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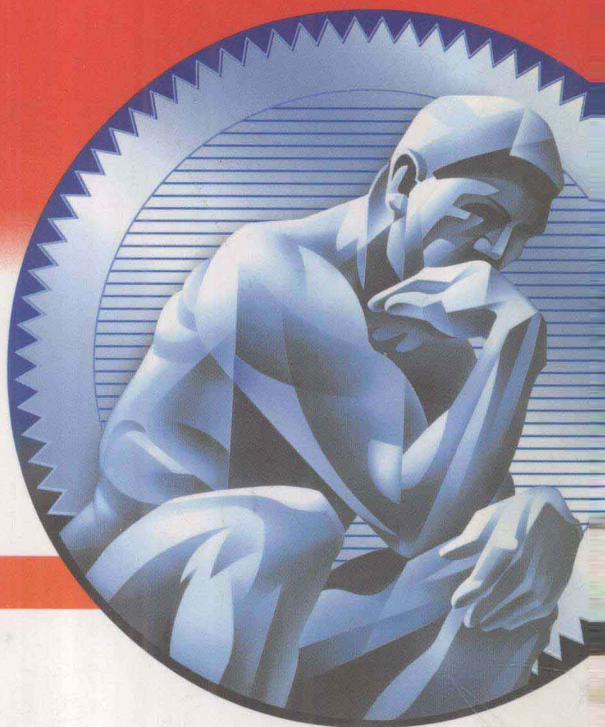
CCNA

学习指南

Cisco Certified Network Associate

(Exam 640-801) (英文版)

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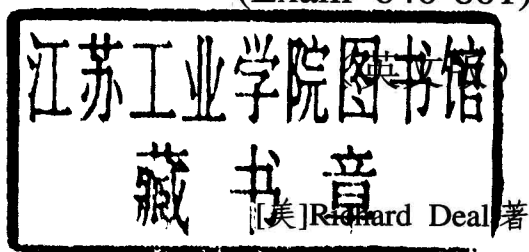
[美] Richard Deal 著



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Richard Deal:

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内容提要

本书以最新版的 CCNA 认证考试 (Exam 640-801) 为目标, 内容不但覆盖核心考试 640-801 的所有考试要点, 而且还涵盖了 CCNA INTRO (Exam 640-821) 和 ICND (Exam 640-811) 的所有考试要点, 并且尽可能详细地介绍了 CCNA 应试者所应该掌握的所有技能。

本书在介绍考试要点时针对每个考试目标, 使用了大量的插图、表格、试验、测试等, 使读者在牢固掌握知识点的同时, 轻松地获得丰富的实践经验。

本书由具有丰富 CCNA 考试经验的专家编写, 是参加 CCNA 考试人员的必备考试教材。

ABOUT THE AUTHOR

For the past six years, Richard Deal has operated his own company, The Deal Group Inc., in Oviedo, FL, east of Orlando. Richard has 17 years experience in the computing and networking industry including networking, training, systems administration, and programming. In addition to a B.S. in Mathematics from Grove City College, he holds many certifications from Cisco and has taught many beginning and advanced Cisco classes. Richard is the author of *Cisco PIX Firewalls*, an in-depth book on Cisco's PIX firewalls and their implementation, published by McGraw-Hill/Osborne. Richard is also the author of *CCNP: Remote Access Exam Prep*, *CCNP: Switching Exam Cram*, and *CCNP: Cisco LAN Switching Configuration Exam Cram* (The Coriolis Group), and also developed CD questions and tutorials for The Coriolis Group. Richard also authored *CCNA Secrets Revealed!* (Boson Software, Inc.), an electronic book. Richard is actively writing Cisco tests for Boson and QuizWare (Boson's Practice Test software can be purchased from www.boson.com—QuizWare's Practice Test software can be purchased from www.quizware.com) and has written computer-based tests for many of Cisco's certification exams, including the CCNA, in addition to developing various courses on networking and networking security.

