MCSE

MICROSOFT CERTIFIED SYSTEMS ENGINEER

Windows NT Server 4.0 in the Enterprise

STUDY GUIDE (EXAM 70-68)

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(Exam 70-68)

Syngress Media, Inc.

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FOREWORD

From Global Knowledge Network

At Global Knowledge Network we strive to support the multiplicity of learning styles required by our students to achieve success as technical professionals. In this series of books, it is our intention to offer the reader a valuable tool for successful completion of the MCSE Certification Exam.

As the world's largest IT training company, Global Knowledge Network is uniquely positioned to offer these books. The expertise gained each year from providing instructor-led training to hundreds of thousands of students worldwide has been captured in book form to enhance your learning experience. We hope that the quality of these books demonstrates our commitment to your lifelong learning success. Whether you choose to learn through the written word, computer-based training, Web delivery, or instructor-led training, Global Knowledge Network is committed to providing you the very best in each of those categories. For those of you who know Global Knowledge Network, or those of you who have just found us for the first time, our goal is to be your lifelong competency partner.

Thank you for the opportunity to serve you. We look forward to serving your needs again in the future.

Warmest regards,

Duncan Anderson
Chief Operating Officer, Global Knowledge Network

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ABOUT THE CONTRIBUTORS

Syngress Media creates books and software for Information Technology professionals seeking skill enhancement and career advancement. Its products are designed to comply with vendor and industry standard course curricula, and are optimized for certification exam preparation. You can contact them on the web at www.syngress.com.

Stace Cunningham is a Systems Engineer with SDC Consulting located in Biloxi, MS. SDC Consulting specializes in the design, engineering, and installation of networks. Stace received his MCSE in October 1996, and is also certified as an IBM Certified LAN Server Engineer, IBM Certified OS/2 Engineer, IBM Certified LAN Server Administrator, Microsoft Certified Product Specialist, IBM Certified LAN Server Instructor, and IBM Certified OS/2 Instructor.

Stace has participated as a Technical Contributor for the IIS 3.0 exam, SMS 1.2 exam, Proxy Server 1.0 exam, Exchange Server 5.0 exam, Exchange Server 5.5 exam, Proxy Server 2.0 exam, IIS 4.0 exam, IEAK exam, and the revised Windows 95 exam. He recently was an instrumental force in the design and engineering of a 1,700-node Windows NT network that is located in more than 20 buildings at Keesler Air Force Base in Mississippi. Among his current projects is assisting in the design and implementation of a 10,000-node Windows NT network, also located at Keesler Air Force Base.

His wife Martha and daughter Marissa are very supportive of the time he spends on the computers located throughout his house. Without their love and support he would not be able to accomplish the goals he has set for himself.

Harry Flowers (MCPS) has been a systems administrator for more than 15 years. He has a B.S. in Mathematics/Computer Science from Rhodes College, and currently works as one of a small group of systems administrators responsible for central computing systems at the University of Memphis. He supports several Windows NT servers for both academic and administrative systems, as well as other Microsoft BackOffice products such as Exchange and

Systems Management Server. Harry is also a Windows NT consultant and trainer for Open Road Technologies.

Brian Frederick is an MCSE with more than five years of technical background. Brian started his computer career at the ripe old age of seven with an Apple II+. Brian attended the University of Northern Iowa, and is married with two adorable children. Brian's hobbies include his kids primarily, as well as Little League baseball, and web page development. Brian also enjoys other sports, electronics, and multi-player gaming. Brian is involved with MCSE classroom training with a local ATEC.

Trevor Glenn is an MCSE, MCT in Dallas, TX. He is a project manager for NewData Strategies, a Microsoft Solution Partner. He is also an Instructor at SMU. Trevor has been involved with Microsoft products since his graduation from the University of South Florida. Trevor dedicates his contributions to this book to the memory of his loving grandmother Marilyn and also to his supportive wife Niecey. He can be reached at tglenn@newdat.com.

Michael D. Kendzierski (MCT, MCSE) works as a Systems Engineer for New Technology Partners, the 1997 Microsoft Solution Provider Partner of the Year. He received his Bachelor's degree from Providence College and has recently completed graduate work at Boston University. He is currently dividing his time between the Midwest and New England, providing consulting, development, and project management for Fortune 100 companies. When he's not fooling around with Visual Basic, he can be found roaming the country, searching for a local Starbucks. He welcomes email and can be reached at Mkendzierski@worldnet.att.net.

