HZ BOOKS

Cisco专业技术丛书

# CCNP Routing 2.0 学习指南 英文版

## CCNP Routing Study Guide (Exam 640-503)

（考试号：640-503）

附赠

（美）Syngress Media公司 著

机械工业出版社 China Machine Press

McGraw Hill Education

Cisco专业技术丛书

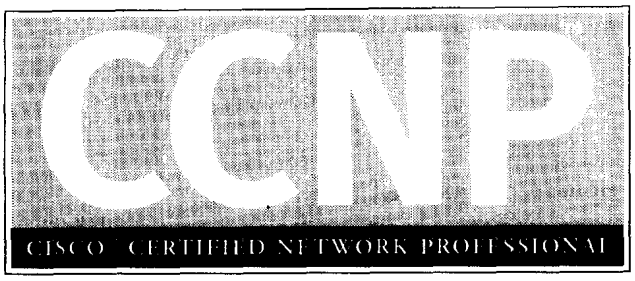
# CCNP Routing 2.0 学习指南

（考试号: 640-503）（英文版）

CCNP Routing Study Guide (Exam 640-503)

（美） Syngress Media公司 著

机械工业出版社
China Machine Press




# CCNP™ Routing Study Guide

## (Exam 640-503)

This study/training guide and/or material is not sponsored by, endorsed by or affiliated with Cisco Systems, Inc. Cisco®, Cisco Systems®, CCDA™, CCNA™, CCDP™, CCNP™, CCIE™, CCSI™, the Cisco Systems logo and the CCIE logo are trademarks or registered trademarks of Cisco Systems, Inc. in the United States and certain other countries. All other trademarks are trademarks of their respective owners.

This publication may be used in assisting students to prepare for an exam. Osborne/McGraw-Hill does not warrant that use of this publication will ensure passing any exam.

Syngress Media, Inc.

Osborne/McGraw-Hill

Berkeley New York St. Louis San Francisco Auckland Bogotá Hamburg London Madrid Mexico City
Milan Montreal New Delhi Panama City Paris São Paulo Singapore Sydney Tokyo Toronto

Syngress Media, Inc.: CCNP Routing Study Guide (Exam 640-503).

ISBN: 0-07-212543-8

Copyright © 2001 by the McGraw-Hill Companies, Inc. All rights reserved, Jointly published by China Machine Press/McGraw-Hill. This edition may be sold in the People's Republic of China only. This book cannot be re-exported and is not for sale outside the People's Republic of China.

本书英文影印版由McGraw-Hill公司授权机械工业出版社在中国大陆境内独家出版发行，未经出版者书面许可，不得以任何方式抄袭、复制或节录本书中的任何部分。

版权所有，侵权必究。

RISBN:0-07-120299-4

**本书版权登记号：图字：01-2001-2581**

**图书在版编目(CIP)数据**

CCNP Routing 2.0学习指南（考试号：640-503）（英文版）/美国西格瑞斯·梅地亚公司著. -北京：机械工业出版社，2001.7

（Cisco专业技术丛书）

书名原文：CCNP Routing Study Guide (Exam 640-503)

ISBN 7-111-09016-0

Ⅰ.C… Ⅱ.美… Ⅲ.计算机通信网-路由选择-工程技术人员-资格考核-自学参考资料-英文 Ⅳ.TN915.05

中国版本图书馆CIP数据核字（2001）第038024号

机械工业出版社（北京市西城区百万庄大街22号 邮政编码 100037）

北京第二外国语学院印刷厂印刷·新华书店北京发行所发行

2001年7月第1版第1次印刷

787mm × 1092mm1/16 · 48印张

印数：0 001-3 000册

定价：115.00元（附光盘）

凡购本书，如有倒页、脱页、缺页，由本社发行部调换

Osborne/McGraw-Hill
2600 Tenth Street
Berkeley, California 94710
U.S.A.

For information on translations or book distributors outside the U.S.A.,
or to arrange bulk purchase discounts for sales promotions, premiums, or fund-raisers, please contact Osborne/McGraw-Hill at the above address.

**CCNP™ Routing Study Guide (Exam 640-503)**

Copyright © 2001 by The McGraw-Hill Companies. All rights reserved. Printed in the United States of America. Except as permitted under the Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher, with the exception that the program listings may be entered, stored, and executed in a computer system, but they may not be reproduced for publication.

