a bet to announce in a book that he's a better golfer than I.

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Introduction

Microsoft Exchange Server is nearing its second decade in development, a product that shipped in the 1990s as an email system that at the time didn't even support integrated calendaring. With the release of Exchange Server 2013, Microsoft has come a *long* way in developing Exchange, not just to add more features and functions, but also to simply integrate several technologies into a common unified communications system. Exchange natively includes email, calendaring, contacts, tasks, voice mail, shared folders, and email archiving, and then tightly integrates with Microsoft Lync and SharePoint to include instant messages, web conferencing, videoconferencing, audio conferencing, document management, content management, and more.

Even though Exchange Server 2013 shipped at the end of 2012, the authors of this book have been fortunate enough to work with Exchange Server 2013 for more than a year in priority early adopter programs of the product and service offerings. The thing about being involved with a product so early on is that our first experiences with these products were without any documentation, Help files that provided guidance, or any shared experiences from others. We had to learn Exchange Server 2013 from experience, usually the hard way, but that has given us a distinct advantage of knowing the product forward and backward better than anyone could ever imagine. And we started to implement Exchange Server 2013 in production environments for a select group of our enterprise customers several months before the product release, gaining valuable experience in the implementation, migration, and cross-product integration that has led to the tips, tricks, and best practices included in this book.

So the pages of this book are filled with years of experience with Microsoft Exchange as well as many, many months of live production environment early adopter deployments that will hopefully help you design, plan, prototype, implement, migrate, administer, and support your Exchange environment.

This book is organized into six parts, each part focusing on core Exchange Server 2013 areas, with several chapters making up each part. The parts of the book are as follows:

- ▶ **Part I: Microsoft Exchange Server 2013 Overview**—This part provides an introduction to Exchange Server 2013 covering what's new, what's different, and how to successfully architect and plan the latest Exchange environments. This part of the book also covers strategies of addressing enterprise deployments of Exchange plus the inclusion of best practices in establishing a solid Active Directory, DNS, fabric, virtualization, and PKI security environment to support Exchange.
- ▶ **Part II: Implementing and Transitioning to Exchange Server 2013**—This part covers the implementation of Exchange Server 2013 from scratch, effectively an organization that may be new to Exchange or an organization looking to start all over again in building out Exchange after a merger or series of acquisitions suggest a clean implementation of Exchange makes the most sense. This part also includes transitioning from Exchange Server 2007 and 2010 to Exchange Server 2013, as well as high-availability designs for Exchange and new strategies in implementing public folders as well as proxy security using Threat Management Gateway (TMG).
- ▶ **Part III: Securing and Compliance in an Exchange Server 2013 Environment**—Security is on everyone's mind these days, so it was a major enhancement to Exchange Server 2013 to support better security of servers, messages, and message archives. This part of the book focuses on policy-based and content-enforced security using updates to Microsoft Active Directory Rights Management Services (RMS); built-in MailTips; the implementation of Microsoft Edge for antivirus and anti-malware; as well as integrated email archiving, retention, and eDiscovery.
- ▶ **Part IV: Exchange Administration, Management, Maintenance, and Optimization**—This part of the book is dedicated to the day-to-day administration of Exchange. This part includes content on the new Exchange Administration Center, using remoting, and role-based administration that may include core features in PowerShell. After you get Exchange Server 2013 in place and do the day-to-day administration, you end up spending time maintaining and supporting the Exchange environment. This includes descriptions of implementation best practices, including management and maintenance practices, Exchange environment optimization, backing up Exchange, implementation of external monitoring through System Center 2012 Operations Manager (SCOM), as well as documentation.
- ▶ **Part V: Platform Integration in an Exchange Server 2013 Environment**—Integration is key in this next wave of Microsoft Office server products, and tying together Exchange, SharePoint, and Unified Messaging are important for organizations looking to simplify communications into a consolidated platform. This part of the book covers Unified Messaging (voice mail) and SharePoint integration.

- **Part VI: Client Access to Exchange**—Another major enhancement in Exchange Server 2013 is its support for both Microsoft as well as non-Microsoft endpoint clients, including full Outlook clients for Windows in Office 2013 as well as full Outlook client support for Apple Mac users. In addition, for mobile users, Microsoft now includes the ability to support not only web-based client access using the age-old Outlook Web Apps (OWA) method of communications access, but now the ability to download apps for mobile phones to support a client-based access to Exchange from Microsoft and non-Microsoft mobile phone devices.

It is our hope that the real-world experience we have had in working with Exchange Server 2013 and our commitment to relaying to you information that will be valuable in your planning, implementation, and migration to an Exchange environment will help you get up to speed on the latest in core unified communications environment.

