(英文原版)

MCSD:

# Visual Basic 6 Desktop Applications 学习指南

MCSD: Visual Basic 6 Desktop Applications Study Guide

微软认证的软件开发专家考试系列丛书之五

〔美〕 Michael Mckelvy 著



電子工業出版社

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Desktop Applications
STUDY GUIDE

MCSD 学习指南系列 微软认证的软件 开发专家考试 系列丛书之五

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# 微软认证考试系列丛书出版说明

当前,计算机系统的开发、管理、使用及维护需要大量不同层次的专业技术人员,评价各种技术人员的水平是一件既复杂又必不可少的工作。为考查、评测有关人员对微软操作系统、软件和网络系统的理解和熟练使用程度,Microsoft公司设计了如下几种认证考试方案:

Microsoft Certified Professional (MCP, 微软认证专业人员)

Microsoft Certified Professional+Internet(MCPI,微软认证的MCP及Internet专业人员)

Microsoft Certified Solution Developer (MCSD, 微软认证软件开发专家)

Microsoft Certified System Engineer (MCSE, 微软认证系统工程师)

Microsoft Certified System Engineer+Internet(MCSEI,微软认证MCSE及Internet工程师)

Microsoft Certified DataBase Administrator (MCDBA, 微软认证数据库管理员)

Microsoft Certified Trainer (MCT, 微软认证培训员)

为帮助国内的技术人员学好、用好微软的产品,顺利通过有关的考试,我们分别以翻译和英文原版重印的形式推出了"MCSE学习指南系列"(中文译本)、"MCSE考试指南系列"(英文原版)和"MCSD学习指南系列"(英文原版)三个系列书。

# MCSE考试

MCSE是Microsoft Certified Systems Engineer(微软认证系统工程师)的缩写形式。MCSE证书意味着持有者具有较高层次的Windows NT、微软操作系统和相关产品的知识。获得MCSE证书需要有良好的计算机基础知识,还需要对操作系统、网络系统和信息化产品有深刻全面的了解,需要经过认真甚至是艰苦的学习和实践过程。由于该证书取之不易,一旦获得便足以说明证书持有者的技术水平,所以该证书得到了普遍的认可,几乎成为许多因外大公司录用人员、提升职务,甚至是提高薪金的依据,所以MCSE考生人数逐年上升。

要获得MCSE证书,需要通过四项必考科目和两项自选科目考试。具体情况如下:

必考科目	考试内容	可选择科目
#1	网络操作系统	Windows NT Server 3.51或Windows NT 4.0
#2	企业网系统应用	Windows NT Server (3.51或4.0) in the Enterprise
#3	网络基础知识	Networking Essentials
#4	微软操作系统知识	Windows 3.1, Windows 3.11 for Workgroups
		Windows 95, Windows NT Workstation, Windows 98
自选科目	考试内容	可选择科目
#5	微软信息服务器产品	SQL Server、SNA Server、Exchange Server或
		Internet Information Server等十余个科目
#6	微软公司有关TCP/IP	TCP/IP for NT Server 4
	方面的产品	

表0.1 MCSE考试内容与可选科目

为配合国内读者学习掌握计算机基础知识、操作系统、网络系统及信息化产品,我们推出了两套MCSE系列从书,即,

- ·MCSE学习指南系列(中文译本)
- · MCSE考试指南系列(英文原版)

#### MCSE学习指南系列

由于MCSE考试的技术水平高,要求考生概念清晰、基础知识牢固、能灵活地运用所学知识,并具有丰富的实践经验。显而易见,MCSE的学习、考试用书也应具备上述特点,介绍MCSE的书籍不但适用于MCSE考生,同时也适用于希望学习、掌握相关知识的普通技术人员。为此我们翻译了本系列丛书,现已推出或将要推出(黑体标识者)的书籍如下:

