

# Windows<sup>®</sup> 2000 MCSE Study System

Alan R. Carter

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## Windows® 2000 MCSE Study System

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*This book is dedicated to my readers,  
who make it possible for me to do the work I love.*

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# INTRODUCTION

Welcome to the *Windows 2000 MCSE Study System*! This book is designed to help you acquire the knowledge, skills, and abilities you need to pass the four core Microsoft Windows 2000 MCSE certification exams:

- **Exam 70-210:** Installing, Configuring, and Administering Microsoft Windows 2000 Professional
- **Exam 70-215:** Installing, Configuring, and Administering Microsoft Windows 2000 Server
- **Exam 70-216:** Implementing and Administering a Microsoft Windows 2000 Network Infrastructure
- **Exam 70-217:** Implementing and Administering a Microsoft Windows 2000 Directory Services Infrastructure

Alternatively, if you've already passed the three Windows NT 4.0 exams (Exams 70-067, 70-068, and 70-073), and you want to take the **Microsoft Windows 2000 Accelerated Exam for MCPs Certified on Microsoft Windows NT 4.0 (Exam 70-240)**, you'll also find everything you need to know in this volume.

This book is designed to be the only book or course you need to prepare for and pass these Windows 2000 exams. For many people, there's no need to spend big bucks to sit in a classroom for several weeks — although I teach those courses and I'm sure I'd enjoy having you as a student. But in all honesty, as long as you have access to a computer, some time, and some self-motivation, most of you can get the knowledge and experience you need from the text, the numerous labs, the exam-style assessment questions, and the other carefully designed study guide elements in this book.

If you're *not* planning to take one or more of these exams, but you want to develop a comprehensive working knowledge of Windows 2000 Professional and Windows 2000 Server, then this book is also for you. I've endeavored to explain — in clear, plain English — how Windows 2000 really works, both on stand-alone computers and in real-life network situations. It's one thing to read a product help file; it's another to actually implement a feature on a live network. This book moves way beyond basic theory to the practical “how to get the job done” that's a necessity for network administrators in today's competitive workplace.

My hope is that you'll find this book the most helpful Windows 2000 product reference you've ever read, and that you'll use it not only to prepare for the Windows 2000 exams, but that you'll come back to it again and again as you perform your day-to-day Windows 2000 tasks.

## How This Book Is Organized

This book is organized into six major parts, followed by a robust glossary, an index, and two compact discs.

Here's what you'll find in this book:

### Part I: Introduction to Windows 2000

Part I presents basic information about Windows 2000. It introduces each of the operating systems in the Windows 2000 family, explains what's new in Windows 2000, takes you through a tour of the Windows 2000 user interface, and covers the basic architecture of Windows 2000. Part I also introduces Active Directory, a core new feature of Windows 2000.

### Part II: Installation and Configuration

Part II covers the basics of installing and configuring Windows 2000. This part presents detailed instructions on how to install Windows 2000 and how to upgrade to Windows 2000 from previous Windows operating systems. Part II also explores how to use the many Control Panel applications on Windows 2000 computers. Finally, this part explains how to work with file systems and configure disks in a Windows 2000 environment, and how to install and configure DNS and Active Directory.

### Part III: Managing and Securing Resources

Part III is all about administering and securing resources on a Windows 2000 computer. This part begins by explaining how to administer and secure Active Directory. It also presents detailed instructions on how to create and manage users and groups, and how to use System Policy and Group Policy to manage users and computers. Part III explores the ins and

outs of sharing, securing, and accessing files and folders, and spells out the important stuff you need to know about managing printing. This part also shows you how to establish and manage auditing. Finally, Part III explains how to back up and recover systems and data, including how to back up and restore Active Directory.

## Part IV: Networking and Interoperability

Part IV takes the administration of Windows 2000 up a notch to the network level. This part addresses your Windows 2000 networking and connectivity concerns. Part IV explains how to create and configure network and dial-up connections. It also covers networking with TCP/IP, managing remote access, and working with Internet Information Services (IIS), the Indexing Service, and Certificate Services. Finally, Part IV shows you how to efficiently deploy Windows 2000 on a network, and how to work with and manage Terminal Services.