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CHAPTER 2

Understanding Core Exchange Server 2013 Design Plans

The fundamental capabilities of Microsoft Exchange Server 2013 are impressive. Improvements to security, reliability, and scalability enhance an already road-tested and stable Exchange Server platform. Along with these impressive credentials comes an equally impressive design task. Proper design of an Exchange Server 2013 platform will do more than practically anything to reduce headaches and support calls in the future. Many complexities of Exchange Server might seem daunting, but with a full understanding of the fundamental components and improvements, the task of designing the Exchange Server 2013 environment becomes manageable.

This chapter focuses specifically on the Exchange Server 2013 components required for design. Key decision-making factors influencing design are presented and tied into overall strategy. All critical pieces of information required to design Exchange Server 2013 implementations are outlined and explained. Enterprise Exchange Server design and planning concepts are expanded in Chapter 3, “Architecting an Enterprise-Level Exchange Server 2013 Environment.”

Planning for Exchange Server 2013

Designing Exchange Server used to be a fairly simple task. When an organization needed email and the decision was made to go with Exchange Server, the only real decision to

IN THIS CHAPTER

- ▶ Planning for Exchange Server 2013
- ▶ Understanding AD Design Concepts for Exchange Server 2013
- ▶ Determining Exchange Server 2013 Placement
- ▶ Configuring Exchange Server 2013 for Maximum Performance and Reliability
- ▶ Securing and Maintaining an Exchange Server 2013 Implementation

make was how many Exchange servers were needed. Primarily, organizations really needed only email and eschewed any “bells and whistles.”

Exchange Server 2013, on the other hand, takes messaging to a whole new level. No longer do organizations require only an email system, but they now require a high level of system availability and resilience and other messaging and unified communications functionality. After the productivity capabilities of an enterprise email platform have been demonstrated, the need for more productivity improvements arises. Consequently, it is wise to understand the integral design components of Exchange Server before beginning a design project.

The Evolution of Exchange Server 2013

Exchange Server 2013 is the evolution of a product that has consistently been improving over the years from its roots. Since the Exchange 5.x days, Microsoft has released dramatic improvements with the 2000 and 2003 versions of the product. Microsoft then followed upon the success of Exchange Server 2003 with some major architectural changes with Exchange Server 2007 and Exchange Server 2010. This latest version, Exchange Server 2013, uses a similar architecture to both Exchange Server 2007 and 2010, but adds further improvements in key areas and simplifies others.

The major areas of improvement in Exchange Server 2013 include many of the concepts and technologies introduced in Exchange Server 2007 and Exchange Server 2010 but expand upon them and include additional improvements. Key areas improved upon in Exchange Server 2013 architecture include the following:

- ▶ **Simplified and streamlined role architecture**—Exchange Server 2013 simplifies the roles that were introduced in Exchange Server 2007 and Exchange Server 2010, collapsing the Transport roles and Unified Messaging roles into the Mailbox and Client Access Server (CAS) roles, simplifying architecture and providing for design options that were previously unavailable, such as the ability to separate CAS and Mailbox servers geographically. In addition, CAS servers are now stateless, which allows them to be used by any type of load balancer.
- ▶ **Database availability groups (DAGs)**—The Exchange Server 2007 concept of Cluster Continuous Replication (CCR) was replaced with a concept called database availability groups in Exchange Server 2010. DAGs, as they are known, remain available in Exchange Server 2013, and allow a copy of an Exchange Server mailbox database to exist in up to 16 locations within an Exchange Server organization.
- ▶ **Transport and access improvements**—All client access continues to be funneled through the CAS role in an organization, which allows for improvements in client access and limited end-user disruption during mailbox moves and maintenance.
- ▶ **Integrated archiving capabilities**—Exchange Server 2013 users and administrators have the ability to archive messages for the purpose of cleaning up a mailbox of old messages, as well as for legal reasons for applying a retention policy on key

messages. Users can simply drag and drop messages into their archive folders, or a policy or rule can be set to have messages automatically moved to the archive folder.

- ▶ **“Access anywhere” improvements**—Microsoft has focused a great deal of Exchange Server 2013 development time on new access methods for Exchange Server, including a greatly enhanced Outlook Web App (OWA) that works with Microsoft and a variety of third-party browsers, Microsoft ActiveSync improvements, Unified Messaging built in, and Outlook Anywhere enhancements. Having these multiple access methods greatly increases the design flexibility of Exchange Server because end users can access email via multiple methods.
- ▶ **Protection and compliance enhancements**—Exchange Server 2013 now has antispam and anti-malware protection built in natively, protecting end users from malicious content. Compliance policies can also be more easily created.
- ▶ **Admin tools improvements and Exchange PowerShell scripting**—Introduced as the primary management tool for Exchange Server 2007, Exchange Server 2013 improves upon PowerShell capabilities and adds additional PowerShell applets and functions. The main graphical user interface (GUI) has also been moved to a Metro UI-style Web console that is accessed through the CAS role. Finally, new split permissions models can be created, which allows Active Directory (AD) and Exchange administrators to have completely separate admin models.

