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*Walter Glenn, Scott Lowe,
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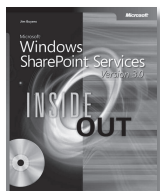
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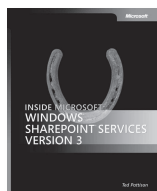
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Table of Contents

<i>Introduction</i>	<i>xxi</i>
---------------------------	------------

Part I

Introduction

1 Overview of Microsoft Exchange Server 2007	3
What Is Exchange Server?	3
Editions of Exchange Server 2007	4
Exchange Server 2007 Standard Edition	4
Exchange Server 2007 Enterprise Edition	5
Understanding Basic Concepts	5
Messaging Systems	5
The Organization of an Exchange Environment	8
Exchange Server Storage	11
What's New in Exchange Server 2007	13
Active Directory Site Routing	14
Split Permissions Model	14
Exchange Server 2007 Setup Wizard	14
Exchange Management	14
Exchange Server Roles	15
Unified Messaging	15
Messaging Policy and Compliance	15
Anti-Spam and Antivirus	15
64-Bit Architecture	16
Outlook Web Access	16
Summary	17

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2 Active Directory for Exchange Administrators	19
Brief Overview of Active Directory	19
Directory Structure in Active Directory	20
Logical Structure of Active Directory	20
Groups	25
Other Active Directory Components	27
Naming Partitions	27
Sites	28
Location Service Providers	28
Global Catalog Servers	28
Client Authentication	29
Active Directory Names	30
Exchange Server 2007 and Active Directory	31
Exchange Server 2007 and Active Directory Site Topology	31
Storing Exchange Server 2007 Data in Active Directory	33
Exchange Server 2007 and Forest Boundaries	36
Configuration Partition and Directory Data	37
DNS Configuration	37
Summary	38
3 Exchange Server 2007 Architecture	39
The Role of Exchange Server 2007 Roles	39
Mailbox Server Role	40
Client Access Server Role	41
Hub Transport Server Role	42
Unified Messaging Server Role	43
Edge Transport Server Role	44
Storage Design Goals in Exchange Server 2007	45
Stores and Storage Groups	46
Increased User Support	48
Individual Backup and Restore	49
Database File Structure	50
On-Demand Content Conversion	50
Single-Instance Message Store	50

Data Recovery and Transaction Logs	51
The Extensible Storage Engine	51
Transaction Log Files	57
The Web Folder Client	62
Public Folders	63
Multiple Public Folder Trees	64
Indexing	64
Index Catalogs	66
Index Size	67
Exchange Server Storage Design	67
Supported Storage Technologies	67
Choosing a RAID Level	68
Planning for Disk Space	69
Logical Unit Number (LUN) Layout	70
Other Storage Notes	71
Testing Your Storage Architecture	72
Transport Architecture	73
SMTP Connectors	73
Creating SMTP Connectors	74
Message Routing	74
Message Transport Scenarios	78
Transport Protocols	81
Summary	83

Part II

Planning Your Deployment

4 Assessing Needs	87
Defining User Needs	88
Messaging	88
Public Folders	89
Connections to Other Systems	90
Remote Access	91
Custom Applications	91
Training and Support Services	91

Assessing Current Resources	92
Defining Your Geographic Profile	92
Defining Your Software Environment	92
Defining Your Network Topology	93
Defining Your Active Directory Model	96
Defining Administrative Needs	98
Summary	98
5 Planning for Deployment	99
Planning the Organization	99
Establishing a Naming Convention	99
Planning Public Folders	102
Planning Gateways	103
Planning Servers	104
Disk Considerations	104
Processor Considerations	106
Memory Considerations	108
Network Considerations	108
Ways to Add Fault Tolerance	109
Summary	109

Part III

Installation and Deployment

6 Installing Exchange Server 2007	113
Preparing for the Installation	114
Gathering Information	114
Verifying Hardware Requirements	116
Getting Service Packs	117
Defining the Role of Your Server	118
Optimizing Hardware through Configuration	119
Verifying System Requirements	120
Creating the Exchange Administrator's Account	124
Playing It Safe	125
Performing the Installation	125
Preparing the Active Directory Environment	126

Installing Exchange Server 2007 in a New Organization	128
The Role of Roles	130
Installing in an Existing Organization	135
Verifying Your Installation	136
Finalizing Exchange Server 2007 Deployment	138
Keeping Exchange Healthy	142
Summary	143
7 Coexisting with Previous Versions of Exchange Server	145
Chapter Background	146
Terminology	146
Exchange Server 2007 Coexistence Deployment Considerations	147
Exchange Server 2003 Native Mode	147
Automatic Coexistence Tasks	148
Global Settings	149
Installing Exchange Server 2007 into an Existing Exchange Server 2003 Organization	150
Coexistence Administration Issues	152
Creating Additional Routing Group Connectors	153
Coexistence Issue: Version-Specific Administration	155
SMTP Connectors and Internet E-Mail	156
Handling Internet E-Mail	157
Adding an SMTP Connector to Your Legacy Exchange Organization	158
Public Folders	162
Public Folder Replication	163
Handling Public Folder Referrals	164
Administering Public Folders	166
Recipient Update Service	167
Complete Coexistence Notes	168
Summary	181
8 Transitioning to Exchange Server 2007	183
The Example Scenario	184
Transition Options	185
Transition Limitations	185
Move Internet Mail to Exchange Server 2007	186

Allow Mail to Flow to the Internet	187
Allow Incoming Mail from the Internet	190
Moving Mailboxes to Exchange Server 2007	192
The Decommissioning Process	199
Re-Home Client Services	200
Remove SMTP Connectors from Your Legacy Exchange Organization	200
Re-Home Public Folders	201
Move the Offline Address Book to Exchange Server 2007	203
Move the Recipient Update Service to Exchange Server 2007	204
Remove Legacy Connectors	205
Uninstall Exchange from Legacy Exchange Servers	207
Remove Legacy Exchange Routing Groups	207
Summary	208
9 High Availability in Exchange Server 2007	209
Continuous Replication and Transaction Logs	210
Local Continuous Replication	213
Preparing for LCR	214
Enabling Local Continuous Replication	215
Cluster Continuous Replication	223
CCR Terminology	224
Preparing for CCR	226
Enabling Continuous Cluster Replication	227
Establishing the Cluster	229
Configure the MNS Quorum to Use the File Share Witness	233
Installing Exchange Server 2007 on Your Cluster	233
Verifying the Status of Your CCR	236
Verifying That a Server Can Handle a Failover	236
Configuring the Transport Dumpster	237
Closing Thoughts on CCR	238
Single Copy Clusters	239
Summary	242

Part IV

Management

10	Managing Exchange Server 2007	245
	Microsoft Management Console	246
	The MMC User Interface	246
	How MMC Works	249
	Using the Exchange Management Console	251
	Major Areas of the Exchange Management Console	252
	Examining the Exchange Hierarchy	254
	Using the Exchange Management Shell	260
	Understanding Cmdlets	262
	Getting Help	263
	Summary	265
11	Creating and Managing Recipients.....	267
	Understanding Recipient Types	268
	Users	269
	Mailbox Users.....	269
	Mail-Enabled Users	286
	Mailbox Resources	288
	Mail Contacts	289
	Creating a Mail Contact	289
	Configuring a Mail Contact	291
	Distribution Groups	291
	Creating a Distribution Group.....	292
	Configuring a Group.....	293
	Creating Dynamic Distribution Groups	296
	Filtering Recipients	297
	Templates	298
	Address Lists.....	299
	Summary	302

