

Over 400,000 Certification Insider™ Press guides in print!

MCSE

考前辅导

Prepare to Pass the
Microsoft
Certification Exam

Microsoft Certified
Professional

Approved Study Guide

NT Workstation 4

Exam #70-073

**MICROSOFT
CERTIFIED
SYSTEMS
ENGINEER**

交互式CD-ROM
两套完整的实战试题



Ed Tittel, Christa Anderson,
and David Johnson



中国水利水电出版社
www.waterpub.com.cn



NT Workstation 4

Exam #70-073

**MICROSOFT
CERTIFIED
SYSTEMS
ENGINEER**

**Ed Tittel, Christa Anderson,
and David Johnson**

中国水利水电出版社

Original English language edition published by The Coriolis Group LLC, 14455N. Hayden Drive, Suite 220, Scottsdale, Arizona 85260 USA, telephone (602)483-0192, fax (602) 483-0193. Copyright © 1999 by The Coriolis Group. English language reprinted copyright © 2000 by China WaterPower Press. All rights reserved.

This book may not be duplicated in any way without the express written consent of the publisher, except in the form of brief excerpts or quotations for the purposes of review. The information contained herein is for the personal use of the reader and may not be incorporated in any commercial programs, other books, databases, or any kind of software without written consent of the publisher. Making copies of this book or any portion for any purpose other than your own is a violation of United States copyright laws.

Trademarks

Certification Insider Press, Exam Cram, and On Site are trademarks of Certification Insider Press. ITP® The ITP logo is a registered trademark of International Thomson Publishing.

Microsoft is a registered trademark in the United States and/or other countries. Certification Insider Press is an independent entity from Microsoft Corporation and not affiliated with Microsoft Corporation in any manner. This text may be used in helping individuals prepare for a Microsoft Certified Professional or Microsoft Certified Systems Engineer Program Exam. Neither Microsoft Corporation, its designated review company, nor Certification Insider Press warrants that use of this text will ensure passing the relevant MCP/MCSE Exam. Some of the product names and company names used in this book have been used for identification purposes only and may be trademarks of registered trademarks of their respective manufacturers and sellers.

Trademarked names appear throughout this book. Rather than list the names and entities that own the trademarks or insert a trademark symbol with each mention of the trademarked name, the publisher states that it is using the names for editorial purposes only and to the benefit of the trademark owner, with no intention of infringing upon that trademark.

Limits of Liability and Disclaimer of Warranty

The author and publisher of this book have used their best efforts in preparing the book and the programs contained in it. These efforts include the development, research, and testing of the theories and programs to determine their effectiveness. The author and publisher make no warranty of any kind, expressed or implied, with regard to these programs or the documentation contained in this book.

The author and publisher shall not be liable in the event of incidental or consequential damages in connection with, or arising out of, the furnishing, performance, or use of the programs, associated instructions, and/or claims of productivity gains.

书 名	MCSE NT Workstation 4考前辅导
作 者	[美] Ed Tittel, Christa Anderson, David Johnson
出版, 发行	中国水利水电出版社 (北京市三里河路6号 100044) 网址: www.waterpub.com.cn E-mail: sale@waterpub.com.cn 电话: (010) 63202266(总机)、68331835 (发行部)
销 售	全国各地新华书店
排 版	北京万水电子信息有限公司
印 刷	北京市天竺颖华印刷厂
规 格	787×1092毫米 16开本 39印张 899千字
版 次	2000年1月第一版 2000年1月北京第一次印刷
印 数	0001-2000册
定 价	73.00元(含光盘)

凡购买我社图书, 如有缺页、倒页、脱页的, 本社发行部负责调换
版权所有·侵权必究

ABOUT THE AUTHORS

Ed Tittel is the President of LANWrights, Inc., an Austin, Texas-based training, consulting, and writing firm. Prior to becoming a full-time freelance writer and trainer, Ed was the director of technical marketing for Novell, Inc. He has written over 30 computer books.

Christa Anderson, *Windows NT Magazine* contributing editor, writes full-time about issues related to Windows NT, LAN, and WAN networking technologies, and computer security.

