

# Contents

## Understand how ISA Server fits into .NET

Just as Proxy Server was considered a member of the Microsoft BackOffice Family, ISA Server also belongs to a new Microsoft "family," the members of which are designed to work with Windows 2000 in an enterprise environment. This group of enterprise servers is now called the Microsoft.Net family, or simply ".Net" (pronounced dot-net) servers.

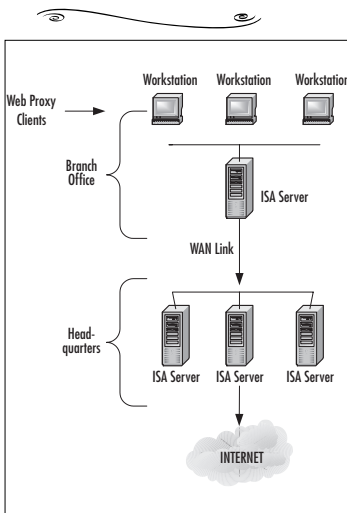
## Introduction

### Chapter 1 Introduction to Microsoft ISA Server

|  |          |
|--|----------|
|  | <b>1</b> |
| What Is ISA Server?  | 2        |
| Why "Security and Acceleration" Server?                                      | 3        |
| Internet Security  | 3        |
| Internet Acceleration  | 8        |
| The History of ISA: Microsoft Proxy Server                                   | 9        |
| In the Beginning: Proxy Server, Version 1.0                                  | 9        |
| Getting Better All the Time: Proxy Server, Version 2.0                       | 10       |
| A New Name for New and Improved Functionality: Proxy Server 3.0 (ISA Server) | 11       |
| ISA Server Options   | 15       |
| ISA Standard Edition   | 15       |
| ISA Enterprise Edition   | 16       |
| ISA Server Installation Modes  | 18       |

|   |    |
|---|----|
| The Microsoft.Net Family of Enterprise Servers    | 19 |
| The Role of ISA Server in the Network Environment | 22 |
| An Overview of ISA Server Architecture            | 22 |
| Layered Filtering                                 | 24 |
| ISA Client Types                                  | 29 |
| ISA Server Authentication                         | 38 |
| ISA Server Features Overview                      | 43 |
| Firewall Security Features                        | 43 |
| Firewall Features Overview                        | 44 |
| System Hardening                                  | 45 |
| Secure, Integrated VPN                            | 46 |
| Integrated Intrusion Detection                    | 49 |
| Web Caching Features                              | 51 |
| Internet Connection-Sharing Features              | 52 |
| Unified Management Features                       | 52 |
| Extensible Platform Features                      | 55 |
| Who This Book Is For and What It Covers           | 56 |
| Summary   | 60 |
| Solutions Fast Track                              | 61 |
| Frequently Asked Questions                        | 65 |

**Find complete coverage of ISA Server in the Enterprise including hierarchical caching**



|   |           |
|---|-----------|
| <b>Chapter 2 ISA Server in the Enterprise</b> | <b>69</b> |
| Introduction                                  | 70        |
| Enterprise-Friendly Features                  | 70        |
| Reliability                                   | 71        |
| Scalability                                   | 72        |
| Scaling Up                                    | 73        |
| Scaling Out                                   | 73        |
| Scaling Down                                  | 73        |
| Multiprocessor Support                        | 73        |
| The Advantages of Multiprocessing             | 73        |
| Why Symmetric Multiprocessing?                | 75        |
| Network Load-Balancing Support                | 76        |
| Clustering                                    | 77        |
| Hierarchical and Distributed Caching          | 77        |
| Total Cost of Ownership                       | 81        |
| Designing Enterprise Solutions                | 83        |
| General Enterprise Design Principles          | 84        |

|   |     |
|---|-----|
| Enterprise Core Services and<br>Protocols         | 84  |
| The Enterprise Networking Model                   | 85  |
| Enterprise Technologies                           | 89  |
| ISA Server Design Considerations                  | 91  |
| Planning Multiserver Arrays                       | 104 |
| Understanding Multiserver Management              | 104 |
| Backing Up the Array Configuration<br>Information | 105 |
| Using Tiered Policy                               | 108 |
| Planning Policy Elements                          | 108 |
| Understanding ISA Server Licensing                | 110 |
| Summary   | 113 |
| Solutions Fast Track                              | 114 |
| Frequently Asked Questions                        | 118 |