It is important to incorporate the concepts of these improvements into any Exchange Server design project because their principles often drive the design process.

Reviewing Exchange Server and Operating System Requirements

Exchange Server 2013 has some specific requirements, both hardware and software, that must be taken into account when designing. These requirements fall into several categories:

- ▶ Hardware
- ▶ Operating system
- ▶ Active Directory
- ▶ Exchange Server version

Each requirement must be addressed before Exchange Server 2013 can be deployed.

Reviewing Hardware Requirements

It is important to design Exchange Server hardware to scale out to the user load, which is expected for at least three years from the date of implementation. This helps retain the value of the investment put into Exchange Server. Specific hardware configuration advice is offered in later sections of this book.

Reviewing Operating System (OS) Requirements

Exchange Server 2013 is optimized for installation on Windows Server 2008 R2 with Service Pack 1 (SP1) or Windows Server 2012. These versions of Windows provide the basis for many of the improvements in Exchange Server 2013. The specific compatibility matrix, which indicates compatibility between Exchange Server versions and operating systems, is illustrated in Table 2.1.

TABLE 2.1 Exchange Server Version Compatibility

Version	Windows 2000 Server	Windows Server 2003	Windows Server 2003 R2	Windows Server 2008	Windows Server 2008 R2	Windows Server 2012
Exchange 2000 Server	Yes	No	No	No	No	No
Exchange Server 2003	Yes	Yes	Yes	No	No	No
Exchange Server 2007	No	Yes*	Yes*	Yes*	Yes*	No
Exchange Server 2010	No	No	No	Yes*	Yes*	Yes*
Exchange Server 2013	No	No	No	No	Yes*	Yes*

* 64-bit editions only supported

Understanding Active Directory Domain Services (AD DS) Requirements

Exchange Server originally maintained its own directory. With the advent of Exchange 2000 Server, however, the directory for Exchange Server was moved to Microsoft Active Directory Domain Services, the enterprise directory system for Windows. This gave greater flexibility and consolidated directories but at the same time increased the complexity and dependencies for Exchange Server. Exchange Server 2013 uses the same model but requires specific AD functional levels and domain controller specifics to run properly.

Exchange Server 2013, while requiring an AD forest in all deployment scenarios, has certain flexibility when it comes to the type of AD it uses. It also provides for new capabilities to completely separate domain administrative rights from Exchange rights, a new feature that will be well appreciated by those organizations that have those administrative duties separated.

From an AD DS design perspective, it is possible to deploy Exchange Server in the following scenarios:

- **Single forest**—The simplest and most traditional design for Exchange Server is one where Exchange Server is installed within the same forest used for user accounts. This design also has the least amount of complexity and synchronization concerns to worry about.

- ▶ **Resource forest**—The Resource forest model in Exchange Server 2013 involves the deployment of a dedicated forest exclusively used for Exchange Server itself, and the only user accounts within it are those that serve as a placeholder for a mailbox. These user accounts are not logged on to by the end users, but rather the end users are given access to them across cross-forest trusts from their particular user forest to the Exchange Server forest. More information on this deployment model can be found in Chapter 4, “Understanding Network Services and Active Directory Domain Controller Placement for Exchange Server 2013.”
- ▶ **Multiple forests**—Different multiple forest models for Exchange Server are presently available, but they do require a greater degree of administration and synchronization. In these models, different Exchange Server organizations live in different forests across an organization. These different Exchange Server organizations are periodically synchronized to maintain a common Global Address List (GAL). More information on this deployment model can also be found in Chapter 4.

It is important to determine which design model will be chosen before proceeding with an Exchange Server deployment because you cannot rename a domain that contains an Exchange server and cannot move an Exchange server to another domain.

Outlining Exchange Server Version Requirements

As with previous versions of Exchange Server, there are separate Enterprise and Standard versions of the Exchange Server 2013 product. The Standard Edition supports all Exchange Server 2013 functionality with the exception of the fact that it is limited to no more than five databases on a single server.

NOTE

Unlike many of the other previous versions of the software, Microsoft provides only a single set of media for Exchange Server 2013. When installed, server version can be set by simply entering a license key. A server can be upgraded from the Trial version to Standard or Enterprise or from Standard to Enterprise. Downgrading the version is not supported.

