Introduction

Professional certifications have been an important part of the computing industry for many years and will continue to become more important. Many reasons exist for these certifications, but the most popularly cited reason is that of credibility. All other considerations held equal, the certified employee/consultant/job candidate is considered more valuable than one who is not.

Goals and Methods

The most important and somewhat obvious goal of this book is to help you pass the ISCW exam (642-825). In fact, if the primary objective of this book were different, the book's title would be misleading; however, the methods used in this book to help you pass the CCNP ISCW exam are designed to also make you much more knowledgeable about how to do your job. Although this book and the accompanying CD-ROM together provide more than enough questions to help you prepare for the actual exam, the method in which they are used is not to simply make you memorize as many questions and answers as you possibly can.

One key methodology used in this book is to help you discover the exam topics that you need to review in more depth, to help you fully understand and remember those details, and to help you prove to yourself that you have retained your knowledge of those topics. So this book helps you pass the exam not by memorization, but by truly learning and understanding the topics. Although the ISCW exam is just one of the foundation areas for the CCNP certification, you should not consider yourself a truly skilled routing and switching engineer or specialist until you have demonstrated that you understand the material covered on the exam. This book would do you a disservice if it did not attempt to help you learn the material. To that end, the book uses the following methods to help you pass the ISCW exam:

■ Helps you discover which test topics you have not mastered

■ Provides explanations and information to fill in your knowledge gaps

■ Supplies exercises and scenarios that enhance your ability to recall and deduce the answers to test questions

■ Provides practice exercises on the topics and the testing process via test questions on the CD-ROM

Who Should Read This Book?

This book is not designed to be a general networking topics book, although it can be used for that purpose. This book is intended to tremendously increase your chances of passing the CCNP ISCW

exam. Although other objectives can be achieved from using this book, the book is written with one goal in mind: to help you pass the exam.

So why should you want to pass the CCNP ISCW exam? Because it is one of the milestones toward getting the CCNP certification; no small feat in itself. And many reasons exist for getting CCNP certification. You might want to enhance your resume, demonstrate that you are serious about continuing the learning process, or help your reseller-employer obtain a higher discount from Cisco by having more certified employees. Or perhaps it would mean a raise, a promotion, or greater recognition.

Strategies for Exam Preparation

The strategy you use to prepare for the CCNP ISCW exam might be slightly different from strategies used by other readers, mainly based on the skills, knowledge, and experience you already have obtained. For instance, if you have attended the ISCW course, you might take a different approach from that taken by someone who has learned switching via on-the-job training. The section "How to Use This Book to Pass the Exam," later in this introduction, includes various preparation strategies that are tailored to match differing reader backgrounds.

Regardless of the strategy you use or the background you have, the book is designed to help you get to the point that you can pass the exam with the least amount of time required. For instance, there is no need for you to practice or read about IP addressing and subnetting if you fully understand it already. However, many people like to make sure that they truly know a topic and thus read over material that they already know. Several book features help you gain the confidence that you know some material already and also help you know what topics you need to study more.

Although this book can be read cover to cover, it is designed to be flexible and allow you to easily move between chapters and sections of chapters to cover just the material that you need more work with. If you intend to read all chapters, the order in the book is an excellent sequence to use.

The chapters cover the following topics:

- **Chapter 1, "Describing Network Requirements"**—This chapter describes the basic framework for network evolution using the Service-Oriented Network Architecture (SONA) framework to build an Intelligent Information Network (IIN).

- **Chapter 2, "Topologies for Teleworker Connectivity"**—This chapter describes connectivity and security requirements for teleworker access to a central site.

- **Chapter 3, "Using Cable to Access a Central Site"**—This chapter describes cable access and the underlying technologies that make it a viable connectivity option for SOHO and teleworkers.

- **Chapter 4, "Using DSL to Access a Central Site"**—This chapter describes DSL access and the underlying technologies that make it a viable connectivity option for SOHO and teleworkers.

- **Chapter 5, "Configuring DSL Access with PPPoE"**—This chapter discusses the PPPoE technology and its use in SOHO and teleworker deployments.

- **Chapter 6, "Configuring DSL Access with PPPoA"**—This chapter discusses the PPPoA technology and its use in SOHO and teleworker deployments.

- **Chapter 7, "Troubleshooting DSL Access"**—This chapter discusses some basic DSL troubleshooting techniques specific to DSL in a SOHO or teleworker deployment.

- **Chapter 8, "The MPLS Conceptual Model"**—This chapter discusses the basic switching technologies and concepts in MPLS networks.

- **Chapter 9, "MPLS Architecture"**—This chapter discusses the manner in which routing and label switching take place in an MPLS network.