1234567890 MMN MMN 019876543210

Book p/n: 0-07-212541-1 and CD p/n: 0-07-212542-X
parts of ISBN: 0-07-212543-8

**Publisher**
Brandon A. Nordin

**Vice President and Associate Publisher**
Scott Rogers

**Editorial Director**
Gareth Hancock

**Associate Acquisitions Editor**
Timothy Green

**Editorial Management**
Syngress Media, Inc.

**Project Editor**
Maribeth A. Corona

**Acquisitions Coordinator**
Jessica Wilson

**Series Editor**
Mark Buchmann

**Technical Editor**
Paul Hogrell

**Technical Reviewer**
Frank Jimenez

**Copy Editor**
Darlene Bordwell

**Production and Editorial**
Black Hole Publishing Services

**Series Design**
Roberta Steele

**Cover Design**
Greg Scott

This book was published with Corel VENTURA™ Publisher.

Information has been obtained by Osborne/McGraw-Hill from sources believed to be reliable. However, because of the possibility of human or mechanical error by our sources, Osborne/McGraw-Hill, or others, Osborne/McGraw-Hill does not guarantee the accuracy, adequacy, or completeness of any information and is not responsible for any errors or omissions or the results obtained from use of such information.

此为试读,需要完整PDF请访问: www.ertongbook.com

# ABOUT THE CONTRIBUTORS

## About Syngress Media

Syngress Media creates books and software for Information Technology professionals seeking skill enhancement and career advancement. Its products are designed to comply with vendor and industry standard course curricula, and are optimized for certification exam preparation. You can contact Syngress via the Web at www.sygnress.com.

## Contributors

**Micah Bartell** (CCIE #5069) is currently a Network Consulting Engineer at Cisco Systems in Dallas, TX. He specializes in large-scale network design and service provider architectures. Micah is an acknowledged expert in IP routing protocols.

**Ricardo Daza** (CISSP, CCNP (LAN-ATM, Voice Access), CCDA, SCNA (Solaris 7), IBM CSE (AIX 4.3 Sys Admin, AIX Firewall), MCSE+I, MCT, CNA) is a Channel Systems Engineer for Cisco Systems (http://www.cisco.com/), working out of Cisco's Seattle, WA office. He has over 10 years of computer consulting experience and has passed nine Cisco Certified Exams including the CCIE Written Qualification Exam (lab scheduled for later this year). During his career, Ricardo has worked on many extensive and diverse projects, including, network infrastructure and security analysis, network design and implementation, network management and documentation, project management and end-user training. He is proficient in a number of different vendor products ranging from Cisco, Microsoft, Sun, Novell, IBM, Bay, and 3Com to name a but a few.

**Benoit Durand** (CCNA, CCDA, CCNP, CCDP, CCIE #5754) is the Midwest Region network engineer for Tivoli Systems (www.tivoli.com), located in Indianapolis, IN. Ben designs and integrates high-end network solutions for Tivoli's worldwide operations while maintaining his own Cisco powered network in Indianapolis. He has over 10 years of networking engineering experience in a wide range of environments. Prior to working at Tivoli, Ben worked on many high-profile military projects for the Canadian Air Force, deploying wide-area network solutions to peacekeeping forces in Kuwait, Yugoslavia, and other exotic

locations. His latest projects involve Voice-over-ATM, Virtual Private Network solutions and Wide-Area Network switching.

Ben lives with his wife Dr. Christy Snider in Kingston, GA and can be reached at ccie5754@hotmail.com.

**Richard A. Holland** (MCSE, MCP+I, CCNP, CSE) is one of the key members of the data/voice integration division of Telec Inc. (http://www.telecinc.com), located in Springfield, MO. He handles both voice and data tasks, and helps develop cost effective solutions that combine voice, data, and video across one network infrastructure as well as Cisco router/switch configuration, Windows NT administration and PBX configuration and maintenance.

Richard lives in Springfield, MO and can be reached at rholland@classicnet.net or rholland@freon.republic.k12.mo.us.

**Damon Merchant** (CCDP, CCNP, CCNA, CCDA, MCSE, MCP, CNE, and CNA) is the President of Corbus Systems, Inc., an information technology firm in Detroit, MI. He has about 10 years experience in networking. Not only is he a network engineering guru, he is also a seasoned software developer. His most recent application, Touch-Tone Administrator for NT, allows network administrators to manage their Windows NT networks from a telephone. Damon also provides training and technical workshops for IT professionals. In his spare time, Damon enjoys playing basketball, ping pong, video games, weight lifting, and candlelight dinners with his wife, Lortensia.

More information about Damon Merchant and his software products can be found at his company's Web site, www.corbus-systems.com. Damon can be e-mailed at damon@corbus-systems.com.

**Tony Olzak** (CCNP, MCSE) presently works as a consultant at Frontway in Toledo, OH. He specializes in the planning, design, and implementation of enterprise networks and is working towards the CCIE certification. In his free time Tony likes to play guitar and write music.