中文书名	丛书编号	适用的考试科目
MCSE: NT Server 4学习指南	MCSE系列丛书之一	表0.1 #1
MCSE: NT Server 4 in the Enterprise学习指南	MCSE系列丛书之二	表0.1 #2
MCSE: 网络基础学习指南	MCSE系列丛书之三	表0.1 #3
MCSE: Windows NT Workstation学习指南	MCSE系列丛书之四	表0.1 #4
MCSE: Windows 95学习指南	MCSE系列丛书之五	表0.1 #4
MCSE: TCP/IP学习指南	MCSE系列丛书之六	表0.1 #6
MCSE: Microsoft Internet Information Server学习指南	MCSE系列丛书之七	表0.1 #5
MCSE: Windows 98学习指南	MCSE系列丛书之十六	表0.1 #4
MCSE: SQL Server 7学习指南	MCSE系列丛书之十七	表0.1 #5
MCSE: Microsoft Internet Information Server 4学习指南	MCSE系列丛书之十八	表0.1 #5
MCSE: TCP/IP for NT Server 4学习指南	MCSE系列丛书之十九	表0.1 #6

表0.2 MCSE系列丛书(学习指南系列)

# MCSE考试指南系列

如果说学习指南系列的特点是,十分注重原理介绍、概念阐述和外沿知识的说明;那么,新的考试指南系列则注意了必须了解的知识、结论,强调了正确的操作方法和实际处理问题的能力,同时介绍了许多MCSE考试的经验和技巧,并附有考试例题。

考虑到考试指南系列书注重结论、致力于支持读者通过MCSE考试等特点,加之MCSE 考生英语水平普遍很高(考试本身需用英语完成),我们以英文重印形式推出了如下的考试 指南系列书,详见表0.3所示。

表U.5 MCSEボ列型市(考风指南ボ列)			
中文书名	丛书编号	适用的考试科目	
MCSE: NT Server 4考试指南	MCSE系列丛书之八	表0.1 #1	
MCSE: NT Server 4 in the Enterprise考试指南	MCSE系列丛书之九	表0.1 #2	
MCSE: Networking Essentials考试指南	MCSE系列丛书之十	表0.1 #3	
MCSE: NT Workstation 4考试指南	MCSE系列丛书之十一	表0.1 #4	
MCSE: TCP/IP for NT Server 4考试指南	MCSE系列丛书之十二	表0.1 #6	
MCSE: Microsoft Internet Information Server 4考试指南	MCSE系列丛书之十三	表0.1 #5	
MCSE: SQL Server 7考试指南	MCSE系列丛书之十四	表0.1 #5	
MCSE: Windows 98考试指南	MCSE系列丛书之十五	表0.1 #4	

表0.3 MCSE系列丛书(考试指南系列)

# MCSD考试

持有MCSD证书,说明持有者具有熟练使用微软操作系统、开发工具和相关技术的能力。因而许多MCSE考生把MCSD考试作为MCSE考试的准备阶段,或者在获取了MCSE证书后再考取MCSD证书。要获取MCSD证书,需要通过如下四种考试(见表0.4):

表0.4 MCSD必考科目与自选科目

必考科目	考试内容	
#1	Analyzing Requirements and Defining Solution Architectures	
系统分析及		
解决方案		
#2	Designing and Implementing Desktop Applications with Visual Basic 6.0	
桌面应用程序开发	Designing and Implementing Desktop Applications with Visual C++ 6.0	
(二择其一)		
#3	Designing and Implementing Distributed Applications with Visual Basic 6.0	
分布式应用程序开发	Designing and Implementing Distributed Applications with Visual C++ 6.0	
(二择其一)		
自选科目	可选择内容	
#4	Implementing a Database Design on Microsoft SQL Server 6.5	
具体应用科目	Designing and Implementing a Database Design with Microsoft SQL Server 7.0	
(任选其一)	Designing and Implementing Data Warehouses with Microsoft SQL Server 7.0	
	Developing Application with Visual C++ Using Microsoft Foundation Class Library	
	Designing and Implementing Web Site with Microsoft FrontPage 98	
	Designing and Implementing Commerce Solutions with Microsoft Site Server 3.0	
	Designing and Implementing Web Solutions with Microsoft Visual InterDev 6.0	