David Johnson, aka DJ, has worked in the networking trenches as a network administrator and trainer for eight years. Working for large corporations, such as Pharmaco and GTECH, he has learned his way around LAN and WAN technologies. DJ is currently general manager at LANWrights, Inc. He has contributed to numerous NT-focused courses and books.

Acknowledgments

I would like to thank Course Technology for this opportunity to explore a new world for us—that of academic publishing. We deeply appreciate their patience and indulgence, especially that of Kristen Duerr and Jennifer Normandin, during the time when we were climbing their steep learning curve. Thanks also to Deb Kaufmann, whose yeomanly efforts helped turn these materials into the finely polished form they now take. Also, thanks to Keith Weiskamp of The Coriolis Group, and Fred Grainger of ITP Publishing, who helped connect us with the great team of people at Course Technology, and to Joseph Dougherty of Course Technology, who put us together so effectively with his staff.

I must extend my most fervent thanks to the in-house team at LANWrights (www.lanw.com), all of whom helped to bring this book to fruition, especially Dawn Rader who managed the project, and handled all the materials that flowed between us and Course Technology. Thanks also to Mary Burmeister, who did much of the scout work on the project and helped us whip things into shape. To Michael, Natanya, and DJ: thanks for all your efforts in helping out when help was needed. And finally, to my late best friend and beloved Labrador retriever, Dusty: I miss you big guy! No more downed machines from your all-powerful, ever-wagging tail makes work a less exciting place to be these days.

Finally, I'd like to thank my co-authors for their camaraderie, hard work, and all the support that went into making this book. I'd also like to thank Microsoft, for making this kind of book not only possible, but necessary.

-Ed Tittel

My thanks to Ed Tittel and Dawn Rader of LANWrights for their help in developing this material and getting it out the door. And, as always, thanks also to Scott for his support while I'm writing. Couldn't do it without you.

-Christa Anderson

First, I would like to thank Ed Tittel and everyone at LANWrights for giving me the opportunity to make the switch from network management to writing. In particular, I would like to thank Dawn Rader. Your help on this book was tremendous and I know I wouldn't sound half as good as I do if you weren't there to correct my mistakes. Thanks for answering all the stupid questions and being patient while I tried to figure out what was going on. Thanks also to my mother for supporting me no matter what decisions I made. "Look, ma! I've been published!!"

-David W. Johnson



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 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. (Windows NT Workstation 4.0 Exam #70-073 is among the required course offerings.) Your MCSE credentials tell a potential employer that you are an expert in Windows NT Workstation.

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 (MCP), 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. For more information on texts from Certification Insider Press that will help prepare you for certification exams, visit our site at 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, letterheads, 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, which 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 (#70-073 for the Implementing and Supporting Microsoft Windows NT Workstation 4.0 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. 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 Workstation 4.0," you'll find an entire page of information about Workstation training and certification. This tells you a lot about your training and preparation options, and mentions the tests that relate to Workstation.
- **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 we've shared with you about the Microsoft Training and Certification pages, and all the other Web-based resources we 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 70-073, Implementing and Supporting Microsoft Windows NT Workstation 4.0, you'll be more likely to get there quickly if you use a search string such as: "**Exam 70-073**" 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, www.altavista.com, or 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 Windows NT Workstation 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.

An interactive CD-ROM with two complete practice exams that allow you to test your skills and knowledge makes this the perfect study guide for the Microsoft certification exam. These materials have been specifically designed to help individuals prepare for Microsoft Certification Exam #70-073, "Implementing and Supporting Microsoft Windows NT Workstation 4.0." Answers to end-of-chapter review questions and projects are also found on the CD-ROM.

ABOUT THE BOOK

To aid you in fully understanding NT Workstation 4 concepts, there are many features in this book that have been designed to help you logically work through and confidently prepare for the exam.

- **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 aid you in the visualization of common setups, theories, and architectures. In addition, many tables provide details and comparisons of both practical and theoretical information.
- **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.
- **Key Terms** Following the Chapter Summary, a list of new Workstation terms and their definitions encourages proper understanding of the chapter's key concepts and provides a useful reference.
- **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.
- **Hands-on Projects** Although it is important to understand the theory behind this technology, nothing can improve upon real world experience. With the exception of those chapters that are purely theoretical, each chapter provides a series of exercises aimed at providing you with hands-on implementation experience.