**Ronald A. Panus** (CCIE 5823, CCNP, CCNA, CCDA, MCSE, MCP + Internet, CNA) is employed by SBC Datacomm (Pacific Bell) as a Professional Services Senior Consultant. Ron's primary work related responsibilities include assessing, designing, and implementing Wide Area Networks for large corporations. He also mentors SBC associates that are striving to rise the technological ladder at SBC Datacomm. Ron has over 16 years of experience in the computer/networking industry. During his career, Ron has worked on a variety of projects in industries

such as NASA's space program, several of the major U.S. airlines, and many startup and established Dot Com company's.

Ron currently lives in Concord, CA with his wife Kathy and their two daughters Kasey Renee and Taylor Ann.

**Charles Riley** (CCNP, MCSE, CNE) is a Technical Solutions Consultant with Sprint Enterprise Network Services (Sprint Paranet) in Fort Worth, TX. He designs and implements networking solutions for Sprint customers. Charles has over 10 years of IT experience, much of it in networking and Cisco products. He worked for the U.S Army in many capacities, including assignments in Germany. He is currently working on his CCIE. Charles is grateful to his wife René, and his daughter Tess, for understanding and supporting his work. He can be reached at ceriley@sprintparanet.com.

**Leland Vandervort** (BA, CCNP, CCDA, CNE3.x) is Director of Network Operations of MultiMania (http://www.multimania.fr/), a web-based community and E-commerce hosting and application provider located in Paris, France, which is positioned among the top four most visited sites in France. He specializes in the design, implementation, and management of large-scale, high-performance network infrastructures for services demanding high availability, based primarily on routing and switching equipment by Cisco Systems and Foundry Networks, as well as a variety of UNIX-based platforms. He has accumulated 10 years of network design, administration, and teaching experience, ranging from radio and satellite telemetry systems, X.25 over radio and land-based links, as well as IPX and IP over a myriad of Internet architectures and technologies.

He spends his spare with aviation, playing flamenco guitar, listening to music, and teaching. He can be contacted at leland@mmania.com or leland@taranta.discpro.org.

**Derek S. Winchester** (CCNP, CCNA, MCSE, MCP+I) is a Senior Network Engineer for a major healthcare insurance provider, located in Columbia, MD. He has 9 years experience in the information systems field, the last 4 being solely dedicated to WAN and LAN technologies. Derek is currently working on his CCIE certification and his Network Security certification. Derek currently resides in Baltimore, MD with his wife Larissa and children Mataya, William, Joy, and Tarell.

## Technical Editor

**Paul Hogrell** (CCIE, CCSI, CCNP) is the Director of Internetworking Services for CertaNet, Inc. (http://www.certanet.com/). He is the Global Knowledge course director for Cisco's BSCN course and is the author and course director for the Border Gateway Protocol course. Paul teaches a variety of Cisco courses including ICND, BSCN, BCRAN, BCMSN, CIT, and CID. For the past 10 years, Paul has been a consultant helping large organizations design and implement complex routing environments. He is considered especially knowledgeable in the Border Gateway Protocol and has worked with several Tier One ISPs on their BGP peering policies.

Paul lives with his wife Kelly and their son Patrick in Canal Winchester, OH and can be reached at hogrell@certanet.com.

## Technical Reviewer

**Frank Jimenez** (CCIE #5738, CCDP, CCNP, MCNE, MCSE, MCP+I) is employed as a Systems Architect at CompuCom Systems, Inc. (http://www.compucom.com), headquartered in Dallas, TX. He has over eight years of experience designing networks to support corporate internetworking, messaging, and management solutions. Frank lives with his wife Diana and three children in Dallas, and can be contacted via email at ccie5738@hotmail.com.

## Series Editor

**Mark Buchmann** (CCIE, CCSI) is a Cisco Certified Internetworking Expert (CCIE) and has been a Certified Cisco Systems Instructor (CCSI) since 1995. He is the owner of MAB Enterprises, Inc., a company providing consulting, network support, training, and various other services. Mark is also a co-owner of www.CertaNet.com, a company providing on-line certification assistance for a variety of network career paths including all the various Cisco certifications.

In his free time he enjoys spending time with his family and boating. He currently lives in Raleigh, NC. Mark is Series Editor for Syngress Cisco books.

# ACKNOWLEDGMENTS

We would like to thank the following people:

- All the incredibly hard-working folks at Osborne/McGraw-Hill: Brandon Nordin, Scott Rogers, Timothy Green, Gareth Hancock, and Jessica Wilson.
- The Black Hole Publishing Services staff for their help in fine tuning the project.

# PREFACE

This book's primary objective is to help you prepare for and pass the CCNP Routing Exam 640-503. We believe that the only way to do this is to help you increase your knowledge and build your skills. After completing this book, you should feel confident that you have thoroughly reviewed all of the objectives that Cisco has established for the exam.