Richard periodically holds bootcamp classes, which provide hands-on configuration of Cisco routers and switches. More information on his bootcamp classes, as well as a current schedule, can be seen at <http://www.quizware.com/dealgroup/>.

PREFACE

The primary objective of this book is to help you achieve the Cisco Certified Network Associate (CCNA) certification so that you can enhance your career. I believe that the only way you can increase your knowledge is through theoretical and practical learning. In other words, this book provides the book learning as well as basic hands-on experience that you'll need to pass the exam. However, once you pass the CCNA exam, your journey is just beginning: you'll need to enhance your newly acquired skills with additional reading and a lot of hands-on experience.

It is important to point out that there are two ways of achieving your CCNA certification:

- Pass the CCNA (640-801) exam, or
- Pass both the INTRO (640-821) and ICND (640-811) exams

The CCNA 640-801 exam includes the same topics that the INTRO 640-821 and ICND 640-811 exams cover. Cisco developed the second approach more for individuals who are just beginning their journey into networking, especially for people taking the CCNA curriculum at a Cisco Network Academy. The two-test approach is better suited for this environment since it takes a year to two years to go through Cisco's CCNA curriculum at the Network Academies. With this approach, you take the INTRO 640-821 exam half way through the curriculum and the ICND 640-811 exam at the end of the curriculum.

If you already have networking experience, especially if that experience includes configuring Cisco devices, you are better off taking the single CCNA 640-801 exam. The main advantage of this approach is that you only have to pay for one exam. Currently, most Cisco exams cost \$125 US to take (at the time of the printing of this book), but Cisco has changed their pricing scheme in the past and will probably do so in the future.

This book was primarily written for those individuals wishing to pass the CCNA 640-801 exam. However, this book contains ALL of the information that you would need in order to pass both the INTRO 640-821 and ICND 640-811

exams. Therefore, it is really up to you which testing approach you wish to take in order to achieve your CCNA certification.

In This Book

This book covers all of the exam objectives posted on Cisco's web site concerning the CCNA 640-801 exam as well as the INTRO 640-821 and ICND 640-811 exams. Each of the chapters cover one or more of the main objectives in this list, especially as it relates to how things work and how to configure them on Cisco's routers and switches.

In Every Chapter

I've created a set of chapter components that call your attention to important items, reinforce important points, and provide helpful exam-taking hints. Take a look at what you'll find in every chapter:

- Every chapter begins with the **Certification Objectives**—what you need to know in order to pass the section on the exam dealing with the chapter topic. The Objective headings identify the objectives within the chapter, so you'll always know an objective when you see it!
- **On The Job** notes describe the issues that come up most often in real-world settings. They provide a valuable perspective on certification- and product-related topics. They point out common mistakes and address questions that have arisen from on the job discussions and experience.
- **Exam Watch** notes point out important information you should learn when preparing for your exam.
- The **Two-Minute Drill** at the end of every chapter is a checklist of the main points of the chapter. It can be used for last-minute review.
- The **Chapter Self Test** section at the back of each chapter offers questions similar to those found on the certification exams. The answers to these questions, as well as explanations of the answers, can be found at the end of each chapter. By taking the Practice Exams after completing each chapter, you'll reinforce what you've learned from that chapter while becoming familiar with the structure of the exam questions.

- The **Exam Readiness Checklist** section at the end of the Introduction and in Appendix B is a list of the official exam objectives, presented exactly as the Vendor specifies them, cross-listed with the exam objectives as they are presented in the book along with page and chapter references. You should work with this list as you study, noting your familiarity with the objectives by checking off the appropriate box before you review each chapter. The table in the Introduction covers exam 640-801. Appendix B covers the objectives for the INTRO and ICND exams.

