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MCSE Training Kit

Exam
70-227

Microsoft®
ISA Server 2000 （影印版）

**Microsoft Internet Security
and Acceleration Server
2000**

Microsoft 公司 著

- ▶ MCP 70-227 考试（Installing,
  Configuring, and Administratering
  Microsoft Internet Security and
  Accelerarion Server 2000 Enter-
  prise Edition）微软指定教材

- ▶ 技能训练练习，可自主安排
  学习进度

- ▶ 涵盖认证考试所要求的概念、
  过程和任务，获取现实的系
  统支持技能

Microsoft ISA Server 2000
（影印版）

[美] Microsoft 公司   著

北京大学出版社

内 容 简 介

ISA Server 是一个企业级的防火墙和 Web 高速缓存服务器，利用 ISA Server 可以优化企业的网络性能并实现网络安全。本书讲述了 Microsoft ISA Server 2000 的安装、配置和管理，主要内容包括安装或升级到（从 Microsoft Proxy Server 2.0）ISA Server、建立 VPNs 和拨号连接及 H.323Gatekeeper、建立和管理访问控制及带宽政策、故障排除等。同时，本书也是微软指定的 MCSE 教材，书中含有系统课程和大量练习题，可以帮您获得利用 ISA Server 2000 优化网络性能并实现网络安全的实际经验。

本书由微软专家编写，集权威性与实用性为一体，是系统管理员和 MCP 考生的必备参考书。

出 版 前 言

如果用一个成语来概括国内计算机图书市场的现状，当谓之"汗牛充栋"。然而，如果您是一位从事计算机应用系统开发或管理的中、高级专业人士，很可能发现这貌似种类齐全的计算机图书中，为您量身定做的并不多见。

依据多年从事计算机图书工作所积累的经验，以及与 IT 领域广泛而深入的接触所获取的信息，我们认识到，具有相当的专业深度和技术前沿性的图书，是计算机专业人员的迫切需要，当然，也是我们从事计算机图书工作、服务专业领域的一大着眼点。

基于这一点，2000 年元月，我们与微软出版社(Microsoft Press)达成合作协议，成立微软图书影印中心，独家代理微软出版社图书影印版在中国大陆的出版、发行，为 IT 业界提供及时的专业技术服务。选题和策划上的匠心独运，使得我们的影印书成为计算机图书中的标新立异者。这里，有四大特色值得读者朋友予以关注。

首先，这是微软出版社第一次授权在中国大陆影印、发行它的版权书。在选题上，可以说独辟蹊径。在内容上，立足技术广度和深度，系统推介微软产品。所有这些，都是目前国内一般计算机图书所无法比拟的。

其次，我们的理念是为国内计算机专业人员学习前沿性的微软技术提供服务。为此，我们不但与微软公司紧密协作与沟通，及时掌握微软最新技术动向，而且组织了精干的工作人员，倾力于微软影印书的出版和发行。

再者，微软影印书主要面向中、高级专业人员，印量有限。这类书的读者对象有较强的针对性，一般来说，包括 IT 决策人员，中、高级开发人员，以及中、高级系统管理人员。因而，我们将每套书的印数控制在 1000~2000 册之间。

最后，微软图书影印版几乎与原版书保持同步发行，最大限度地满足了国内读者跟踪微软最新技术的需求。软件升级越来越快，新软件令人目不暇接。作为技术载体之一的图书，只有迅速作出反应，把新软件介绍给读者，才能赢得他们的青睐。总之，兵贵神速，这是我们的目标。

正应验了前人的预言，21 世纪是一个信息时代。软件作为信息系统的神经，在我们生活的这个时代里发挥着举足轻重的作用，而微软公司和它推出的各种软件，更是令世人为之瞩目。我们将立足图书，继续并扩大与微软公司的合作，在中国信息产业的发展道路上留下自己的足迹。

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出版者

2000 年 10 月

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About This Book

Welcome to *MCSE Training Kit: Microsoft Internet Security and Acceleration Server 2000*. This training kit teaches you how to install and configure Microsoft Internet Security and Acceleration Server 2000 (ISA Server), an enterprise-class firewall and Web caching server. The book begins with an overview of the features and benefits of ISA Server and then describes how to plan and perform an ISA Server installation. It then teaches you how to configure the various features of ISA Server, including the firewall, caching, publishing, multilevel policies, and H.323 Gatekeeper features. The book then reviews various methods of monitoring and troubleshooting ISA Server performance.