### **Chapter 3 Security Concepts and Security Policies 121**

|  |     |
|--|-----|
| Introduction   | 122 |
| Security Overview                                    | 122 |
| Defining Basic Security Concepts                     | 123 |
| Knowledge Is Power                                   | 123 |
| Think Like a Thief                                   | 124 |
| The Intrusion Triangle                               | 125 |
| Removing Intrusion Opportunities                     | 126 |
| Security Terminology                                 | 127 |
| Addressing Security Objectives                       | 129 |
| Controlling Physical Access                          | 130 |
| Physical Access Factors                              | 130 |
| Physical Security Summary                            | 139 |
| Preventing Accidental Compromise<br>of Data          | 140 |
| Know Your Users                                      | 140 |
| Educate Your Users                                   | 140 |
| Control Your Users                                   | 141 |
| Preventing Intentional Internal<br>Security Breaches | 141 |
| Hiring and Human Resource<br>Policies                | 142 |
| Detecting Internal Breaches                          | 142 |

**See how to  
incorporate ISA Server  
in your security plan**



ISA Server's firewall function prevents unauthorized packets from entering your internal network. ISA also provides monitoring of intrusion attempts as well as allowing you to set alerts to notify you when intrusions occur. This chapter also covers system hardening, Secure Sockets Layer, SSL tunneling, and SSL bridging.

|  |     |
|--|-----|
| Preventing Intentional Internal Breaches                     | 145 |
| Preventing Unauthorized External Intrusions and Attacks      | 145 |
| External Intruders with Internal Access                      | 146 |
| Tactical Planning  | 146 |
| Recognizing Network Security Threats                         | 147 |
| Understanding Intruder Motivations                           | 147 |
| Recreational Hackers   | 147 |
| Profit-Motivated Hackers                                     | 148 |
| Vengeful Hackers   | 149 |
| Hybrid Hackers   | 149 |
| Classifying Specific Types of Attacks                        | 150 |
| Social Engineering Attacks                                   | 150 |
| Denial-of-Service Attacks                                    | 152 |
| Scanning and Spoofing  | 161 |
| Source-Routing Attack  | 164 |
| Other Protocol Exploits                                      | 165 |
| System and Software Exploits                                 | 165 |
| Trojans, Viruses, and Worms                                  | 166 |
| Categorizing Security Solutions                              | 168 |
| Hardware Security Solutions                                  | 168 |
| Hardware-Based Firewalls                                     | 168 |
| Other Hardware Security Devices                              | 168 |
| Software Security Solutions                                  | 169 |
| Windows 2000 Security Features                               | 169 |
| Security Software  | 169 |
| Designing a Comprehensive Security Plan                      | 170 |
| Evaluating Security Needs                                    | 171 |
| Assessing the Type of Business                               | 172 |
| Assessing the Type of Data                                   | 172 |
| Assessing the Network Connections                            | 173 |
| Assessing Management Philosophy                              | 173 |
| Understanding Security Ratings                               | 174 |
| Legal Considerations   | 175 |
| Designating Responsibility for Network Security              | 176 |
| Responsibility for Developing the Security Plan and Policies | 176 |

|  |     |
|--|-----|
| Responsibility for Implementing<br>and Enforcing the Security Plan<br>and Policies | 176 |
| Designing the Corporate Security Policy  | 177 |
| Developing an Effective Password<br>Policy   | 178 |
| Educating Network Users on Security<br>Issues                                      | 182 |
| Incorporating ISA Server into Your<br>Security Plan                                | 182 |
| ISA Server Intrusion Detection   | 182 |
| Implementing a System-Hardening<br>Plan with ISA                                   | 184 |
| System-Hardening Goals and<br>Guidelines   | 185 |
| Using the Security Configuration<br>Wizard   | 186 |
| Using SSL Tunneling and Bridging   | 187 |
| SSL Tunneling  | 187 |
| SSL Bridging   | 188 |
| Summary  | 192 |
| Solutions Fast Track   | 193 |
| Frequently Asked Questions   | 198 |