Sean Wallbridge is a Consultant with NexGen Technologies located in Hamilton, Bermuda. NexGen Technologies is a professional services organization focusing on the design, implementation, and management of sophisticated business solutions that leverage the entire Microsoft BackOffice suite. Sean's qualifications include MCSE+Internet (3.5*x*/4.*x*), CNA, MSS and Microsoft Certified Trainer. Specializing in delivering solutions for Microsoft Exchange, SMS, SQL, IIS, Proxy Server and NT, Sean takes pride in building sophisticated BackOffice and Intranet turnkey solutions. Sean can be reached by e-mail at sean@wallbridge.com or by visiting www.wallbridge.com/sean/

Technical Review and From the Classroom Sidebars by:

Shane Clawson is a principal in Virtual Engineering, a consulting and engineering firm specializing in network consulting and technology process re-engineering. Shane has more than 20 years' experience as an instructor in the networking field. He is a Microsoft Certified System Engineer (MCSE) and a Microsoft Certified Trainer (MCT) who has been working with Windows NT since its inception. He specializes in Microsoft networking and BackOffice products. Shane can be reached at ShaneCSE@msn.com.

ACKNOWLEDGMENTS

PREFACE

This book's primary objective is to help you prepare for and pass the required MCSE exam so you can begin to reap the career benefits of certification. We believe that the only way to do this is to help you increase your knowledge and build your skills. After completing this book, you should feel confident that you have thoroughly reviewed all of the objectives that Microsoft has established for the exam.

In This Book

This book is organized around the actual structure of the Microsoft exam administered at Sylvan Testing Centers. Most of the MCSE exams have six parts to them: Planning, Installation and Configuration, Managing Resources, Connectivity, Monitoring and Optimization, and Troubleshooting. Microsoft has let us know all the topics we need to cover for the exam. We've followed their list carefully, so you can be assured you're not missing anything.

In Every Chapter

We've created a set of chapter components that call your attention to important items, reinforce important points, and provide helpful exam-taking hints. Take a look at what you'll find in every chapter:

■ Every chapter begins with the **Certification Objectives**—what you need to know in order to pass the section on the exam dealing with the chapter topic. The Certification Objectives are sequentially numbered, so you'll always know an objective when you see it.

exam Watch

EXERCISE

- **Exam Watch** notes call attention to information about, and potential pitfalls in, the exam. These helpful hints are written by MCSEs who have taken the exams and received their certification—who better to tell you what to worry about? They know what you're about to go through!

- **Certification Exercises** are interspersed throughout the chapters. These are step-by-step exercises that mirror vendor-recommended labs. They help you master skills that are likely to be an area of focus on the exam. Don't just read through the exercises; they are hands-on practice that you should be comfortable completing. Learning by doing is an effective way to increase your competency with a product.

- **From the Classroom** sidebars describe the issues that come up most often in the training classroom setting. These sidebars give you a valuable perspective into certification- and product-related topics. They point out common mistakes and address questions that have arisen from classroom discussions.

- **Q & A** sections lay out problems and solutions in a quick-read format:

QUESTIONS AND ANSWERS

I am installing NT and I have HPFS...	Convert it before you upgrade. NT 4 does not like HPFS.

- The **Certification Summary** is a succinct review of the chapter and a re-statement of salient points regarding the exam.

- The **Two-Minute Drill** at the end of every chapter is a checklist of the main points of the chapter. It can be used for last-minute review.

- The **Self Test** offers questions similar to those found on the certification exams, including multiple choice, true/false questions, and fill-in-the-blank. The answers to these questions, as well as explanations

of the answers, can be found in Appendix A. By taking the Self Test after completing each chapter, you'll reinforce what you've learned from that chapter, while becoming familiar with the structure of the exam questions.

Some Pointers

Once you've finished reading this book, set aside some time to do a thorough review. You might want to return to the book several times and make use of all the methods it offers for reviewing the material:

1. *Re-read all the Two-Minute Drills*, or have someone quiz you. You also can use the drills as a way to do a quick cram before the exam.