## Part V: Monitoring, Optimizing, and Troubleshooting

Part V explains how to use various Windows 2000 tools and techniques to monitor, optimize, and troubleshoot the performance of a specific Windows 2000 computer or an entire network. It explores how to optimize and troubleshoot memory, processor, disk, and application performance on a Windows 2000 computer, as well as how to monitor and optimize usage of system resources and network traffic. Part V also explains how to manage, optimize, and troubleshoot Active Directory replication and performance.

## Part VI: Resources

Part VI features several valuable appendixes. You'll find a table of the actual exam objectives for each of the four core Microsoft Windows 2000 MCSE certification exams (including cross-references to the section in this book where each objective is covered), important information and tips on how to prepare for the exams, and a complete listing and description of the contents of the compact discs included with this book.

## CD-ROMs

The two compact discs included with this book contain some really excellent resources. First, a 120-day evaluation copy of Microsoft Windows 2000 Server is included for you. You and I both know that having access to the Windows 2000 product is absolutely essential if you're going to learn how to use it. You'll also find a test engine and practice test questions for each of the four core Microsoft Windows 2000 MCSE certification exams. Next, you'll find a complete electronic version of this book, in PDF format, along with Adobe Acrobat Reader so you can easily navigate this resource. Finally, an evaluation copy of Diskkeeper Server, a premier defragmentation utility for use on Windows 2000 and Windows NT NTFS partitions, is included.

## How Each Chapter Is Structured

When this book was designed, a lot of thought went into its structure, and particularly into the specific elements that would provide you with the best possible learning and exam preparation experience.

Here are the elements you'll find in each chapter:

- The specific exams for which this chapter helps you prepare
- A list of exam objectives (by exam) covered by this chapter
- A Chapter Pre-Test
- Clear, concise text on each topic
- Step-by-step instructions on how to perform Windows 2000 tasks
- Screen shots and graphics that are worth more than a thousand words
- A Key Point Summary
- A comprehensive Study Guide that contains:
  - ▶ Exam-style Assessment Questions
  - ▶ Scenario problems for you to solve, as appropriate
  - ▶ Lab Exercises to perform on your computer, as appropriate
  - ▶ Answers to Chapter Pre-Test questions, Assessment Questions, and Scenarios

## How to Use This Book

This book can be used either by individuals working independently or by groups in a formal classroom setting.

For best results (and we both know that the only acceptable results are passing scores on the MCSE exams), I recommend the following plan of attack as you use this book. First, take the Chapter Pre-Test, then read the chapter and the Key Point Summary. Use this summary to see if you've really got the key concepts under your belt. If you don't, go back and reread the section(s) you're not clear on. Then do all of the Assessment Questions and Scenarios at the end of the chapter. Finally, do the Lab Exercises. Remember, the important thing is to master the tasks that are tested by the exams. There's really no way to master tasks without seeing the various Windows 2000 screens over and over again.

The chapters of this book have been designed to be studied sequentially. In other words, it would be best if you complete Chapter 1 before you proceed to Chapter 2. A few chapters could probably stand alone, but all in all, I recommend a sequential approach. The Lab Exercises have also been designed to be completed in a sequential order, and often depend on the successful completion of the previous labs.

After you've completed your study of the chapters and reviewed the Assessment Questions and Lab Exercises in the book, use the test engine on the compact disc included with this book to get some experience answering practice questions. The practice questions will help you assess how much you've learned from your study and will also familiarize you with the type of exam questions you'll face when you take the real exams. Once you identify a weak area, you can restudy the corresponding chapters to improve your knowledge and skills in that area.

## Prerequisites

Although this book is a comprehensive study and exam preparation guide, it does not start at ground zero. I assume you have the following knowledge and skills at the outset:

- Basic terminology and basic skills to use a Microsoft Windows product. (This could be Windows 95, Windows 98, or a Windows NT product.)