12 Using Public Folders	303
Understanding Public Folder Storage	304
Using Public Folders in Outlook 2007	305
Creating a Public Folder in Outlook	305
Managing Public Folders in Outlook	305
Managing Public Folder Databases in the Exchange Management Console	307
Creating a New Public Folder Database	308
Removing a Public Folder Database	309
Creating and Managing Public Folders in the Exchange Management Shell	311
Creating a Public Folder	311
Removing a Public Folder	311
Getting Information about a Public Folder	312
Managing Settings for a Public Folder	312
Summary	314
13 Creating and Managing Storage Groups	315
Review of Exchange Server 2007 Storage Architecture	315
Benefits of Using Storage Groups	317
Increased User Support	318
Individual Backup and Restore	319
Hosting of Multiple Businesses	319
Support for Special Mailboxes	320
Planning Storage Groups	320
Planning for Disk Space	321
Planning for Multiple Storage Groups	324
Planning for Backup and Restore Throughput	325
Managing Storage Groups	326
Creating Storage Groups	326
Modifying Storage Group Configuration	329
Removing Storage Groups	332
Managing Stores	333
Creating a Mailbox Store	333
Modifying Mailbox Database Configuration	335
Summary	343
14 Unified Messaging	345
Unified Messaging Overview	346

Unified Messaging Features	346
Exchange Server 2007 Unified Messaging Objects	348
Creating and Managing Unified Messaging Objects	350
Unified Messaging Dial Plans	350
Unified Messaging Mailbox Policy	357
Unified Messaging IP Gateways	363
Associating Servers with Dial Plans	366
Enabling Unified Messaging for Individual Mailboxes	367
Summary	370

Part V

Maintenance

15 Troubleshooting Exchange Server 2007	373
Using Troubleshooting Tools	373
Using Event Viewer	373
Using Diagnostics Logging	375
Inbox Repair Tool	379
RPinG Utility	380
Eseutil.exe Offline Tool	383
Best Practices Analyzer	385
Mail Flow Troubleshooter	387
Performance Troubleshooter	389
Other Useful Utilities	390
Finding Help	390
Product Documentation	391
Microsoft TechNet	391
Internet Newsgroups	391
Summary	392
16 Disaster Recovery	393
Backup and Restore Technologies	393
The Exchange Database	394
Volume Shadow Copy Service	399
Exchange Streaming Backup API	401
Other Exchange Server Components	405

Backup and Restore Strategies	406
Recovering an Exchange Mailbox Server	410
Recovering an Exchange Mailbox Database	414
Recovering a Single Exchange Mailbox	414
Backing up an Exchange Mailbox Server	416
Backing up an Exchange Mailbox Database	417
Backing up a Single Exchange Mailbox	418
Planning for Corruption	419
Implementing Backup Strategies	420
Operational Best Practices	425
Summary	426
17 Tuning Exchange Server 2007 Performance	427
Understanding How the Performance Snap-in Works	427
Performance Monitoring Concepts	428
Collecting Data with the Performance Snap-In	429
Viewing Collected Data	430
Evaluating the Four Main Subsystems in Windows	431
Evaluating Memory Usage	432
Evaluating Processor Usage	433
Evaluating Disk Usage	434
Evaluating Network Usage	436
Using the Performance Snap-in to Tune Exchange Server 2007	437
SMTP System Monitor Counters	437
Outlook Web Access	438
Unified Messaging Counters	439
Using Other Exchange Performance Tools	442
Microsoft Exchange Server Jetstress Tool	442
Exchange Load Generator	444
Summary	445

Part VI

Security

18 Security Policies and Exchange Server 2007	449
Why Are Information Security Policies Important?	450

Information Security Policies and Electronic Policies	452
Information Security Policies for Exchange Server 2007	453
Password Policies	453
Logon Policies	454
Acceptable Use Policies	455
Computer Viruses, Trojans, and Worms	456
Schema Extensions by Exchange Server 2007	457
Data Security	459
Legal Exposure to Unwanted E-Mail Content	460
Backing Up and Archiving Exchange Databases	461
E-Mail Integrity	462
Miscellaneous Elements to Consider	463
Related Resources	464
Summary	465
19 Exchange Server Security Basics	467
The Scope of Security	468
Motivations of a Criminal Hacker	469
How Hackers Work	470
Physical Security	474
Administrative Security	474
The Built-in Exchange Administrative Groups	475
The Add Exchange Administrator Wizard	477
SMTP Security	480
Computer Viruses	485
What Is a Virus?	485
Trojans	486
Worms	486
Junk E-Mail	487
Security Tools Provided by Microsoft	488
Summary	489
20 Antivirus and Anti-Spam	491
The Edge Transport Server at a Glance	491
Edge Transport Server Deployment	493
Verify the Edge Transport Server's DNS Suffix	493

Configure Firewalls to Pass Edge Traffic	494
Install Active Directory Application Mode	495
Install the Exchange Server 2007 Edge Transport Server Role	495
Subscribe the Edge Transport Server to the Exchange Server 2007 Organization	497
Managing Anti-Spam Features	502
Content Filtering	502
Connection Filtering: IP Allow List	506
Connection Filtering: IP Allow List Providers	508
Connection Filtering: IP Block List	509
Connection Filtering: IP Block List Providers	511
Recipient Filtering	514
Sender Filtering	515
Sender ID	517
Attachment Filtering	520
Managing Antivirus with Microsoft Forefront Security for Exchange Server ...	524
About Microsoft Forefront Security for Exchange Server	525
Installing Microsoft Forefront Security for Exchange Server	525
Managing Microsoft Forefront Security for Exchange Server	527
Other Microsoft Forefront Security for Exchange Server Benefits	529
Summary	530

21 Securing Exchange Server 2007 Messages 531

Windows Server 2003 Security Protocols	531
Understanding the Public Key Infrastructure in Windows Server 2003	532
Encryption and Keys	532
Encryption Schemes	533
Certificate Services in Windows Server 2003	534
Managing the Public Key Infrastructure	540
Installing and Configuring Certificate Services	540
Installing Web Enrollment Support	545
Using the Web Enrollment Pages	546
Viewing Information About Certificates	551
Securing Messaging in Outlook 2007	555
Initially Trusting a Certificate	556

Encryption and Outlook 2007	556
Digital Signatures and Outlook 2007	557
S/MIME and Outlook 2007	557
Configuring Outlook 2007 for Secure Messaging	558
Installing Exchange Certificate Templates	560
Understanding How Exchange Server 2007 Integrates with Windows Server 2003 Security	561
Summary	564