Some Pointers

Once you've finished reading this book, set aside some time to do a *thorough* review. You might want to return to the book several times and make use of all the methods it offers for reviewing the material:

1. *Re-read all the Two-Minute Drills*, or have someone quiz you. You also can use the drills as a way to do a quick cram before the exam.
2. *Re-read all the Exam Watch notes*. These are important items you should know for the exam. In other words, don't be surprised to see these topics appear on the real exam.
3. *Re-take the Self Test sections at the Back of each chapter*. Taking the tests right after you've read the chapter is a good idea, because the questions help reinforce what you've just learned. However, it's an even better idea to go back later and do all the questions in the book in one sitting. Pretend that you're taking the live exam. (When you go through the questions the first time, you should mark your answers on a separate piece of paper. That way, you can run through the questions as many times as you need to until you feel comfortable with the material)
4. *Use the Flashcard program on the CD*. This program has 300 flashcards with a basic question and answer format. The flashcards cover important topics on the CCNA exams that you should be very familiar with. The flashcards can be used on a Windows-based PC or a PDA. Please see the CD for PDA requirements.

5. *Do all the Practice Exercises in each of the chapters.* There will be some simulation questions on the real CCNA exams. In the simulation questions, you'll be required to perform basic configuration *and* troubleshooting tasks on a Cisco router and/or switch. Therefore, it is important that you have good configuration skills. Use the Practice Exercises to hone your configuration skills! I have developed two types of simulation questions in this book. All of them have to do with configuring Cisco routers and Catalyst switches; however, some of them also have you troubleshoot networking problems, where two or three configuration errors are introduced into the network and it is your job to track down these configuration errors, using the tools you learned about throughout this book, and fix them.

Practice Exams and the Simulator

As I mentioned earlier, it is important that you have hands-on experience not only for the exam, but also to prepare you for working with Cisco equipment in a real network. A lot of time and effort has been devoted in the creation of the Practice Exercises in this book. I have developed two figures which display the network topology used with the simulator.

As you can see from these figures, you have four PCs, two routers (a 2600 and a 2500), two Catalyst 2950 switches, and two Catalyst 1900 switches. Throughout the chapters that have Practice Exercises, they will refer you to this part of the book

FIGURE 1

Basic network topology for the Practice Exercises.

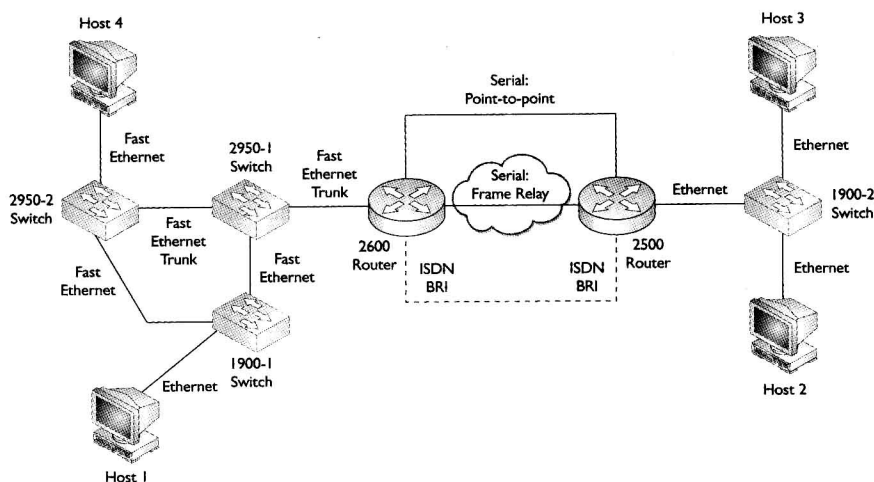
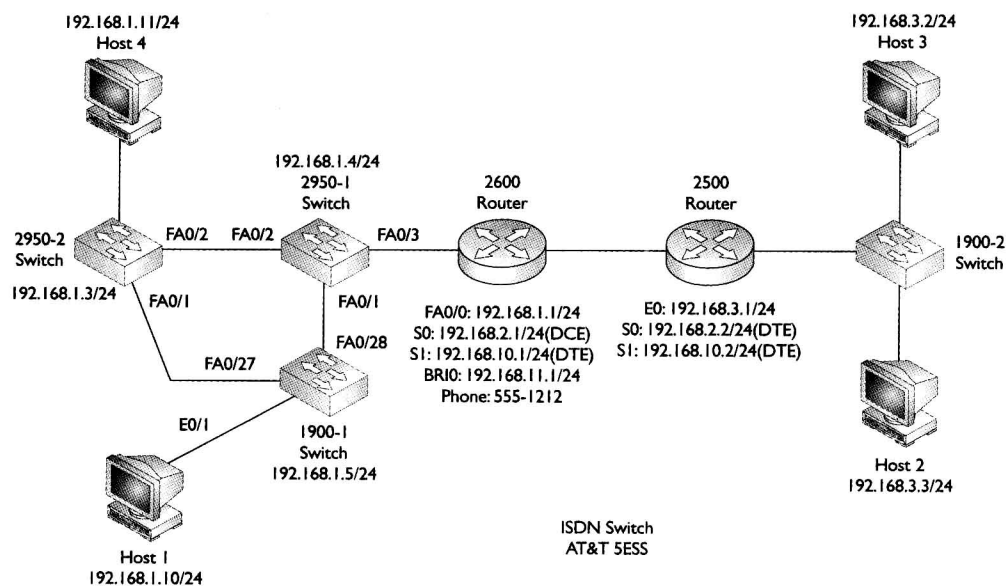