## **Chapter 4 ISA Server Deployment Planning and Design 201**

|  |     |
|--|-----|
| Introduction                                     | 202 |
| ISA Deployment: Planning and Designing<br>Issues | 202 |
| Assessing Network and Hardware<br>Requirements   | 202 |
| System Requirements                              | 203 |
| Software Requirements                            | 203 |
| Processor Requirements                           | 204 |
| Multiprocessor Support                           | 205 |
| RAM Configuration                                | 206 |
| Disk Space Considerations                        | 208 |
| Cache Size Considerations                        | 208 |
| Logging and Reporting                            | 209 |
| Network Interface Configuration                  | 210 |

|   |            |
|---|------------|
| Active Directory Implementation                     | 216        |
| Mission-Critical Considerations                     | 217        |
| Hard Disk Fault Tolerance                           | 217        |
| Mirrored Volumes (Mirror Sets)                      | 218        |
| RAID 5 Volumes (Stripe Sets with Parity)            | 219        |
| Network Fault Tolerance                             | 223        |
| Server Fault Tolerance                              | 224        |
| Bastion Host Configuration                          | 227        |
| Planning the Appropriate Installation Mode          | 228        |
| Installing in Firewall Mode                         | 229        |
| Installing in Cache Mode                            | 229        |
| Installing in Integrated Mode                       | 230        |
| Planning for a Standalone or an Array Configuration | 231        |
| Planning ISA Client Configuration                   | 233        |
| The Firewall Client                                 | 233        |
| The Web Proxy Client                                | 235        |
| The SecureNat Client                                | 236        |
| Assessing the Best Solution for Your Network        | 236        |
| Internet Connectivity and DNS Considerations        | 238        |
| Level of Service                                    | 238        |
| External Interface Configuration                    | 239        |
| DNS Issues  | 240        |
| Summary   | 242        |
| Solutions Fast Track                                | 242        |
| Frequently Asked Questions                          | 246        |
| <b>Chapter 5 ISA Server Installation</b>            | <b>249</b> |
| Introduction  | 250        |
| Installing ISA Server on a Windows 2000 Server      | 250        |
| Putting Together Your Flight Plan                   | 250        |
| Installation Files and Permissions                  | 251        |
| CD Key and Product License                          | 251        |
| Active Directory Considerations                     | 252        |
| Server Mode   | 253        |
| Disk Location for ISA Server Files                  | 253        |

## Understand the differences between Proxy Server 2.0 and ISA Server

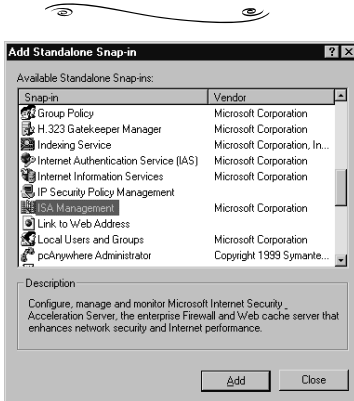
- IPX/SPX is not supported.
- The Web Proxy Service listens on Port 8080 and Web proxy client implications.
- The Winsock client is not required on published servers.
- The Web cache is stored as a single file.
- There is no SOCKS service.
- The firewall client doesn't support 16-bit operating systems.
- There are incompatibilities between ISA and IIS on same machine.

|   |     |
|---|-----|
| Internal Network IDs and the Local Address Table                                | 254 |
| ISA Server Features Installation  | 254 |
| Performing the Installation   | 255 |
| Installing ISA Server: A Walkthrough  | 255 |
| Upgrading a Standalone Server to an Array Member: A Walkthrough                 | 267 |
| Performing the Enterprise Initialization  | 268 |
| Backing Up a Configuration and Promoting a Standalone Server to an Array Member | 271 |
| Changes Made After ISA Server Installation                                      | 278 |
| Migrating from Microsoft Proxy Server 2.0                                       | 278 |
| What Gets Migrated and What Doesn't   | 278 |
| Functional Differences Between Proxy Server 2.0 and ISA Server                  | 281 |
| Learn the ISA Server Vocabulary   | 285 |
| Upgrading Proxy 2.0 on the Windows 2000 Platform                                | 286 |
| Upgrading a Proxy 2.0 Installation on Windows NT 4.0                            | 290 |
| A Planned Upgrade from Windows NT 4.0 Server to Windows 2000                    | 290 |
| Summary   | 293 |
| Solutions Fast Track  | 294 |
| Frequently Asked Questions  | 297 |