Part VII

Clients

22 Overview of Exchange Clients	567
Microsoft Office Outlook 2007	568
Windows Mail and Microsoft Outlook Express	570
Outlook Web Access	572
Standard Internet E-Mail Clients	573
Non-Windows Platforms	573
UNIX Clients	574
Macintosh Clients	574
Choosing a Client for Exchange Server	574
Summary	575
23 Deploying Microsoft Office Outlook 2007	577
Installing Outlook 2007	577
Standard Outlook Installation	578
Installing Outlook 2007 by Using the Office Customization Tool	579
Supporting Outlook 2007	579
Using Cached Exchange Mode	580
Enabling Multiple Users in Outlook 2007	586
Outlook Anywhere	590
Summary	593
24 Supporting Outlook Web Access	595
Features of OWA	595
Deploying OWA	596

Single-Server Scenario	596
Multiserver Scenario	597
ISA Server 2006 and OWA	600
Authentication Options	601
Configuring OWA Properties and Features	610
Managing Access to UNC Shares and SharePoint	
Document Repositories	611
OWA Segmentation	617
OWA User Features	622
Summary	624
25 Supporting Other Clients	625
Post Office Protocol Version 3	625
Enabling POP3	627
Administering POP3	627
Internet Messaging Access Protocol 4	632
Enabling IMAP4	633
Administering IMAP4	634
POP3/IMAP4 Considerations	639
Summary	640

Part VIII

Appendices

A Default Directory Structure for Exchange Server 2007	643
B Delivery Status Notification Codes	645
C Default Log File Locations	649
D Default Diagnostic Logging Levels for Exchange Processes	651
<i>Glossary</i>	<i>657</i>
<i>Index</i>	<i>669</i>

Managing Exchange Server 2007



Microsoft Management Console	246
Using the Exchange Management Console	251
Using the Exchange Management Shell	260
Summary	265

Now that you've installed Microsoft Exchange Server 2007, you're probably eager to start working with it. You'll want to begin creating mailboxes, groups, and other recipients, but first you need to know some basics of managing the Exchange system.

Exchange Server 2007 introduces a radical shift in the way you manage an Exchange server or organization. Exchange Server 2007 is built entirely upon a new command-line interface named Exchange Management Shell—a modified version of the new Windows PowerShell. You can perform just about every imaginable administrative function with Exchange Server 2007 by using shell commands called cmdlets.

The graphical management interface for Exchange Server 2007 is Exchange Management Console. It is essentially a Microsoft Management Console (MMC) snap-in that is built to run commands from the Exchange Management Shell. Whenever you configure an object in the console or run a wizard, the interface actually is using the underlying Exchange Management Shell to issue the appropriate commands. In fact, when you issue a command in the console, it even provides information about how to issue those same commands from the Exchange Management Shell, providing a friendly way to get to know the shell interface and command structure.

This chapter introduces you to the Microsoft Management Console, the Exchange Management Console, and the Exchange Management Shell. Throughout this book, you learn about ways to perform administrative functions in both interfaces. This chapter is meant to give you grounding in the two interfaces you'll be using to manage Exchange Server 2007.

Microsoft Management Console

Microsoft Management Console (MMC) provides a common environment for the management of various system and network resources. MMC is actually a framework that hosts modules called snap-ins, which provide the actual tools for managing a resource. For example, you manage Exchange Server 2007 using the Microsoft Exchange snap-in.

Note The Start menu icon that loads the Exchange Management Console essentially creates an MMC and loads the Microsoft Exchange snap-in, and you can do nearly all your administration by selecting this shortcut. However, you may find it useful to add the Microsoft Exchange snap-in to an MMC console you create along with other snap-ins representing common tasks you perform.

MMC itself does not provide any management functionality. Rather, the MMC environment provides for seamless integration between snap-ins. This allows administrators and other users to create custom management tools from snap-ins created by various vendors. Administrators can save the tools they have created for later use and share them with other administrators and users. This model gives administrators the ability to delegate administrative tasks by creating different tools of varying levels of complexity and giving them to the users who will perform the tasks.

The MMC User Interface

When you first load MMC, you might notice that it looks a lot like Microsoft Windows Explorer. MMC uses a multiple-document interface, meaning that you can load and display multiple console windows in the MMC parent window simultaneously. Figure 10-1 shows the MMC parent window with the Microsoft Exchange snap-in loaded. The next few sections discuss the main parts of this window.

MMC Toolbar

The main MMC toolbar holds six menus: File, Action, View, Favorites, Window, and Help. The View, Favorites, Window, and Help menus are pretty much what you would expect. The View menu lets you customize the columns you see in the display and turn on or off visual effects. The Favorites menu lets you add items to a list of favorites and organize that list into categories. The Favorites list can include shortcuts to tools, items in the console, or tasks. The Window menu lets you manage console windows if you have more than one window open in MMC. The Help menu lets you access general MMC Help as well as Help for the snap-ins that are currently loaded.

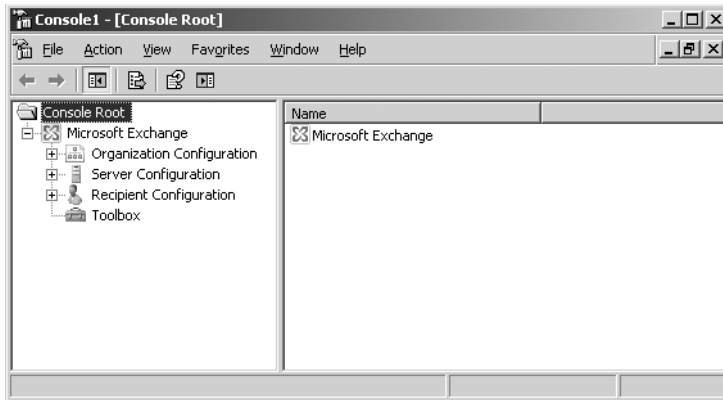


Figure 10-1 MMC window with the Microsoft Exchange snap-in loaded

The Action menu provides access to commands pertinent to the object you have selected in the console. The commands on the Action menu change depending on what snap-in is loaded and what object within that snap-in is currently selected.

The File menu is where most of the action is. From this menu, you can open and save consoles and even create new ones. You can also add snap-ins to and remove them from open consoles and set general MMC options. Options you can set include the following:

- **Console Title** Specifies the console name as it appears in the MMC title bar.
- **Console Mode** Author mode grants the user full access to all MMC functionality. User mode comes in three flavors: Full Access lets the user access all MMC commands but not add or remove snap-ins or change console properties; Limited Access Multiple Window allows the user to access only the areas of the console tree that were visible when the console was saved and to open new windows; Limited Access Single Window works the same as Limited Access Multiple Window, except that users cannot open new windows.

Other options define whether users can access context menus on taskpads, save changes to the console, and customize views.

Scope Pane

The Scope pane contains a hierarchy of containers referred to as a console tree. Some containers are displayed as unique icons that graphically represent the type of items they contain. Others are displayed as folders, simply indicating that they hold other objects. Click the plus sign next to a container to expand it and display the objects inside. Click the minus sign to collapse the container.

Details Pane

The Details pane changes to show the contents of the container selected in the Scope pane. In other words, the Details pane shows the results of the currently selected scope. The Details pane can display information in a number of ways, referred to as *views*.