Note For more information on becoming a Microsoft Certified Systems Engineer, see the section titled "The Microsoft Certified Professional Program" later in this chapter.

Each chapter in this book is divided into lessons. Most lessons include hands-on procedures that allow you to practice or demonstrate a particular concept or skill. Each chapter ends with a short summary of all chapter lessons and a set of review questions to test your knowledge of the chapter material.

The "Getting Started" section of this chapter provides important setup instructions that describe the hardware and software requirements to complete the procedures in this course. It also provides information about the networking configuration necessary to complete some of the hands-on procedures. Read through this section thoroughly before you start the lessons.

Intended Audience

This book was developed for information technology (IT) professionals who need to design, plan, implement and support Internet Security and Acceleration Server 2000 or who plan to take the related Microsoft Certified Professional exam 70-227: Installing, Configuring, and Administering Microsoft Internet Security and Acceleration (ISA) Server, Enterprise Edition.

Prerequisites

This course requires that students meet the following prerequisites:

- At least one year of hands-on experience administering networks, including at least 6 months experience with the Windows 2000 operating system.
- Strong familiarity with implementing TCP/IP features such as DNS, gateways, subnetting, and routing tables.
- Strong familiarity with implementing Windows 2000 features such as Active Directory directory service, Routing and Remote Access, Performance Monitor, Quality of Service (QoS), Microsoft Management Console (MMC).

Reference Materials

You might find the following reference materials useful:

- **The ISA Server official Web site.** Available online at http://www.microsoft.com/isaserver
- **Microsoft TechNet.** Available monthly on CD-ROM and online at http://www.microsoft.com/technet
- **MCP Magazine Online.** Available online at http://www.mcpmag.com
- **Windows 2000 TCP/IP Protocols and Services Technical Reference.** By Thomas Lee and Joseph Davies. Microsoft Press, 2000.

About the CD-ROM

The Supplemental Course Materials compact disc contains a variety of informational aids that may be used throughout this book. Included on this CD-ROM is the evaluation version of Microsoft Internet Security and Acceleration Server 2000, Enterprise Edition software. For more information regarding this software, see the section titled "Getting Started" late in this introduction.

The CD-ROM also contains a fully searchable electronic version of the book. For information about the electronic book, see the section "About the Electronic Book" later in this introduction.

The Supplemental Course Materials CD-ROM also contains files required to perform the hands-on procedures. These files can be used directly from the CD-ROM or copied onto your hard disk. The files include a demonstration of Microsoft ISA Server 2000, and practice files that accompany the book exercises.

Features of This Book

Each chapter opens with a "Before You Begin" section, which prepares you for completing the chapter.

▶   The chapters are then broken in to lessons. Whenever possible, lessons contain practices that give you an opportunity to use the skills being presented or explore the part of the application being described. All practices offer step-by-step procedures that are identified with a bullet symbol like the one to the left of this paragraph.

The "Review" section at the end of the chapter allows you to test what you have learned in the chapter's lessons.

Appendix A, "Questions and Answers" contains all of the book's questions and corresponding answers.

Notes

Several types of Notes appear throughout the lessons.

- Notes marked **Tip** contain explanations of possible results or alternative methods.

- Notes marked **Important** contain information that is essential to completing a task.

- Notes marked **Note** contain supplemental information.

- Notes marked **Caution** or **Warning** contain warnings about possible loss of data.
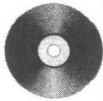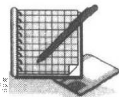
Conventions

The following conventions are used throughout this book.

Notational Conventions

- Characters or commands that you type appear in **bold** type.

- *Italic* in syntax statements indicates placeholders for variable information. *Italic* is also used for book titles.

- Names of files and folders appear in Title caps, except when you are to type them directly. Unless otherwise indicated, you can use all lowercase letters when you type a file name in a dialog box or at a command prompt.