## Chapter 6 Managing ISA Server 299

|   |     |
|---|-----|
| Introduction                            | 300 |
| Understanding Integrated Administration | 300 |
| The ISA Management Console              | 301 |
| Adding ISA Management to a Custom MMC   | 302 |
| The Components of the ISA MMC           | 305 |
| The ISA Console Objects                 | 312 |
| ISA Wizards                             | 330 |
| The Getting Started Wizard              | 330 |

## Everything you need to manage ISA Server



ISA Management can be  
added to a custom MMC.

|   |     |
|---|-----|
| Rules Wizards   | 330 |
| VPN Wizards   | 331 |
| Performing Common Management Tasks                              | 332 |
| Configuring Object Permissions                                  | 332 |
| Default Permissions   | 332 |
| Special Object Permissions                                      | 332 |
| Setting Permissions on ISA Objects                              | 334 |
| Managing Array Membership                                       | 335 |
| Creating a New Array  | 335 |
| Adding and Removing Computers                                   | 335 |
| Promoting a Standalone ISA Server                               | 336 |
| Using Monitoring, Alerting, Logging, and<br>Reporting Functions | 337 |
| Creating, Configuring, and Monitoring<br>Alerts                 | 338 |
| Viewing Alerts  | 338 |
| Creating and Configuring Alerts                                 | 338 |
| Refreshing the Display  | 343 |
| Event Messages  | 343 |
| Monitoring Sessions   | 344 |
| Using Logging   | 345 |
| Logging to a File   | 345 |
| Logging to a Database   | 346 |
| Configuring Logging   | 348 |
| Generating Reports  | 351 |
| Creating Report Jobs  | 351 |
| Viewing Generated Reports                                       | 356 |
| Configuring Sort Order for<br>Report Data                       | 362 |
| Saving Reports  | 362 |
| Configuring the Location for Saving<br>the Summary Database     | 363 |
| Understanding Remote Administration                             | 365 |
| Installing the ISA Management Console                           | 365 |
| Managing a Remote Standalone<br>Computer                        | 365 |
| Remotely Managing an Array or<br>Enterprise                     | 366 |
| Using Terminal Services for Remote<br>Management of ISA         | 367 |



**Hundreds of security alerts, undocumented hints, and ISA Server mysteries make sure you don't miss a thing**

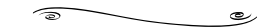
### **SECURITY ALERT!**

SecureNAT clients must be configured with the address of a DNS server that can resolve Internet names. You can use a DNS server located on the Internet (such as your ISP's DNS server), or you can configure an internal DNS server to use a forwarder on the Internet. Unlike the RRAS NAT Service, the ISA server does not perform DNS Proxy Services for the SecureNAT clients.

|  |            |
|--|------------|
| Installing Terminal Services on the ISA Server             | 367        |
| Installing Terminal Services Client Software               | 369        |
| Summary  | 372        |
| Solutions Fast Track                                       | 373        |
| Frequently Asked Questions                                 | 375        |
| <b>Chapter 7 ISA Architecture and Client Configuration</b> | <b>377</b> |
| Introduction   | 378        |
| Understanding ISA Server Architecture                      | 379        |
| The Web Proxy Service                                      | 380        |
| The Firewall Service                                       | 382        |
| How the Firewall Service Works                             | 382        |
| The Network Address Translation Protocol Driver            | 384        |
| The Scheduled Content Download Service                     | 385        |
| ISA Server Services Interactions                           | 386        |
| Configuration Changes and ISA Server Services Restarts     | 388        |
| Installing and Configuring ISA Server Clients              | 390        |
| The SecureNAT Client                                       | 390        |
| SecureNAT Clients on Simple Networks                       | 391        |
| SecureNAT Clients on "Not-Simple" Networks                 | 392        |
| Limitations of the SecureNAT Client                        | 394        |
| Manually Configuring the SecureNAT Client                  | 396        |
| Configuring the SecureNAT Client via DHCP                  | 397        |
| The Firewall Client  | 398        |
| Advantages of Using the Firewall Client                    | 398        |
| Disadvantages of Using the Firewall Client                 | 399        |

|   |     |
|---|-----|
| DNS Configuration Issues for Firewall Clients       | 401 |
| Deploying the Firewall Client                       | 403 |
| Manual Installation of a Firewall Client via URL    | 404 |
| Command-Line Parameters for a Scripted Installation | 407 |
| Automatic Installation                              | 408 |
| Configuring the Firewall Client                     | 411 |
| Automating the Configuration of the Firewall Client | 413 |
| Firewall Service Client Configuration Files         | 423 |
| The Web Proxy Client                                | 428 |
| Why You Should Configure the Web Proxy Client       | 428 |
| DNS Considerations for the Web Proxy Client         | 430 |
| Configuring the Web Proxy Client                    | 430 |
| Autodiscovery and Client Configuration              | 433 |
| Summary   | 435 |
| Solutions Fast Track                                | 437 |
| Frequently Asked Questions                          | 440 |