Note The View menu also lets you customize the columns that are shown in the scope and details panes. In the Details pane itself, you can rearrange columns and click a column heading to reorder rows alphabetically or chronologically.

In addition to the standard views, for some snap-ins you can also create a taskpad view to show in the Details pane. A taskpad view is a dynamic HTML (DHTML) page that presents shortcuts to commands available for a selected item in the Scope pane. Each command is represented as a task that consists of an image, a label, a description, and a mechanism for instructing the snap-in to run that command. Users can run the commands by clicking a task.

You can use taskpad views to do the following things:

- Include shortcuts to all the tasks a specific user might need to perform.
- Group tasks by function or user by creating multiple taskpad views in a console.
- Create simplified lists of tasks. For example, you can add tasks to a taskpad view and then hide the console tree.
- Simplify complex tasks. For example, if a user frequently performs a given task involving several snap-ins and other tools, you can organize, in a single location, shortcuts to those tasks that run the appropriate property sheets, command lines, dialog boxes, or scripts.

Snap-in Root Container

The snap-in root container is the uppermost container in the snap-in; it is usually named based on the product or task with which it is associated. MMC supports stand-alone and extension snap-ins. A stand-alone snap-in, such as Microsoft Exchange, provides management functionality without requiring support from another snap-in. Only one snap-in root container exists for each stand-alone snap-in. An extension snap-in requires a parent snap-in above it in the console tree. Extension snap-ins extend the functionality provided by other snap-ins.

Containers and Objects

Exchange Server 2007 is a great example of an object-based, hierarchical directory environment. All the little bits and pieces that make up Exchange are objects that interact

with one another to some degree. The objects you see in the scope and details panes can be divided into two types:

- **Containers** Containers can contain both other containers and noncontainer objects. Container objects can also appear in the Details pane. They are used to logically group all the objects that make up a management environment. An administrator uses the container objects to organize the tree and then to navigate through it.
- **Leaf Objects** A leaf object is simply an object that cannot contain other objects. Some common leaf objects with which an administrator works daily include servers and connectors.

You manage all the objects in an MMC console through the use of property sheets. A *property sheet* is a dialog box you open by selecting an object and then choosing Properties from the Action menu. It consists of one or more tabs that contain controls for setting a group of related properties. Figure 10-2 shows the property sheet for a server object in the Microsoft Exchange snap-in.

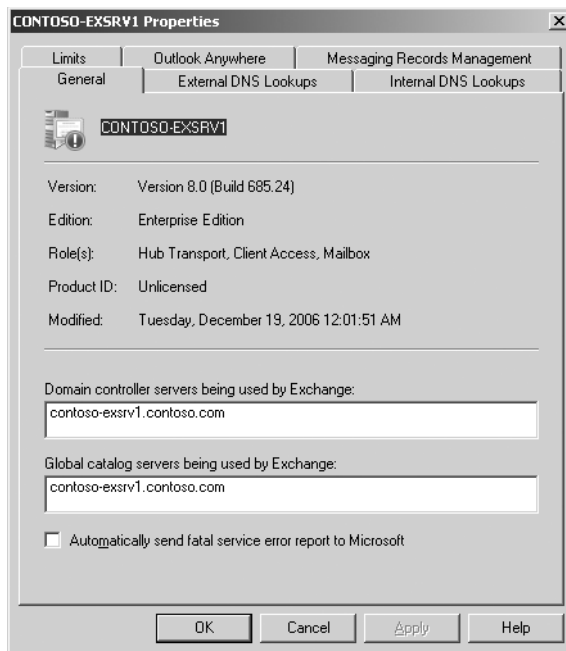


Figure 10-2 Property sheet for a server object

How MMC Works

The MMC interface permits snap-ins to integrate within a common management console. This gives all snap-ins a similar look and feel, although they might perform their tasks in

different ways. The console itself offers no management functions; it merely acts as a host to the snap-ins. Snap-ins always reside in a console; they do not run by themselves.

Snap-ins

Each MMC tool is built of a collection of instances of smaller tools called MMC snap-ins. A snap-in is the smallest unit of console extension and represents one unit of management behavior. The snap-in might call on other supporting controls and dynamic-link libraries (DLLs) to accomplish its task.

Snap-ins extend MMC by adding and enabling management behavior. They can provide this behavior in a number of ways. For example, a snap-in might add elements to the container tree, or it might extend a particular tool by adding shortcut menu items, toolbars, property sheet tabs, wizards, or Help to an existing snap-in. There are two basic types of snap-ins:

- **Stand-alone Snap-ins** Provide management functionality even if they are alone in a console with no other supporting snap-ins. They do not rely on any other snap-ins being present. The Exchange System snap-in is an example of a stand-alone snap-in.
- **Extension Snap-ins** Provide a variety of functionality, but only when used in conjunction with a parent snap-in. Some extend the console namespace, while others simply extend context menus or specific wizards.

Note Many snap-ins support both modes of operation, offering some stand-alone functionality and also extending the functionality of other snap-ins.

Packages

Snap-ins are usually shipped in groups called *packages*. For example, the Microsoft Windows operating system itself includes one or more packages of snap-ins. Additionally, other vendors might ship products composed entirely of packages of snap-ins. Grouping snap-ins into packages provides convenience for downloading and installation. It also permits several snap-ins to share core DLLs so that these DLLs do not have to be placed in every snap-in.

Custom Tools

MMC provides functionality for creating custom management tools. It allows administrators to create, save, and then delegate a customized console of multiple snap-ins tailored for specific tasks. Administrators can assemble these specific snap-ins into a tool (also called a *document*) that runs in one instance of MMC. For example, you can create a tool that manages many different aspects of the network—Active Directory, replication topology,

file sharing, and so on. After assembling a tool, the administrator can save it in an .msc file and then reload the file later to instantly re-create the tool. The .msc file can also be e-mailed to another administrator, who can then load the file and use the tool.

Custom Consoles

One of the primary benefits of MMC is its support for customization of tools. You can build custom MMC consoles tailored for specific management tasks and then delegate those consoles to other administrators. These tools can focus on the particular management requirements of various administrator groups.

For example, you could create a custom console, as shown in Figure 10-3, that includes the Microsoft Exchange, Active Directory Users and Computers, Disk Management, and Event Viewer snap-ins—several tools that are important to any Exchange administrator.

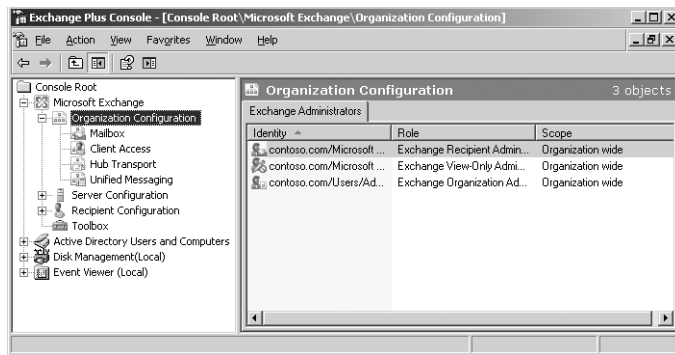


Figure 10-3 A custom console with various snap-ins

More Info Obviously, there is a lot more to MMC than can be covered in a single chapter, especially when the chapter is really about using the Microsoft Exchange System snap-in. For more information about MMC, start with the Help file available from any console window.