- File name extensions appear in all lowercase.

- Acronyms appear in all uppercase.

- Monospace type represents code samples, examples of screen text, or entries that you might type at a command prompt or in initialization files.

- Square brackets [ ] are used in syntax statements to enclose optional items. For example, [*filename*] in command syntax indicates that you can choose to type a file name with the command. Type only the information within the brackets, not the brackets themselves.

- Braces { } are used in syntax statements to enclose required items. Type only the information within the braces, not the braces themselves.

- Icons represent specific sections in the book as follows:

Icon	Represents
	A file contained on the CD-ROM. Some files are needed to complete a hands-on practice; others contain supplemental information about the topic being discussed. The purpose of the file and its location are described in the accompanying text.
	A hands-on practice. You should perform the practice to give yourself an opportunity to use the skills being presented in the lesson.
	Chapter review questions. These questions at the end of each chapter allow you to test what you have learned in the lessons. You will find the answers to the review questions in the Questions and Answers section at the end of the book.

Keyboard Conventions

- A plus sign (+) between two key names means that you must press those keys at the same time. For example, "Press ALT+TAB" means that you hold down ALT while you press TAB.

- A comma (,) between two or more key names means that you must press each of the keys consecutively, not together. For example, "Press ALT, F, X" means that you press and release each key in sequence. "Press ALT+W, L" means that you first press ALT and W together, and then release them and press L.

- You can choose menu commands with the keyboard. Press the ALT key to activate the menu bar, and then sequentially press the keys that correspond to the highlighted or underlined letter of the menu name and the command name. For some commands, you can also press a key combination listed in the menu.

- You can select or clear check boxes or option buttons in dialog boxes with the keyboard. Press the ALT key, and then press the key that corresponds to the underlined letter of the option name. Or you can press TAB until the option is highlighted, and then press the spacebar to select or clear the check box or option button.

- You can cancel the display of a dialog box by pressing the ESC key.

Chapter and Appendix Overview

This self-paced training course combines notes, hands-on procedures, multi-media presentations, and review questions to teach you how to install, configure, and implement Microsoft Internet Security and Acceleration Server 2000. It is designed to be completed from beginning to end, but you can choose a customized track and complete only the sections that interest you. (See the next section, "Finding the Best Starting Point for You" for more information.) If you choose the customized track option, see the "Before You Begin" section in each chapter. Any hands-on procedures that require preliminary work from preceding chapters refer to the appropriate chapters.

The book is divided into the following chapters:

The "About This Book" section contains a self-paced training overview and introduces the components of this training. Read this section thoroughly to get the greatest educational value from this self-paced training and to plan which lessons you will complete.

Chapter 1, "Introduction to Microsoft Internet Security and Acceleration Server 2000," provides an overview of the features and benefits of ISA Server.

Chapter 2, "Installing Microsoft Internet Security and Acceleration Server 2000," teaches you how to perform an ISA Server installation, including the process of planning for an installation and migrating from Proxy Server 2.0.

Chapter 3, "Configuring Secure Internet Access," teaches you how to establish secure Internet access for ISA Server clients. This includes installing and configuring clients as Firewall clients and SecureNAT clients, configuring automatic discovery, configuring Internet access through a dial-up connection, and troubleshooting Internet connectivity.

Chapter 4, "Configuring Internet Security through Access Policies," explains how to create a customized and secure Internet access policy. This chapter teaches you how to create policy elements such as schedules and destination sets that you may later use in site and content rules or in protocol rules. It also shows you how to create these rules so that you can control network traffic to and from your network. The chapter then includes a lesson describing ISA Server's packet filtering feature and how to configure packet filters suited to your network needs. Finally, the chapter explains how to configure intrusion detection in ISA Server so that you will know when someone has launched an attack against your network.

Chapter 5, "Configuring Internet Acceleration through the ISA Server Cache," teaches you how to use ISA Server as a means to accelerate Internet connectivity for server clients. This includes configuring cache properties, active caching, and scheduled content downloads.