**Answers all your questions about configuring outbound access**



**Q:** I want to prevent users from gaining access to .MP3 files from the Napster site. Is there an easy way to do this?

**A:** Yes. Configure a site and content rule that prevents downloading of .MP3 files. If you are interested in blocking only .MP3 files, you can create a new content group in the Policy Elements node and then use this content group to create the site and content rule to limit the download of .MP3s.

|   |            |
|---|------------|
| <b>Chapter 8 Configuring ISA Server for Outbound Access</b>       | <b>443</b> |
| Introduction  | 444        |
| Configuring the Server for Outbound Access                        | 444        |
| Configuring Listeners for Outbound Web Requests                   | 445        |
| Server Performance  | 448        |
| Network Configuration Settings                                    | 449        |
| Firewall Chaining: Routing SecureNAT and Firewall Client Requests | 449        |
| Configuring Firewall and SecureNAT Client Routing                 | 450        |
| Routing Web Proxy Client Requests                                 | 453        |
| Configuring a Web Proxy Service Routing Rule                      | 454        |
| Routing to a Linux Squid Server                                   | 461        |

|  |     |
|--|-----|
| Configuring ISA Web Proxy Chaining       | 463 |
| Configuring Routing for ISA              |     |
| Server Chains                            | 466 |
| Outbound PPTP Requests                   | 468 |
| The Local Address Table                  | 470 |
| Configuring the LAT                      | 471 |
| Building the Routing Table               | 473 |
| Configuring the Local Domain Table       | 475 |
| Creating Secure Outbound Access Policy   | 477 |
| Creating and Configuring Policy Elements | 479 |
| Dial-up Entries                          | 480 |
| Bandwidth Priorities                     | 484 |
| Schedules                                | 487 |
| Destination Sets                         | 489 |
| Client Address Sets                      | 492 |
| Protocol Definitions                     | 494 |
| Content Groups                           | 498 |
| Creating Rules Based on Policy Elements  | 501 |
| Bandwidth Rules                          | 502 |
| Creating a Bandwidth Rule                | 503 |
| Managing Bandwidth Rules                 | 507 |
| Site and Content Rules                   | 509 |
| Creating a Site and Content Rule         | 509 |
| Managing Site and Content Rules          | 513 |
| Protocol Rules                           | 516 |
| Protocol Rules Depend on Protocol        |     |
| Definitions                              | 516 |
| Creating a Protocol Rule                 | 517 |
| Creating a Protocol Rule to Allow        |     |
| Multiple Protocol Definitions:           |     |
| PCAnywhere 9.x                           | 520 |
| Creating a Protocol Rule to Allow        |     |
| Access to Multiple Primary Port          |     |
| Connections                              | 522 |
| Managing Protocol Rules                  | 522 |
| IP Packet Filters                        | 523 |
| Dynamic Packet Filtering                 | 524 |
| Packet Filters for Network Services      |     |
| Located on the ISA Server                | 524 |

|   |     |
|---|-----|
| Configuring Application Filters That Affect Outbound Access | 528 |
| FTP Access Filter   | 528 |
| HTTP Redirector Filter                                      | 530 |
| SOCKS Filter  | 534 |
| Streaming Media Filter                                      | 535 |
| Live Stream Splitting                                       | 536 |
| Understanding and Configuring the Web Proxy Cache           | 538 |
| Cache Configuration Elements                                | 539 |
| Configuring HTTP Caching                                    | 539 |
| Configuring FTP Caching                                     | 541 |
| Configuring Active Caching                                  | 542 |
| Configuring Advanced Caching Options                        | 544 |
| Scheduled Content Downloads                                 | 546 |
| Summary   | 551 |
| Solutions Fast Track  | 552 |
| Frequently Asked Questions                                  | 555 |