- **Chapter 10, "Configuring Frame Mode MPLS"**—This chapter discusses the configuration of MPLS technologies on Cisco routers.

- **Chapter 11, "MPLS VPN Technologies"**—This chapter describes MPLS VPN architecture and how it improves upon traditional VPN models.

- **Chapter 12, "IPsec Overview"**—This chapter describes the concepts used to secure network connections today with IPsec. The various protocols and concepts are covered.

- **Chapter 13, "Site-to-Site VPN Operations"**—This chapter discusses the purpose and use of site-to-site VPNs. It shows configuration of site-to-site VPNs via both the CLI and SDM.

- **Chapter 14, "GRE Tunneling over IPsec"**—This chapter discusses the use of GRE over IPsec to permit dynamic routing over VPN connections. Once again, both CLI and SDM configurations are discussed.

- **Chapter 15, "IPsec High Availability Options"**—This chapter discusses how failures in a network can occur and what steps can be taken to mitigate the risks of failure.

- **Chapter 16, "Configuring Cisco Easy VPN"**—This chapter examines the use of the Cisco Easy VPN solution to simplify the deployment of VPN connections to remote offices.

- **Chapter 17, "Implementing the Cisco VPN Client"**—This chapter discusses the installation, configuration, and use of the Cisco VPN Client for individual VPN connections.

- **Chapter 18, "Cisco Device Hardening"**—This chapter discusses the various vulnerabilities that exist in network devices and explains steps to secure the devices from compromise.

- **Chapter 19, "Securing Administrative Access"**—This chapter discusses the various ways to restrict administrative access to Cisco devices.

- **Chapter 20, "Using AAA to Scale Access Control"**—This chapter examines how to quickly configure and maintain a system that uses AAA with either Remote Authentication Dial-In User Service (RADIUS) or Terminal Access Controller Access Control System Plus (TACACS+) as part of its security strategy

- **Chapter 21, "Cisco IOS Threat Defense Features"**—This chapter examines the advantages, concepts, and strategy behind the Cisco IOS firewall offerings, how the Cisco IOS firewall operates, and the differences between packet filters, application layer gateways (ALG), and stateful packet filters. All these concepts contribute to the overall security strategy as implemented by the administrator to create greater flexibility in access control to prevent security breaches.

- **Chapter 22, "Implementing Cisco IOS Firewalls"**—This chapter explores how to quickly set up, configure, and monitor a firewall using Cisco IOS Software features in order to secure your network.

- **Chapter 23, "Implementing Cisco IDS and IPS"**—This chapter discusses the concepts of both IPS and IDS systems, and how to configure the Cisco IOS IPS solution via both the CLI and SDM.

Sample test questions and the testing engine on the CD-ROM allow simulated exams for final practice.

Each of these chapters uses several features to help you make best use of your time in that chapter. The features are as follows:

- **"Do I Know This Already?" quiz**—Each chapter begins with a quiz that helps you determine the amount of time you need to spend studying that chapter. The quiz is broken into subdivisions, each of which corresponds to a section of the chapter. Following the directions at the beginning of each chapter, the "Do I Know This Already?" quiz will direct you to study all or particular parts of the chapter.

- **Foundation Topics**—This is the core section of each chapter that explains the protocols, concepts, and configuration for the topics in the chapter.

- **Foundation Summary**—Near the end of each chapter, this section collects the most important tables and figures from the chapter. This section is designed to help you review the key concepts in the chapter and is an excellent tool for last-minute review.

- **Q&A**—These end-of-the-chapter questions, based on the topics covered in the "Foundation Topics" section, challenge your recall of the key topics covered in the chapter.

■ **CD-ROM-based practice exam**—The companion CD-ROM contains a large number of questions that are not included in the text of the book. You can answer these questions by using the simulated exam feature or by using the topical review feature. This is the best tool for helping you prepare for the test-taking process.

Pedagogical Approach

Retention and recall are the two features of human memory most closely related to performance on tests. This exam preparation guide focuses on increasing both retention and recall of the topics on the exam. The other human characteristic involved in successfully passing the exam is intelligence; this book does not address that issue.

Adult retention is typically less than that of children. For example, it is common for 4-year-olds to pick up basic language skills in a new country faster than their parents. Children retain facts as an end unto itself; adults typically either need a stronger reason to remember a fact or must have a reason to think about that fact several times to retain it in memory. For these reasons, a student who attends a typical Cisco course and retains 50 percent of the material is actually quite an amazing student.

Memory recall is based on connectors to the information that needs to be recalled—the greater the number of connectors to a piece of information, the better chance and better speed of recall.