Scaling Exchange Server 2013

Exchange 2000 Server originally provided the basis for servers that could easily scale out to thousands of users in a single site, if necessary. Exchange Server 2003 further improved the situation by introducing Messaging Application Programming Interface (MAPI) compression and RPC over HTTP. Exchange Server 2007 and Exchange Server 2010 and their 64-bit architecture allowed for even further scalability and reduced I/O levels. Finally, Exchange Server 2013 and the separation of client traffic to load-balanced client access servers enable the client tier to be much more scalable than with previous versions.

Site consolidation concepts enable organizations that might have previously deployed Exchange servers in remote locations to have those clients access their mailboxes across

wide area network (WAN) links or dial-up connections by using the enhanced Outlook or OWA clients. This solves the problem that previously existed of having to deploy Exchange servers and global catalog (GC) servers in remote locations, with only a handful of users, and greatly reduces the infrastructure costs of setting up Exchange Server.

Having Exchange Server 2013 Coexist with an Existing Network Infrastructure

In a design scenario, it is necessary to identify any systems that require access to email data or services. For example, it might be necessary to enable a third-party monitoring application to relay mail off the Simple Mail Transfer Protocol (SMTP) engine of Exchange Server so that alerts can be sent. Identifying these needs during the design portion of a project is subsequently important.

Identifying Third-Party Product Functionality

Microsoft built specific hooks into Exchange Server 2013 to enable third-party applications to improve upon the built-in functionality provided by the system. For example, built-in support for antivirus scanning, backups, and Unified Messaging exist right out of the box, although functionality is limited without the addition of third-party software. The most common additions to Exchange Server implementation are the following:

- ▶ Antivirus (though it is important to note that Exchange Server 2013 now has these features built in)
- ▶ Backup
- ▶ Phone/PBX/Unified Messaging integration
- ▶ Fax software
- ▶ Archiving software

Understanding AD Design Concepts for Exchange Server 2013

After all objectives, dependencies, and requirements have been mapped out, the process of designing the Exchange Server 2013 environment can begin. Decisions should be made in the following key areas:

- ▶ AD DS design
- ▶ Exchange server placement
- ▶ Global catalog placement
- ▶ Client access methods

Understanding the AD DS Forest

Because Exchange Server 2013 relies on the Windows Server 2008 AD DS for its directory, it is therefore important to include AD DS in the design plans. In many situations and AD implementations, whether based on Windows Server 2003, Windows Server 2008, or Windows Server 2012, AD DS already exists in the organization. In these cases, it is necessary only to plan for the inclusion of Exchange Server into the existing forest.

NOTE

Exchange Server 2013 has several key requirements for AD. First, all domains and the forest must be at least in Windows Server 2003 functional levels. Second, it requires that at least one domain controller in each site that includes Exchange Server be at least Windows Server 2003 Service Pack 2 (SP2), Windows Server 2008, Windows Server 2008 R2, or Windows Server 2012.

If an AD DS structure is not already in place, a new AD DS forest must be established for Exchange to be installed into. Designing the AD DS forest infrastructure can be complex, and can require nearly as much thought into design as the actual Exchange Server configuration itself. Therefore, it is important to fully understand the concepts behind AD DS before beginning an Exchange Server 2013 design.

In short, a single instance of AD DS consists of a single AD DS forest. A forest is composed of AD DS trees, which are contiguous domain namespaces in the forest. Each tree is composed of one or more domains, as illustrated in Figure 2.1.

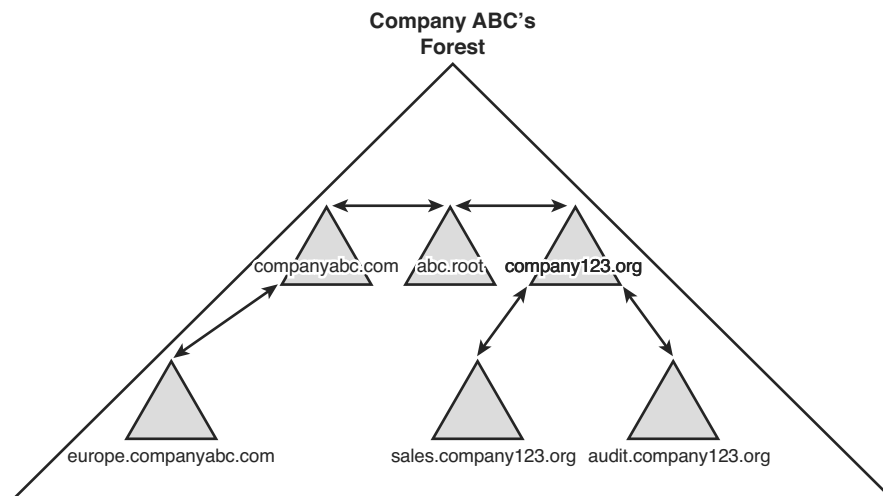


FIGURE 2.1 Multitree AD DS forest design.

Certain cases exist for using more than one AD DS forest in an organization:

- ▶ **Political limitations**—Some organizations have specific political reasons that force the creation of multiple AD DS forests. For example, if a merged corporate entity requires separate divisions to maintain completely separate information technology (IT) infrastructures, more than one forest is necessary.
- ▶ **Security concerns**—Although the AD DS domain serves as a de facto security boundary, the ultimate security boundary is effectively the forest. In other words, it is possible for user accounts in a domain in a forest to hack into domains within the same forest if they know what they are doing. Although these types of vulnerabilities are not common and are difficult to do, highly security-conscious organizations should implement separate AD DS forests or organizational units with delegated rights.
- ▶ **Application functionality**—A single AD DS forest shares a common directory schema, which is the underlying structure of the directory and must be unique across the entire forest. In some cases, separate branches of an organization require that certain applications, which need extensions to the schema, be installed. This might not be possible or might conflict with the schema requirements of other branches. These cases might require the creation of a separate forest, though this particular scenario is particularly discouraged.
- ▶ **Exchange-specific functionality (resource forest)**—In certain circumstances, it might be necessary to install Exchange Server 2013 into a separate forest to enable Exchange Server to reside in a separate schema and forest instance. An example of this type of setup is an organization with two existing AD DS forests that creates a third forest specifically for Exchange Server, called a resource forest, and uses cross-forest trusts to assign mailbox permissions.

The simplest designs often work the best. The same principle applies to AD DS design. The designer should start with the assumption that a simple forest and domain structure will work for the environment. However, when factors such as those previously described create constraints, multiple forests can be established to satisfy the requirements of the constraints.

Understanding the AD Domain Structure

After the AD DS forest structure has been chosen, the domain structure can be laid out. As with the forest structure, it is often wise to consider a single domain model for the Exchange Server 2013 directory. In fact, if deploying Exchange Server is the only consideration, this is often the best choice.

There is one major exception to the single domain model: the placeholder domain model. The placeholder domain model has an isolated domain serving as the root domain in the forest. The user domain, which contains all production user accounts, would be located in a separate domain in the forest, as illustrated in Figure 2.2.

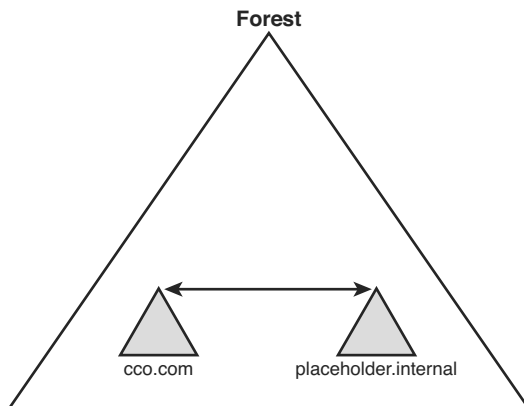


FIGURE 2.2 The placeholder domain model.

The placeholder domain structure segregates high-level schema-access accounts into a completely separate domain from the regular user domain. Access to the placeholder domain can be audited and restricted to maintain tighter control on the critical schema. The downside to this model, however, is the fact that the additional domain requires a separate set of domain controllers, which increases the infrastructure costs of the environment. In general, this makes this domain model less desirable for smaller organizations because the trade-off between increased cost and less security is too great. This is a model that was once commonly deployed by organizations before it became apparent that the domain is not an effective security boundary.

Reviewing AD DS Infrastructure Components

Several key components of AD must be installed within an organization to ensure proper Exchange Server 2013 and AD DS functionality. In smaller environments, many of these components can be installed on a single machine, but all need to be located within an environment to ensure server functionality.

Outlining the Domain Name System (DNS) Impact on Exchange Server 2013 Design

In addition to being tightly integrated with AD DS, Exchange Server 2013 is joined with the Domain Name System (DNS). DNS serves as the lookup agent for Exchange Server 2013, AD, and most new Microsoft applications and services. DNS translates common names into computer-recognizable IP addresses. For example, the name `www.cco.com` translates into the IP address of `12.155.166.151`. AD DS and Exchange Server 2013 require that at least one DNS server be made available so that name resolution properly occurs.

Given the dependency that both Exchange Server 2013 and AD DS have on DNS, it is an extremely important design element.