## **Chapter 9 Configuring ISA Server for Inbound Access     557**


|  |     |
|--|-----|
| Introduction                                     | 558 |
| Configuring ISA Server Packet Filtering          | 558 |
| How Packet Filtering Works                       | 558 |
| Default Packet Filters                           | 559 |
| When Packet Filtering Is Disabled                | 559 |
| Static versus Dynamic Packet Filtering           | 559 |
| When to Manually Create Packet Filters           | 560 |
| Enabling Packet Filtering                        | 561 |
| Creating Packet Filters                          | 561 |
| Managing Packet Filters                          | 569 |
| Supporting Applications on the ISA Server        | 571 |
| Publishing Services on Perimeter Networks        |     |
| Using Packet Filters                             | 573 |
| Packet Filtering Options                         | 575 |
| Routing between Public and Private Networks      | 575 |
| Packet Filtering/Routing Scenarios               | 576 |
| Packet Filtering Enabled with IP Routing Enabled | 578 |

|   |     |
|---|-----|
| The Packet Filters Tab  | 578 |
| Enabling Intrusion Detection  | 580 |
| Application Filters That Affect Inbound Access                          | 581 |
| DNS Intrusion Detection Filter  | 581 |
| Configuring the H.323 Filter  | 582 |
| POP Intrusion Detection Filter  | 583 |
| RPC Filter  | 583 |
| SMTP Filter   | 584 |
| The General Tab   | 584 |
| The Attachments Tab   | 584 |
| The Users/Domains Tab   | 587 |
| Configuring the SMTP Message Screener                                   | 587 |
| Designing Perimeter Networks  | 595 |
| Limitations of Perimeter Networks                                       | 595 |
| Perimeter Network Configurations  | 596 |
| Back-to-Back ISA Server Perimeter Networks                              | 596 |
| Tri-homed ISA Server Perimeter Networks                                 | 599 |
| Publishing Services on a Perimeter Network                              | 600 |
| Publishing FTP Servers on a Perimeter Network                           | 602 |
| Enabling Communication between Perimeter Hosts and the Internal Network | 603 |
| Bastion Host Considerations   | 604 |
| Configuring the Windows 2000 Bastion Host                               | 604 |
| Summary   | 607 |
| Solutions Fast Track  | 607 |
| Frequently Asked Questions  | 609 |

## **Chapter 10 Publishing Services to the Internet 611**

|  |     |
|--|-----|
| Introduction                               | 612 |
| Types of Publishing                        | 612 |
| Web Publishing                             | 612 |
| Server Publishing                          | 613 |
| Publishing Services on a Perimeter Network | 614 |
| Web Server Publishing                      | 615 |
| Preparing to Publish                       | 615 |

**Complete instructions  
for publishing content  
on a private network,  
including undocu-  
mented tips**

 You must configure a packet filter for the TZO client software to work correctly. Remember that all applications on the ISA server that require external network access require static packet filters. The packet filter settings are:

**Filter type:** Custom  
**IP protocol:** TCP  
**Direction:** Outbound  
**Local port:** Dynamic  
**Remote port:** Fixed Port  
**Remote port number:**  
 21331

|  |     |
|--|-----|
| DNS Entries  | 615 |
| DNS Client/Server Infrastructure   | 616 |
| Destination Sets   | 618 |
| ISA Client Configuration   | 620 |
| Configuring the Inbound Web<br>Requests Listener                           | 621 |
| Web Publishing Walkthrough—Basic Web<br>Publishing                         | 627 |
| Publishing a Web Site on the ISA Server                                    | 630 |
| Readying IIS for Publishing  | 631 |
| Creating the Publishing Rule   | 632 |
| Web Publishing through Protocol Redirection                                | 637 |
| Creative Publishing Using Destination Sets                                 | 639 |
| Secure Web Site Publishing   | 642 |
| Terminating the Secure Connection<br>at the ISA Server                     | 643 |
| Bridging Secure Connections as SSL<br>Requests                             | 650 |
| Publishing a Secure Web Site via<br>Server Publishing Rules                | 653 |
| Publishing Services  | 653 |
| Limitations of Server Publishing Rules                                     | 654 |
| You Can Publish a Service Only Once  | 654 |
| You Cannot Redirect Ports  | 655 |
| You Cannot Bind a Particular External<br>Address to an Internal IP Address | 655 |
| Server Publishing Bypasses<br>the Web Proxy Service                        | 655 |
| SecureNAT Does Not Work<br>for All Published Servers                       | 656 |
| You Cannot Use Destination<br>Sets in Server Publishing Rules              | 656 |
| Preparing for Server Publishing  | 656 |
| Protocol Definitions   | 657 |
| ISA Client Configuration   | 657 |
| Client Address Sets  | 657 |
| Server Publishing Walkthrough—Basic Server<br>Publishing                   | 658 |
| Secure Mail Server Publishing  | 662 |