### MCSD学习指南系列

为配合广大读者学习MCSD方面的知识,考取MCSD证书,我们以英文重印形式,首先推出如下MCSD学习指南系列书(黑体标识者为最新推出或近期推出),见表0.5。

表0.5 MCSD系列丛书(学习指南系列)

中文书名	丛书编号	适用的考试科目
MCSD: SQL Server 6.5 Database Design学习指南	MCSD系列丛书之四	表0.4 #4
MCSD: Visual Basic 6 Desktop Application学习指南	MCSD系列丛书之五	表0.4 #2
MCSD: Visual Basic 6 Distributed Application学习指南	MCSD系列丛书之六	表0.4 #3
MCSD: Analyzing Requirements and Defining Solution	MCSD系列丛书之七	表0.4#1
Architecture学习指南		
MCSD: Visual C++ 6 Desktop Application学习指南	MCSD系列丛书之八	表0.4 #2
MCSD: Visual C++ 6 Distributed Application学习指南	MCSD系列丛书之九	表0.4 #3
MCSD: SQL Server 7 Database Design学习指南	MCSD系列丛书之十	表0.4 #4

由于采用"重印"方式,即从SYBEX公司购买版权,同时获取该书的文本文件和图形文件,在国内重新排版印刷,这样做的优势在于:

- •降低了图书价格, 重印书比原版图书便宜许多。
- •缩短了制作周期,重印书与原版书的"出版时差"不足两个月。
- •提高了制作质量,使用原文件排版,印刷质量明显优于各种影印外文原版书。

综上诸多优势,不难想象,重印系列书会受到广大读者的欢迎。

由于MCSE、MCSD及考试科目和软件版本在不断地增加或升级,因此我们推出的品种也会随之增加或调整。请读者留意书店内的销售广告或本系列书中的最新说明(恕不另行通知)。

最后,向支持和喜爱我们图书的广大读者表示感谢,并肯请读者对书中存在的问题提 出批评和指正。

1999年 • 着

To my wife, Wanda, and my children, Laura and Eric, for their love and support, and for their patience during the long hours of the project.

# **Acknowledgments**

A book like this is not the effort of a single individual; it takes a talented team of people to create a book that is useful to the reader and is a quality publication. I would like to thank all the members of the team that helped me put this book together. First, the team at Sybex—Brenda Frink, Malka Geffen, Blythe Woolston, and Bill Gibson; second, our editor—Sharon Wilkey. Finally, I would like to thank my friend and colleague, Tracy Liveoak, who worked as the technical editor to make sure that all explanations were right.

## Introduction

hese days, almost every job requires some level of computer literacy. You will even find computers being used in most restaurants to handle order processing, a task that was previously done by hand. For all the tasks that are being performed by computer, someone needed to write the software to handle the task. This is the role of the software developer. Finding qualified software developers is a major issue for many companies today.

But how is a company supposed to determine who is qualified and who is just a computer user with a few elementary programming skills? Determining the qualifications of people is difficult when there are so many who claim to be computer experts, even if their expertise is limited to setting up their own Web page. To help with the task of determining who is qualified and who is not, Microsoft developed its Microsoft certification program to certify those people who have the skills to work with Microsoft products and networks.

For developers, this certification is in the form of the Microsoft Certified Solution Developer. This certification establishes that a person is familiar with the inner workings of Windows and has skills in working with multiple programming languages or development environments. Visual Basic is one of the languages in which you can be certified on your way to becoming an MCSD. Even if MCSD certification is not your goal, being Microsoft certified in Visual Basic can make it easier for you to get a programming job or to command a higher salary for the job.

