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# Networking Essentials

Exam #70-058

**MICROSOFT  
CERTIFIED  
SYSTEMS  
ENGINEER**

交互式CD-ROM  
两套完整的实战试题



Ed Tittel  
David Johnson



中国水利水电出版社  
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## About the Authors

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-Ed Tittel

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. (Networking Essentials Exam #70-058 is among the required course offerings). Your MCSE credentials tell a potential employer that you are an expert in networking.

### 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](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, 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 (#70-058 for the Networking Essentials 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

By far, the best source 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 Networking Essentials," you'll find an entire page of information about Networking Essentials training and certification. This tells you a lot about your training and preparation options, and mentions all the tests that relate to Networking Essentials.



- **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.

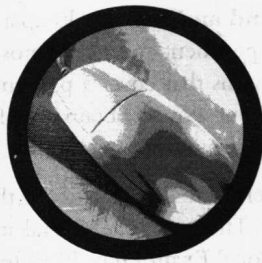
## COPING WITH CHANGE ON THE WEB

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 70-058, Networking Essentials, you'll be more likely to get there quickly if you use a search string such as: **"Exam 70-058" 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 Networking Essentials 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 #70-058, "Networking Essentials." 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 Networking Essentials 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 of networking components aid you in the visualization of common networking 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 networking 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 networking 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 certain networking 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—important aspects of network administration.
- **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. As experienced network administrators, the authors have practical experience with how networks work in real business 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 networking essentials. 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 Networking Essentials (#70-058). 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 several appendices that are worthy of further investigation.

- **Appendix A: Common Network Standards and Specifications** This appendix provides information about the standards-making process as it applies to networking, and coverage of the most important and influential network standards-making bodies in the U.S. and worldwide.
- **Appendix B: Planning and Implementing Networks** This appendix provides a detailed overview of the planning required prior to undertaking network design and installation, including user training requirements and post-sales technical support issues.
- **Appendix C: Network Troubleshooting Guide** Here you can find brief, cogent advice on how to recognize, isolate, and diagnose trouble on a network, be it media, hardware, or software related.
- **Appendix D: Networking Resources, Online and Offline** This is a compilation of all of the printed and online references mentioned throughout this book.
- **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 Internet access is also available, you should 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
- 2X 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 Networking Essentials (Exam # 70-058). 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 Networking Essentials 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

<b>CHAPTER ONE</b>	
Introduction to Networks and Networking Concepts	1
<b>CHAPTER TWO</b>	
Network Design Essentials	33
<b>CHAPTER THREE</b>	
Networking Media	51
<b>CHAPTER FOUR</b>	
Network Interface Cards	101
<b>CHAPTER FIVE</b>	
Making Networks Work	135
<b>CHAPTER SIX</b>	
Network Communications and Protocols	159
<b>CHAPTER SEVEN</b>	
Network Architectures	193
<b>CHAPTER EIGHT</b>	
Simple Network Operations	231
<b>CHAPTER NINE</b>	
Understanding Complex Networks	261
<b>CHAPTER TEN</b>	
Network Administration and Support	283
<b>CHAPTER ELEVEN</b>	
Enterprise and Distributed Networks	315
<b>CHAPTER TWELVE</b>	
Wide Area and Large-Scale Networks	343
<b>CHAPTER THIRTEEN</b>	
Solving Network Problems	369
<b>CHAPTER FOURTEEN</b>	
Understanding and Using Internet Resources	403
Appendix A: Common Networking Standards and Specifications	423
Appendix B: Planning and Implementing Networks	433
Appendix C: Network Troubleshooting Guide	449
Appendix D: Networking Resources, Online and Offline	455
GLOSSARY	459
INDEX	481

# TABLE OF CONTENTS

## CHAPTER ONE

<b>Introduction to Networks and Networking Concepts</b>	<b>1</b>
What Is Networking?	2
Networking Fundamentals	2
Local and Wide Area Networks	4
A Networking Lexicon	5
Clients, Peers, and Servers	5
The Network Medium Carries Network Messages	6
Network Protocols	6
Network Software	7
Network Types	8
Peer-to-Peer Networking	8
Server-Based Networks	11
Hybrid Networks	12
Server Hardware Requirements	13
Specialized Servers	14
Selecting the Right Type of Network	16
Chapter Summary	16
Key Terms	17
Review Questions	22
Hands-on Projects	26
Case Projects	32

## CHAPTER TWO

<b>Network Design Essentials</b>	<b>33</b>
Network Design	34
Designing a Network Layout	34
Standard Topologies	34
Bus	35
Star Topology	38
Ring Topology	39
Hubs	41
Active Hubs	41
Passive Hubs	41
Hybrid Hubs	42



Variations of the Major Topologies	42
Mesh Topology	42
Star Bus Topology	43
Star Ring Topology	43
Selecting a Topology	44
Constructing a Network Layout	44
Chapter Summary	46
Key Terms	46
Review Questions	47
Hands-on Projects	49
Case Projects	50
<b>CHAPTER THREE</b>	
<b>Networking Media</b>	<b>51</b>
Network Cabling: Tangible Physical Media	52
Primary Cable Types	52
General Cable Characteristics	53
Baseband and Broadband Transmission	55
Coaxial Cable	56
Twisted-Pair Cable	62
Fiber-Optic Cable	66
Cable Selection Criteria	69
The IBM Cabling System	70
Wireless Networking: Intangible Media	71
The Wireless World	72
Types of Wireless Networks	73
Wireless LAN Applications	73
Wireless LAN Transmission	74
Wireless Extended LAN Technologies	78
Microwave Networking Technologies	79
Trends in Wireless Networking	81
Chapter Summary	82
Key Terms	83
Review Questions	91
Hands-on Projects	96
Case Projects	98
<b>CHAPTER FOUR</b>	
<b>Network Interface Cards</b>	<b>101</b>
Network Interface Card (NIC) Basics	102
From Parallel to Serial, and Vice Versa	102
PC Buses	105

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