Using the Exchange Management Console

The Exchange Management Console provides a graphical view of all the resources and components of an Exchange organization. No matter how many servers you have set up, you can manage them all from a single Exchange Management Console window. Use this window, and the property sheets of all the objects in it, to navigate the Exchange organizational hierarchy and perform the various tasks associated with Exchange administration.

You use both container and leaf objects to administer an Exchange organization. Most objects in the Exchange System console window—both container and leaf—have a property sheet that allows you to configure various parameters for that object and make it act in the way that best serves the organization's needs. You can open an object's property sheet by selecting the object and choosing Properties from the Action menu. You can also right-click an object and choose Properties from its shortcut menu. You use property sheets to both configure and administer Exchange Server 2007.

Major Areas of the Exchange Management Console

You can start the Exchange Management Console by clicking Start, pointing to All Programs, then to Microsoft Exchange Server 2007, and then clicking Exchange Management Console. The Exchange Management Console is divided into the major areas shown in Figure 10-4. These areas include:

- **Console tree** The console tree is located on the left side of the console and is organized by containers that represent the hierarchy of the Exchange organization. The specific containers that are displayed are based on the server roles that are installed. When you select a container in the console tree, the results of that container are shown in the Result pane.
- **Results pane** The Results pane is located in the center of the console. This pane displays objects that reflect the container you have selected in the console tree. For example, if you select the Mailbox object inside the Recipient Configuration container, the Results pane shows individual mailboxes.
- **Work pane** The Work pane is located at the bottom of the Result pane. The Work pane is shown only when you select objects under the Server Configuration container, such as Mailbox, Client Access, or Unified Messaging. This pane displays objects based on the server role that is selected in the Server Configuration container. For example, if you select the Mailbox object in the Server Configuration container, the Results pane shows a list of Mailbox servers. When you select a server in the Results pane, storage groups on that server are shown in the Work pane.
- **Actions pane** The Actions pane is located on the right side of the console. This pane lists actions you can perform based on the object that is selected in the console tree, Results pane, or Work pane. These actions are the same actions you can take by displaying the Action menu or by right-clicking the object. For this reason, you might find it more useful to hide the Actions pane. You can do this by clicking the Show/Hide Action Pane button on the Exchange Management Console toolbar.

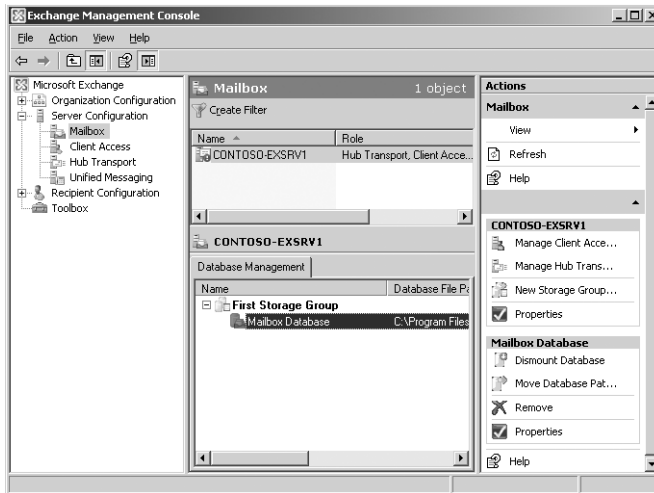


Figure 10-4 Areas of the Exchange Management Console

Real World Explore!

The sheer number of property sheets you encounter when administering Exchange Server 2007 can seem daunting, but don't let them intimidate you. Take the time to play with the program. You probably won't be able to remember exactly where to go to accomplish every administrative task in Exchange Server 2007, but it helps to think about what the task involves. If you need to manage the way all mailboxes on a server are handled, find the Mailbox container inside the Server Configuration container. If you need to manage a single mailbox, find the Mailbox container inside the Recipient Configuration container. Each component handles a different aspect of the configuration, so multiple components might be involved with a single configuration or administrative task. As you use the program and get used to the Exchange environment, it becomes easier to navigate the program and find exactly the object or objects you need to administer.

Learning the contents and layout of the various property sheets in the Exchange Management Console is a key to learning how Exchange Server 2007 works. After you know how to organize tasks that match the way Exchange Server 2007 is structured, your administrative tasks flow more easily.



To administer an Exchange environment with the Exchange Management Console, you must log on to Active Directory under a domain user account that has administrative privileges for administering the Exchange organization.

Examining the Exchange Hierarchy

The top of the hierarchy in the console tree of the Exchange Management Console is the snap-in root container that represents the Exchange organization, as shown in Figure 10-5. The snap-in root container is named Microsoft Exchange. All the Exchange containers are held within this container. Additionally, selecting the root container shows two tabbed screens in the Results pane: Finalize Deployment, which shows you tasks to perform after installation (and which is discussed in Chapter 6, “Installing Exchange Server 2007”); and End-to-End Scenario, which allows you to configure end-to-end solutions in Exchange, such as implementing best practices for disaster recovery.

There are four primary containers directly within the snap-in root container. The following sections describe each of these containers.

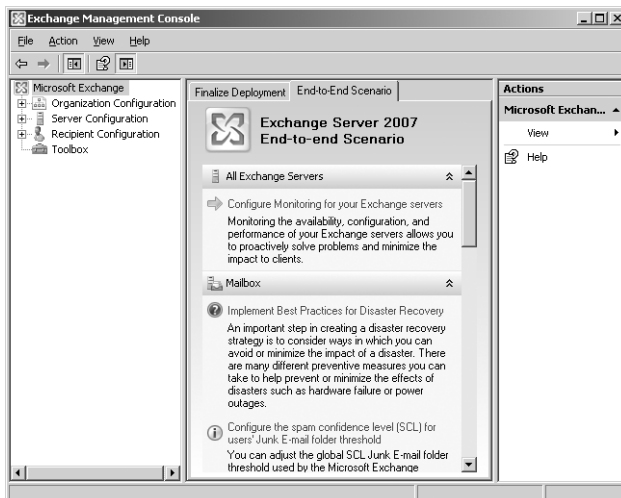


Figure 10-5 The Exchange hierarchy

Organization Configuration

Selecting the Organization Configuration container itself displays all users configured as Exchange administrators and allows you to configure administrative access roles for users or groups, as shown in Figure 10-6. You must be a member of the Exchange Server Administrators group in order to view the Organization Configuration container or change the roles assigned to users.