FIGURE 2 Addressing for the network topology used for the Practice Exercises.

for the layout of the network topology and the addressing assigned to the devices in the topology. Please refer to these figures when performing the exercises.

INTRODUCTION

How to Take a Cisco Certification Examination

This introduction covers the importance of your CCNA certification and prepares you for taking the actual examination. It gives you a few pointers on methods of preparing for the exam, including how to study and register, what to expect, and what to do on exam day.

Catch the Wave!

Congratulations on your pursuit of Cisco certification! In this fast-paced world of networking, few certification programs are as valuable as the one offered by Cisco.

The networking industry has virtually exploded in recent years, accelerated by nonstop innovation and the Internet's popularity. Cisco has stayed at the forefront of this tidal wave, maintaining a dominant role in the industry.

The networking industry is highly competitive, and evolving technology only increases in its complexity, so the rapid growth of the networking industry has created a vacuum of qualified people. There simply aren't enough skilled networking people to meet the demand. Even the most experienced professionals must keep current with the latest technology in order to provide the skills that the industry demands. Cisco certification programs can help networking professionals succeed as they pursue their careers.

Cisco started its certification program many years ago, offering only the designation Cisco Certified Internetwork Expert (CCIE). Through the CCIE program, Cisco provided a means to meet the growing demand for experts in the field of networking. However, the CCIE tests are brutal, with a failure rate of over 80 percent! Fewer than 5 percent of candidates pass on their first attempt! As you might imagine, very few people ever attain CCIE status.

In early 1998, Cisco recognized the need for intermediate certifications, and several new programs were created. Four intermediate certifications were added: CCNA (Cisco Certified Network Associate), CCNP (Cisco Certified Network Professional), CCDA (Cisco Certified Design Associate), and CCDP (Cisco

Certified Design Professional). In addition, several specialties were added to the professional and CCIE certification levels.

exam

Watch

I would encourage you to take beta tests when they are available. Not only are the beta exams less expensive than the final exams (some are even free!), but also, if you pass the beta, you will receive credit for passing the exam. If you don't pass the beta, you will have seen many of the questions in the pool of available questions, and can use this information when you

prepare to take the exam for the second time. Remember to jot down important information immediately after the exam. You will have to do this after leaving the exam area, since materials written during the exam are retained by the testing center. This information can be helpful when you need to determine which areas of the exam were most challenging for you as you study for the subsequent test.