Chapter 6, "Secure Server Publishing," teaches you how to publish servers on the Internet securely behind ISA Server. This includes publishing Web servers, mail servers, and other Internet servers (such as FTP servers).

Chapter 7, "Securing Enterprise Networks with ISA Server," teaches you how to deploy ISA Server in more complex enterprise networks, including those that require the use of virtual private networks and of a centralized, multi-tiered policy.

Chapter 8, "Secure Videoconferencing with H.323 Gatekeeper," teaches you how to deploy videoconferencing in an ISA Server network. This chapter describes how to use ISA Server's H.323 Gatekeeper as a central switch for videoconferencing calls, and how to use rules to route calls to aliases.

Chapter 9, "Monitoring and Optimizing ISA Server Performance," teaches you how to use various tools in ISA Server to monitor and optimize ISA Server behavior. This includes configuring alerts, using ISA Server logs and reports, configuring bandwidth rules, and using ISA Server Performance Monitor counters.

Chapter 10, "Troubleshooting ISA Server," introduces you to the many tools and strategies that you can use to troubleshoot problems in ISA Server behavior.

Appendix A, "Questions and Answers," lists all of the review questions from the book showing the page number where the question appears and the suggested answer.

Appendix B, "Deploying and Administering ISA Server in a Complex Network," walks you through several hypothetical installations of Microsoft Internet Security and Acceleration Server 2000 (ISA Server) Enterprise Edition to test your understanding of and ability to troubleshoot the product. Because the exam is based on both knowledge of the software and real-world experience, we strongly recommend that you study this appendix before taking MCP exam 70-227.

Appendix C, "Event Messages," is a reference used to aid troubleshooting in ISA Server. It presents the full list of Event Messages in ISA Server, along with a description of the probable cause and action necessary to remedy problems, if necessary.

A Glossary of terms related to firewalls and ISA Server is also included as a means to help you become familiar with these topics.

Finding the Best Starting Point for You

Because this book is self-paced, you can skip some lessons and revisit them later. Note, however, that in many cases you must complete exercises in early chapters before completing exercises in the other chapters. Use the following table to find the best starting point for you:

If you	Follow this learning path
Are preparing to take the Microsoft Certified Professional exam 70-227: Installing, Configuring, and Administering Microsoft Internet Security and Acceleration (ISA) Server, Enterprise Edition.	Read the "Getting Started" section. Then work through Chapters 1–3. Work through the remaining chapters in any order.
To review information about specific topics from the exam,	Use the "Where to Find Specific Skills in This Book" section that follows this table.

Where to Find Specific Skills in This Book

The following tables provide a list of the skills measured on certification exam 70-227, Installing, Configuring, and Administering Microsoft Internet Security and Acceleration (ISA) Server, Enterprise Edition. The table provides the skill, and where in this book you will find the lesson relating to that skill.

Note Exam skills are subject to change without prior notice and at the sole discretion of Microsoft.

Installing ISA Server

Skill Being Measured	Location in Book
Preconfigure network interfaces.	Chapter 2, Lesson 2
Verify Internet connectivity before installing ISA Server.	Chapter 2, Lesson 2
Verify DNS name resolution.	Chapter 2, Lesson 2
Install ISA Server. Installation modes include integrated, firewall, and cache.	Chapter 2, Lesson 1; Chapter 2, Lesson 2
Construct and modify the local address table (LAT).	Chapter 2, Lesson 2
Calculate the size of the cache and configure it.	Chapter 2, Lesson 1; Chapter 2, Lesson 2; Chapter 5, Lesson 2

Skill Being Measured	Location in Book
Install an ISA Server computer as a member of an array.	Chapter 2, Lesson 2; Chapter 7, Lesson 2
Upgrade a Microsoft Proxy Server 2.0 computer to ISA Server.	Chapter 2, Lesson 3
Back up the Proxy Server 2.0 configuration.	Chapter 2, Lesson 3
Troubleshoot problems that occur during setup.	Chapter 2, Lesson 2