Recall and retention work together. If you do not retain the knowledge, it will be difficult to recall it. This book is designed with features to help you increase retention and recall. It does this in the following ways:

■ By providing succinct and complete methods of helping you decide what you recall easily and what you do not recall at all.

■ By giving references to the exact passages in the book that review those concepts you did not recall so that you can quickly be reminded about a fact or concept. Repeating information that connects to another concept helps retention, and describing the same concept in several ways throughout a chapter increases the number of connectors to the same pieces of information.

■ By including exercise questions that supply fewer connectors than multiple-choice questions. This helps you exercise recall and avoids giving you a false sense of confidence, as an exercise with only multiple-choice questions might do. For example, fill-in-the-blank questions require you to have better recall than multiple-choice questions.

Finally, accompanying this book is a CD-ROM that has exam-like, multiple-choice questions. These are useful for you to practice taking the exam and to get accustomed to the time restrictions imposed during the exam.

How This Book Can Help You Pass the CCNP ISCW Exam

The primary focus of this book is not to teach material in the detail that is covered by an instructor in a 5-day class with hands-on labs. Instead, we tried to capture the essence of each topic and to present questions and scenarios that push the envelope on each topic that is covered for the ISCW exam.

The audience for this book includes both candidates who have successfully completed the ISCW class and candidates who have not taken the ISCW class but have a breadth of experience in this area. The **show** and **debug** commands from that class are fair game for questions within the ISCW exam, and hands-on work is the best way to commit those to memory.

If you have not taken the ISCW course, the quizzes and scenarios in this book should give you a good idea of whether you are sufficiently prepared to skip the class and test out based on your experience. On the flip side, however, you should know that although having the knowledge from just a classroom setting can be enough to pass the exam, some questions assume a CCNA level of internetworking knowledge.

How to Use This Book to Pass the Exam

There are four sections in each chapter: a short pre-assessment quiz, the main topics of the chapter, a summary of the key points of the chapter, and a test to ensure that you have mastered the topics in the chapter.

Each chapter begins with a "Do I Know This Already?" quiz, which maps to the major topic headings in the chapter. If you get a high score on this quiz, you might want to review the "Foundation Summary" section at the end of the chapter and then take the chapter test. If you score high on the test, you should review the summary to see if anything else should be added to your crib notes for a final run-through before taking the live test.

The "Foundation Summary" section in each chapter provides a set of "crib notes" that can be reviewed prior to the exam. These notes are not designed to teach, but merely to remind the reader what was in the chapter. Each "Foundation Summary" section consists of charts and raw data that complement an understanding of the chapter information.

All "Do I Know This Already?" and "Q&A" questions, with answers, are in Appendix A, "Answers to the 'Do I Know This Already?' Quizzes and Q&A Sections." These conveniently located questions can be read and reviewed quickly prior to taking the live test. The CD-ROM has testing software, as well as many additional questions similar to the format of the ISCW exam. These questions should be a valuable resource when making final preparations for the exam.

Anyone preparing for the ISCW exam can use the guidelines at the beginning of each chapter to guide their study. However, if you would like some additional guidance, the final parts of this

chapter give additional strategies for study, based on how you have prepared before buying this book. So, find the section that most closely matches your background in the next few pages, and then read some additional ideas to help you prepare. There is a section for the reader who has passed other CCNP exams and is ready for the ISCW exam, one for the reader who has passed the CCNA and is starting the CCNP track, and one for the reader who has no Cisco certifications and is starting the CCNP track.

You Have Passed Other CCNP Exams and Are Preparing for the ISCW Exam

Scenario 1: You Have Taken the ISCW Course

Because you have taken other Cisco exams and have taken the ISCW course, you know what you are up against in the test experience. The ISCW exam is like all the others. The questions and answer selections are sometimes confusing if you read too much into them.

The best approach with this book is to take each chapter's "Do I Know This Already?" quiz and focus on the parts for which you draw a blank. It is best not to jump to the final exam until you have given yourself a chance to review the entire book. Save the final exam to test your knowledge after you have mentally checked each section to verify that you have an idea of what the whole test could cover. Remember that the CD-ROM testing engine spools out a sampling of questions and might not give you a good picture the first time you use it; the test engine could spool a test that is easy for you, or it could spool one that is very difficult.

Before the test, make your own notes using the "Foundation Summary" sections and your own handwritten notes. Writing something down, even if you are copying it, makes it easier to remember. Once you have your bank of notes, study them, and then take the final exam three or four times. Each time you take the test, force yourself to read each question and each answer, even if you have seen them before. Again, repetition is a super memory aid.

Scenario 2: You Have Not Taken the ISCW Course

Because you have taken other Cisco exams, you know what you are up against in the test experience. The ISCW exam is like all the others. The questions and answer selections are sometimes confusing if you read too much into them.