The purpose of this book is to make it easier for you to pass the Visual Basic certification exam. After working through the book, you will understand the objectives covered by the test and will know the types of questions to expect on the test.

# Your Key to Passing Exam 70-176

This book provides the key to passing Exam 70-176, Designing and Implementing Desktop Applications with Microsoft Visual Basic 6.0. You'll find all the information relevant to this exam, including hundreds of practice questions, all designed to make sure that when you take the real exam, you are ready for even the picky questions on less frequently used options.

# **Understand the Exam Objectives**

To help you prepare for certification exams, Microsoft provides a list of exam objectives for each test. This book is structured according to the objectives for Exam 70-176, designed to measure your ability to create applications in Visual Basic.



Exam objectives are subject to change at any time without prior notice and at Microsoft's sole discretion. Please visit Microsoft's Web site (www.microsoft.com\train\_cert) for the most current listing of exam objectives.

#### Is This Book for You?

The target audience for this book is the programmer who has some experience with Visual Basic but needs to understand the topics covered in the exam objectives. Although the explanations and exercises are written to be easily understandable, a certain level of Visual Basic programming background is assumed. If you are not familiar with the basics of programming in Visual Basic, you would probably do well to take an introductory class or read an introductory book before continuing toward certification.

# **Understanding Microsoft Certification**

Microsoft offers several levels of certification for anyone who has or is pursuing a career as a professional developer working with Microsoft products:

- · Microsoft Certified Professional (MCP)
- · Microsoft Certified Professional + Internet
- Microsoft Certified Solution Developer (MCSD)
- Microsoft Certified Systems Engineer (MCSE)
- · Microsoft Certified Systems Engineer + Internet
- Microsoft Certified Database Administrator (MCDBA)
- Microsoft Certified Trainer (MCT)

The one you choose depends on your area of expertise and your career goals.

#### **Microsoft Certified Professional (MCP)**

This certification is for individuals with expertise in one specific area. MCP certification is often a stepping stone to MCSE or MCSD certification and allows you some benefits of Microsoft certification after just one exam.

By passing one core exam (meaning an operating system exam), you become an MCP.

#### **Microsoft Certified Solution Developer (MCSD)**

The MCSD certification identifies developers with experience working with Microsoft operating systems, development tools, and technologies. To achieve the MCSD certification, you must pass four exams:

- 1. Analyzing Requirements and Defining Solution Architectures
- 2. A desktop application development exam selected from the following:
  - Designing and Implementing Desktop Applications with Visual Basic 6.0
  - Designing and Implementing Desktop Applications with Microsoft Visual C++ 6.0

- **3**. A distributed application development exam selected from the following:
  - Designing and Implementing Distributed Applications with Microsoft Visual Basic 6.0
  - Designing and Implementing Distributed Applications with Microsoft Visual C++ 6.0
- 4. One Elective Exam

Some of the electives include:

- Implementing a Database Design on Microsoft SQL Server 6.5
- Designing and Implementing a Database with Microsoft SQL Server
   7.0
- Designing and Implementing Data Warehouses with Microsoft SQL Server 7.0
- Developing Applications with Microsoft Visual C++ Using the Microsoft Foundation Class Library
- Designing and Implementing Web Sites with Microsoft Front Page 98
- Designing and Implementing Commerce Solutions with Microsoft Site Server 3.0, Commerce Edition
- Designing and Implementing Web Solutions with Microsoft Visual InterDev 6.0



Desktop and distributed application exams for Microsoft Visual J++ 6.0 and Microsoft Visual FoxPro 6.0 are in development and will be available in 1999.

# Microsoft Certified Systems Engineer (MCSE)

For network professionals, the MCSE certification requires commitment. You need to complete all the steps required for certification. Passing the exams shows that you meet the high standards that Microsoft has set for MCSEs.