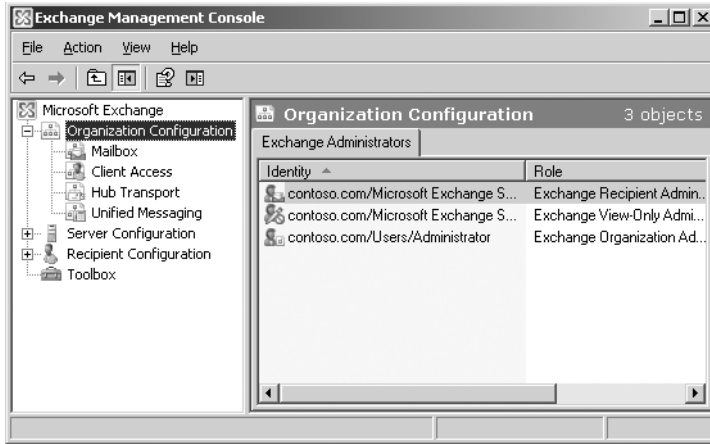


Figure 10-6 Viewing Exchange administrative roles with the Organization Configuration container

Exchange administrator roles are similar in function to Windows Server security groups. Administrator roles allow you to easily assign sets of permissions to users for the most common administrative functions in Exchange Server. Exchange administrative roles include the following:

- **Exchange Server Administrators** This role provides access to only local server Exchange configuration data, either in the Active Directory or on the physical computer on which Exchange Server 2007 is installed. Users who are members of the Exchange Server Administrators role have permissions to administer a particular server, but do not have permissions to perform operations that have global impact in the Exchange organization. Members assigned to this role are granted the following:
 - ❑ They are made owners of all local server configuration data. As owners, members of the role have full control over the local server configuration data.
 - ❑ They are made local administrators on the computer on which Exchange is installed.
 - ❑ They are made members of the Exchange View-Only Administrators role.
- **Exchange Organization Administrators Role** The Exchange Organization Administrators role provides administrators with full access to all Exchange properties and objects in the Exchange organization. Additionally, members assigned this role are granted the following:
 - ❑ They are made owners of the Exchange organization in the configuration container of Active Directory. As owners, members of the role have control over

the Exchange organization data in the configuration container in Active Directory and the local Exchange server Administrator group.

- ❑ They are given Read access to all domain user containers in Active Directory. Exchange grants this permission during setup of the first Exchange Server 2007 server in the domain, for each domain in the organization. These permissions are also granted by being a member of the Exchange Recipient Administrator role.
 - ❑ They are given Write access to all Exchange-specific attributes in all domain user containers in Active Directory. Exchange Server 2007 grants this permission during setup of the first Exchange Server 2007 server in the domain, for each domain in the organization. These permissions are also granted by being a member of the Exchange Recipient Administrator role.
 - ❑ They are made owners of all local server configuration data. As owners, members have full control over the local Exchange server. Exchange Server 2007 grants this permission during setup of each Exchange server.
- **Exchange Recipient Administrators Role** The Exchange Recipient Administrators role has permissions to modify any Exchange property on an Active Directory user, contact, group, dynamic distribution list, or public folder object. Members are granted the following:
- ❑ They are given Read access to all the Domain User containers in Active Directory that have had Setup /PrepareDomain run in those domains.
 - ❑ They are given Write access to all the Exchange-specific attributes on the Domain User containers in Active Directory that have had Setup /PrepareDomain run in those domains.
 - ❑ They are automatically granted membership in the Exchange View-Only Administrator role.
- **Exchange View-Only Administrators Role** The Exchange View-Only Administrators role has read-only access to the entire Exchange organization tree in the Active Directory configuration container and read-only access to all the Windows domain containers that have Exchange recipients.

The Organization Configuration container contains the following containers:

- **Mailbox** At the organization level, the Mailbox container allows you to manage Mailbox server role settings that apply to the entire Exchange organization. You can create and manage address lists, managed custom folders, messaging records management (MRM) mailbox policies, and offline address books (OABs). You learn more about this in Chapter 11, “Creating and Managing Recipients.”

- **Client Access** At the organization level, the Client Access container allows you to create and manage Exchange ActiveSync mailbox policies for mobile users. These policies apply common sets of security settings or policies to collections of users.
- **Hub Transport** At the organization level, the Hub Transport container allows you to configure features of the Hub Transport server role. The Hub Transport server role handles all internal mail flow, applies organizational message routing policies, and is responsible for delivering messages to a recipient's mailbox.
- **Unified Messaging** At the organization level, the Unified Messaging container allows you to manage Unified Messaging (UM) server role settings that apply to your entire Exchange Server 2007 organization. You can maintain existing or create new UM dial plans, UM IP gateways, UM mailbox policies, and UM auto attendants. For more information on Unified Messaging, see Chapter 14, "Unified Messaging."

Server Configuration

Use the Server Configuration container, shown in Figure 10-7, to view a list of all the servers in your Exchange organization and perform tasks specific to server roles. When you select the Server Configuration container itself, you can view the role, version, edition, product ID, cluster status, last modified time, and site for each server in the Results pane. For more information about how to view these columns in the Results pane, see the section, "Custom Consoles," earlier in this chapter.

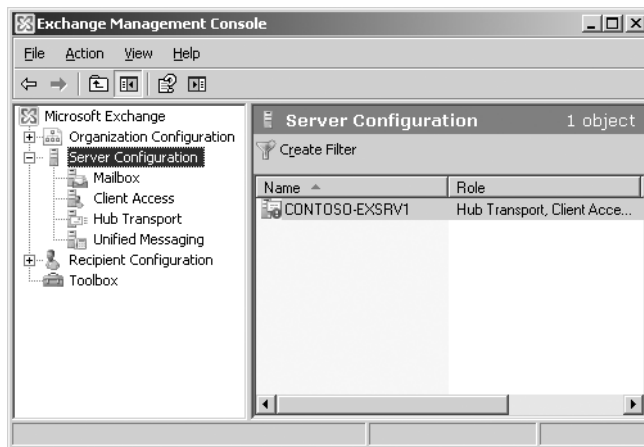


Figure 10-7 Viewing the Server Configuration container

The containers that appear under Server Configuration show only the Exchange servers that have a particular server role installed. The Server Configuration container contains the following containers:

- **Mailbox** At the server level, the Mailbox container allows you to display a list of all servers in the organization that have the Mailbox server role installed and to perform actions specific to that server role. The Database Management tab in the Work pane lists all the storage groups and databases that exist on the selected server.
- **Client Access** At the server level, the Client Access container allows you to view and maintain the settings for Microsoft Outlook Web Access (OWA), Exchange ActiveSync, and the offline address book (OAB).
- **Hub Transport** At the server level, the Hub Transport container allows you to display a list of all servers in the organization that have the Hub Transport server role installed and to perform actions specific to that server role.
- **Unified Messaging** At the server level, the Unified Messaging container allows you to configure voice messaging, fax, and e-mail messaging into one store that users can access from a telephone and a computer. Exchange Server 2007 Unified Messaging integrates Microsoft Exchange with telephony networks and brings the Unified Messaging features to the core of Microsoft Exchange.

Recipient Configuration

The Recipient Configuration container, shown in Figure 10-8, allows you to perform a variety of recipient management tasks. You can view all the recipients in your organization, create new recipients, and manage existing mailboxes, mail contacts, mail users, and distribution groups.