Why Vendor Certification?

Over the years, vendors have created their own certification programs because of industry demand. This demand arises when the marketplace needs skilled professionals and an easy way to identify them. Vendors benefit because it promotes people skilled in their product. Professionals benefit because it boosts their careers. Employers benefit because it helps them identify qualified people.

In the networking industry, technology changes too often and too quickly to rely on traditional means of certification, such as universities and trade associations. Because of the investment and effort required to keep network certification programs current, vendors are the only organizations suited to keep pace with the changes. In general, such vendor certification programs are excellent, with most of them requiring a solid foundation in the essentials, as well as their particular product line.

Corporate America has come to appreciate these vendor certification programs and the value they provide. Employers recognize that certifications, like university degrees, do not guarantee a level of knowledge, experience, or performance; rather, they establish a baseline for comparison. By seeking to hire vendor-certified employees, a company can assure itself that not only has it found a person skilled in networking, but also it has hired a person skilled in the specific products the company uses.

Technical professionals have also begun to recognize the value of certification and the impact it can have on their careers. By completing a certification program, professionals gain an endorsement of their skills from a major industry source. This endorsement can boost their current position, and it makes finding the next job even easier. Often a certification determines whether a first interview is even granted.

Today a certification may place you ahead of the pack. Tomorrow it will be a necessity to keep from being left in the dust.

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Signing up for an exam has become easier with a Web-based test registration system. To sign up for the CCNA exams, access Prometric's site (<http://www.2test.com> to locate a test center, or <http://www.prometric.com> to register) or Vue's site (<http://www.vue.com>), and register for the Cisco Career Certification path. You will need to get

an Internet account and password, if you do not already have one for these sites. Just select the option for first-time registration, and the Web site will walk you through that process. The registration wizard even provides maps to the testing centers, something that is not available when you call Prometric or Vue on the telephone.

Cisco's Certification Program

Cisco now has a number of certifications for the Routing and Switching career track. While Cisco recommends a series of courses for each of these certifications, they are not required. Ultimately, certification is dependent upon a candidate's passing a series of exams. With the right experience and study materials, you can pass each of these exams without taking the associated class.

Cisco has recently changed the certification track for the CCNA and CCNP exams. They have updated the exam tracks to accommodate changes in Cisco technology.

Cisco recommends that any new candidate planning to achieve Cisco certification follow the current 801 exam track. Any candidate who is currently pursuing CCNP status and who has already taken exams under the 2.0 path may continue to take the 2.0 exams to achieve the CCNP. You have one year after starting your certification track to finish all the exams. You may mix-and-match

exams, however, between the different versions. For instance, if you started your CCNP with an earlier version of the exam, but Cisco discontinued these tests, you can still finish your CCNP by completing the remaining exams that you have left to take from the most current version of the exam. For more information about Cisco exams visit Cisco on the web at <http://www.cisco.com/>.

exam

Watch

In addition to the technical objectives that are being tested for each exam, you will find much more useful information on Cisco's Web site at <http://www.cisco.com>. You will find information on becoming certified, exam-specific information, sample

test questions, and the latest news on Cisco certification. This is the most important site you will find on your journey to becoming Cisco certified. The Career and Certification sections of the web site change periodically, so be sure to check for updates regularly.

Computer-Based Testing

In a perfect world, you would be assessed for your true knowledge of a subject, not simply how you respond to a series of test questions. But life isn't perfect, and it just isn't practical to evaluate everyone's knowledge on a one-to-one basis. (Cisco actually does have a one-to-one evaluation, but it's reserved for the CCIE Laboratory exam).

For the majority of its certifications, Cisco evaluates candidates using a computer-based testing service operated by Prometric or Vue. This service is quite popular in the industry, and it is used for a number of vendor certification programs, including Novell's CNE and Microsoft's MCSE. Thanks to Prometric's and Vue's large number of facilities, exams can be administered worldwide, generally in the same town as a

prospective candidate.

