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# NT SERVER 4

Exam #70-067

**MICROSOFT  
CERTIFIED  
SYSTEMS  
ENGINEER**

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Michael Palmer



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# NT SERVER 4

江苏工业学院图书馆  
藏书章

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**Michael Palmer**

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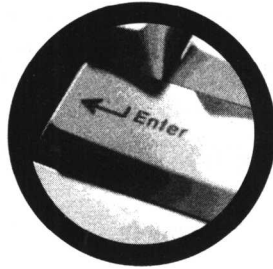
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## ABOUT THE AUTHOR

**Michael Palmer**, a Ph.D. from the University of Colorado at Boulder, has extensive background and experience training people from various disciplines to become teachers and trainers in technical network areas like network design and implementation, and client/server software development.

### Acknowledgments

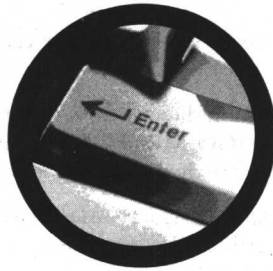
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—Michael Palmer

### Dedication

*In memory of Arthur Weisbach, a great teacher.*



## FOREWORD

The big technology question for the '90s and beyond is, "Are you certified?" Certification is rapidly becoming the key to professional career enhancement for network engineers, technicians, software developers, web designers and even professional office workers.

### WHY BECOME A MICROSOFT CERTIFIED PROFESSIONAL?

Becoming a Microsoft Certified Professional (MCP) can open many doors for you. Obtaining the appropriate Microsoft Certified Professional credentials can provide a formal record of your skills to potential employers. Certification can be equally effective in helping you secure a raise or promotion.

The Microsoft Certified System Engineer (MCSE) program is made up of a series of required and elective exams in several different tracks. Combinations of individual courses can lead to certification in a specific track. Most tracks require a combination of required and elective courses. (Implementing and Supporting Microsoft Windows NT Server 4.0 Exam #70-067 is among the required course offerings). Your MCSE credentials tell a potential employer that you are an expert in server administration.

### WANT TO KNOW MORE ABOUT MICROSOFT CERTIFICATION?

There are many additional benefits to achieving Microsoft Certified status. These benefits apply to you as well as to your potential employer. As a Microsoft Certified Professional, you will be recognized as an expert on Microsoft products, have access to ongoing technical information from Microsoft, and receive special invitations to Microsoft conferences and events. You can obtain a comprehensive, interactive tool that provides full details about the Microsoft Certified Professional Program online at [www.microsoft.com/train\\_cert/cert/cert.htm](http://www.microsoft.com/train_cert/cert/cert.htm). For more information on texts from Certification Insider Press that will help prepare you for certification exams, visit our site at [www.certificationinsider.com](http://www.certificationinsider.com).

When you become a Microsoft Certified Professional, Microsoft sends you a Welcome Kit that contains the following:

1. Microsoft Certified Professional wall certificate. Also, within a few weeks after you have passed any exam, Microsoft sends you a Microsoft Certified Professional Transcript that shows which exams you have passed.
2. License to use the Microsoft Certified Professional logo. You are licensed to use the logo in your advertisements, promotions, proposals, and other materials, including business cards, letter-heads, advertising circulars, brochures, yellow page advertisements, mailings, banners, resumes, and invitations.

3. Microsoft Certified Professional logo sheet. Before using the camera-ready logo, you must agree to the terms of the licensing agreement.
4. Access to technical and product information directly from Microsoft through a secured area of the MCP Web site. Dedicated forums on CompuServe (GO MECFORUM) and The Microsoft Network enable Microsoft Certified Professionals to communicate directly with Microsoft and one another.
5. One-year subscription to *Microsoft Certified Professional Magazine*, a career and professional development magazine created especially for Microsoft Certified Professionals.
6. Invitations to Microsoft conferences, technical training sessions, and special events.