The following list applies to the NT 4.0 track. Microsoft still supports a track for 3.51, but 4.0 certification is more desirable because it is the current operating system.

To become an MCSE, you must pass a series of six exams:

- 1. Networking Essentials (waived for Novell CNEs)
- 2. Implementing and Supporting Microsoft Windows NT Workstation 4.0 (or Windows 95)
- 3. Implementing and Supporting Microsoft Windows NT Server 4.0
- **4**. Implementing and Supporting Microsoft Windows NT Server 4.0 in the Enterprise
- 5. Elective
- 6. Elective

Some of the electives include:

- Internetworking with Microsoft TCP/IP on Microsoft Windows NT 4.0
- Implementing and Supporting Microsoft Internet Information Server 4.0
- Implementing and Supporting Microsoft Exchange Server 5.5
- Implementing and Supporting Microsoft SNA Server 4.0
- Implementing and Supporting Microsoft Systems Management Server 1.2
- Implementing a Database Design on Microsoft SQL Server 6.5
- System Administration for Microsoft SQL Server 6.5

#### Microsoft Certified Database Administrator

The MCDBA certification is the premier certification for database support and development professionals. This certification requires four core exams in the subjects of Microsoft SQL Server 7.0 and Windows NT platform support. The core exams include:

- 1. Implementing and Supporting Microsoft Windows NT 4.0
- 2. Implementing and Supporting Microsoft Windows NT 4.0 in the Enterprise
- 3. System Administration of Microsoft SQL Server 7.0
- **4**. Designing and Implementing a Database with Microsoft SQL Server 7.0 In addition, you must pass one elective exam. Some of the more popular include:
  - Designing and Implementing Distributed Applications with Microsoft Visual Basic 6.0
  - Designing and Implementing Distributed Applications with Microsoft Visual C++ 6.0
  - Designing and Implementing Data Warehouses with Microsoft SQL Server 7.0
  - Implementing and Supporting Microsoft Internet Information Server 4.0
  - Internetworking with Microsoft TCP/IP on Microsoft Windows NT  $4.0\,$

#### Microsoft Certified Trainer (MCT)

As an MCT, you can deliver Microsoft certified courseware through official Microsoft channels.

The MCT certification is more costly because, in addition to passing the exams, it requires that you sit through the official Microsoft courses. You also need to submit an application that must be approved by Microsoft. The number of exams you are required to pass depends on the number of courses you want to teach.



For the most up-to-date certification information, visit Microsoft's Web site at www.microsoft.com/train\_cert.

#### **Preparing for the MCSD Exams**

To prepare for the MCSD certification exams, you should try to work with the product as much as possible. In addition, there are a variety of resources from which you can learn about the products and exams:

- · You can take instructor-led courses.
- You can take online training. This is a useful option for people who cannot find any courses in their area or who do not have the time to attend classes.
- If you prefer to use a book to help you prepare for the MCSD tests, you
  can choose from a wide variety of publications, including test-preparedness books similar to this one.



For more MCSD information, point your browser to the Sybex Web site, where you'll find information about the MCP program, job links, and descriptions of other quality titles in the Network Press line of MCSD-related books. Go to http://www.sybex.com and click the MCSD logo.

#### Scheduling and Taking an Exam

When you think you are ready to take an exam, call Prometric Testing Centers at (800) 755-EXAM (755-3926). They'll tell you where to find the closest testing center. Before you call, get out your credit card because each exam costs \$100. (If you've used this book to prepare yourself thoroughly, chances are you'll only have to shell out that \$100 once!)

You can schedule the exam for a time that is convenient for you. The exams are downloaded from Prometric to the testing center, and you show up at your scheduled time and take the exam on a computer.

After you complete the exam, you will know right away whether you have passed. At the end of the exam, you will receive a score report. It will list the six areas that you were tested on and how you performed. If you pass the exam, you don't need to do anything else. Prometric uploads the test results to Microsoft. If you don't pass, it's another \$100 to schedule the exam again. But at least you will know from the score report where you did poorly, so you can study that particular information more carefully.

