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Exam 70-220

# WINDOWS® 2000 Security Design

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# MCSE™ Windows® 2000 Security Design



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—David Frederick, Information Systems Manager, *Wycliffe Associates*

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# Microsoft Course Objectives

## Exam 70-220: Designing Security for a Microsoft Windows 2000 Network

| Windows 2000 Networking Basics | Chapter: |
|---|---|
| Describe how key technologies within Windows 2000 are used to secure a network and its resources. | 1 |
| Plan a Windows 2000 administrative structure so that permissions are granted only to appropriate users. | 1 |
| Plan an Active Directory structure that facilitates secure and verifiable user account creation and administration. | 1 |

| Assessing Security Risks | Chapter: |
|---|---|
| Determine what is at risk if security is compromised on a network common threats against network security. | 2 |
| Review common standards against which security is measured and discuss a methodology for securing enterprise networks. | 2 |

| Introducing the Windows 2000 Security Model | Chapter: |
|---|---|
| Analyze the role of Windows 2000 Active Directory in the Windows 2000 security framework. | 3 |
| Describe how objects and resources are secured in Windows 2000 and the authentication protocols used by Windows 2000. | 3 |
| Examine common methods of encrypting and validating data. | 3 |
| Describe how Windows 2000 supports the encryption of data and how a public key infrastructure is used. | 3 |
| Plan security for local resources and access on a local network. | 3 |

| Planning Administrative Access and User Accounts | Chapter: |
|---|---|
| Define the network administrative roles that exist in an organization. | 6 |
| Plan memberships in the Windows 2000 administrative groups and secure administrative access to the network. | 6 |
| Design a Windows 2000 domain and organizational unit structure that will support your account and group policy configuration. | 5 |
| Plan for the creation of accounts within the OU structure and plan a delegation of authority strategy for OUs. | 5 |
| Design an audit strategy that will track changes made to the Active Directory contents. | 5 |

| Securing Windows 2000-Based Computers and File and Print Resources | Chapter: |
|---|---|
| Evaluate the security requirements for Windows 2000-based systems with respect to their role in the enterprise network. | 4 |
| Plan physical and hardware configuration measures to secure Windows 2000-based systems and design security configuration templates. | 4 |
| Plan the use of security baseline templates to evaluate the current security configuration of a Windows 2000-based system. | 4 |
| Describe the security provided in the file systems supported by Windows 2000. | 7 |
| Design a security strategy for protecting the registry, files resources, and print resources by using Access Control Lists. | 7 |
| Design a strategy for the protection and recovery of file resources, auditing, and secure backup and restore. | 7 |
| Plan for virus protection in your network security design. | 7 |

| Securing Communication Channels on the Local Network and Secure Access to Non-Microsoft Clients | Chapter: |
|---|---|
| Assess potential risks to data when it is transported between clients on the Local Area Network. | 8 |
| Compare and contrast the network authentication methods that can be used by Windows 2000 clients and down-level clients. | 8 |
| Design a strategy for protecting data transmissions and an IPSec strategy for encrypting private network data transmissions. | 8 |
| Describe the inherent risks and the management strategy involved when deploying standard IP client/server sockets-based applications, and the additional security measures that must be taken when integrating NetWare, Macintosh, and Unix clients on your network. | 11 |

| Providing Secure Access to Remote Users and Offices | Chapter(s): |
|---|---|
| Compare and contrast the common methods that may be used by remote users to connect to the private network and the server configuration options available to allow secure remote connectivity to your network by individual users. | 9 |
| Compare and contrast the client configuration options available to allow secure connectivity to a remote private network. | 9 |
| Create a distributed authentication framework for remote clients, and introduce how networks interact and are connected. | 9, 10 |
| Plan secure WAN links to branch offices using dedicated network connections and tunneling technologies over public networks. | 10 |

| Maintaining Security When Allowing Public Access to Your Private Network and Accessing Networks from Your Network | Chapter: |
|---|---|
| Analyze the common threats that are introduced when your private network is connected to a public network. | 12 |
| Design a firewall strategy and a secure method for exposing private network resources to the public network. | 12 |
| Plan secure placement of servers when working with interconnected private and public networks. | 12 |
| Analyze the various threats that are introduced to the network when users are allowed to access the Internet. | 13 |
| Design a strategy for protecting the private network IP addressing scheme from the public network. | 13 |
| Design the server-side and client-side requirements for maintaining security when authenticated users access public networks. | 13 |
| Plan security when trusted individuals and organizations access private network data and resources over a public network. | 13 |

| Authenticating Trusted Partners | Chapter: |
|---|---|
| Design a secure framework for partner access using Windows 2000 user accounts and trust relationships. | 14 |
| Compare and contrast the methods available for authenticating clients by using Internet technologies. | 14 |

| Providing Secure Resource Access to Trusted Partners | Chapter: |
|---|---|
| Design secure resource access for trusted partners by using ACLs (access control lists). | 15 |
| Plan which resources will be exposed to trusted partners and where those resources will be placed on the network. | 15 |
| Design secure access to resources using Web technologies and a certificate-based authentication framework for a Windows 2000 network. | 15 |
| Choose a Certificate Authority and use Certificates. | 15 |

| Developing a Security Plan | Chapter: |
|---|---|
| Plan the composition of a security team that will develop your organization's security plan. | 16 |
| Determine the security needs for your network and analyze the current security configuration of your network. | 16 |
| Design a security plan rollout and the security baseline for your network based on your organization's security goals. | 16 |
| Design a strategy to maintain your network's current level of security as the security landscape changes. | 16 |

# Windows 2000 MCSE 考试简介

## 考试课程

随着 Windows 2000 的推出，微软公司也推出了有关 Windows 2000 的认证考试。根据参加考试人员的不同情况，其有关考试科目并不相同，有关考试科目如下。

Windows 2000 MCSE 考试科目

| | |
|---|---|
| **核心考试** | |
| 如果没有通过以下三种 **Windows NT** 考试 | |
| Exam 70-067 | Implementing and Supporting Microsoft Windows NT Server 4.0 |
| Exam 70-068 | Implementing and Supporting Microsoft Windows NT Server 4.0 in the Enterprise |
| Exam 70-073 | Microsoft Windows NT Workstation 4.0 |
| 则必须参加以下四种考试 | |
| Exam 70-210 | Installing, Configuring and Administering Microsoft Windows 2000 Professional |
| Exam 70-215 | Installing, Configuring and Administering Microsoft Windows 2000 Server |
| Exam 70-216 | Implementing and Administering Microsoft Windows 2000 Network Infrastructure |
| Exam 70-217 | Implementing and Administering Microsoft Windows 2000 Directory Services Infrastructure |
| 如果已经通过考试 **70-067**，**70-068** 和 **70-073**，则可以参加下面的加速考试 | |
| Exam 70-240 | Microsoft Windows 2000 Accelerated Exam for MCPs Certified on Microsoft Windows NT 4.0 |
| **可选核心考试** | |
| 从下面考试中选择一种 | |
| Exam 70-219* | Designing a Microsoft Windows 2000 Directory Services Infrastructure |
| Exam 70-220* | Designing Security for a Microsoft Windows 2000 Network |
| Exam 70-221* | Designing a Microsoft Windows 2000 Network Infrastructure |
| **选修考试** | |
| 从下面考试中选择两种 | |
| Exam 70-019 | Designing and Implementing Data Warehouse with Microsoft SQL Server 7.0 |
| Exam 70-219* | Designing a Microsoft Windows 2000 Directory Services Infrastructure |
| Exam 70-220* | Designing Security for a Microsoft Windows 2000 Network |
| Exam 70-221* | Designing a Microsoft Windows 2000 Network Infrastructure |
| Exam 70-222 | Migrating from Microsoft Windows NT 4.0 to Microsoft Windows 2000 |
| Exam 70-028 | Administering Microsoft SQL Server 7.0 |
| Exam 70-029 | Designing and Implementing Databases on Microsoft SQL Server 7.0 |
| Exam 70-080 | Implementing and Supporting Microsoft Internet Explorer 5.0 by Using the Internet Explorer Administrating Kit |
| Exam 70-081 | Implementing and Supporting Microsoft Exchange Server 5.5 |
| Exam 70-085 | Implementing and Supporting Microsoft SNA Server 4.0 |
| Exam 70-086 | Implementing and Supporting Microsoft Systems Management Server 2.0 |
| Exam 70-088 | Implementing and Supporting Microsoft Proxy Server 2.0 |

**注**：上表并不全面——应试者可以参加有关微软产品早期版本的考试。但是，我们在这里所给出的都是最新版本的考试，这样应试者通过这些考试后拿到的证书有效期能够长久一些。上表并没有列出那些即将撤消的考试。

* 不能同时选择两种。

## 如何准备考试

### 考试准备

为完成微软认证考试的复习，我们建议您首先从本书“Self-Assessment”（自我评价测试）开始。这会帮助读者正确评价自己在理想和实际情况下相对 MCSE 要求的知识水平。

我们强烈建议读者对将要参加考试的软件进行反复的练习，诸如安装、配置等方面的学习。因为对于在考试中可能遇到的问题，任何学习方法都不如亲自动手试验有效。书本学习固然重要，但是亲自动手试验是最好的老师。

针对任何有关 Windows 2000 MCSE 的考试，下面的材料将对读者有很大帮助：

http://www.microsoft.com/trainingandservices/上的考试复习资料、实习测试及自我评估考试。

http://www.examcram.com 上的复习考试建议、实习测试、每日问题及讨论组等。

微软培训工具包——微软出版社为这些认证考试专门提供的工具包。如果想要更多信息，请访问 http;//mspress.microsoft.com/findabook/list/series_ak.htm。在该工具包中读者可以找到自己所需要的考试复习资料。

微软技术资料 CD（Microsoft TechNet CD）——在每月出版的 CD 中包括全部 Windows 2000 网络架构及相关主题的资料。它提供了包括产品详情介绍、技术讲解、相应工具，以及有关如何访问为 Window 2000 网络架构举行的专业研讨会的在线培训资料等在内的大量信息。该 CD 每年预定费 299 美元。考试人员也可以访问 http://www.microsoft.com/technet 站点并查找 TechNet 预定菜单，以获得更多的信息。

学习指南——包括本出版社在内的数家出版社提供了有关 Windows 2000 MCSE 方面的图书。其中本社即将陆续出版的图书如下：

《考前冲刺》系列——为考试人员提供了如何通过考试的相关资料。

《考前辅导》系列——提供了比《考前冲刺》更为翔实的资料。

这两套丛书都是从考试的观点出发，目的是教会读者掌握 MCSE 认证考试的所有知识。同时拥有这两套丛书对通过考试来说非常有用。

此外，《考前辅导》还为读者准备了交互式多媒体考试模拟试题光盘，通过交互式多媒体光盘读者可以客观真实地体验 MCSE 考试。

### 参加认证考试

如果已经完成考试内容的复习，就可以到考试中心进行登记以参加考试。每一上机考试费用为 100 美元。如果考试没有通过，考试人员需要再付 100 美元重新考试。

## 考试的设计与安排

微软 Windows 2000 考试形式不同于以往的考试。对于设计考试 70-219、70-220 和 70-221，它们由一系列事例研究和六种不同类型的问题组成。对于核心的考试 70-210、70-215、70-216 和 70-217，同样会出现上述六种类型的问题，但是考试人员可能不会再遇到多问题的事例研究。

对于设计考试，每一事例研究提出一个详细的问题，考试人员必须认真阅读并加以分析。每一事例研究的相关问题为六种类型中的一种。认真对待事例中的细节是考试人员取得成功的关键。考试人员需要反复阅读事例研究及对应的试题才能知道如何回答问题。

完成一个事例研究后，可以检查试题及自己的答案。但是，一旦转移到下一个事例研究，就不能回到上一个事例研究，也不能再对答案进行任何改动。

六种试题类型为：（1）单选；（2）多选；（3）建立列表与记录器（排序）；（4）创建树；（5）拖动与连接；（6）选择与放置（拖放）。

试题类型的变动由考试中心进行，读者可以访问 http://www.examcram.com 查看试题类型。

### 考试形式

现在，微软使用四种考试形式：（1）事例研究（case study）；（2）定长测试（fixed length）；（3）适应性测试（adaptive）；（4）简易格式测试（short form）。

微软的设计考试使用事例研究。在这些考试中，考试人员必须认真分析考题中给出的事例，从而回答出与这个事例研究相关的问题。这种考试含有一个或多个事例研究（主题标签），每一个事例研究后面跟有 4 到 10 个问题。对于设计考试和四种核心 Windows 2000 考试，其试题类型分别为选择题、建立列表和重新排序、创建树、拖动与连接，以及选择与放置。不同的考试题目不太相同，有些考试完全是基于事例的，而其它则不是。

其它微软考试将使用具有更高测试性能的考试形式，但这些形式可能不会立即出现。虽然试题类型主要为选择题，但是逻辑性使其比过去的微软考试更加复杂。它使用了一组按固定顺序排列的问题，一般称之为定长测试。一些试题使用一个较为完善的用户界面，微软称之为仿真（simulation）。用于测试考试人员在类似真实操作环境下，对软件和系统知识的掌握。可到 http://www.microsoft.com/trainingandservices/default.asp?PageID=mcp 下载仿真练习。

适应性测试用于确定考试人员的知识水平和能力。适应性考试看起来与定长测试相似，但是它们用于发现考生是否能够正确回答试题的难度水平。具有不同知识或能力水平的考试人员会见到不同的试题。知识或能力水平较高的考试人员将会得到一组题量较小而难度较大的试题；相反，知识或能力水平较低的考试人员将会得到一组题量较大而难度较小的试题。两部分考试人员答题的正确率可能相同，但是那些知识或能力水平较高的考试人员将得到较高的分数，因为他回答的问题所值的分数多一些。

同样，那些知识或能力水平较低的考试人员可能回答出比那些知识或能力水平较高的考试人员更多的问题。这就说明了为什么适应性测试采用不同的试题数目和答题时间。

适应性考试是通过评估考试人员最近一次的答题来进行的。一个正确的回答将会给考试人员引出一道较难的问题（同时，测试软件对考试人员的知识和能力水平的评估也有所提高）。这种考试持续进行，直到考查出考试人员的真实能力水平为止。当考试人员答题的正确度达到一个统计意义上的合意值（换句话说，证明自己已经达到考试所要求的知识与能力的水平）时，考试结束。或者，考试人员已经完成所有给出的答题而仍未测试出自己的水平（这种情况下，考试几乎是失败了），考试结束。

微软也为大部分流行考试引入了简易格式测试。这种考试为考试人员提供 25 到 30 道试题及 60 分钟的答题时间。

微软考试可以以任一种考试方式出现。在考试中，无论遇到何种考试方式，都必须按照该方式的要求进行答题，而不能跳过去选择其它考试方式。

**注意**：适应性测试与定长测试或简易格式测试之间最大的不同是，在定长测试或简易格式测试中，考试人员可以在反复阅读试题后再重新回到这些试题上。而在适应性考试中，考试人员在试题出现以后，就必须进行回答，并且以后不会再有机会重新看到这些试题。

## 针对不同考试形式的应试策略

选择策略之前，必须知道自己所遇到的考试形式：事例研究测试、定长测试、简易格式测试或适应性测试。

如果参加的考试不是事例研究测试的形式，则考试软件可能会通知考试人员该考试为适应性考试。如果考试的介绍没有提到适应性测试，则可能是一个定长测试（50 到 70 个问题）。如果考试题目的数量在 25 到 30 之间，则是一个简易格式测试。有些考试会通知这次考试由一套适应性测试题开始，接着是一些定长测试题。通过第一道试题应该能够知道所遇到的考试形式。

### 针对事例研究测试的应试策略

大部分考试人员发现用于设计考试（70-219，70-220，70-221）的事例研究考试类型是最难以掌握的。进行这种类型的考试时，最好的办法就是把每个事例研究都当作一个独立的考试。这类考试中最大的挑战就是考试人员会感到没有足够的时间去完成所有给出的事例。

每一个事例都提供大量的资料。在有效回答问题之前，需要阅读并研究这些资料。参加这类考试的窍门是首先浏览所给的事例以抓住重要部分。考试时必须保证已阅读了整个事例，这样才能理解问题的上下文。然后快速移到问题上面，并进行浏览。

一旦离开事例而移动到下一个事例，则不再允许返回到该事例。

### 针对定长测试和简易格式测试的应试策略

考试人员在参加定长测试或简易格式测试时，一个众所周知的原则就是首先从头到尾将所有问题浏览一遍，且只回答那些自己有绝对把握能正确回答的问题。随后，自己可以知道有多少问题留下未答，现在可以对这些复杂问题做更深的研究分析。

幸运的是，对于定长测试和简易格式测试，微软考试软件很容易实现多次浏览试题。在每一道试题的左上角有一个复选框，用于考试人员做出标记，以便以后重新浏览这道试题。

### 针对适应性测试的应试策略

适应性测试的应试原则可概括为“在第一次就答对问题”。考试人员在参加适应性测试中，不能选择跳过当前出现的试题而移动到下一道试题，因为考试软件要依据考试人员对当前试题的回答来选择下一道试题。由于这套考试软件只给考试人员一次答题机会，因此，一旦考试人员转移到下一试题，则无法再回到前面的试题。但是，考试人员可以做笔记，因为有时前面试题中的一些信息可能对后面试题的回答有所启发。

如果在适应性考试中考试人员遇到不能解答的试题，则必须立刻猜测一个答案。由于考试软件工作原理的缘故，如果猜测正确，考试人员将会受到猜测正确的对待。因此，接下来自己将会得到一道稍难一些的试题。

**注意**：如果考试人员参加的是定长测试或简易格式测试，则应等到最后检查有标记的试题时（正如自己将要用完答题时间，或根本就无法给出答案时），才可以开始对那些剩下的问题进行猜测。同样，在每一次事例研究测试中，考试人员可以采用相同的方法（但是，在这类考试中，一旦考试人员离开这道试题，就不再允许返回）。如果考试人员参加的是一次适应性测试，则应该在使用其它方法无法得到正确答案时，再进行猜测以移到下一道试题。不管怎么讲，猜题是考试人员所能采取的最后答题技巧。

许多试题都假定一个有特殊效用的默认行为在起作用，如果考试人员能够知道这个默认行为，就可以解开考试中的难题。

## 考试的核心策略

考试的核心是对于知识的掌握。我们应该明白，是知识培养了自信心，是自信心铸造了成功。如果读者能够认真学习本书中的内容，并复习每一章后面的习题，将会知道自己应在哪些方面补充知识和学习。

阅读本书时，应当进行本书及配套光盘上的测试。可以单击光盘上测试引擎中的更新按钮以从 http://www.examcram.com 上下载有关试题的更新。

进行模拟考试能够检查出自己的真实水平，并帮助自己知道哪些方面的知识需要进一步学习。

本文摘译自本书英文前言部分，读者应详细阅读本书的文前部分，以得到更详细的考试信息。翻译不妥之处，敬请见谅。

*This book is dedicated to my wife, Sheronna.*
*Without her continuous support and encouragement, neither the idea for this book nor its accomplishment would even have been attempted let alone completed.*
*Thank you for everything—always.*
*—Rich Alan McMahon, Sr.*

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*The actual writing of this book is just one part of many required to finish this project. Thank you to my wife Darcy, for taking care of all the things I was required to neglect in order to complete this book. I see no way I could have done it without her.*
*The authors would also like to thank each other; it was definitely the epitome of a team effort.*
*—Glen R. Bicking*

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# About the Authors

This pair of career networking professionals has more than 35 years of combined computer experience.

The lead author, **Richard Alan McMahon, Sr.** (MCSE, MCT, MCP, MCP+I, CTT, CNE, CNI, CNA), was introduced to computing in the early 70s during the enlisted portion of his military career as he worked on his college degree along the way to becoming a commissioned aviator as an officer in the United States Air Force. Rich graduated from University of Arizona with a double-major bachelor's degree in Operations Management (OM) and Management Information Systems (MIS) the very first semester it was offered. His first Master's degree (University of Arkansas), also earned while in the military, is in Operations Management and his dual-emphasis MBA (Hardin-Simmons University) is in Systems Analysis and Marketing. When, as a Major, he retired from the service, Rich's interest in computing and teaching computers intensified. He became a Texas-certified, secondar- education, business teacher with an emphasis in computer education. After several advancing district-level IT positions in various school districts, his involvement in networking began with the local school district in Conroe, Texas. At about the same time, he started the certification path and ended up writing a NetWare 5 text for SouthWestern Educational Publishing. Later he started his MCSE training, became involved in Microsoft's worldwide pilot "Train-The-Trainer" program, and became a national spokesperson as one of the first nine AATP mentors while teaching both high school and college networking courses. Rich was invited to participate in Microsoft's Windows 2000 beta testing program and, as an OEM provider, has played an active part in the rollout of each new Microsoft product. Currently a professor at the University of Houston, Downtown, Rich is teaching MIS, Systems Analysis, and Operating Systems classes in addition to a networking class that is planned to expand into an MBA program in the near future. Rich can be reached at: mcmahonr@zeus.dt.uh.edu.

The second author, **Glen R. Bicking** (MCSE, MCT, MCP, MCSE+I, CNA, A+, Network+), was born and raised in Wisconsin and now calls Oshkosh his home. With the area's impressive "fly in" so important to the local community, it is only natural that after graduating high school Glen joined the Air Force to work on the planes as an aircraft mechanic. After the Air Force, he moved to California and became a professional diver along the state's coast and then at the oil platforms in

the Gulf of Mexico. With the advent of the 80s' oil crisis, Glen took his technical skills back to Wisconsin where he began repairing copiers and fax machines, then computers, and finally computer networks. Once discovering the certification track he worked as a System Engineer at a local computer integration company and now uses his MCT teaching the track at a local training center. His credits include A+ and Network+ certifications as well as NetWare's CNA in addition to those he holds for Microsoft. Glen has been very active in Microsoft's Windows 2000 beta program, updating his certifications to include all applicable Windows 2000 versions, and is already teaching the new materials at his company's training center.

# Acknowledgments

First and foremost both authors would like to express extreme thanks to our immediate families. Without the seemingly limitless support from Darcy, Sheronna, Ricky, and Lauren – the authors' families – this book would never have been completed. They endured long, painstaking stretches of working on, editing, discussing, researching, and compiling the apparent truckloads of information that went into this book's preparation. They put up with long evenings and the project's insatiable drain on what should have been quality family time. They sacrificed potential vacation time and even allowed putting off life-changing events such as purchasing a new home until after the project was completed. It goes without saying that they were what kept both authors going.

Additionally, however, the authors would like to depart from the usual format for acknowledgments and give credit to those who started them along this path so many years ago. They want to thank the very group of people who were instrumental in helping them either make the turn toward the computer field in the first place or to choose networking as a career. It is, after all, these people who put the idea in their heads or provided the means by which they both became knowledgeable enough to create this book.

Rich McMahon recalls that Drs. Chase and Aquilano, his University of Arizona advisors, had the foresight to suggest that he become an MIS student in that school's newest degree plan at the time. They required him to use all computer logic, programming, and theory classes as his electives because they saw the computer changing the previously manual-calculation ridden Production and Operations field Rich was pursuing. They planted the seed in Rich's career development. Nurturing that seed and providing the networking growth pattern came later when Rich moved to Conroe, Texas and began teaching at a local high school. It was Lindy Bingham who pushed the idea of channeling Rich's computer expertise from the general to the networking-specific. Her idea of bringing networking to the high school's curriculum offerings was just the way to get Rich involved. Once she sparked the interest it was Mathew and Madeleine Feinberg owners of AVATAR Computer Solutions in Houston, Texas who provided the financial backing that actually facilitated the required training.

Glen Bicking's interest started when he bought his first computer in the early 80's - a Commodore VIC20 with 3K of memory. At the time, it seemed like everything anyone would need. Since that time, Glen's interest in computers would just not die. Unlike many other hobbies that come and go, computers just seemed to hang on and not let go. While working as an office equipment repairperson, Glen knew his true interest was still in computers. As computer networks became increasingly common, Glen decided to make a career change and start learning computer networking and pursuing his MCSE certification. Many people helped along the way but Glen could always count on the support of his wife Darcy and his mother Lucille. Unfortunately, Glen's mother died of cancer in 1996, but her inspiration remained.

Without any one of these individuals (especially the authors' families) neither career would have happened and this book would not have been possible. It is, therefore, in sincere grateful appreciation that the authors both offer their resounding thanks.

# Exam Insights

Welcome to *MCSE Windows 2000 Security Design Exam Prep*! This comprehensive study guide aims to help you get ready to take—and pass—Microsoft certification Exam 70-220, titled "Designing Security for a Microsoft Windows 2000 Network." This Exam Insights section discusses exam preparation resources, the testing situation, Microsoft's certification programs in general, and how this book can help you prepare for Microsoft's Windows 2000 certification exams.

*Exam Prep* study guides help you understand and appreciate the subjects and materials you need to pass Microsoft certification exams. We've worked from Microsoft's curriculum objectives to ensure that all key topics are clearly explained. Our aim is to bring together as much information as possible about Microsoft certification exams.

Nevertheless, to completely prepare yourself for any Microsoft test, we recommend that you begin by taking the Self-Assessment included in this book immediately following this Exam Insights section. This tool will help you evaluate your knowledge base against the requirements for an MCSE under both ideal and real circumstances.

Based on what you learn from that exercise, you might decide to begin your studies with some classroom training or some background reading. You might decide to read The Coriolis Group's *Exam Prep* book that you have in hand first, or you might decide to start with another study approach. You may also want to refer to one of a number of study guides available from Microsoft or third-party vendors. We also recommend that you supplement your study program with visits to **ExamCram.com** to receive additional practice questions, get advice, and track the Windows 2000 MCSE program.

We also strongly recommend that you install, configure, and fool around with the software that you'll be tested on, because nothing beats hands-on experience and familiarity when it comes to understanding the questions you're likely to encounter on a certification test. Book learning is essential, but hands-on experience is the best teacher of all!

# How to Prepare for an Exam

Preparing for any Windows 2000 Server-related test (including "Designing Security for a Microsoft Windows 2000 Network") requires that you obtain and study materials designed to provide comprehensive information about the product and its capabilities that will appear on the specific exam for which you are preparing. The following list of materials will help you study and prepare:

- The Windows 2000 Server product CD includes comprehensive online documentation and related materials; it should be a primary resource when you are preparing for the test.
- The exam preparation materials, practice tests, and self-assessment exams on the Microsoft Training & Services page at **www.microsoft.com/trainingandservices/default.asp?PageID=mcp**. The Testing Innovations link offers samples of the new question types found on the Windows 2000 MCSE exams. Find the materials, download them, and use them!
- The exam preparation advice, practice tests, questions of the day, and discussion groups on the **ExamCram.com** e-learning and certification destination Web site (**www.examcram.com**).

In addition, you'll probably find any or all of the following materials useful in your quest for Network Security Design expertise:

- *Microsoft training kits*—Microsoft Press offers a training kit that specifically targets Exam 70-220. For more information, visit: **http://mspress.microsoft.com/prod/books/3873.htm**. This training kit contains information that you will find useful in preparing for the test.
- *Microsoft TechNet CD*—This monthly CD-based publication delivers numerous electronic titles that include coverage of Network Security Design and related topics on the Technical Information (TechNet) CD. Its offerings include product facts, technical notes, tools and utilities, and information on how to access the Seminars Online training materials for Network Security Design. A subscription to TechNet costs $299 per year, but it is well worth the price. Visit **www.microsoft.com/technet/** and check out the information under the "TechNet Subscription" menu entry for more details.
- *Study guides*—Several publishers—including The Coriolis Group—offer Windows 2000 titles. The Coriolis Group series includes the following:
  - *The Exam Cram series*—These books give you information about the material you need to know to pass the tests.
  - *The Exam Prep series*—These books provide a greater level of detail than the *Exam Cram* books and are designed to teach you everything you need

to know from an exam perspective. Each book comes with a CD that contains interactive practice exams in a variety of testing formats.

Together, the two series make a perfect pair.

- *Multimedia*—These Coriolis Group materials are designed to support learners of all types—whether you learn best by reading or doing:
  - *The Exam Cram Personal Trainer*—Offers a unique, personalized, self-paced training course based on the exam.
  - *The Exam Cram Personal Test Center*—Features multiple test options that simulate the actual exam, including Fixed-Length, Random, Review, and Test All. Explanations of correct and incorrect answers reinforce concepts learned.
- *Classroom training*—CTECs, online partners, and third-party training companies (like Wave Technologies, Learning Tree, Data-Tech, and others) will all be offering classroom training on Network Security. These companies aim to help you prepare to pass the Security Design test. Although such training runs upwards of $350 per day in class, most of the individuals lucky enough to take similar training courses (including your humble authors, who've even taught such courses) find them to be quite worthwhile.
- *Other publications*—There's no shortage of materials available about Network Security Design. The complete resource section in the back of the book should give you an idea of where we think you should look for further discussion.

By far, this set of required and recommended materials represents a nonpareil collection of sources and resources for Network Security Design and related topics. We anticipate that you'll find that this book belongs in this company.

## Taking a Certification Exam

Once you've prepared for your exam, you need to register with a testing center. Each computer-based MCP exam costs $100, and if you don't pass, you may retest for an additional $100 for each additional try. In the United States and Canada, tests are administered by Prometric (formerly Sylvan Prometric), and by Virtual University Enterprises (VUE). Here's how you can contact them:

- *Prometric*—You can sign up for a test through the company's Web site at **www.prometric.com**. Or, you can register by phone at 800-755-3926 (within the United States or Canada) or at 410-843-8000 (outside the United States and Canada).
- *Virtual University Enterprises*—You can sign up for a test or get the phone numbers for local testing centers through the Web page at **www.vue.com/ms/**.