A Microsoft Certified Systems Engineer receives all the benefits mentioned above and the following additional benefits:

1. Microsoft Certified Systems Engineer logos and other materials to help you identify yourself as a Microsoft Certified Systems Engineer to colleagues or clients.
2. One-year subscription to the Microsoft TechNet Technical Information Network.
3. One-year subscription to the Microsoft Beta Evaluation program. This benefit provides you with up to 12 free monthly beta software CDs for many of Microsoft's newest software products. This enables you to become familiar with new versions of Microsoft products before they are generally available. This benefit also includes access to a private CompuServe forum where you can exchange information with other program members and find information from Microsoft on current beta issues and product information.

## **CERTIFY ME!**

So you are ready to become a Microsoft Certified Professional. The examinations are administered through Sylvan Prometric (formerly Drake Prometric) and are offered at more than 700 authorized testing centers around the world. Microsoft evaluates certification status based on current exam records. Your current exam record is the set of exams you have passed. To maintain Microsoft Certified Professional status, you must remain current on all the requirements for your certification.

Registering for an exam is easy. To register, contact Sylvan Prometric, 2601 West 88th Street, Bloomington, MN, 55431, at (800) 755-EXAM (3926). Dial (612) 896-7000 or (612) 820-5707 if you cannot place a call to an 800 number from your location. You must call to schedule the exam at least one day before the day you want to take the exam. Taking the exam automatically enrolls you in the Microsoft Certified Professional program; you do not need to submit an application to Microsoft Corporation.

When you call Sylvan Prometric, have the following information ready:

1. Your name, organization (if any), mailing address, and phone number.
2. A unique ID number (e.g., your Social Security number).
3. The number of the exam you wish to take (#70-067 for the NT Server 4 exam).
4. A method of payment (e.g., credit card number). If you pay by check, payment is due before the examination can be scheduled. The fee to take each exam is currently \$100.

## **ADDITIONAL RESOURCES**

One of the best sources of information about Microsoft certification tests comes from Microsoft itself. Because its products and technologies—and the tests that go with them—change frequently, the best place to go for exam-related information is online.

If you haven't already visited the Microsoft Training and Certification pages, do so right now. As of this writing, the Training and Certification home page resides at [www.microsoft.com/Train\\_Cert/default.htm](http://www.microsoft.com/Train_Cert/default.htm). Note that it may not be there by the time you read this, or it may have been replaced by something new, because the Microsoft site changes regularly. Should this happen, please read the next section, titled "Coping with Change on the Web."

The menu options in the home page's left-hand column point to important sources of information in the Training and Certification pages. Here's what to check out:

- **Train\_Cert Summaries/By Product and Technology** Use this to jump to product-based summaries of all classroom education, training materials, study guides, and other information for specific products. Under the heading "Microsoft NT Server 4," you'll find an entire page of information about NT Server 4 training and certification. This tells you a lot about your training and preparation options, and mentions all the tests that relate to NT Server 4.
- **Technical Certification/Find an Exam** Pulls up a search tool that lets you list all Microsoft exams and locate all exams pertinent to any Microsoft certification (MCP, MCSD, MCSE, MCT, and so on), or those exams that cover a particular product. This tool is quite useful not only to examine the options, but also to obtain specific test preparation information, because each exam has its own associated preparation guide.
- **Site Tools/Downloads** Here, you'll find a list of the files and practice tests that Microsoft makes available to the public. These include several items worth downloading, especially the Certification Update, the Personal Exam Prep (PEP) tests, various assessment exams, and a general Exam Study Guide. Try to peruse these materials before taking your first test.

Of course, these are just the high points of what's available in the Microsoft Training and Certification pages. As you browse through them—and we strongly recommend that you do—you'll probably find other information we didn't mention here that is every bit as interesting and compelling.

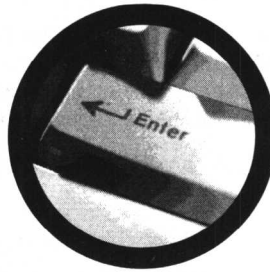
## COPING WITH CHANGE ON THE WEB

Sooner or later, all the specifics I've shared with you about the Microsoft Training and Certification pages, and all the other Web-based resources I mention throughout the rest of this book, will go stale or be replaced by newer information. In some cases, the URLs you find here may lead you to their replacements; in other cases, the URLs will go nowhere, leaving you with the dreaded 404 error message, "File not found."