Configuring and Troubleshooting ISA Server Services

Skill Being Measured	Location in Book
Configure and troubleshoot outbound Internet access.	Chapter 3, Lesson 4
Configure ISA Server hosting roles.	Chapter 6, Lesson 1; Chapter 6, Lesson 2; Chapter 6, Lesson 3
Configure ISA Server for Web publishing.	Chapter 6, Lesson 2
Configure ISA Server for server proxy.	Chapter 3, Lesson 1; Chapter 5, Lesson 1; Chapter 5, Lesson 2
Configure ISA Server for server publishing.	Chapter 6, Lesson 1; Chapter 6, Lesson 3
Configure H.323 Gatekeeper for audio and video conferencing.	Chapter 8, Lesson 1; Chapter 8, Lesson 2
Configure gatekeeper rules. Rules include telephone, e-mail, and Internet Protocol (IP).	Chapter 8, Lesson 2
Configure gatekeeper destinations by using the Add Destination Wizard.	Chapter 8, Lesson 2
Set up and troubleshoot dial-up connections and Routing and Remote Access dial-on-demand connections.	Chapter 3, Lesson 4; Chapter 10, Lesson 2
Set up and verify routing rules for static IP routes in Routing and Remote Access.	Chapter 5, Lesson 1; Chapter 10, Lesson 1
Configure and troubleshoot virtual private network (VPN) access.	Chapter 7, Lesson 3; Chapter 10, Lesson 2
Configure the ISA Server computer as a VPN endpoint without using the VPN Wizard.	Chapter 7, Lesson 3; Chapter 10, Lesson 2

(continues)

Configuring and Troubleshooting ISA Server Services *(continued)*

Skill Being Measured	Location in Book
Configure the ISA Server computer for VPN pass-through.	Chapter 7, Lesson 3; Chapter 10, Lesson 2
Configure multiple ISA Server computers for scalability. Configurations include Network Load Balancing (NLB) and Cache Array Routing Protocol (CARP).	Chapter 7, Lesson 2

Configuring, Managing, and Troubleshooting Policies and Rules

Skill Being Measured	Location in Book
Configure and secure the firewall in accordance with corporate standards.	Chapter 4, Lesson 1
Configure the packet filter rules for different levels of security, including system hardening.	Chapter 4, Lesson 1; Chapter 4, Lesson 5
Create and configure access control and bandwidth policies.	Chapter 9, Lesson 4
Create and configure site and content rules to restrict Internet access.	Chapter 4, Lesson 4
Create and configure protocol rules to manage Internet access.	Chapter 4, Lesson 3
Create and configure routing rules to restrict Internet access.	Chapter 5, Lesson 1
Create and configure bandwidth rules to control bandwidth usage.	Chapter 9, Lesson 4
Troubleshoot access problems. Chapter 10, Lesson 2	Chapter 10, Lesson 1;
Troubleshoot user-based access problems.	Chapter 10, Lesson 2
Troubleshoot packet-based access problems.	Chapter 10, Lesson 2
Create new policy elements. Elements include schedules, bandwidth priorities, destination sets, client address sets, protocol definitions, and content groups.	Chapter 4, Lesson 2
Manage ISA Server arrays in an enterprise.	Chapter 7, Lesson 1; Chapter 7, Lesson 2 .
Create an array of proxy servers.	Chapter 7, Lesson 2
Assign an enterprise policy to an array.	Chapter 7, Lesson 1

Deploying, Configuring, and Troubleshooting the Client Computer

Skill Being Measured	Location in Book
Plan the deployment of client computers to use ISA Server services. Considerations include client authentication, client operating system, network topology, cost, complexity, and client function.	Chapter 2, Lesson 1
Configure and troubleshoot the client computer for secure network address translation (SecureNAT).	Chapter 3, Lesson 1; Chapter 3, Lesson 4
Install the Firewall Client software. Considerations include the cost and complexity of deployment.	Chapter 3, Lesson 1
Troubleshoot autodetection.	Chapter 3, Lesson 2
Configure the client computer's Web browser to use ISA Server as an HTTP proxy.	Chapter 3, Lesson 1