- **Case Projects** Finally, each chapter closes with a section that proposes a real-world situation. You are asked to evaluate the situation and decide upon the course of action to be taken to remedy the problems described. This valuable tool helps the student sharpen decision-making and troubleshooting skills.
- **Solutions** The answers for all review questions and projects are included on the companion CD-ROM.

TEXT AND GRAPHIC CONVENTIONS USED IN THIS BOOK

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



Note icons present additional helpful material related to the subject.



Tip icons highlight suggestions on ways to attack problems you may encounter in a real-world situation. The authors have practical experience with how Workstation works in real situations.



Caution icons appear in the margin next to concepts or steps that often cause difficulty. Each caution anticipates a potential mistake and provides methods for avoiding the same problem in the future.



Hands-on project icons precede each hands-on activity in this book.



Case project icons are located at the end of each chapter. They mark a more involved, scenario-based project. In this extensive case example, students are asked to independently implement 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 Workstation 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 Workstation 4.0 (#70-073). 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 information that is worthy of further investigation.

Appendix Microsoft Windows NT Server 4.0 NET Command Reference This reference provides a guide to using NET commands to configure Windows NT from the command line.

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

HARDWARE AND SOFTWARE REQUIREMENTS

Before You Begin

Individuals who wish to get the most from these materials should have access to a networked PC that is running Microsoft Windows 95, Windows NT Workstation 4.0, or Windows NT Server 4.0. If you have access to a Web browser, you will be able to complete all of the exercises in this book. The following table summarizes the requirements and recommendations (in parentheses) for each of these operating systems:

Item	Windows 95	NT Workstation 4.0	NT Server 4.0
MB RAM	16 (32)	12 (64)	16 (64)
MB Disk space	90 (200)	116 (400)	124 (1,000)
CPU	386/16 (486+)	486/33 (Pentium)	486/33 (Pentium)
Display type	VGA(SVGA)	VGA(SVGA)	VGA(SVGA)
Network	Yes	Yes	Yes

When it comes to any of these operating systems, it's wise to meet the recommended configurations, rather than the minimum configurations. While each of them will work at the minimum configurations, such systems will be slow and sometimes painful to use. In fact, it's nearly impossible to give any of these operating systems too much memory, disk space, or CPU power. These various Windows environments almost exemplify the notion that "more is better" when it comes to such things.

SYSTEM REQUIREMENTS FOR TEST PREP SOFTWARE:

- 8 MB RAM (16 MB recommended)
- VGA/256 Color display or better
- 4X 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. The questions were expertly prepared to test your readiness for the official Microsoft certification examination on NT Workstation 4.0 (Exam #70-073). 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 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 Windows NT Workstation 4.0 certification exam, we have included solutions for the end-of-chapter Review Questions, Hands-on Projects, and Case Projects on the CD.

BRIEF TABLE OF CONTENTS

CHAPTER ONE	
Introduction to Windows NT Workstation	1
CHAPTER TWO	
Installing Windows NT Workstation 4.0	27
CHAPTER THREE	
Users, Groups, and Policies	57
CHAPTER FOUR	
Configuring Windows NT Workstation	103
CHAPTER FIVE	
File Systems	151
CHAPTER SIX	
File and Directory Security	189
CHAPTER SEVEN	
Creating Windows NT Security Structures	235
CHAPTER EIGHT	
Windows NT Network Architecture	261
CHAPTER NINE	
TCP/IP and Netware Connectivity	299
CHAPTER TEN	
Workgroups, Domains, and Network Browsing	335
CHAPTER ELEVEN	
Remote Access Services	361
CHAPTER TWELVE	
Printing	389
CHAPTER THIRTEEN	
Performance Tuning	425
CHAPTER FOURTEEN	
Windows NT Components	459
CHAPTER FIFTEEN	
Bootling Windows NT	493
CHAPTER SIXTEEN	
Troubleshooting Windows NT Workstation	519
Appendix: Windows NT Server 4.0 NET Command Reference	549
GLOSSARY	573
INDEX	585