2. *Re-read all the Exam Watch notes.* Remember that these are written by MCSEs who have taken the exam and passed. They know what you should expect—and what you should be careful about.

3. *Review all the Q & A scenarios* for quick problem solving.

4. *Re-take the Self Tests.* Taking the tests right after you've read the chapter is a good idea, because it helps reinforce what you've just learned. However, it's an even better idea to go back later and do all the questions in the book in one sitting. Pretend you're taking the exam. (For this reason, you should mark your answers on a separate piece of paper when you go through the questions the first time.)

5. *Take the on-line tests.* Boot up the CD-ROM and take a look. We have more third-party tests on our CD than any other book out there, so you'll get quite a bit of practice.

6. *Complete the exercises.* Did you do the exercises when you read through each chapter? If not, do them! These exercises are designed to cover exam topics, and there's no better way to get to know this material than by practicing.

7. *Check out the web site.* Global Knowledge Network invites you to become an active member of the Access Global web site. This site is an online mall and an information repository that you'll find invaluable. You can access many types of products to assist you in your preparation for the exams, and you'll be able to participate in forums, on-line discussions, and threaded discussions. No other book brings you unlimited access to such a resource. You'll find more information about this site in Appendix C.

MCSE Certification

Although you've obviously picked up this book to study for a specific exam, we'd like to spend some time covering what you need to complete in order to attain MCSE status. Because this information can be found on the Microsoft web site, www.microsoft.com/train_cert, we've repeated only some of the more important information. You should review the train_cert site and check out Microsoft's information, along with their list of reasons to become an MCSE, including job advancement.

As you probably know, to attain MCSE status, you must pass a total of six exams—four requirements and two electives. One required exam is on networking basics, one on NT Server, one on NT Server in the Enterprise, and one on a client (either Windows NT Workstation or Windows 95 or 98). There are several electives from which to choose. The most popular electives now are on TCP/IP and Exchange Server 5. The following table lists the exam names, their corresponding course numbers, and whether they are required or elective. We're showing you the NT 4.0 track and not the NT 3.51 track (which is still offered).

Exam Number	Exam Name	Required or Elective
70-58	Networking Essentials	Required
70-63	Implementing and Supporting Microsoft Windows 95 or 98	Required (either 70-63/ 70-98 or 70-73)
70-67	Implementing and Supporting Microsoft Windows NT Server 4.0	Required

Exam Number	Exam Name	Required or Elective
70-68	Implementing and Supporting Microsoft Windows NT Server 4.0 in the Enterprise	Required
70-73	Implementing and Supporting Microsoft Windows NT Workstation 4.0	Required (either 70-73 or 70-63)
70-14	Supporting Microsoft System Management Server 1.2	Elective
70-59	Internetworking with Microsoft TCP/IP on Windows NT 4.0	Elective
70-81	Implementing and Supporting Microsoft Exchange Server 5.5	Elective
70-85	Implementing and Supporting Microsoft SNA Server 4.0	Elective
70-87	Implementing and Supporting Microsoft Internet Information Server 4.0	Elective
70-88	Implementing and Supporting Microsoft Proxy Server 2.0	Elective
TBA	System Administration for Microsoft SQL Server X	Elective
TBA	Implementing a Database Design on SQL Server X	Elective

The CD-ROM Resource

This book comes with a CD-ROM full of supplementary material you can use while preparing for the MCSE exams. We think you'll find our book/CD package one of the most useful on the market. It provides all the sample tests available from testing companies such as Transcender, Microhard, Self Test Software, BeachFront Quizzer, and VFX Technologies. In addition to all these third-party products, you'll find an electronic version of the book, where you can look up items easily and search on specific terms. The special self-study module contains another 300 sample questions, with links to the electronic book for further review. There's more about this resource in Appendix B.

How to Take a Microsoft Certification Examination

**by John C. Phillips, Vice President of Test Development,
Self Test Software
(Self Test's PEP is the official Microsoft practice test.)**

Good News and Bad News

If you are new to Microsoft certification, we have some good news and some bad news. The good news, of course, is that Microsoft certification is one of the most valuable credentials you can earn. It sets you apart from the crowd, and marks you as a valuable asset to your employer. You will gain the respect of your peers, and Microsoft certification can have a wonderful effect on your income.