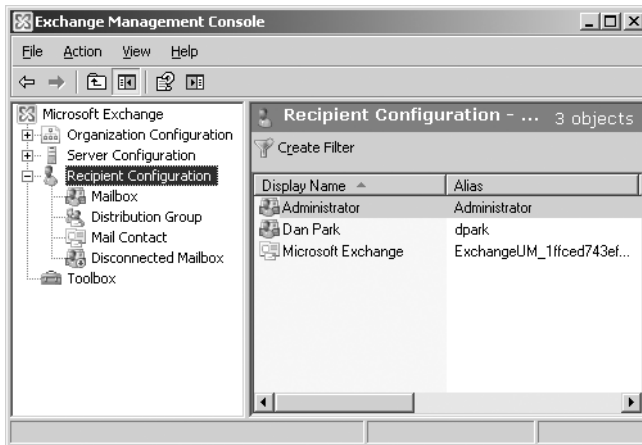


Figure 10-8 Viewing the Recipient Configuration container

The Recipient Configuration container contains the following containers:

- **Mailbox** At the recipient level, the Mailbox container allows you to manage mailbox users and resource mailboxes. Resource mailboxes include room and equipment

mailboxes. You can create new mailboxes and remove, disable, or move existing mailboxes. You can also configure mailbox properties, enable and disable Unified Messaging (UM), and manage mobile devices.

- **Distribution Group** The Distribution Group container allows you to manage mail-enabled distribution groups (which include security groups) and dynamic distribution groups. You can create new distribution groups and remove, disable, or configure existing distribution groups.
- **Mail Contact** The Mail Contact container allows you to manage mail contacts. You can create new mail contacts and delete or configure existing mail contacts.
- **Disconnected Mailbox** The Disconnected Mailbox container allows you to view and connect disabled mailboxes. Disconnected mailboxes are retained based on the configured mailbox database limits. You will see only the mailboxes that have been disconnected within the retention period that is specified for the mailbox database.

Toolbox

The Toolbox is a collection of tools that are installed with Microsoft Exchange Server 2007. The Toolbox provides a central location for diagnostic, troubleshooting, and recovery activities using various Exchange tools.

The tools in the toolbox are divided into the following categories:

- **Configuration Management Tools** This category contains only the Exchange Server Best Practices Analyzer, which automatically examines an Exchange Server 2007 deployment and determines whether the configuration is in line with Microsoft best practices. Run the Exchange Server Best Practices Analyzer after installing a new Exchange server or after making any configuration changes. You learn more about this tool in Chapter 15, “Troubleshooting Exchange Server 2007.”
- **Disaster Recovery Tools** This category contains two tools: Database Recovery Management Tool and Database Troubleshooter. Both tools work through a set of troubleshooting steps to help identify and resolve database issues.
- **Mail Flow Tools** This category contains the following three tools:
 - **Mail Flow Troubleshooter** This tool allows you to troubleshoot common mail flow problems. After selecting a symptom of the mail flow problems you are experiencing (such as delays or non-delivery reports), the tool attempts to find a solution and then provides advice to walk you through the correct troubleshooting path. It shows an analysis of possible root causes and provides suggestions for corrective actions.
 - **Message Tracking Tool** This tool lets you view a detailed log of all message activity as messages are transferred to and from an Exchange Server 2007

server that has the Hub Transport server role, the Mailbox server role, or the Edge Transport server role installed. You can use message tracking logs for mail flow analysis, reporting, and troubleshooting.

- ❑ **Queue Viewer** This tool allows you to monitor mail flow and inspect queues and messages. You can also perform actions to the queuing databases such as suspending or resuming a queue, or removing messages
- **Performance Tools** This category contains two tools: Performance Monitor and Performance Troubleshooter. Performance Monitor is a tool you can configure to collect information about the performance of your messaging system. Specifically, you can use it to monitor, create graphs, and log performance metrics for core system functions. Performance Monitor is covered in detail in Chapter 17, “Tuning Exchange Server 2007 Performance.” Performance Troubleshooter helps you to locate and identify performance-related issues that could affect an Exchange server. You diagnose a problem by selecting the symptoms observed. Based on the symptoms, the tool walks you through the correct troubleshooting path. This tool is covered in Chapter 15.

Using the Exchange Management Shell

The Exchange Management Shell, shown in Figure 10-9, is based on Microsoft Windows PowerShell, which provides a powerful command-line interface for executing and automating administrative tasks. With the Exchange Management Shell, you can manage every aspect of Exchange Server 2007, including enabling new e-mail accounts, configuring store database properties, and just about every other management task associated with Exchange Server 2007.

```
Machine: contoso-exsrv1 | Scope: contoso.com

Welcome to the Exchange Management Shell!

Full list of cmdlets:      get-command
Only Exchange cmdlets:   get-excommand
Cmdlets for a specific role: get-help -role <UM> or <Mailbox>
Get general help:         help
Get help for a cmdlet:    help <cmdlet-name> or <cmdlet-name> -?
Show quick reference guide: quickref
Exchange team blog:       get-exblog
Show full output for a cmd: <cmd> ! format-list

Tip of the day #67:
What's the difference between server-side filtering and client-side filtering? Server-side filtering is used with the recipient and queue cmdlets, which support the Filter parameter, because these cmdlets can return large result sets. The server filters the results by using the criteria you specify, and then sends you the filtered results. Client-side filtering can be used with any cmdlet. The entire result set is sent to the client computer, which then filters the data and provides a filtered result set. Client-side filtering uses the Where-Object cmdlet, which can be shortened to Where.
```

Figure 10-9 The Exchange Management Shell

In fact, you can use the Exchange Management Shell to perform every task available in the Exchange Management Console and a number of tasks that cannot be performed

in the Exchange Management Console. It helps to think of it this way: the Exchange Management Console provides a graphical interface for most of the functionality of the Exchange Management Shell. When you run a command in the Exchange Management Console, the Exchange Management Shell is actually called to perform the command. When you perform a command in the Exchange Management Console, the graphic interface often even shows you the associated shell command, as shown in Figure 10-10.

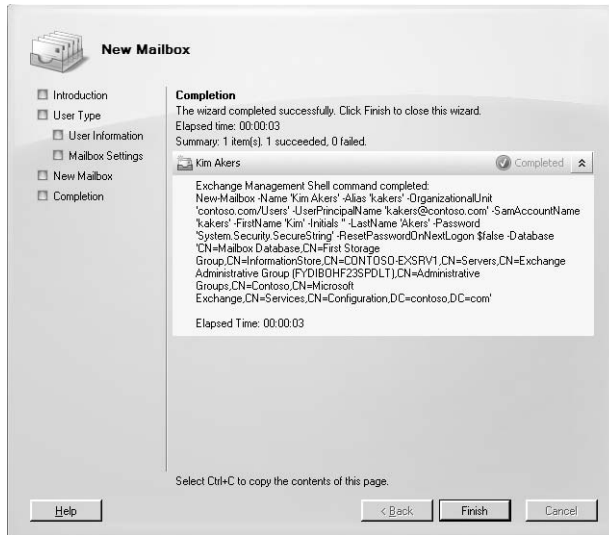


Figure 10-10 Viewing shell commands from the Exchange Management Console

So why use the shell instead of the console? Aside from the fact that some commands (such as those used to manage public folders) are only available as shell commands, the shell also offers a flexibility that can speed up and simplify common operations. For example, with a single shell command, you can get a list of recipients, filter that list according to a set of criteria, and then perform a function on only the filtered list of recipients.