## In This Book

This book is organized around the topics covered within the CCNP Routing Exam administered at Sylvan Testing Centers.

## In Every Chapter

We'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 the chapters:

- Each 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 Certification Objective headings identify the objectives within the chapter, so you'll always know an objective when you see it!

**EXERCISE 1-1**

- **Certification Exercises** are interspersed throughout the chapters. These are step-by-step exercises. They help you master skills that are likely to be an area of focus on the exam. Don't just read through the exercises; they are hands-on practice that you should be comfortable completing. Learning by doing is an effective way to increase your competency with the language.
- **From the Classroom** sidebars describe the issues that come up most often in the training classroom setting. These sidebars give you a valuable perspective into certification- and product-related topics. They point out common mistakes and address questions that have arisen from classroom discussions.



此为试读,需要完整PDF请访问: www.ertongbook.com

- S & S sections lay out specific scenario questions and solutions in a quick-to-read format.

| SCENARIO & SOLUTION | |
|---|---|
| You have just taken over as the network administrator and have no information on the password for one of your 3600 series routers. What is a possible solution? | Perform the password recovery process on the 3600 series router. |
| You have been informed that a new remote location needs connectivity. It will require ISDN access and a four-port hub. What model of router would provide a solution here? | The 803 and 804 both provide for ISDN with a four-port hub.? |
| An OC-1 connection is being installed at your central location that now employs a 2600 series router. What changes will need to be made at the central site to accommodate this connection? | A 3600 series with the HSSI port will be needed here. |

- The **Certification Summary** is a succinct review of the chapter and a re-statement of salient points regarding the 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.
- Q&A The **Self Test** offers questions similar to those found on the certification exam. The answers to these questions, as well as explanations of the answers, can be found in Appendix A. By taking the Self Test after completing each chapter, you'll reinforce what you've learned from that chapter, while becoming familiar with the structure of the exam questions.

## 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. *Review all the S & S scenarios* for quick problem solving.
3. *Re-take the Self Tests.* Taking the tests right after you've read the chapter is a good idea, because it helps 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 you're taking the exam. (For this reason, you should mark your answers on a separate piece of paper when you go through the questions the first time.)
4. *Complete the exercises.* Did you do the exercises when you read through each chapter? If not, do them! These exercises are designed to cover exam topics, and there's no better way to get to know this material than by practicing.

# INTRODUCTION

## How to Take a Cisco Certification Examination

This introduction covers the importance of your CCNP 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. That's where 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 CCIE certifications; currently CCIE candidates can receive their CCIE in five areas: Routing and Switching, WAN Switching, ISP-Dial, SNA/IP Integration, and Design.

***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 every question 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, if you didn't pass. 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.

***Signing up for an exam has become easier with the new Web-based test registration system. To sign up for the CCNP exams, access http://www.2test.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 2test.com. 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 Sylvan Prometric on the telephone.***

# Cisco's Certification Program

Cisco now has a number of certifications for the Routing and Switching career track, as well as for the WAN 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.

Table i-1 shows the Cisco CCNP 2.0 exam track.

The Foundation Routing and Switching exam (640-509) can be taken in place of the Routing, Switching, and Remote Access exams.

As you can see, the CCNA is the foundation of the Routing and Switching track, after which candidates can pursue the Network Support path to CCNP and CCIE, or the Network Design path to CCDA, CCDP, and to CCIE Design.

TABLE i-1

CCNP 2.0 Track

| Exam Name | Exam # |
|---|---|
| CCNA 2.0 | 640-507 |
| Routing | 640-503 |
| Switching | 640-504 |
| Remote Access | 640-505 |
| Support | 640-506 |

Please note that if you have taken CCNP exams from the 1.0 track (Exam #'s 640-403, 640-404, 640-405, 640-440) you may take the remainder of your exams from the 2.0 track, but you will be certified as a CCNP 1.0.

***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/warp/public/10/wwtraining/certprog. 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.***

***When I find myself stumped answering multiple-choice questions, I use my scratch paper to write down the two or three answers I consider the strongest, and then underline the answer I feel is most likely correct. Here is an example of what my scratch paper looks like when I've gone through the test once:***

***21. B or C***
***33. A or C***

***It is extremely helpful to you mark the question and then continue. You can return to the question and immediately pick up your thought process where you left off. Use this technique to avoid having to reread and rethink questions.***
***You will also need to use your scratch paper during complex, text-based scenario questions to create visual images to help you understand the question. For example, during the CCNP exam you will need to draw multiple networks and the connections between them or calculate a subnet mask for a given network. By drawing the layout or working the calculation while you are interpreting the question, you may find a hint that you would not have found without your own visual aid. This technique is especially helpful if you are a visual learner.***

# 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

此为试读,需要完整PDF请访问: www.ertongbook.com