For the most part, Prometric and Vue exams work similarly from vendor to vendor. However, there is an important fact to know about Cisco's exams: They use the traditional test format, not the newer adaptive format. This allows Cisco to choose an appropriate number of questions on each objective in order to test your knowledge.

exam

Watch

Cisco no longer allows you to mark questions for later review—once you answer a question, you cannot go back and change your answer!

To discourage simple memorization, Cisco exams present a different set of questions every time the exam is administered. In the development of the exam, hundreds of questions are compiled and refined, using beta testers. From this large collection, a random sampling is drawn for each test. Plus, Cisco has developed simulation questions that require you to place basic configurations on Cisco devices and troubleshooting an existing network topology. These types of questions require a candidate to have hands-on, and not just book learning, experience.

Each Cisco exam has a specific number of questions and test duration. Testing time is typically generous, and the time remaining is always displayed in the corner of the testing screen, along with the number of remaining questions. If time expires during an exam, the test terminates, and incomplete answers are counted as incorrect.

At the end of the exam, your test is immediately graded, and the results are displayed on the screen. Scores for each subject area are also provided, but the system will not indicate which specific questions were missed. A report is automatically printed at the proctor's desk for your files. The test score is electronically transmitted back to Cisco.

In the end, this computer-based system of evaluation is reasonably fair. You might feel that one or two questions were poorly worded; this can certainly happen, but you shouldn't worry too much. Ultimately, it's all factored into the required passing score.

Question Types

Cisco exams pose questions in a variety of formats, most of which are discussed here. As candidates progress toward the more advanced certifications, the difficulty of the exams is intensified, through both the subject matter and the question formats.

True/False

The classic true/false question format is not used in the Cisco exams, for the obvious reason that a simple guess has a 50 percent chance of being correct. Instead, true/false questions are posed in multiple-choice format, requiring the candidate to identify the true or false statement from a group of selections.

Multiple Choice

Multiple-choice is the primary format for questions in Cisco exams. These questions may be posed in a variety of ways.

Select the Correct Answer This is the classic multiple-choice question, in which the candidate selects a single answer from a minimum of four choices. In addition to the question's wording, the choices are presented in a Windows radio

exam

Watch

In order to pass these challenging exams, you may want to talk with other test takers to determine what is being tested, and what to expect in terms of difficulty. The most helpful way to communicate with other CCNA hopefuls is the Cisco Network Professional Connection. With this bulletin-board system, you can ask questions from other members, including employees of Cisco.

These discussions cover everything imaginable concerning Cisco networking equipment and certification. Go to <http://forum.cisco.com/eforum/servlet/NetProf?page=main> to learn how to access this source of a wealth of information. Note that at the time of publication, this information was correct. Please contact Cisco directly for the most up-to-date information about Cisco's forums.

button format, in which only one answer can be selected at a time. The question will instruct you to "Select the best answer" when they are looking for just one answer.

Select the Three Correct Answers The multiple-answer version is similar to the single-choice version, but multiple answers must be provided. This is an all-or-nothing format; all the correct answers must be selected, or the entire question is incorrect. In this format, the question specifies exactly how many answers must be selected. Choices are presented in a check box format, allowing more than one answer to be selected. In addition, the testing software prevents too many answers from being selected.

Select All That Apply The open-ended version is the most difficult multiple-choice format, since the candidate does not know how many answers should be selected. As with the multiple-answer version, all the correct answers must be selected to gain credit for the question. If too many answers or not enough answers are selected, no credit is given. This format presents choices in check box format, but the testing software does not advise the candidates whether they've selected the correct number of answers. Cisco's CCIE exams have questions like this. You probably won't see any questions like this on the CCNA exam.

Freeform Response

Freeform responses are prevalent in Cisco's advanced exams, particularly where the subject focuses on router configuration and commands. In the freeform format, no choices are provided. Instead, the test prompts for user input, and the candidate must