The best approach with this book, because you have not taken the class, is to take each chapter's "Do I Know This Already?" quiz as an aid for what to look for as you read the chapter. Once you have completed a chapter, take the end-of-chapter test to see how well you have assimilated the material.

After you complete each chapter, you should use the CD-ROM testing engine to find out how well you know the material.

Before the test, make notes using the "Foundation Summary" sections and your own additions. Writing something down, even if you are copying it, makes it easier to remember. Once you have your bank of notes, study them, and then take the final practice exam on the CD-ROM testing engine three or four times. Each time you take the test, force yourself to read each question and each answer, even if you have seen them before. Again, repetition is a super memory aid.

You Have Passed the CCNA and Are Preparing for the ISCW Exam

Scenario 1: You Have Taken the ISCW Course

Because you have taken other Cisco exams and have taken the ISCW course, you know what you are up against in the test experience. The ISCW exam is like all the others. The questions and the answer selections are sometimes confusing if you read too much into them.

The best approach with this book is to take each chapter's "Do I Know This Already?" quiz and focus on the parts for which you draw a blank. It is best not to jump to the final exam until you have given yourself a chance to review the entire book. Save the final exam to test your knowledge after you have mentally checked each section to verify that you have an idea of what the whole test could cover. The CD-ROM testing engine spools out a sampling of questions and might not give you a good picture the first time you use it; the test engine could spool a test that is easy for you, or it could spool one that is very difficult.

Before the test, make your own notes using the "Foundation Summary" sections and your own additions. Writing something down, even if you are copying it, makes it easier to remember. Once you have your bank of notes, study them, and then take the final practice exam on the CD-ROM testing engine three or four times. Each time you take the test, force yourself to read each question and each answer, even if you have seen them before. Again, repetition is a super memory aid.

Scenario 2: You Have Not Taken the ISCW Course

Because you have taken other Cisco exams, you know what you are up against in the test experience. The ISCW exam is like all the others. The questions and answer selections are sometimes confusing if you read too much into them.

The best approach with this book, because you have not taken the class, is to take each chapter's "Do I Know This Already?" quiz to determine what to look for as you read the chapter. Once you have completed a chapter, take the end-of-chapter test to see how well you have assimilated the material.

After you complete each chapter, you should use the CD-ROM testing engine to find out how well you know the material.

Before the test, make your own notes using the "Foundation Summary" sections and your own additions. Writing something down, even if you are copying it, makes it easier to remember. Once you have your bank of notes, study them, and then take the final practice exam on the CD-ROM testing engine three or four times. Each time you take the test, force yourself to read each question and each answer, even if you have seen them before. Again, repetition is a super memory aid.

You Have Experience and Want to Skip the Classroom Experience and Take the ISCW Exam

Scenario 1: You Have CCNA Certification

Because you have taken other Cisco exams, you know what you are up against in the test experience. The ISCW exam is like the others. The questions and the answer selections are sometimes confusing if you read too much into them.

The best approach with this book, because you have not taken the course, is to take each chapter's "Do I Know This Already?" quiz to determine what to look for as you read the chapter. Once you have completed a chapter, take the end-of-chapter test to see how well you have assimilated the material.

After you complete each chapter, you should use the CD-ROM testing engine to find out how well you know the material.

Before the test, make your own notes using the "Foundation Summary" sections and your own additions. Writing something down, even if you are copying it, makes it easier to remember. Once you have your bank of notes, study them, and then take the final practice exam on the CD-ROM testing engine three or four times. Each time you take the test, force yourself to read each question and each answer, even if you have seen them before. Again, repetition is a super memory aid.

Scenario 2: You Do Not Have a CCNA Certification

Why don't you have the certification? The prerequisite for the CCNP certification is to be certified as a CCNA, so you really should pursue your CCNA certification before tackling the CCNP certification. Beginning with the ISCW exam gives you a skewed view of what is needed for the Cisco Professional certification track.

That being said, if you *must* pursue the certifications out of order, follow the spirit of the book. Read each chapter and then do the quiz at the front of the chapter to see if you caught the major points. Once that is done, try the test on the CD-ROM and pay particular attention to the VUE/ Thomson Prometric-way of testing so that you are prepared for the live test.

One Final Word of Advice

The "Foundation Summary" section and your notes are your "crib note" knowledge of ISCW. These pieces of paper are valuable when you are studying for the CCIE or Cisco recertification exam. You should take the time to organize them so that they become part of your paper "long-term memory."

Reviewing information that you actually wrote in your own handwriting is the easiest data to put back into your brain RAM. Gaining a certification but losing the knowledge is of no value. For most people, maintaining the knowledge is as simple as writing it down. Good luck to all!