- Basic mouse skills: being able to left-click, right-click, double-click, use the pointer, and so on.
- Networking knowledge or experience equal to the scope required to pass an industry networking certification exam, such as CompTIA's Network+ exam.

If you meet these prerequisites, you're ready to begin this book.

If you don't have the basic Windows experience or mouse skills, I recommend you work through a self-study book, such as *Windows 98 for Dummies* (IDG Books Worldwide, Inc.) or *Windows 2000 Professional for Dummies* (IDG Books Worldwide, Inc.).

If you don't have the networking knowledge or experience, I recommend you use a book such as *Networking Essentials MCSE Study Guide* (IDG Books Worldwide, Inc.) or *Networking for Dummies* (IDG Books Worldwide, Inc.) to obtain this knowledge *before* you begin this book.

## How to Determine What You Should Study

Your individual certification goals will ultimately determine which parts of this book you should study. If you want to pass two or more of the Microsoft Windows 2000 MCSE certification exams, or simply want to develop a comprehensive working knowledge of Windows 2000, I recommend you study, in sequential order, the entire book.

If you are preparing only for the Workstation exam, I suggest you follow the recommended study plan shown in Table 1.

If you are preparing only for the Server exam, I suggest you follow the recommended study plan shown in Table 2.

If you are preparing only for the Network exam, I suggest you follow the recommended study plan shown in Table 3.

If you are preparing only for the Directory Services exam, I suggest you follow the recommended study plan shown in Table 4.

**TABLE 1 Chapters that Prepare You for Exam 70-210: Installing, Configuring, and Administering Microsoft Windows 2000 Professional**

Chapter Number	Chapter Title
1	Overview of Windows 2000
3	Installing Windows 2000
4	Upgrading to Windows 2000



Chapter Number	Chapter Title
5	Using Control Panel
6	Working with File Systems and Disks
9	Managing Users and Groups
10	Using System Policy and Group Policy
11	Sharing, Securing, and Accessing Files and Folders
12	Managing Printing
13	Auditing and Security
14	Backup and Recovery
15	Creating and Configuring Network and Dial-Up Connections
16	Networking with TCP/IP
18	Managing Web and Certificate Services
19	Deploying Windows 2000 on Your Network
21	Monitoring, Optimizing, and Troubleshooting Performance

**TABLE 2 Chapters that Prepare You for Exam 70-215: Installing, Configuring, and Administering Microsoft Windows 2000 Server**

Chapter Number	Chapter Title
1	Overview of Windows 2000
2	Overview of Active Directory
3	Installing Windows 2000
4	Upgrading to Windows 2000
5	Using Control Panel
6	Working with File Systems and Disks
9	Managing Users and Groups
10	Using System Policy and Group Policy
11	Sharing, Securing, and Accessing Files and Folders
12	Managing Printing
13	Auditing and Security
14	Backup and Recovery

*Continued* ►

**TABLE 2** *(continued)*

Chapter Number	Chapter Title
15	Creating and Configuring Network and Dial-up Connections
16	Networking with TCP/IP
17	Managing Remote Access
18	Managing Web and Certificate Services
19	Deploying Windows 2000 on Your Network
20	Managing Terminal Services
21	Monitoring, Optimizing, and Troubleshooting Performance

**TABLE 3 Chapters that Prepare You for Exam 70-216: Implementing and Administering a Microsoft Windows 2000 Network Infrastructure**

Chapter Number	Chapter Title
1	Overview of Windows 2000
3	Installing Windows 2000 (Although technically there are no Network exam objectives covered in this chapter, you'll need to install Windows 2000 in order to perform the labs in the later chapters.)
7	Installing and Configuring DNS and Active Directory
15	Creating and Configuring Network and Dial-up Connections
16	Networking with TCP/IP
17	Managing Remote Access
18	Managing Web and Certificate Services
21	Monitoring, Optimizing, and Troubleshooting Performance

**TABLE 4 Chapters that Prepare You for Exam 70-217: Implementing and Administering a Microsoft Windows 2000 Directory Services Infrastructure**

Chapter Number	Chapter Title
1	Overview of Windows 2000
2	Overview of Active Directory
3	Installing Windows 2000 (Although technically there are no Directory Services exam objectives covered in this chapter, you'll need to install Windows 2000 in order to perform the labs in the later chapters.)

Chapter Number	Chapter Title
7	Installing and Configuring DNS and Active Directory
8	Administering and Securing Active Directory
9	Managing Users and Groups
10	Using System Policy and Group Policy
12	Managing Printing
13	Auditing and Security
14	Backup and Recovery
19	Deploying Windows 2000 on Your Network
22	Managing, Optimizing, and Troubleshooting Active Directory Replication and Performance

## Hardware and Software You'll Need

You'll need access to various hardware and software to be able to do the Lab Exercises in this book. It's extremely important that you do these labs to acquire the skills tested by the Microsoft Windows 2000 exams.



### CAUTION

Some of the Lab Exercises in this book have the potential to erase or corrupt data on existing hard disks. Make sure you back up all important data and programs before you attempt to perform the labs. Better yet, do the labs on a computer that doesn't contain any vital data or programs.

Here are the minimum hardware requirements:

- Intel-based computer with Pentium/133MHz processor, 256MB of RAM, and 2GB of hard disk space.
- Keyboard
- CD-ROM drive
- Mouse or other pointing device
- VGA monitor and graphics card
- Network adapter card

I strongly recommend that you only use hardware found on the Microsoft Windows 2000 Hardware Compatibility List (HCL). This list, which is updated periodically, ships with the Windows 2000 product. The HCL is named `HCL.txt`, and is located on the Windows 2000 compact disc in the `\Support` folder.

Optional equipment that you might benefit from using includes:

- Printer
- Tape drive
- Modem and Internet connection (so you can access online resources)

Here is the software you'll need:

- Microsoft Windows 2000 Professional (particularly if you're preparing for the Professional exam)
- Microsoft Windows 2000 Server



#### TIP

The compact disc included with this book contains an evaluation copy of Windows 2000 Server.

## Conventions Used in This Book

Every book has its own set of conventions, so I'll explain the ones I've used in this book to you right up front.

### Windows 2000 is Windows 2000

Windows 2000 encompasses four operating systems:

- Windows 2000 Professional
- Windows 2000 Server
- Windows 2000 Advanced Server
- Windows 2000 Datacenter Server

There are some differences between these four Windows 2000 operating systems, but because they're all based on the same kernel, they are fundamentally the same operating system. When you learn how to perform a

task using Windows 2000 Server, it's usually the same as learning how to perform the same task using Windows 2000 Professional. So, if you're wondering how I can prepare you for four Windows 2000 exams in one book, it's for this reason: Windows 2000 is Windows 2000.

Because of the similarities of the Windows 2000 operating systems, throughout this book, except where differences are noted, when you read "Windows 2000" you can assume I'm referring to all three of the most commonly used Windows 2000 operating systems: Windows 2000 Professional, Windows 2000 Server, and Windows 2000 Advanced Server.

## New Terms

How could I talk about Windows 2000 and other computer stuff without using all kinds of fancy acronyms and terms? You know, the alphabet soup you throw into everyday conversation around the dinner table that causes your family members to roll their eyes?

I've chosen to italicize new or potentially unfamiliar terms, such as *Active Directory*, as I define them. Normally, I'll define a new term right after its first mention. If you happen to see an unfamiliar word that's italicized, such as *application programming interface* (API), but it's not followed by a definition, you can flip to the glossary to read the definition of the term.

## Navigating Menus and Other Important Stuff

When navigating the menus in Windows 2000, I use an arrow symbol — ⇨ — to tell you which menu item to point to next.

For example, if I say you can access Windows Explorer by selecting Start ⇨ Programs ⇨ Accessories ⇨ Windows Explorer, what I mean is that you should click the Start button, then point to Programs, then point to Accessories, and finally point to Windows Explorer and release the mouse button.

One particular term I use a lot when explaining the commands and steps to perform a task is the word *highlight*. When I say you should highlight an item, I mean that you should select or click it so that Windows 2000 causes the item to be highlighted when all of the other items in the list or box remain displayed in normal text.

Finally, when you do the Lab Exercises and are asked to type something, the text you are instructed to type will be printed in bold, like this: **domain1.mcse**

## Code

All code listings and uniform resource locators (URLs) in this book are presented in monospace font, like this:

```
http://www.microsoft.com
```

I've also used this type of font to identify names of files, folders, network drives, paths to network resources, fully qualified domain names (FQDNs), and character-based screen content when presented verbatim.

When you see monospace font presented in italics, the italicized text represents a variable that could actually have a different name. For example, I frequently use the term *SystemRoot* to indicate the drive and folder that Windows 2000 is installed in on your computer, which, by default, is usually `C:\winnt`. This folder, however, can actually be named anything you want to call it.

When a variable consists of two or more words, I use underscores to connect the words. An example of this type of variable is found in the naming structure of an FQDN, which is *server\_name.domain\_name.root\_domain\_name*. In this example, the variables “server name,” “domain name,” and “root domain name” are separated by underscores to convey the fact that the connected words represent a single variable.

Lastly, some command-line utilities have optional switches. When I refer to such an optional switch, I show the switch in a pair of brackets, like this:

```
[ /v ]
```

## Icons

Several different icons are used throughout this book to draw your attention to matters that deserve a closer look:



- ▶ Professional
- ▶ Server
- ▶ Network
- ▶ Active Directory

You'll see an icon similar to this at the beginning of each chapter and at the beginning of each Lab Exercise. It will let you know, at a glance, exactly which exams the chapter or lab is designed to help you prepare for.



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**CAUTION**

This icon is used to warn you that something unfortunate could happen if you're not careful. It also points out information that could save you a lot of grief. It's often easier to prevent a tragedy than to fix it afterwards.



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**CROSS-REFERENCE**

This icon points you to another place in this book for more coverage of a particular topic. It may point you back to a previous chapter where important material has already been covered, or it may point you ahead to let you know that a topic will be covered in more detail later on.



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**EXAM TIP**

This icon points out important information or advice for those preparing to take any of the four core Microsoft Windows 2000 MCSE certification exams.



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**IN THE REAL WORLD**

Sometimes things work differently in the real world than books – or product documentation – say they do. This icon draws your attention to the author's real-world experiences, which will hopefully help you on the job if not on the Windows 2000 exams.



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**TIP**

This icon is used to draw your attention to a little piece of friendly advice, a helpful fact, a shortcut, or a bit of personal experience that might be of use to you.

## How to Contact Me

I've done my very best to make sure the contents of this book are technically accurate and error free. My technical reviewer and editors have also worked hard toward this goal.

However, I know that perfection isn't a possibility in the real world, and if you find an error, or have some other comment or insight, I'd appreciate hearing from you. You can contact me via the Internet at [alan\\_carter@usa.net](mailto:alan_carter@usa.net).

I always read all of my readers' e-mail messages, and, when possible, include your corrections and ideas in future printings. However, because of

the high volume of e-mail I receive, I can't respond to every message. Please don't take it personally if I don't respond to your e-mail message.

Also, one last note: although I enjoy hearing from my readers, please don't write to me for product support or for help in solving a particular Windows 2000 problem you're experiencing on your computer or network. I think that Microsoft does a far better job of product support than I could ever do, so I leave this arena entirely to the men and women specifically trained to answer your technical questions.

I guess that about wraps up the general comments. From here you can get started on the nuts and bolts of learning about Windows 2000, and get ready to pass those exams. I wish you great success!



# **Windows<sup>®</sup> 2000 MCSE Study System**