Monitoring, Managing, and Analyzing ISA Server Use

Skill Being Measured	Location in Book
Monitor security and network usage by using logging and alerting.	Chapter 9, Lesson 1; Chapter 9, Lesson 2
Configure intrusion detection.	Chapter 4, Lesson 6
Configure an alert to send an e-mail message to an administrator.	Chapter 9, Lesson 1
Automate alert configuration.	Chapter 9, Lesson 1
Monitor alert status.	Chapter 9, Lesson 1; Chapter 10, Lesson 1
Troubleshoot problems with security and network usage. Chapter 10, Lesson 2	Chapter 10, Lesson 1;
Detect connections by using Netstat.	Chapter 10, Lesson 1
Test the status of external ports by using Telnet or Network Monitor.	Chapter 10, Lesson 1
Analyze the performance of ISA Server by using reports. Report types include summary, Web usage, application usage, traffic and utilization, and security.	Chapter 9, Lesson 3
Optimize the performance of the ISA Server computer. Considerations include capacity planning, allocation priorities, and trend analysis.	Chapter 2, Lesson 1; Chapter 9, Lesson 5

(continues)

Monitoring, Managing, and Analyzing ISA Server Use *(continued)*

Skill Being Measured	Location in Book
Analyze the performance of the ISA Server computer by using Performance Monitor.	Chapter 9, Lesson 5
Analyze the performance of the ISA Server computer by using reporting and logging.	Chapter 9, Lesson 2; Chapter 9, Lesson 3
Control the total RAM used by ISA Server for caching.	Chapter 9, Lesson 5

Getting Started

This self-paced training course contains hands-on procedures to help you learn about Microsoft Internet Security and Acceleration Server 2000, Enterprise Edition.

To complete some of these procedures, you must have two networked computers. Both computers must be capable of running Windows 2000 Server. Service Pack 1 must be installed on each computer.

Hardware Requirements

Each computer must have the following minimum configuration. All hardware should be on the Microsoft Windows 2000 Server Hardware Compatibility List.

- Computer with 300 MHz or higher Pentium II-compatible CPU running Microsoft Windows 2000 Server or Windows 2000 Advanced Server with Service Pack 1 or later, or Windows 2000 Datacenter Server operating system
- 256 megabytes (MB) of RAM
- Hard drive of at least 2 GB formatted as a single NTFS partition
- 200 MB of available hard-disk space after OS is installed
- Network adapter for communicating with the internal network
- Modem for communicating with the Internet
- CD-ROM drive
- Sound card and audio output
- Microsoft Mouse or compatible pointing device

Software Requirements

The following software is required to complete the procedures in this course. A 120-day evaluation copy of Microsoft Internet Security and Acceleration Server 2000, Enterprise Edition, is included on a CD-ROM in this kit.

- Windows 2000 Server (Service Pack 1 or later)

- Microsoft Internet Security and Acceleration Server 2000, Enterprise Edition

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Note The 120-day Evaluation Edition provided with this training is not the full retail product and is provided only for the purposes of training and evaluation. Microsoft Technical Support does not support this evaluation edition. For additional support information regarding this book and the CD-ROM (including answers to commonly asked questions about installation and use), visit the Microsoft Press Technical Support web site at Http://mspress.microsoft.com/support/. You can also email TKINPUT@MICROSOFT.COM, or send a letter to Microsoft Press, Attn: Microsoft Press Technical Support, One Microsoft Way, Redmond, WA 98502-6399.

Setup Instructions

Many of the exercises in this training kit are performed in a two-computer Ethernet network. To perform the exercises properly, you must set the network up according to the following specifications.

The first computer should have an internal network adapter and an external modem connected to a working telephone line. The computer should be named Server1 and configured as a domain controller in the domain domain01.local. Server1 will be assigned an IP address of 192.168.0.1/24 on its internal network adapter. No default gateway should be specified for the internal interface, but a valid external DNS Server on the Internet should be specified as the preferred DNS server and 192.168.0.1 as the alternate DNS server. The following two Windows 2000 components should be installed on Server1 in addition to the defaults: Management and Monitoring Tools, Windows Media Services. Create a dial-up connection to your ISP from Server1. Verify that you can successfully connect to your ISP and access the Internet before beginning the installation of ISA Server in Chapter 2.

After you install Windows 2000 on Server1, install and configure Active Directory from Server1 with the following specifications: