J. PETER BRUZZESE

Exchange Server 2007

HOW-TO

Real Solutions for Exchange Server 2007 SP1 Administrators

SAMS

Exchange Server 2007 How-To

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INTRODUCTION

Using This Book

- How To Educate Yourself About Exchange 2007 SP1
- How To Benefit from This Book
- How To Continue Expanding Your Knowledge

How To Educate Yourself About Exchange 2007 SP1

In truth, whenever you pick up a book that catches your eye, flip to an article that draws your interest, or research and locate a site or blog that interests you, you are attempting to educate yourself in some way. Perhaps it is a subject you already know or one for which, you can extract the information you need much faster and easier than a novice because of your preexisting knowledge.

The motivation behind education varies from person to person. Some simply love to learn to enhance their own knowledge of a subject, even if they never intend to use that knowledge in the working world. Some, on the other hand, are required to learn to perform a job. A messaging engineer, much like a physician, must keep up with the latest practices and techniques to stay on top of the profession he has chosen.

Most Exchange books are 800, 900, or even 1,500 pages in length! And for some, that is just the kind of book they need to accomplish their messaging goals. However, this book is a "how-to" book. It's designed to give an administrator what she needs to understand the concepts involved in managing an Exchange 2007 SP1 environment and to perform the necessary tasks.

There are many ways to educate yourself about Exchange 2007 SP1. You can review books, articles, and websites, but for on-the-job, in-the-trenches, step-by-step information, look no further than this book!

How To Benefit from This Book

We've designed this book to be easy to read from cover to cover. The goal is to gain a full understanding of Exchange. We divided the subject matter into 12 easy-to-navigate and easy-to-use chapters:

- Chapter 1, "Introduction to Exchange 2007 SP1"
- Chapter 2, "Consider Deployment Scenarios"
- Chapter 3, "Install Exchange 2007"
- Chapter 4, "Manage Storage and Databases"
- Chapter 5, "Manage Recipients"
- Chapter 6, "Manage Organization Permissions and Mailbox Settings"
- Chapter 7, "Configure the Client Access Server"
- Chapter 8, "Administrate Transport Settings"
- Chapter 9, "Design and Deploy Disaster Recovery Settings"
- Chapter 10, "Design and Deploy High Availability for Exchange 2007"
- Chapter 11, "Configure a Unified Messaging Server"
- Chapter 12, "Monitor and Troubleshoot Your Exchange Environment"

In each of these chapters are subheadings that focus on the primary elements of design and deployment of that portion of Exchange.

Under the subheadings are scenario-problem introductions. These serve as starting points for the administrator to consider. At times, the information provided helps you deal with a specific problem that you might face. Typically, a scenario is described that enables the administrator to determine whether this direction is needed for his particular organization.

The solution that follows each scenario-problem includes additional information about a particular technology or design element to consider before providing step-by-step instructions. This additional information is provided so that you have more than just commands, but also the underlying reasons for the instructions.

When additional information is needed that doesn't fit neatly into the subject matter or it is essential that the message stand out to attract your attention, we use a note.

NOTE This is an example of a note.

At other times, when a task that is performed through the Exchange Management Console (EMC) is shown to you in PowerShell through the Exchange Management Shell, we use a special note that looks like this:

PS **NOTE** The cmdlet through the Exchange Management Shell to move a storage group path is Move-StorageGroupPath-Identity "Name of Storage Group" -LogFolderPath:"New Location Path" -SystemFolderPath:"New Location Path."

Perhaps the most important aspect of the how-to premise is the provision of step-by-step instruction that walks you through each and every step of the wizards and dialog boxes that Exchange provides in the GUI console. Along with clear instructions on managing and configuring your Exchange organization, we provide clear figures and screenshots of only the most important elements you face visually while working with your Exchange servers.

How To Continue Expanding Your Knowledge

Certainly there are more books, articles, and websites you can and should consider to expand your knowledge of Exchange 2007, especially because Exchange 2007 will continue to evolve and change as Microsoft adds more features, fixes, and enhancements. How does one stay on top of this flood of information about Exchange?

Several websites are invaluable and should be added to your Favorites at work. They include the following:

- The Microsoft Exchange Team Blog (http://msexchangeteam.com)—Truly, this is the finest resource on the Internet for Exchange information because it comes directly from the creators of Exchange and the finest instructors and MVPs Exchange has to offer.
- TechNet for Exchange 2007 (http://technet.microsoft.com/en-us/library/bb124558.aspx)—In addition to the Exchange team itself, this is the best location for organized, clear, up-to-date information about Exchange 2007.

In addition, several blog sites from Exchange gurus are worth investigating, including the following:

- http://exchangepedia.com/blog (by Bharat Suneja)
- http://exchange-genie.blogspot.com (by Brian Tirch)
- http://mostlyexchange.blogspot.com (by Jim McBee)
- http://robichaux.net/blog/ (by Paul Robichaux)
- http://blogs.technet.com/scottschnoll/ (by Scott Schnoll)

These are just a handful of the ones I personally enjoy; you can easily find more. Choose the ones you feel are most helpful to you.

Last, but certainly not least, you are welcome to visit my website (http://www.exclusivelyexchange.com) for free Exchange education. It includes links to articles I wrote, a variety of interviews, and so on. You might be most interested in the collection of free screencasts for Exchange and PowerShell.

CHAPTER 1

Introduction to Exchange 2007 SP1

IN THIS CHAPTER

- An Overview of Exchange 2007 SP1
- Choose Your Exchange Server Roles
- Determine Your Server Type: Server 2003 or 2008
- Choose Your Exchange 2007 Version
- Choose the Right Hardware for the Role
- Ensure the Needed Software Is Installed First
- Ensure Components Are Installed Per Server Role
- Plan Your Exchange Storage Architecture

An Overview of Exchange 2007 SP1

You may be new to Exchange and perhaps you are new to messaging servers in general, but one thing is certain: You are not new to email. Email has become the underlying foundation for a new civilization based upon global communication. According to estimates, more than one billion people utilize email in one form or another with that number growing to two billion by 2012. With the increase in email use comes the need for advances to the underlying messaging infrastructure—the servers behind it all—to provide additional features, as well as the necessary disaster recovery, high availability, and storage architecture solutions that people might not know they need.

What is the end result? The answer is new server applications every couple of years. This brings us to the subject of our book: Exchange 2007 SP1. Exchange 2007 SP1 is the latest in messaging servers from Microsoft. It's new, it's impressive, and it's different. With those differences, messaging administrators have much to concern themselves with because the new features come with an entirely new set of interfaces. Yes, there is more than one interface. Exchange 2007 has the Exchange Management Console (EMC), shown in Figure 1.1, which is the GUI console. It also has the Exchange Management Shell (EMS), shown in Figure 1.2, which is the command-line interface (CLI). Before you say, "I'll stick with the GUI," it's important to mention that there are some things that can be done only in the CLI. Not to worry, we will get you through it.

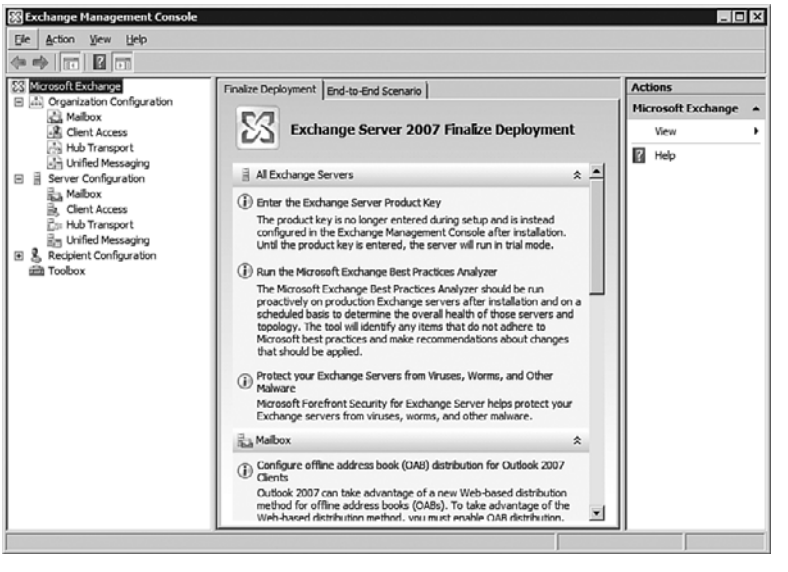

FIGURE 1.1
The Exchange Management Console (EMC) for Exchange 2007 SP1.

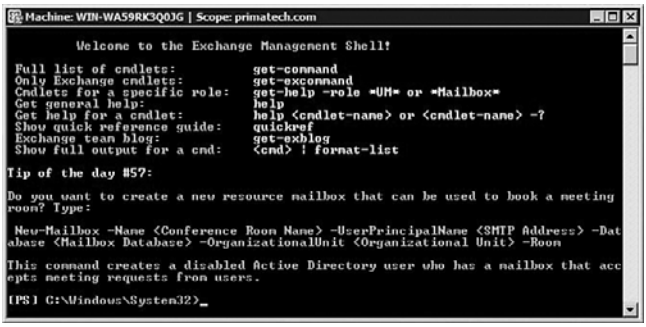

FIGURE 1.2
The Exchange Management Shell (EMS).

If you are new to Exchange or if you are moving from a previous version to Exchange 2007, you might be curious about what new features it has to offer.

New Features for Exchange 2007

Here is a quick list of features that Exchange 2007 offers:

- Active Directory integration—Beginning with Exchange 2000, there has been a connection between Active Directory (AD) and Exchange in the underlying catalog of users and their details. However, with Exchange 2007, trust is put into the capability of AD to route information. So, routing groups (an important aspect in Exchange 2000/2003) are eliminated completely with the AD site topology handling the routing needs of Exchange.
- Autodiscover—Connected to the Client Access Server role (to be discussed shortly), this new feature in Exchange assists in connecting a remote user to his mailbox server. In addition to optimizing bandwidth in assisting remote users, this feature benefits the internal client connections in that it helps to automatically configure Outlook profiles. Note: The Autodiscover service is only available for Outlook 2007 clients. Earlier versions, including Outlook 2003, do not have the ability to use the service.
- Availability—This service helps determine the availability of your Hub Transport (HT) servers in an effort to load balance inbound and outbound connections from mailbox servers. This not only enhances the flow of mail but also prevents the failure of a single Hub Transport server from stopping your flow of mail. The best part is that this is handled automatically and requires no configuration on the part of the administrator.
- EMC and EMS—As mentioned earlier, there are new administrative interfaces to work with in Exchange 2007. The EMC is somewhat familiar to us and mimics the feel of the System Manager, although with a more intuitive structure, and the new Actions pane helps present the options available. The EMS is based on the new scripting language PowerShell 1.0, which is a CLI that enables you to perform powerful administrative tasks with a simple set of commands called cmdlets (pronounced command-lets).

- High availability—Exchange RTM offered three flavors of high availability, with SP1 providing an additional one. Three of these use a technique called continuous replication, which plays off Exchange storage architecture to provide secondary copies of your Exchange mailbox database. With Local Continuous Replication (LCR) and Standby Continuous Replication (SCR), you do not need clustering services, whereas Cluster Continuous Replication (CCR) does use active/passive clustering technology. Single Copy Clusters (SCC) are similar to the high availability services from Exchange 2003.
- Performance enhancements—The required platform for Exchange 2007 is 64-bit hardware and software, which improves performance and capacity. Combined with the improved architectural features, by making the step toward 64-bit, an increase in the memory cache size, an increased number of storage groups, and an increased number of information stores per server are possible.
- Unified Messaging—One of the server roles we discuss in this chapter is Unified Messaging, which is a feature-rich solution for many organizations that want to unify their email, voice mail, and incoming faxes. It might require the purchase of some new hardware or an effort to use older hardware. However, it might be worth the cost and effort because it doesn't simply provide one location access for those items mentioned; it also provides multiple access solutions (such as phone, Outlook Web Access, mobile devices, and so on).

The list continues with items that relate to the new server roles (for example, antispam agents in the transport server roles), disaster recovery solutions, and with tools that adhere to best practices or troubleshoot your server. As you look through this how-to guide, note items such as transport rules and managed content settings, journaling, and so on. Exchange 2007 is a substantial and impressive release.

Additional Features with SP1

The release of SP1 includes some changes from the RTM version. None of these changes are major in the overall structure and design, but they do provide features and fixes that might make your experience with Exchange more enjoyable.