Reviewing DNS Namespace Considerations for Exchange Server

Given Exchange Server 2013's dependency on DNS, a common DNS namespace must be chosen for the AD DS structure to reside in. In multiple tree domain models, this could

be composed of several DNS trees, but in small organization environments, this normally means choosing a single DNS namespace for the AD DS domain.

There is a great deal of confusion between the DNS namespace in which AD DS resides and the email DNS namespace in which mail is delivered. Although they are often the same, there is no reason that the two namespaces have to be the same. When Exchange Server is first installed, the AD domain is chosen as the default SMTP domain, but that can be changed. For example, CompanyABC's AD DS structure is composed of a single domain named `abc.internal`, and the email domain to which mail is delivered is `companyabc.com`. The separate namespace, in this case, was created because someone believed that it reduced the security vulnerability of maintaining the same DNS namespace both internally and externally (published to the Internet).

Likewise, there is no necessary relationship between the Active Directory user principal name (UPN) that can be used for user logon and the SMTP email address, but using the same for both makes it easier for users.

For simplicity, CompanyABC could have chosen `companyabc.com` as its AD DS namespace. This choice increases the simplicity of the environment by making the AD DS logon UPN and the email address the same. For example, the user Pete Handley is `pete@companyabc.com` for logon and `pete@companyabc.com` for email. This option is the choice for many organizations because the need for user simplicity often trumps the higher security.

Optimally Locating Global Catalog Servers

Because all Exchange Server directory lookups use AD, it is vital that the essential AD global catalog information is made available to each Exchange server in the organization. For many small offices with a single site, this simply means that it is important to have a full global catalog server available in the main site where there are Exchange servers.

The global catalog is an index of the AD DS database that contains a partial copy of its contents. All objects within the AD DS tree are referenced within the global catalog, which enables users to search for objects located in other domains. Not every attribute of each object is replicated to the global catalogs, only those attributes that are commonly used in search operations, such as first name and last name. Exchange Server 2013 uses the global catalog for the email-based lookups of names, email addresses, and other mail-related attributes.

NOTE

Exchange Server 2013 cannot make use of Windows Server 2008 Read-Only Domain Controllers (RODCs) or Read-Only Global Catalog (ROGC) servers, so be sure to plan for full GCs and domain controllers (DCs) for Exchange Server.

Because full global catalog replication adds bandwidth usage to the standard domain controller replication, it is important to design a site structure to reflect the available WAN link capacity. If a sufficient amount of capacity is available, a full global catalog server can be deployed. If, however, capacity is limited, universal group membership caching can be enabled to reduce the bandwidth load.

Determining Exchange Server 2013 Placement

Previous versions of Exchange Server essentially forced many organizations into deploying servers in sites with relatively few users. With the concept of site consolidation in more recent versions of Exchange, smaller numbers of Exchange servers can service clients in multiple locations, even if they are separated by slow WAN links. For small and medium-sized organizations, this essentially means that fewer servers are required. In addition, Exchange Server 2013 introduces new consolidated server role concepts, which should be understood so that the right server can be deployed in the right location.

2

Understanding Exchange Server 2013 Server Roles

Exchange Server 2013 firmed up the server role concept outlined with Exchange Server 2007 and 2010 and simplified them. Before Exchange Server 2007, server functionality was based on how a server was used rather than the components that were installed, such as referring to an Exchange server as a front-end, bridgehead, or back-end server. In reality, there was no official terminology that was used for Exchange server roles; these terms evolved through common use. Exchange Server 2007 and 2010 introduced new roles that were very specific, but Microsoft found that most clients were seldom deploying all of those roles on separate servers and were combining them together, especially the Hub Transport and Client Access Server roles.

Microsoft has combined server roles in Exchange Server 2013, but more for technical rather than usage reasons. The server roles included in Exchange Server 2013 include the following:

- ▶ **Client Access Server**—The CAS role allows for client connections via nonstandard methods such as OWA, Exchange ActiveSync, Post Office Protocol 3 (POP3), and Internet Message Access Protocol (IMAP). Exchange Server 2013 also forces MAPI traffic and effectively all client traffic through the CAS layer. CAS servers in Exchange Server 2013 are also completely stateless, so they can be load-balanced for redundancy purposes using any number of load-balancing technologies, including simple solutions such as DNS Round Robin (though this is not recommended). As with the other server roles, the CAS role can coexist with other roles for smaller organizations with a single server, for example.
- ▶ **Mailbox server**—The Mailbox server role is intuitive; it acts as the storehouse for mail data in users' mailboxes and down-level public folders if required. All connections to the mailbox servers are proxied through the CAS servers. The Mailbox server role also handles the previous Hub Transport and Unified Messaging capabilities that were separate roles in the past.
- ▶ **Edge Transport server**—The Edge Transport server is unchanged from Exchange Server 2010, providing a gateway for SMTP traffic for message hygiene and recipient filtering. Note that the RTM version of Exchange Server 2013 does not support a 2013 server being installed with the Edge Transport role, though it does support existing Exchange Server 2010 Edge Transport servers. This is expected to be remedied in later releases of Exchange Server.

The first two roles can be installed on a single server or on multiple servers. For smaller organizations, a single server holding all Exchange Server 2013 components is sufficient. For larger organizations, a more complex configuration might be required. For more information on designing large and complex Exchange Server implementations, see Chapter 4.

Understanding Environment Sizing Considerations

In some cases with very small organizations, the number of users is small enough to warrant the installation of all AD DS and Exchange Server 2013 components on a single server. This scenario is possible, as long as all necessary components—DNS, a global catalog domain controller, and Exchange Server 2013—are installed on the same hardware. In general, however, it is best and highly recommended to separate AD DS and Exchange Server onto separate servers wherever possible.

Identifying Client Access Points

At its core, Exchange Server 2013 essentially acts as a storehouse for mailbox data. Access to the mail within the mailboxes can take place through multiple means, some of which might be required by specific services or applications in the environment. A good understanding of what these services are and if and how your design should support them is warranted.

Outlining Full Outlook Client Access

The “heavy” client of Outlook is in its latest 2013 version and has gone through a significant number of changes, both to the look and feel of the application and to the back-end mail functionality. The look and feel has been streamlined based on Microsoft research and customer feedback. The latest Outlook client, Outlook 2013, uses the Office Ribbon introduced with Office 2007 to improve the client experience. Outlook connects to Exchange CAS servers, improving the scalability of the environment.

In addition to MAPI compression, Outlook 2013 expands upon Outlook’s ability to run in cached mode, which automatically detects slow connections between client and server and adjusts Outlook functionality to match the speed of the link. When a slow link is detected, Outlook can be configured to download only email header information. When emails are opened, the entire email is downloaded, including attachments if necessary. This drastically reduces the amount of bits across the wire that is sent because only those emails that are required are sent across the connection.

The Outlook client is the most effective and full-functioning client for users who are physically located close to an Exchange server. With the enhancements in cached mode functionality, however, Outlook can also be effectively used in remote locations. When making the decision about which client to deploy as part of a design, you should keep these concepts in mind.

Accessing Exchange Server with OWA

The OWA client in Exchange Server 2013 has been enhanced and optimized for performance and usability. There is now less difference between the full-functioning client and

OWA. The most recent improvement is the ability to take OWA content offline and work on a cached version of a mailbox from an offline browser. Also new is updated support for non-Microsoft browsers, such as Firefox, Safari, and Chrome.

Using Exchange ActiveSync (EAS)

Exchange ActiveSync (EAS) support in Exchange Server 2013 allows a mobile client, such as an iPhone, Android phone, iPad, Android tablet, or Windows Phone device, to synchronize with the Exchange server, allowing for access to email from a handheld device.

Understanding the SMTP

The SMTP is the standard protocol for Internet email delivery. SMTP is built in to Exchange servers and is used by Exchange Server systems for relaying mail messages from one system to another, similar to the way that mail is relayed across SMTP servers on the Internet.

By default, Exchange Server 2013 uses DNS to route messages destined for the Internet out of the Exchange Server topology. If, however, a user wants to forward messages to a smart host before they are transmitted to the Internet, a Send connector can be so configured.

Using Outlook Anywhere (Previously Known as RPC over HTTP)

One very effective and improved client access method to Exchange Server 2013 is known as Outlook Anywhere. This technology was previously referred to as RPC over HTTP(S). This technology enables standard Outlook 2013/2010/2007 access using a protocol that firewalls typically allow to pass. The Outlook client encapsulates Outlook RPC packets into HTTP or HTTPS packets and sends them across standard web ports (80 and 443), where they are then extracted by the Exchange Server 2013 system. Outlook Anywhere also obviates the need for a virtual private network (VPN) connection for Outlook connectivity to the Exchange server.

Configuring Exchange Server 2013 for Maximum Performance and Reliability

After decisions have been made about AD design, Exchange server placement, and client access, optimization of the Exchange server itself helps ensure efficiency, reliability, and security for the messaging platform.

Designing an Optimal Operating System Configuration for Exchange Server

As previously mentioned, Exchange Server 2013 only operates on the Windows Server 2008 R2 with SP1 or Windows Server 2012 operating systems. The Standard Edition of Windows Server 2008 is sufficient for Exchange servers when the server is not a member of a DAG.

NOTE

Contrary to popular misconception, the Enterprise Edition of Exchange Server can be installed on the Standard Edition of the operating system, and vice versa. Choose the version of each based on the requirements.

Working with Multiple Exchange Server Databases

Exchange Server 2013 database availability groups allow for multiple databases to be installed across multiple servers and to have multiple versions of those databases in more than one location. It also has the following advantages:

- ▶ **Reduce database restore time**—Smaller databases take less time to restore from tape, so it may make more sense to deploy a larger quantity of smaller databases. This concept can be helpful if there is a group of users who require quicker recovery time (such as management). All mailboxes for this group might then be placed in a separate database to provide quicker recovery time in the event of a server or database failure.
- ▶ **Provide for separate mailbox limit policies**—Each database can be configured with different mailbox storage limits. For example, the standard user database could have a 200-MB limit on mailboxes, and the management database could have a 500-MB limit.
- ▶ **Mitigate risk by distributing user load**—By distributing user load across multiple databases, the risk of losing all user mail connectivity is reduced. For example, if a single database failed that contained all users, no one would be able to mail. If those users were divided across three databases, however, only one third of those users would be unable to mail in the event of a database failure.

Monitoring Design Concepts with System Center Operations Manager 2012

The enhancements to Exchange Server 2013 do not stop with the improvements to the product itself. New functionality has been added to the Exchange Management Pack for System Center Operations Manager that enables OpsMgr to monitor Exchange servers for critical events and performance data. The OpsMgr Management Pack is preconfigured to monitor for Exchange Server–specific information and to enable administrators to proactively monitor Exchange servers. More information is presented in Chapter 17, “Using Microsoft System Center Operations Manager to Monitor Exchange Server 2013.”

Securing and Maintaining an Exchange Server 2013 Implementation

One of the greatest advantages of Exchange Server 2013 is its emphasis on security. Along with Windows Server, Exchange Server 2013 was developed during and after the Microsoft Trustworthy Computing initiative, which effectively put a greater emphasis on security

over new features in the products. In Exchange Server 2013, this means that the OS and the application were designed with services “Secure by Default.”

With Secure by Default, all nonessential functionality in Exchange Server must be turned on if needed. This is a complete change from earlier Microsoft practice, which had all services, add-ons, and options turned on and running at all times, presenting much larger security vulnerabilities than was necessary. Designing security effectively becomes much easier in Exchange Server 2013 because it now becomes necessary only to identify components to turn on, as opposed to identifying everything that needs to be turned off.

2

Patching the Operating System Using Windows Software Update Services

Although Windows Server presents a much smaller target for hackers, viruses, and exploits by virtue of the Secure by Default concept, it is still important to keep the OS up to date against critical security patches and updates. Currently, two approaches can be used to automate the installation of server patches. The first method involves configuring the Windows Server Automatic Updates client to download patches from Microsoft and install them on a schedule. The second option is to set up an internal server to coordinate patch distribution and management. The solution that Microsoft supplies for this functionality is known as Windows Software Update Services (WSUS).

WSUS enables a centralized server to hold copies of OS patches for distribution to clients on a preset schedule. WSUS can be used to automate the distribution of patches to Exchange Server 2013 servers, so that the OS components will remain secure between service packs. WSUS might not be necessary in smaller environments, but can be considered in medium-sized to large organizations that want greater control over their patch management strategy.

Summary

Exchange Server 2013 offers a broad range of functionality and improvements to messaging and is well suited for organizations of any size. With proper thought for the major design topics, a robust and reliable Exchange Server email solution can be put into place that will perfectly complement the needs of any organization.

When Exchange Server design concepts have been fully understood, the task of designing the Exchange Server 2013 infrastructure can take place.

Best Practices

The following are best practices from this chapter:

- ▶ Use DAGs to distribute multiple copies of all mailboxes to multiple locations, taking advantage of high availability and disaster recovery capabilities that are built in to Exchange Server 2013.
- ▶ Separate the Exchange Server log and database files onto separate physical volumes.

- ▶ Plan for a Windows Server 2003 forest functional level and at least one Windows Server 2003 SP2 or later domain controller in each site that will run Exchange Server.
- ▶ Integrate a backup strategy into Exchange Server design.
- ▶ Install at least two global catalog servers in the same site as any Exchange server.
- ▶ Keep the OS and Exchange Server up to date through service packs and software patches, either manually or via Windows Software Update Services.
- ▶ Keep the AD DS design simple, with a single forest and single domain, unless a specific need exists to create more complexity.
- ▶ Identify the client access methods that will be supported and match them with the appropriate Exchange Server 2013 technology.
- ▶ Monitor DNS functionality closely in the environment on the AD DS domain controllers.

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