The bad news is that Microsoft certification tests are not easy. You may think you will read through some study material, memorize a few facts, and pass the Microsoft examinations. After all, these certification exams are just computer-based, multiple-choice tests, so they must be easy. If you believe this, you are wrong. Unlike many "multiple guess" tests you have been exposed to in school, the questions on Microsoft certification examinations go beyond simple factual knowledge.

The purpose of this introduction is to teach you how to take a Microsoft certification examination. To be successful, you need to know something about the purpose and structure of these tests. We will also look at the latest innovations in Microsoft testing. Using *simulations* and *adaptive testing*, Microsoft is enhancing both the validity and security of the certification process. These factors have some important effects on how you should prepare for an exam, as well as your approach to each question during the test.

We will begin by looking at the purpose, focus, and structure of Microsoft certification tests, and examine the effect these factors have on the kinds of

questions you will face on your certification exams. We will define the structure of examination questions and investigate some common formats. Next, we will present a strategy for answering these questions. Finally, we will give some specific guidelines on what you should do on the day of your test.

Why Vendor Certification?

The Microsoft Certified Professional program, like the certification programs from Lotus, Novell, Oracle, and other software vendors, is maintained for the ultimate purpose of increasing the corporation's profits. A successful vendor certification program accomplishes this goal by helping to create a pool of experts in a company's software, and by "branding" these experts so that companies using the software can identify them.

We know that vendor certification has become increasingly popular in the last few years because it helps employers find qualified workers, and because it helps software vendors like Microsoft sell their products. But why vendor certification rather than a more traditional approach like a college degree in computer science? A college education is a broadening and enriching experience, but a degree in computer science does not prepare students for most jobs in the IT industry.

A common truism in our business states, "If you are out of the IT industry for three years and want to return, you have to start over." The problem, of course, is *timeliness*; if a first-year student learns about a specific computer program, it probably will no longer be in wide use when he or she graduates. Although some colleges are trying to integrate Microsoft certification into their curriculum, the problem is not really a flaw in higher education, but a characteristic of the IT industry. Computer software is changing so rapidly that a four-year college just can't keep up.

A marked characteristic of the Microsoft certification program is an emphasis on performing specific job tasks rather than merely gathering knowledge. It may come as a shock, but most potential employers do not care how much you know about the theory of operating systems, networking, or database design. As one IT manager put it, "I don't really care what my employees know about the theory of our network. We don't need someone to sit at a desk and think about it. We need people who can actually do something to make it work better."

You should not think that this attitude is some kind of anti-intellectual revolt against "book learning." Knowledge is a necessary prerequisite, but it is not enough. More than one company has hired a computer science graduate as a network administrator, only to learn that the new employee has no idea how to add users, assign permissions, or perform the other day-to-day tasks necessary to maintain a network. This brings us to the second major characteristic of Microsoft certification that affects the questions you must be prepared to answer. In addition to timeliness, Microsoft certification is also job task oriented.

The timeliness of Microsoft's certification program is obvious, and is inherent in the fact that you will be tested on current versions of software in wide use today. The job task orientation of Microsoft certification is almost as obvious, but testing real-world job skills using a computer-based test is not easy.

Computerized Testing

Considering the popularity of Microsoft certification, and the fact that certification candidates are spread around the world, the only practical way to administer tests for the certification program is through Sylvan Prometric testing centers. Sylvan Prometric provides proctored testing services for Microsoft, Oracle, Novell, Lotus, and the A+ computer technician certification. Although the IT industry accounts for much of Sylvan's revenue, the company provides services for a number of other businesses and organizations, such as FAA pre-flight pilot tests. In fact, most companies that need secure test delivery over a wide geographic area use the services of Sylvan Prometric. In addition to delivery, Sylvan Prometric also scores the tests and provides statistical feedback on the performance of each test question to the companies and organizations that use their services.

Typically, several hundred questions are developed for a new Microsoft certification examination. The questions are first reviewed by a number of subject matter experts for technical accuracy, and then are presented in a beta test. The beta test may last for several hours, due to the large number of questions. After a few weeks, Microsoft Certification uses the statistical feedback from Sylvan to check the performance of the beta questions.

Questions are discarded if most test takers get them right (too easy) or wrong (too difficult), and a number of other statistical measures are taken of