|   |     |
|---|-----|
| Configuring ISA Server to Support Outlook Web Access          | 666 |
| Publishing a Terminal Server                                  | 667 |
| Terminal Server on the ISA Server                             | 668 |
| Terminal Server on the Internal Network and on the ISA Server | 669 |
| Terminal Services Security Considerations                     | 671 |
| Publishing a Web Server Using Server Publishing               | 672 |
| The H.323 Gatekeeper Service                                  | 674 |
| Gatekeeper-to-Gatekeeper Calling                              | 677 |
| ILS Servers   | 679 |
| NetMeeting Clients on the Internet                            | 680 |
| Configuring the Gatekeeper                                    | 682 |
| Creating Destinations   | 682 |
| Call Routing Rules  | 684 |
| Managing the Gatekeeper                                       | 691 |
| Virtual Private Networking                                    | 693 |
| Configuring VPN Client Access                                 | 693 |
| Gateway-to-Gateway VPN Configuration                          | 695 |
| Configuring the Local VPN                                     | 695 |
| Configuring the Remote VPN                                    | 700 |
| Testing the Configuration                                     | 702 |
| Summary   | 704 |
| Solutions Fast Track  | 706 |
| Frequently Asked Questions                                    | 709 |

## **Chapter 11 Optimizing, Customizing, Integrating, and Backing Up ISA Server 713**

|  |     |
|--|-----|
| Introduction                                       | 714 |
| Optimizing ISA Server Performance                  | 714 |
| Establishing a Baseline and Monitoring Performance | 716 |
| How Baselines Are Used                             | 716 |
| Defining Threshold Values                          | 717 |
| Using the Performance Monitor Tools                | 717 |
| Addressing Common Performance Issues               | 742 |
| Addressing Network Bandwidth Issues                | 742 |
| Addressing Load-Balancing Issues                   | 746 |

## Master the Windows Messenger Service



A Network Message Is Sent to the Specified Account When the Alert Is Triggered

|  |     |
|--|-----|
| Cache Configuration Issues   | 748 |
| Editing the Windows 2000 Registry to Tune ISA Performance Settings     | 752 |
| Customizing ISA Server   | 754 |
| Using the ISA Server Software Developer's Kit                          | 755 |
| Administration Scripts   | 755 |
| Sample Filters   | 757 |
| Using Third-Party Add-ons  | 758 |
| Types of Add-on Programs   | 758 |
| Overview of Available Add-on Programs                                  | 760 |
| Integrating ISA Server with Other Services                             | 760 |
| Understanding Interoperability with Active Directory                   | 761 |
| Standalone versus Array Member   | 761 |
| The Active Directory Schema  | 761 |
| ISA Server and Domain Controllers                                      | 762 |
| Understanding Interoperability with Routing and Remote Access Services | 762 |
| RRAS Components  | 762 |
| RRAS and ISA Server  | 763 |
| Understanding Interoperability with Internet Information Server        | 764 |
| IIS Functionality  | 764 |
| Publishing IIS to the Internet   | 764 |
| Understanding Interoperability with IPSecurity                         | 765 |
| How IPSec Works  | 766 |
| How IPSec Is Configured in Windows 2000                                | 766 |
| IPSec and ISA Server   | 768 |
| Integrating an ISA Server into a Windows NT 4.0 Domain                 | 769 |
| Backing Up and Restoring the ISA Configuration                         | 769 |
| Backup Principles  | 769 |
| Backing Up and Restoring Standalone Server Configurations              | 770 |
| Backing Up and Restoring Array and Enterprise Configurations           | 771 |
| Backing Up and Restoring an Array Configuration                        | 772 |



|  |     |
|--|-----|
| Backing Up and Restoring an Enterprise Configuration | 773 |
| Summary  | 775 |
| Solutions Fast Track                                 | 776 |
| Frequently Asked Questions                           | 780 |