TABLE OF CONTENTS

CHAPTER ONE

Introduction to Windows NT Workstation	1
A History of Windows NT	2
Windows NT Server and NT Workstation	3
Other Microsoft Operating Systems	3
The Windows NT Environment	4
Portability	4
Multithreading	5
Multitasking	5
Security	6
File Systems	6
Support for Multiple Clients	7
Multiprocessor Support	7
Compatibility	7
Storage	8
Connectivity	8
Windows NT Architecture	9
Modular, Component-Oriented Design	10
Modes of Operation	10
Kernel Mode	12
NT Memory Architecture	14
Comparison of NT Workstation and NT Server	15
Comparison of NT Workstation and Windows 95	15
NT Workstation Hardware Requirements	16
The Hardware Qualifier Disk	17
Enterprise Models	18
Workgroup Model	18
Domain Model	19
Chapter Summary	20
Key Terms	20
Review Questions	23
Case Projects	25

CHAPTER TWO

Installing Windows NT Workstation 4.0	27
Upgrading Versus Installing	28
Bootting Multiple Operating Systems	28
Planning the Installation	29
Types of Installations	29
Partitioning the Hard Disk	30

Unattended Installations	30
Creating the UDF	32
The \$OEM\$ Directory	33
Using the SYSDIFF Utility	34
Beginning the NT Workstation Installation	35
Floppyless CD-ROM Installation for a Windows Client	35
Floppyless Network Installation for a DOS Computer	35
Floppyless Network Installation for a Windows 95 Computer	36
Floppyless Network Installation for a Windows NT Computer	36
Local Installation Using Installation Disks	36
WINNT and WINNT32	36
Text Mode Windows NT Setup	37
Hardware Detection	37
Upgrade or Install?	38
Choose Components	38
Partition Selection	39
Examining the Hard Disk	40
Graphical-Mode Setup	40
Configuration Options	40
Username, Computer Name, and Administrator Password	40
Emergency Repair Disk	41
Selecting Components for Installation	41
Network Settings	41
Selecting the Network Adapter	41
Selecting Network Protocols	42
Choosing Network Services	43
Configuring Bindings	44
Entering the Name of a Workgroup or Domain	44
Choosing Final Settings	44
Removing Windows NT	44
Deleting Windows NT from a FAT Partition	45
Deleting Windows NT if NTFS Is in Use	45
Chapter Summary	46
Key Terms	47
Review Questions	48
Hands-on Projects	50
Case Projects	56
CHAPTER THREE	
Users, Groups, and Policies	57
Windows NT User Accounts	58
Logging On to NT Workstation	59
Administrator	60
Guest	60
Naming Conventions	60
Managing Accounts with the User Manager	61
Creating a New User Account	62
Disabling User Accounts	64

Deleting User Accounts	64
Renaming User Accounts	65
Using the Groups Button	65
Creating a User Profile	66
Setting Dialin Options	67
Managing Users and Resources with Groups	68
Planning Groups	69
Default Local Groups	69
Creating Local Groups	71
NT Workstation Security Policies	72
The Account Policy	72
The User Rights Policy	74
The Audit Policy	76
System Policies	79
Chapter Summary	80
Key Terms	80
Review Questions	83
Hands-on Projects	87
Case Projects	100
CHAPTER FOUR	
Configuring Windows NT Workstation	103
The Windows NT Control Panel	104
System Applet	106
Date/Time Applet	111
Services Applet	112
Telephony Applet	114
Add/Remove Programs Applet	115
SCSI Adapters Applet	116
Devices Icon	118
Tape Devices Applet	119
PCMCIA Applet	120
Ports Applet	121
User-Specific Settings	122
Local Profiles	123
Roaming Profiles	123
Sounds Applet	124
Mouse Applet	125
Keyboard Applet	126
Display Applet	128
(MS-DOS) Console Applet	130
UPS Applet	134
The Registry	135
HKEY_LOCAL_MACHINE	136
The Registry Editors: REGEDIT and REGEDT32	137
Windows NT Diagnostics (WinMSD)	138
Chapter Summary	140
Key Terms	140