Note The Exchange Management Shell also provides a robust and flexible scripting platform that can reduce the complexity of current Microsoft Visual Basic scripts. Tasks that previously required many lines in Visual Basic scripts can now be done by using as little as one line of code in the Exchange Management Shell. The Exchange Management Shell provides this flexibility because it does not use text as the basis for interaction with the system, but uses an object model that is based on the Microsoft .NET platform. This object model enables the Exchange Management Shell cmdlets to apply the output from one command to subsequent commands when they are run.

To open the Exchange Management Shell, follow these steps:

1. Click Start, point to All Programs, and then point to Microsoft Exchange Server 2007.
2. Click Exchange Management Shell.

More Info This section is intended to introduce you to the basics of using the Exchange Management Shell. Throughout this book, you find specific examples of using shell commands to complete administrative tasks. For more information on using the Exchange Management Shell, please consult the Exchange Server 2007 Help files. Help includes detailed advice on using advanced options such as **WhatIf** and comparison parameters, command output, shell variables, structured data, and scripting.

Understanding Cmdlets

At first glance, the shell may seem similar to other command-line interfaces with which you may be familiar. However, after working with the shell for just a few minutes, you see that there are dramatic differences.

In the Exchange Management Shell, a cmdlet is the smallest unit of functionality. A cmdlet is roughly analogous to a built-in command in other types of shells. You type cmdlets directly into the shell interface.

All cmdlets consist of at least two parts:

- **A verb** The verb represents the action of the command. An example of a verb is **get**, which is used to retrieve information about an object. Table 10-1 lists the most common verbs used in the Exchange Management Shell.
- **A noun** The noun represents the recipient of the verb's action. An example of a noun would be an object in the Exchange organization such as a mailbox server. The noun in this case would be **MailboxServer**.

Cmdlets always contain a verb and a noun separated by a hyphen. To continue the previous example, the cmdlet for getting information about a mailbox server would be:

`Get-MailboxServer`

Table 10-1 Common Verbs in the Exchange Management Shell

Verb	Function
Disable	Disables the specified Exchange object
Enable	Enables the specified Exchange object
Get	Retrieves information about an object

Table 10-1 Common Verbs in the Exchange Management Shell (Continued)

Verb	Function
Move	Moves an object from one container to another
New	Creates a new object
Remove	Deletes an object
Set	Modifies the properties of an object

Obviously, you can't do too much with just a verb and a noun. For example, the cmdlet **Get-MailboxServer** doesn't provide enough information for the shell to do anything. You need to specify which mailbox server and likely what information you want to get. You provide this extra information through parameters. Parameters provide information to the cmdlet, either identifying an object and its attributes to act on, or controlling how the cmdlet performs its task.

To use a parameter, type a space following the verb-noun pair and then type the parameters you need. The name of the parameter is always preceded by a hyphen (-) and the use of parameters follows this syntax:

Verb-Noun **[-ParameterName <ParameterValue>]**

For example, to get information about a specific mailbox server (say, a server named `contoso-exsrv1`), add the identity parameter to the cmdlet, like this:

```
Get-MailboxServer -Identity contoso-exsrv1
```

Note You can find a complete reference of cmdlets including parameters available in the Exchange Management Shell in the Exchange Server 2007 Help files. The cmdlets used to perform various activities are included throughout this book.

Getting Help

Obviously, it is difficult to remember all the verbs, nouns, and parameters available in the Exchange Management Shell. Fortunately, there are several ways to get help right within the shell.

Help Cmdlets

Three help cmdlets are available in the shell to help you find the information you need to perform tasks: **Get-Help**, **Get-Command**, and **Get-ExCommand**.

When you use the **Get-Help** command by itself (that is, when you type no parameters with it), the shell provides basic information about using the shell, as shown in Figure 10-11.

```
Machine: contoso-exsrv1 | Scope: contoso.com
TOPIC
  Get-Help

SHORT DESCRIPTION
  Displays help about PowerShell cmdlets and concepts.

LONG DESCRIPTION

SYNTAX
  get-help <<CmdletName> [-<TopicName>]
  help <<CmdletName> [-<TopicName>]
  <CmdletName> -?

  "Get-help" and "-?" display help on one page.
  "Help" displays help on multiple pages.

Examples:
  get-help get-process      : Displays help about the get-process cmdlet.
  get-help about-signing    : Displays help about the signing concept.
  help where-object         : Displays help about the where-object cmdlet.
  help about-foreach        : Displays help about foreach loops in PowerShell.
```

Figure 10-11 Getting help in the Exchange Management Shell

You can also use several parameters along with the **Get-Help** cmdlet to get more focused help on the task you're trying to perform. For example, you can use the name of a cmdlet as a parameter to get help on using that cmdlet. Typing the following gives you help on using the **Get-MailboxServer** cmdlet:

```
Get-Help Get-MailboxServer
```

You can even go a step further by adding parameters to further narrow the help you receive. Following the **Get-Help <cmdlet>** syntax, you can add the following parameters:

- **Get-Help <cmdlet> -Full** Provides full help on the specified cmdlet.
- **Get-Help <cmdlet> -Parameter <parametername>** Provides just the help view for the specific parameter of the cmdlet you name.
- **Get-Help <cmdlet> -Examples** Provides just the examples portion of the help view for the cmdlet you name.

You can use the **Get-Command** cmdlet by itself (no parameters) to view a list of all commands available in the shell. You can also add **Onoun** and **Dverb** parameters to the **Get-Command <commandname>** syntax to view all cmdlets with the specified noun or verb.

Also, you can use the **Get-ExCommand** cmdlet to return all the cmdlets that are specific to Exchange Server 2007. Otherwise, the **Get-Excommand** cmdlet works just like the **Get-Command** cmdlet.

Tab Completion

Tab completion helps reduce typing when using the shell. When you have typed a partial cmdlet name, just press Tab, and the Exchange Management Shell completes the cmdlet name if it finds a matching cmdlet. If it finds multiple matching cmdlets, the shell cycles through each cmdlet name as you keep pressing Tab. When you use tab completion with cmdlet names, you must supply at least the verb and the hyphen (-).

For example, you can use Tab completion to quickly view the nouns associated with the get verb. Just type **Get-** at the prompt and then keep pressing Tab to cycle through the available nouns you can use with **get**.

For another example, if you cannot remember (or just didn't want to type) a full cmdlet such as **Get-MailboxServer**, you can type **Get-Mail** and press Tab to find the correct cmdlet without having to type the full name.

Summary

This chapter provided a basic introduction to the tools used to administer an Exchange Server 2007 organization. The primary tool you use to administer Microsoft Exchange Server 2007 is the Exchange Management Console, which provides a graphical environment for configuring the various services and components of an Exchange organization. Exchange Server 2007 also features the new Exchange Management Shell, a powerful command-line interface for managing an Exchange organization. Chapter 11 begins a series of chapters that look at specific aspects of Exchange administration. In it, you learn how to create and manage the basic Exchange recipients.