#### **Test-Taking Hints**

If you know what to expect, your chances of passing the exam will be much greater. The following are some tips that can help you achieve success:

**Get there early and be prepared** This is your last chance to review. Bring your Study Guide and review any areas you feel unsure of. If you need a quick drink of water or a visit to the restroom, take the time before the exam. After your exam starts, it will not be paused for these needs.

When you arrive for your exam, you will be asked to present two forms of ID. You will also be asked to sign a paper verifying that you understand the testing rules (for example, the rule that says that you will not cheat on the exam).

Before you start the exam. you will have an opportunity to take a practice exam. It is not related to Windows NT and is simply offered so that you will have a feel for the exam-taking process.

What you can and can't take in with you These are closed-book exams. The only thing that you can take in is scratch paper provided by the testing center. Use this paper as much as possible to diagram the questions. Many times diagramming questions will help make the answer clear. You will have to give this paper back to the test administrator at the end of the exam.

Many testing centers are very strict about what you can take into the testing room. Some centers will not even allow you to bring in items like a zipped-up purse. If you feel tempted to take in any outside material, be aware that many testing centers use monitoring devices such as video and audio equipment (so don't swear, even if you are alone in the room!).

Prometric Testing Centers take the test-taking process and the test validation very seriously.

**Test approach** As you take the test, if you know the answer to a question, fill it in and move on. If you're not sure of the answer, mark your best guess, then mark the question.

At the end of the exam, you can review the questions. Depending on the amount of time remaining, you can then view all the questions again, or you can view only the questions that you were unsure of. I always like to double-check all my answers, just in case I misread any of the questions on the first pass. (Sometimes half of the battle is in trying to figure out exactly what the question is asking you.) Also, sometimes I find that a related question provides a clue for a question that I was unsure of.

Be sure to answer all questions. Unanswered questions are scored as incorrect and will count against you. Also, make sure that you keep an eye on the remaining time so that you can pace yourself accordingly.

If you do not pass the exam, note everything that you can remember while the exam is still fresh on your mind. This will help you prepare for your next try. Although the next exam will not be exactly the same, the questions will be similar, and you don't want to make the same mistakes.

#### After You Become Certified

Once you become an MCSD, Microsoft kicks in some goodies, including:

• A one-year subscription to the Microsoft Beta Evaluation program, which is a great way to get your hands on new software. Be the first kid on the block to play with new and upcoming software.

- Access to a secured area of the Microsoft Web site that provides technical support and product information. This certification benefit is also available for MCP certification.
- Permission to use the Microsoft Certified Professional logos (each certification has its own logo), which look great on letterhead and business cards.
- An MCSD certificate (you will get a certificate for each level of certification you reach), suitable for framing or for sending copies to Mom.
- A one-year subscription to *Microsoft Certified Professional Magazine*, which provides information on professional and career development.

#### How to Use This Book

This book is designed to help you prepare for the MCSD exam. The book reviews each of the exam objectives and explains how to accomplish the objectives. The explanations include exercises that help you understand how to implement the programming concepts.

Each chapter of the book contains review questions to help you make sure you understand the material in the chapter and to prepare you for the exam itself.

For each chapter:

- Review the exam objectives as you work through the chapter. (You may want to check the www.microsoft.com/train\_cert Web site to make sure the objectives haven't changed.)
- **2**. Study the chapter carefully, making sure you fully understand the information.
- **3**. Complete all hands-on exercises in the chapter, referring to the text so that you understand every step you take.
- **4**. Answer the practice questions at the end of the chapter. (You will find the answers to these questions in Appendix A.)
- **5**. Note which questions you did not understand, and study those sections of the book again.

At this point, you are well on your way to becoming certified! Good Luck!

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