When that happens, please don't give up! There's always a way to find what you want on the Web, if you're willing to invest some time and energy. To begin with, most large or complex Web sites—and Microsoft's qualifies on both counts—offer a search engine. As long as you can get to the site itself, you can use this tool to help you find what you need.

The more particular or focused you can make a search request, the more likely it is that the results will include information you can use. For instance, you can search the string "Training and Certification" to produce a lot of data about the subject in general, but if you're specifically looking for, for example, the Preparation Guide for Exam 70-067, Implementing and Supporting Microsoft Windows NT Server 4.0, you'll be more likely to get there quickly if you use a search string such as: "Exam 70-067" AND "Preparation Guide". Likewise, if you want to find the Training and Certification downloads, try a search string such as: "Training and Certification" AND "download page".

Finally, don't be afraid to use general search tools like [www.search.com](http://www.search.com), [www.altavista.com](http://www.altavista.com), or [www.excite.com](http://www.excite.com) to find related information. Although Microsoft offers the best information about its certification exams online, there are plenty of third-party sources of information, training, and assistance in this area that do not have to follow a party line like Microsoft does. The bottom line is: if you can't find something where the book says it lives, start looking around.



## INTRODUCTION

Welcome to *MCSE NT Server 4 Exam Prep*! This new book from Certification Insider Press offers you real-world examples, interactive activities, and over 100 hands-on projects that reinforce key concepts and help you prepare for the exam. This book also features troubleshooting tips for solutions to common problems that you will encounter.

The companion interactive CD-ROM features a unique test simulation environment with two complete practice exams that allow you to test your skills and knowledge making this the perfect study guide for the Microsoft certification exam. The exam questions have been specially written based on the content of the book to reinforce what you have learned. These materials have been specifically designed to help individuals prepare for Microsoft Certification Exam #70-067, "NT Server 4." Answers to end-of-chapter review questions and projects are also found on the CD-ROM.

### ABOUT THE BOOK

Career opportunities abound for well-prepared server administrators. This book is designed as your doorway into server administration through Windows NT Server 4.0. If you are new to Windows NT Server or server administration, this is your ticket to an exciting future. Others who have prior experience with Windows NT Server will find that the book adds depth and breadth to that experience. Also, the book provides the knowledge you need to prepare for Microsoft's certification exam #70-067, Implementing and Supporting Microsoft Windows NT Server 4.0. The exam is used for certification as a Windows NT Server Product Specialist, and it is a crucial step in becoming a Microsoft Certified Systems Engineer.

Although Windows NT Server is young as a network operating system, it is mature in what it can accomplish for large and small organizations. It provides the cornerstone on which to build a business, an Internet Web site, or access to information-rich data sources. The success of Windows NT Server is reflected in the huge number of software vendors and developers who develop in this environment or who have switched from other environments to Windows NT Server.

When you complete this book, you will be at the threshold of a server administration career that can be very fulfilling and challenging. This is a rapidly advancing field that offers ample opportunity for personal growth and for making a contribution to your business or organization. The book is intended to provide you with knowledge that you can apply right away and a sound basis for understanding the changes that you will encounter in the future. It also is intended to give you the hands-on skills you need to be a valued professional in your organization.

The book is filled with hands-on projects that cover every aspect of installing and managing Windows NT Server. The projects are designed to make what you learn come alive through actually performing the tasks. Besides the hands-on projects, each chapter offers case projects that put you in the shoes of a Windows NT server consultant who works in all kinds of situations fulfilling the needs of clients. Also, every chapter includes a range of practice questions to help prepare you for the Microsoft certification exam. All of these features are offered to reinforce your learning so you feel confident in the knowledge you have gained from each chapter.

Chapter 1, "Networking with Microsoft Windows NT Server," explains the history and current capabilities of Windows NT Server. It also shows how Windows NT Server can be home to Internet and intranet applications. In Chapter 2, "Basic Network Design and Protocols," you learn the fundamentals of how networks work and how you can plan and design your own network for computing with NT Server. Chapter 3, "Server Hardware," gives you detailed information about how to select a computer on which to install Windows NT Server. In Chapter 3, you learn about computer architecture, how to select a network interface card, and how to choose disk storage.

After learning about hardware, you are ready to install the Windows NT Server operating system, the subject of Chapter 4, "Server Installation." This chapter shows you how to plan in advance for a successful installation and then how to execute it. In Chapter 5, "Server Configuration," you learn how to configure the server for specialized monitors, keyboards, network communications, and many other needs. Chapter 6, "Configuring Server Storage, Backup, and Performance Options," continues with configuration issues for server disk storage, backups, and performance enhancement. It also shows you how to protect against lost data and equipment power failures.

In Chapter 7, "Server Clients," you learn how to set up network computers to communicate with a network and with Windows NT Server. Also, different client operating systems are compared to help you decide which best suit your work situation. Chapter 8, "Managing the Server Through Accounts and Groups," marks your introduction into server management by establishing how users access the server. In Chapter 9, "Managing Server Folders, Permissions, and Software Installation," you continue learning server management by setting up folders and software for users to access.

As you learn in Chapter 10, "Printer Management," Windows NT Server takes much of the headache out of managing network printing. It shows you how to set up and manage all types of printers. In Chapter 11, "Remote Access," you learn how to turn a Windows NT Server into a tool that can be accessed from home by telecommuters or by users who travel from city to city. This chapter also shows you how to set up server administration tools so you can access them remotely.

Chapter 12, "Interoperating with Novell NetWare," explains how to set up Windows NT Server to communicate with NetWare servers and how users can access a NetWare server through an NT Server. Internet and intranet services are the focus of Chapter 13, "Internet and Intranet Services." In this chapter you learn how to make a Windows NT Server function as a full-featured Internet Web site.

The last three chapters of the book show you how to enhance the performance of Windows NT server and how to troubleshoot problems. In Chapter 14, "Server and Network Monitoring," you learn how to use Windows NT Server tools to track server performance. Chapter 15, "Performance Tuning," includes information about how to tune vital server elements such as memory, file system cache, disk storage, and network communications. In Chapter 16, "Troubleshooting," you learn how to troubleshoot a full range of problems that can emerge, including hardware and network problems. Finally, Appendix A provides supplementary information about Windows NT Server utilities that can be purchased from Microsoft and third-party sources. Appendix B provides a full summary of Windows NT Server commands.

## FEATURES

To aid you in fully understanding Windows NT Server 4 concepts, there are many features in this book designed to improve its pedagogical value.

- **Chapter Objectives.** Each chapter in this book begins with a detailed list of the concepts to be mastered within that chapter. This list provides you with a quick reference to the contents of that chapter, as well as a useful study aid.
- **Illustrations and Tables.** Numerous illustrations of server screens and components aid you in the visualization of common setup steps, theories, and concepts. In addition, many tables provide details and comparisons of both practical and theoretical information.
- **Hands-On Projects.** Although it is important to understand the theory behind server and networking technology, nothing can improve upon real-world experience. To this end, along with theoretical explanations, each chapter provides numerous hands-on projects aimed at providing you with real-world implementation experience.

- **Chapter Summaries.** Each chapter's text is followed by a summary of the concepts it has introduced. These summaries provide a helpful way to recap and revisit the ideas covered in each chapter.
- **Review Questions.** End-of-chapter assessment begins with a set of review questions that reinforce the ideas introduced in each chapter. These questions not only ensure that you have mastered the concepts, but are written to help prepare you for the Microsoft certification examination.
- **Case Projects.** Located at the end of each chapter is a continuous running case. In this extensive case example, as a consultant at the fictitious Aspen Consulting, you implement the skills and knowledge gained in the chapter through real-world server setup and administration scenarios.

## TEXT AND GRAPHIC CONVENTIONS

Wherever appropriate, additional information and exercises have been added to this book to help you better understand what is being discussed in the chapter. Icons throughout the text alert you to additional materials. The icons used in this book are described below.



The Note icon is used to present additional helpful material related to the subject being described.



Each hands-on activity in this book is preceded by the Hands-On icon and a description of the exercise that follows.



Tips are included from the author's experience that provide extra information about how to attack a problem, how to set up Windows NT Server for a particular need, or what to do to in certain real-world situations.



The cautions are included to help you anticipate potential mistakes or problems so you can prevent them from happening.



Case Project icons mark the running case project. These are more involved, scenario-based assignments. In this extensive case example, you are asked to implement independently what you have learned.

## WHERE SHOULD YOU START?

This book is intended to be read in sequence, from beginning to end. Each chapter builds upon those that precede it, to provide a solid understanding of NT Server 4. After completing the chapters, you may find it useful to go back through the book, and use the review questions and projects to prepare for the Microsoft certification test for NT Server 4 (#70-067). Readers are also encouraged to investigate the many pointers to online and printed sources of additional information that are cited throughout this book.

## DON'T MISS IT! VALUABLE INFORMATION AT THE END OF THE BOOK

In addition to its core materials, this book includes appendices that are worthy of further investigation.

**Appendix A:** Provides supplementary information about Windows NT Server utilities that can be purchased from Microsoft and third-party sources.

**Appendix B:** Provides a full summary of Windows NT Server commands.

**Glossary:** This is a complete compendium of all of the acronyms and technical terms used in this book, with definitions.

## BEFORE YOU BEGIN

To complete the projects and assignments in the book, you will need access to a file server and a workstation. The server should be equipped with Microsoft Windows NT Server 4. A few projects require Internet access for information searches. These projects are not mandatory; however, the projects will give you experience using this resource as a prospective server administrator.

**System Requirements.** The recommended software and hardware configurations are as follows:

**Workstation Clients**

- Windows 95 or Windows NT Workstation
- Pentium with 16 MB of RAM minimum
- VGA monitor
- Mouse or pointing device
- Network interface card cabled to the file server
- Hard disk with at least 110 MB free
- CD-ROM drive
- Internet access and a browser (recommended but not required for selected research assignments)

**File Server**

- Listed in Microsoft's Hardware Compatibility List
- 32-bit bus computer with an 80486 33 MHz or faster processor
- VGA or better resolution monitor
- Mouse or pointing device
- High density 3.5-inch floppy disk drive
- CD-ROM drive
- 16 MB or more memory
- One or more hard disks with at least 125 MB of disk storage free
- Network interface card for network communications
- Tape system (recommended but not required)
- Modem (recommended but not required)
- Printer (to practice setting up a network printer)

**System Requirements for Test Prep Software:**

- 8 MB RAM (16 MB recommended)
- VGA/256 Color display or better
- 8X CD-ROM Drive
- Windows NT 4.0 or Windows 95

## ABOUT THE CD-ROM

To become a Microsoft Certified Professional, you must pass rigorous certification exams that provide a valid and reliable measure of technical proficiency and expertise. The CD-ROM that comes with this book can be used in conjunction with the book to help you assess your progress in the event you choose to pursue Microsoft Professional Certification. The CD-ROM contains specially designed test simulation software that features two 55-question practice exams. These content-based questions were expertly prepared to test your readiness for the official Microsoft certification examination on NT Server 4 (Exam #70-067). The practice exam questions simulate the interface and format of the actual certification exams.

### **PRACTICE EXAM FEATURES:**

- 55 questions, just like the actual exam
- 90-minute timed test to ensure exam readiness
- Questions that can be marked and answered later
- Graphical representation of your test grade

### **SOLUTIONS TO END-OF-CHAPTER QUESTIONS AND PROJECTS**

For further help in making sure you are prepared for the NT Server 4 certification exam, we have included solutions for the end-of-chapter Review Questions, Hands-on Projects, and Case Projects on the CD-ROM.

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