Review Questions	141
Hands-on Projects	144
Case Projects	149
CHAPTER FIVE	
File Systems	151
File Storage	152
File-System Objects	152
Hard Disk Structure	153
FAT File System	158
Characteristics and Limitations	159
Benefits	159
FAT Versus VFAT	159
FAT Versus FAT32	160
Long Filenames and 8.3 Filenames	161
8.3 Syntax and Limitations	161
Long Filename Syntax and Limitations	162
Converting Long Filenames to 8.3 Aliases	162
NTFS	163
Characteristics and Capabilities of NTFS	163
Fault Tolerance	164
Security	165
File Recovery	166
File and Partition Sizes	166
File Compression	167
POSIX Support	167
Performance Issues	168
Converting to NTFS	168
Converting a Data Partition	169
Converting a System Partition	169
Other Windows NT-Supported File Systems	169
Compact Disk File System (CDFS)	170
Networks as File Systems	170
HPFS and Windows NT 4.0	170
Windows NT 4.0 Disk Administrator	171
Volume Sets	171
System and Boot Partitions	172
Mirroring and Duplexing	173
Stripe Sets with and Without Parity	173
Drive Letter Assignment	173
Recovering Disk Configuration Information	174
Third-Party Disk Management Tools	174
Chapter Summary	176
Key Terms	176
Review Questions	179
Hands-on Projects	183
Case Projects	188

CHAPTER SIX

File and Directory Security	189
Security Planning	190
Defining Security Requirements	190
Creating a Security Plan	192
Communicating the Plan	193
Sharing Information on a Network	193
Creating a Share	194
Naming the Share	194
Setting Permissions	195
Viewing Shared Resources	197
Accessing Shares	198
Share Security versus NTFS Security	200
NTFS Security Advantages	201
NTFS Permissions	201
Access Permissions	201
User and Group Permissions	202
Permission Inheritance	202
Viewing Directory and File Permissions	203
Changing Permissions	203
The Change Access Control Lists (CACLS) Command	204
CACLS Description and Syntax	204
Batch File Examples	205
Special Access Permissions	206
How to Set Special Access Permissions	207
Default Permissions	207
Why Everyone Gets Full Control Permissions	209
Implications and Countermeasures	209
Copying and Moving Files	209
Auditing NTFS Activities	210
Enabling File and Directory Auditing	210
Selecting Events to Audit	211
Reading and Understanding Windows NT Audit Logs	212
Virus Protection	213
Virus-Scanning Software Options	213
The Importance of Keeping Current	214
Windows NT Backup Utility	214
Common Backup Problems and Considerations	215
Windows NT Backup Options	215
Third-Party Backup Options	220
Chapter Summary	220
Key Terms	221
Review Questions	222
Hands-on Projects	225
Case Projects	234

CHAPTER SEVEN

Creating Windows NT Security Structures	235
The NT Security Model	236
Logon Authentication	236
Objects	237
Access Control	238
Security Information in the Registry	239
The Security Accounts Manager (SAM)	239
Security Subsystem Keys	239
Matching ACLs and Access Tokens	240
Customizing the Logon Process	241
Disabling the Default Username	243
Adding a Security Warning Message	243
Changing the Shell	244
Disabling the Shutdown button	244
Automating Logons	245
Security-Related Registry Settings	245
Automatic Account Lockout	249
Chapter Summary	251
Key Terms	251
Review Questions	253
Hands-on Projects	256
Case Projects	259

CHAPTER EIGHT

Windows NT Network Architecture	261
Windows NT Network Components	262
OSI Reference Model	263
Physical Layer (Layer 1)	265
Data Link Layer (Layer 2)	266
Network Layer (Layer 3)	266
Transport Layer (Layer 4)	266
Session Layer (Layer 5)	267
Presentation Layer (Layer 6)	267
Application Layer (Layer 7)	267
The Windows NT Network Model	268
Boundary Layers	269
Programming Interfaces	269
Components: File-System Drivers	270
Boundary Layer: Transport Driver Interface (TDI)	270
Components: Transport Protocols	270
Boundary Layer: Network Driver Interface Specification (NDIS)	271
Default Network Components	271
Network Protocols	272
NetBEUI	273
NWLink	274
TCP/IP	275