## **Chapter 12 Troubleshooting ISA Server 783**

### **Find step-by-step instructions for troubleshooting ISA Server**

|  |  |     |
|--|--|-----|
| 1. Information gathering                           | Introduction   | 784 |
| 2. Analysis and planning                           | Understanding Basic Troubleshooting Principles   | 785 |
| 3. Implementation of a solution                    | Troubleshooting Guidelines   | 786 |
|  | The Five Steps of Troubleshooting  | 786 |
| 4. Assessment of the effectiveness of the solution | Troubleshooting Tips   | 791 |
|  | ISA Server and Windows 2000  |     |
|  | Diagnostic Tools   | 793 |
| 5. Documentation of the incident                   | ISA Server Troubleshooting Resources   | 795 |
|  | Troubleshooting ISA Server Installation and Configuration Problems                       | 802 |
|  | Hardware and Software Compatibility Problems   | 802 |
|  | ISA Server Doesn't Meet Minimum System Requirements                                      | 803 |
|  | ISA Server Exhibits Odd Behavior When Windows 2000 NAT Is Installed                      | 803 |
|  | Internal Clients Are Unable to Access External Exchange Server                           | 804 |
|  | Initial Configuration Problems   | 804 |
|  | Unable to Renew DHCP Lease   | 804 |
|  | Failure of Services to Start After Completing Installation                               | 805 |
|  | Inability to Join Array  | 805 |
|  | Inability to Save LAT Entry  | 806 |
|  | ISA Server Control Service Does Not Start  | 806 |
|  | Troubleshooting Authentication and Access Problems                                       | 807 |
|  | Authentication Problems  | 807 |
|  | User's HTTP Request Is Sometimes Allowed, although a Site and Content Rule Denies Access | 808 |

|   |     |
|---|-----|
| Failure to Authenticate Users of<br>Non-Microsoft Browsers                          | 809 |
| Error Message When Using Pass-Through<br>Authentication with NTLM                   | 810 |
| Access Problems   | 810 |
| Inability of Clients to Browse External<br>Web Sites                                | 811 |
| Problems with Specific Protocols or<br>Protocol Definitions                         | 811 |
| Inability of Clients to PING External<br>Hosts                                      | 812 |
| Redirection of URL Results in Loop<br>Condition                                     | 812 |
| Ability of Clients to Continue Using a<br>Specific Protocol After Disabling of Rule | 813 |
| Dial-up and VPN Problems  | 813 |
| Inability of ISA Server to Dial Out to<br>the Internet                              | 813 |
| Dial-up Connection Is Dropped   | 814 |
| Inability of PPTP Clients to Connect<br>through ISA Server                          | 814 |
| Troubleshooting ISA Client Problems   | 815 |
| Client Performance Problems   | 815 |
| Slow Client Connection: SecureNAT<br>Clients  | 815 |
| Slow Internal Connections: Firewall<br>Clients                                      | 816 |
| Client Connection Problems  | 816 |
| Inability of Clients to Connect via<br>Modem  | 817 |
| Inability of SecureNAT Clients to<br>Connect to the Internet                        | 817 |
| Inability of Clients to Connect to<br>External SSL Sites                            | 818 |
| Inability of SecureNAT Clients to<br>Connect Using Computer Names                   | 819 |
| Inability of SecureNAT Clients to<br>Connect to a Specific Port Due to<br>a Timeout | 819 |

|   |            |
|---|------------|
| Troubleshooting Caching and Publishing Problems | 820        |
| Caching Problems                                | 820        |
| All Web Objects Not Being Cached                | 820        |
| Web Proxy Service Does Not Start                | 821        |
| Publishing Problems                             | 821        |
| Inability of Clients to Access Published        |            |
| Web Server                                      | 822        |
| Inability of External Clients to Send           |            |
| E-mail via Exchange Server                      | 822        |
| Summary   | 824        |
| Solutions Fast Track                            | 824        |
| Frequently Asked Questions                      | 828        |
| <b>Appendix ISA Server 2000 Fast Track</b>      | <b>831</b> |
| <b>Index</b>                                    | <b>869</b> |