These features include the following:

- Deployment options—Enhancements that enable Exchange 2007 SP1 to install and run better on a server that is running Server 2008.
- ActiveSync improvements—Additional policy settings have been added to the mobile policies you can create. A remote wipe confirmation and Direct Push improvements have been added in an effort to compete more fully with BlackBerry.
- Outlook Web access improvements—These enhancements are more for the benefit of your users in that they now have the ability to access their deleted items. A monthly calendar view has also been added. Users can create and edit server-side rules. Public folders are supported through the /owa virtual directory. S/MIME support has also been included. Additionally, several customization features have been provided.

- POP3/IMAP4 Interface—If you worked with the RTM of Exchange 2007 and had to make adjustments to the POP or IMAP settings, you quickly learned that there was no GUI interaction available, and you had to go through the EMS. Microsoft heard its customers' concerns about this, and now an administrative interface exists in the EMC.
- Public folder management—As mentioned, the RTM was missing some key elements in the GUI to administer Public folders and that led you to the EMS. SP1 adds those management features into the EMC.

These are just a few of the enhancements (many are behind the scenes, such as the improvements made to transport algorithms), but there are others like the new SCR high availability option we mentioned earlier. There is also now the capability to import and export with .pst files, and there are other new enhancements to the Unified Messaging role.

Your Next Step

It might be hard to determine what you need to do next. Before you begin installation, you need to first make a few decisions, including the following:

- What server role (or roles) should I install?
- What hardware and software should I concern myself with, including which version of server should I use—2003 or 2008?
- Depending on the server role and my view of Exchange architecture, how should I plan my disk configuration? Let's begin with an understanding of roles. However, we are going to switch to the how-to format of the book so that you begin getting used to the structure.

Choose Your Exchange Server Roles

Scenario/Problem: Exchange 2007 has five different server roles you can install. How do you know which one to install?

Solution: The choice might be easy if you are dealing with a small environment where you plan to use one Exchange Server. In that case, you need to install the Typical server roles, which include the Mailbox role, the Client Access Server role, and the Hub Transport role. We discuss the step-by-step installation of roles in Chapter 3, "Install Exchange 2007."

If you need to install roles one at a time, which role is designed to handle which responsibilities? Consider the following five server roles:

- Mailbox (MB)—Hosts mailbox databases and public folder databases. Ordinarily, you can install the MB role with other roles on a single server (with the exception of the Edge Transport) unless you plan to use cluster services to provide CCR or SCC high availability options within Exchange.

- Client Access Server (CAS)—This role is similar to the front-end server for the Exchange 2000/2003 infrastructure and provides connections to a mailbox through Outlook Web Access (OWA), ActiveSync for Mobile devices, Outlook Anywhere, POP, and IMAP support. It also provides free/busy data through the availability service and supports the autodiscover services.
- Hub Transport (HT)—This role is similar to the Bridgehead server of Exchange 2000/2003. All mail coming in and out of your organization goes through the HT role. This means transport rules established on the HT role enable you to control mail while in transit. It relies completely on Active Directory to have a logical infrastructure in place to support the flow of mail.
- Unified Messaging (UM)—Provides Voice over IP (VoIP) with your mailbox. Email, voicemail, and incoming faxes can all come in to your Inbox. You can check the messages and calendar through multiple access interfaces (phone, email, or web browser). For this to work, you need a telephony expert for the installation and configuration of the telephony infrastructure (or the reconfiguration of your existing infrastructure). You might have a legacy Private Branch Exchange (PBX) that will work with a VoIP Gateway, or you can purchase a new IP-PBX.
- Edge Transport (ET)—This role is not a part of the Active Directory (and cannot be installed with any other role) but resides on the perimeter of the network using Active Directory Application Mode (ADAM) and synchronizes with the HT servers on the internal network. Its purpose is to provide additional security, antivirus, and antispam to your messaging organization. It's a recommended but not required role.

Determine Your Server Type: Server 2003 or 2008

Scenario/Problem: You have your new 64-bit server. Which flavor of Windows Server operating system should you install?

Solution: The choice might be in your hands, unless you've already made the decision to use the RTM version of Exchange, in which case you must go with Server 2003. The RTM of Exchange 2007 cannot be installed on a server running 2008. However, you can use SP1 on a server running both 2003 and 2008.

Keep in mind, however, that a network that includes Server 2008 domain controllers can still have a Server 2003 running Exchange 2007 RTM.

NOTE The management tools for Exchange RTM, which you traditionally can install on a variety of different systems in your network to administer Exchange without physically having to be present at the server, will not work on Server 2008 or Vista. However, the SP1 version of the tools can be installed on both.

The following operating systems are possible with Exchange 2007 RTM:

- Windows 2003 Server 64-bit Standard, Enterprise, or Datacenter with SP1 or higher (with or without the Multilingual User Interface Pack [MUI]).
- Windows 2003 Server 64-bit R2 Standard, Enterprise, or Datacenter (with or without the MUI).

The following operating systems are possible with Exchange 2007 SP1:

- The previously listed 2003 options, with SP2 installed.
- 64-bit edition of the Windows Server 2008 Standard operating system.
- 64-bit edition of the Windows Server 2008 Enterprise operating system.
- 64-bit edition of the Windows Server 2008 Datacenter operating system.

NOTE You cannot upgrade Exchange RTM to SP1 and upgrade to Server 2008. The supported method of installed Exchange 2007 SP1 on a server running 2008 is to perform a clean install of both.

Choose Your Exchange 2007 Version

Scenario/Problem: Exchange 2007 offers RTM and SP1 flavors that come in both Standard and Enterprise Editions. The RTM and SP1 options vary (with SP1 offering newer features) and the Standard and Enterprise editions contain differences in supported features.

Solution: If you are using a Server 2008 environment and do not wish to add a Server 2003 machine to the mix, you cannot use the RTM version of Exchange because it will not install on 2008. However, the SP1 version has more features and will install on both 2003 and 2008 servers.

NOTE Microsoft licenses Exchange as a Server/Client Access License (CAL) model. This means you purchase the server and receive a license, but also need to ensure you have a CAL for every user or device that accesses the Exchange Server.

We assume you will probably look at the SP1 flavor of Exchange, so we focus the rest of this book on that version only. Ninety-five percent of the information and steps will still work fine with the RTM version, aside from some of the alterations to the features and GUI we mentioned previously with SP1.

That brings us to the Standard or Enterprise differences:

- Standard Edition—Enables the creation of up to five storage groups and a maximum of five databases per Mailbox server role. In addition, there is a 16TB

per database storage limit (same as the Enterprise edition) with support for Local Continuous Replication (LCR) and Standby Continuous Replication (SCR) only.

- Enterprise Edition—Enables the creation of up to 50 storage groups with a maximum of 50 databases per Mailbox server role. In addition, there is a 16TB per database storage limit with support for all four flavors of high availability including LCR, SCR, Cluster Continuous Replication (CCR), and Single Copy Clusters (SCC). Keep in mind though that Server has different editions as well, and if you want to use clustering, you need clustering services, which lean toward the Enterprise Edition of Server.

Choose the Right Hardware for the Role

Scenario/Problem: Initially, you might make decisions regarding the planning of your Exchange deployment, but eventually you have to include hardware into the discussion. With each of the server roles mentioned previously, you have different functionality, and by extension, different hardware requirements.

Solution: The solution begins with the processor. You then need to determine memory and hard disk needs per role. The interesting thing is that you might already have a system in place that you can use for your Exchange Server. You might not have to purchase anything.

The Processor

There are two primary processor options for you to consider, and you might have already guessed from looking at your server operating system choices that they are both 64-bit processors.

You can use:

- A processor that supports Intel's Extended Memory 64 Technology (EM64T)
- AMD 64 platform processors

The AMD Opteron or the Intel Xeon 64-bit processors are good choices, but there might be others that work fine. Keep in mind that the Intel Itanium (IA64) doesn't work with Server 2003 64, so that would hinder its use under those circumstances. Microsoft generally provides a list of approved servers and processor types that you can check ahead of time before you purchase to ensure you have compatibility with their processor requirements.

You might consider a multicore processor for your Exchange server because tests have shown that there is a performance benefit.

The Memory

Several theories regarding the memory needed depending on the server role exist. With the Typical installation where you have all the roles on one system, Microsoft recommends 2GB of RAM with 5MB added per user (with the number of storage groups also considered, as you'll soon see).

On the Mailbox servers where you have your storage groups, you are wise to include 2GB of RAM for every one to four groups. So, if you have five to eight groups, you would make sure you have 4GB and so on.

In terms of necessity, your Edge and HT servers do not require a substantial amount of memory to perform well. Per processor core, 1GB of memory with a 2GB minimum should suffice.

Disk Space

Installing Exchange requires about 1.2GB of space. If you are working with Unified Messaging language packs, you need to consider 500MB for each one. Make sure you have 200MB on your system drive.

Note that all disk volumes for Exchange 2007 should be NTFS formatted.

Edge Transport and HT servers store the message queue database and should therefore have at least 500MB of free space for Exchange 2007 SP1.

Obviously, your biggest disk sizes are needed on the servers that handle the mail repositories—your Mailbox role. How does one determine the amount of storage needed? Often it depends on the server configuration. Are you using a form of fault tolerance or high availability? How many users per mailbox? How many storage groups and databases and so forth? Remember, you aren't just looking at providing the proper capacity here; you need to ensure performance is looked after, too.

There is a requirements calculator located on the MS Exchange Team's site that is somewhat complicated but worth playing with, as shown in Figure 1.3. The site is located at: http://msexchangeteam.com/files/12/attachments/entry438481.aspx.

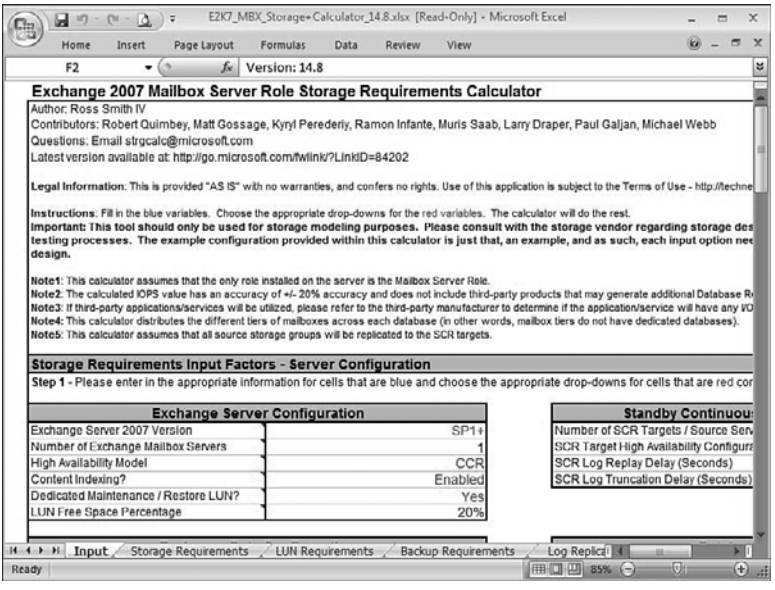

FIGURE 1.3
The Exchange 2007 Mailbox Server Role Storage Requirements Calculator spreadsheet.

With the Mailbox server, several considerations beyond the mailbox space itself exist. Imagine that each user is allowed 1GB of space, and you have 500 user mailboxes on that server. All 500 users might not have mailboxes that are full, but you have to be prepared for that level of mail. In addition to the database, there are transaction logs that are growing each day for which you need to be prepared (and you might prepare by moving those to other drives). You have deleted item and deleted mailbox retention to think about. Full text indexing uses about 25 percent of the total size of the mailbox database! Translation: Lots of disk space is a good thing on those mailbox servers. Faster, reliable disk technologies are always the wiser choice when putting together your Exchange servers.

NOTE For more detailed information regarding the processor, memory, and hard-disk configuration that will best suit your environment, consider Microsoft's technical site at http://technet.microsoft.com/en-us/library/bb124558(EXCHG.80).aspx, as well as the Exchange Team's blog site at http://msexchangeteam.com/.

Ensure the Needed Software Is Installed First

Scenario/Problem: There are three software installations that you have to perform prior to installing any of the server roles. These include the following:

- .NET Framework 2.0 or 3.0
- Microsoft Management Console 3.0
- Windows PowerShell

Solution: When attempting to perform the installation from the ISO file or the DVD, you are presented with a graphic screen that indicates whether those first three items are installed before proceeding to Step 4, which is Install Microsoft Exchange. One way to install those options is to click the links from the installation screen, or, you can seek out and install these features personally. In some cases, you might not need to install them.

.NET Framework v. 3.0 or 2.0 with Hotfix or SP1

On Server 2008, perform the following steps:

1. Select Start, and then click the Control Panel.
2. From Control Panel, double-click Administrative Tools.
3. From Administrative Tools, double-click Server Manager.
4. From within the Server Manager console tree, choose Features, and then select Add Features.
5. Using the Add Features Wizard, select .NET Framework 3.0, and then finish the wizard.

On Server 2003, you are welcome to download the 3.0 Framework and install. If you are already running 2.0, you will be prompted that there has been an update to this version for download before the installation of Exchange will take place. Or, you can simply download the .NET Framework 2.0 SP1 (which includes the update).

Make sure you use the 64-bit version of the .NET Framework.

Microsoft Management Console (MMC) 3.0

If you run Server 2003 R2 or Server 2008, the 3.0 Microsoft Management Console (MMC) is already installed, and you do not need to do anything else. If you work with Server 2003 (pre-R2), you might need to install the MMC 3.0, which can be downloaded either from the installation portal link or by downloading it directly from Microsoft at http://support.microsoft.com/?kbid=907265.

PowerShell 1.0

Installing PowerShell from Server 2008 is done in the following way:

1. Select Start, and then click Control Panel.
2. From Control Panel, double-click Administrative Tools.
3. From Administrative Tools, double-click Server Manager.
4. From within the Server Manager console tree, choose Features, and then select Add Features.
5. Using the Add Features Wizard, select PowerShell, and then finish the wizard.

If you are working with Server 2003, you need to download and install PowerShell. This can be done through the installation portal link or by going to the download site (http://support.microsoft.com/?kbid=926139) for PowerShell and performing the download and install manually.

Ensure Components Are Installed Per Server Role

Scenario/Problem: Depending on the server role, there might be components that should be enabled to provide specific functionality to that role.

Solution: Ensure you have all the components needed for the role you are working on installing. Otherwise, the installation will not succeed and the installation wizard will assist you by reminding you to turn on certain components you need.

The following components are necessary for the roles you install:

Mailbox Role:

- Internet Information Services (IIS)
- COM+ access (IIS 6.0 component)
- World Wide Web Publishing Service (W3SVC)

These can all be installed through Add or Remove Programs in Control Panel on Server 2003, or through Programs and Features in Server 2008.

The Client Access Server Role:

- World Wide Web Service
- ASP.NET
- For Outlook Anywhere: Remote Procedure Call (RPC) over HTTP Proxy

These can all be installed through Add or Remove Programs in Control Panel on Server 2003, or through Programs and Features in Server 2008.

The Edge Transport Role:

Must not be a member of an Active Directory domain, but must have the following:

- On a Server 2003: Active Directory Application Mode (ADAM) installed to provide functionality that is needed.
- On a Server 2008 with Exchange 2007 SP1: Active Directory Lightweight Directory Services (AD LDS)

The Hub Transport Role:

Because Exchange 2007 Hub Transport servers use their own implementation of the Simple Mail Transfer Protocol (SMTP), you need to avoid installing the IIS SMTP services. This goes for the Edge Transport server as well.

The Unified Messaging Role:

- Microsoft Exchange Speech Service—This is installed automatically when you choose to install Exchange 2007 with the UM role. However, if you have a server that runs Microsoft Speech Server, you have to remove the Speech Server services because UM relies on its own set of services.
- Windows Media Encoder 9 Series x64 Edition.
- Windows Media Audio 9 Voice codec for x64.
- Microsoft Core XML Services (MSXML) 6.0.

Plan Your Exchange Storage Architecture

Scenario/Problem: In the planning stages, before you install your first Exchange Server, you need to understand the way the storage architecture works. Understanding this can help you in planning and in simply understanding overall what happens within your Exchange world when messages come and go.

Solution: Let's take a look at how a message is handled by the Mailbox Server in terms of storage groups, databases, and transaction logs.

When you install Exchange, by default, a First Storage Group is created with a single database. You can add more storage groups (up to 5 for the Standard Edition or up to 50 for the Enterprise Edition) and within each one of those storage groups, you can add databases (up to 5 for the Standard Edition or up to 50 for the Enterprise Edition). Each database you add has the *.edb extension. If you create a mailbox and place it within a database within a storage group, when that mailbox receives mail, the Exchange Server adds it to the database. Understandably, these databases grow as more mail is added.

NOTE The default database size limit for Exchange 2007 Standard Edition is 50GB. There is no limit for the Enterprise Edition. It is possible, however, to use the Registry Editor to modify the database size limit. To learn how, visit this site: http://technet.microsoft.com/en-us/library/bb232092(EXCHG.80).aspx.

When an email message enters the Mailbox server, it goes through the memory and is written to transaction logs. Each log is 1MB in size (a reduction from 5MB in previous versions of Exchange). Depending on the amount of traffic coming into the Exchange Server, the data is also written to the database. Now the email message has been written to two locations: the database where the user will check in using his email client and retrieve his mail, and the transaction logs where the email is broken up, depending on its size, into 1MB chunks.

Transaction logs are created in a log stream; in other words, they follow a sequential manner. Although the current log written to might look like an E00.log, additional logs might look more like E000000002E (as you can see in Figure 1.4). There can be up to 2,147,483,647 log files in a log stream. The current log is not committed to the database and does not have its name changed until after it is filled to the full 1MB capacity. Then, it is closed out.

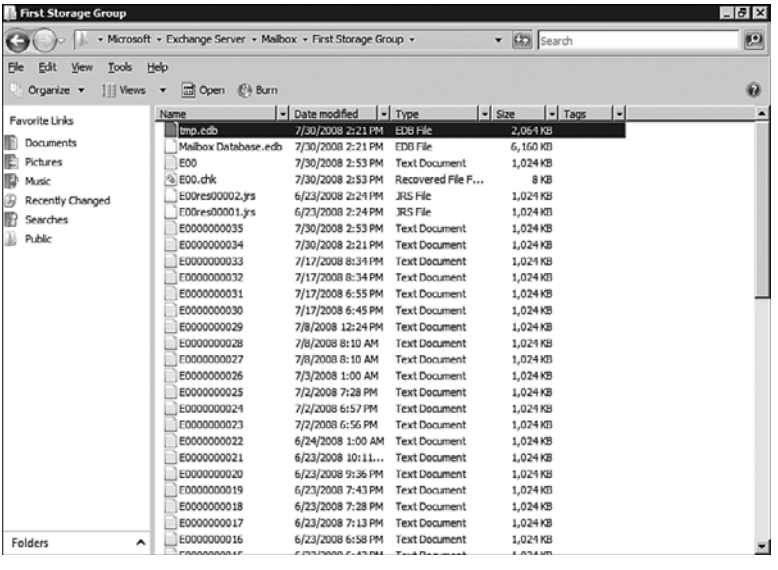

FIGURE 1.4
Your Exchange Database and transaction logs.

There is a check file to keep track of which transaction logs have been added to the database so that none are missed. A couple of reserve logs also exist, just in case the disk space runs out and you need a little extra space (although 2MB of extra transaction log space won't buy you much).

NOTE Each storage group can handle multiple databases; however, it is recommended that you place one database in one storage group. One key element to keep in mind is that the transaction logs are intertwined with a storage group. In the event you have three databases in the same storage group, the transaction logs will continue to use the log stream approach for all three at once. This might have a negative impact on performance and disaster recovery at some point, which is why the recommendation to use one database for each storage group exists.

The goal with transaction logs is to provide redundancy for your database. This can be a protection for you, but only if you separate the transaction logs from your database.

Consider the following scenario: You perform nightly backups of your Exchange database. It's Thursday, around 4:00 p.m., and the disk handling your database crashes (or your database corrupts) and you need to restore the database from backup. No problem, you have last night's backup handy. However, what about the mail from that day? It's not going to be in the backup of the database, right? However, it will be located in those transaction logs. So, you restore the database, and the transaction logs replay themselves into the newly restored database. Obviously, this works only if the transaction logs are not ruined along with the database. The obvious point is to separate the two onto different disks.

Overall, the best practice is to move your database and transaction logs off the drive that holds the system files and then separate the database from the transaction logs. To go one step further, if you can place your databases on a form of striped volume (if redundancy is provided some other way) or a striped volume with parity (a RAID 5 setup) to enable fault tolerance, and if you can mirror your transaction logs, you can achieve the best-practice level of storage for your mailbox servers.

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