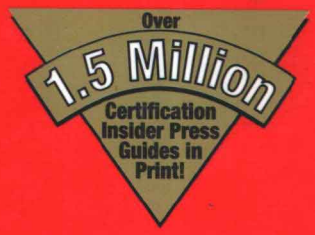
The Smartest Way To Get Certified™

CCNP 考前冲刺

The perfect supplement to all certification study guides



Cisco Internetwork Troubleshooting

Exam 640-440

Cisco Certified Network Professional

Matthew E. Luallen

中国水利水电出版社
www.waterpub.com.cn
印刷工业出版社

CCNP Cisco Internetwork Troubleshooting

Matthew Luallen

中国水利水电出版社

图书在版编目（CIP）数据

CCNP Cisco Internetwork Troubleshooting考前冲刺/（美）洛兰（Luallen, M. E.）著. －北京：中国水利水电出版社，2001.1
ISBN 7-5084-0548-X

Ⅰ. C... Ⅱ. 洛... Ⅲ. 计算机网络－故障修复－工程技术人员－资格考核－自学参考资料－英文 Ⅳ. TP393

中国版本图书馆CIP数据核字（2000）第82256号

书　　名	CCNP Cisco Internetwork Troubleshooting 考前冲刺
作　　者	[美] Matthew E. Luallen
出版、发行	中国水利水电出版社（北京市三里河路6号 100044） 网址：www.waterpub.com.cn E-mail：sale@waterpub.com.cn 电话：(010) 63202266（总机）、68331835（发行部）
销　　售	全国各地新华书店
排　　版	北京万水电子信息有限公司
印　　刷	北京市天竺颖华印刷厂
规　　格	787×1092毫米　16开本　29.25印张　675千字
版　　次	2001年1月第一版　2001年1月北京第一次印刷
印　　数	0001—2000册
定　　价	47.00元

凡购买我社图书，如有缺页、倒页、脱页的，本社发行部负责调换

Our readers tell us why

Certification Insider Press is #1

After reading another company's book, I wasn't sure if I would pass, so I bought an *Exam Cram*. Your book filled in all the gaps that the other book had left out. I passed the test on the first try!

—Johnathan Corbett

After using other study materials, I still felt something was missing. I found out about the *Exam Cram* series and ordered some books, and I'm glad I did. With the help of your books, I literally passed all of my six MCSE exams in six consecutive weeks. Now, I'm on my way to my MCSE+I certification, and my *Exam Cram* is still with me.

—Dr. Syed Anis Hamdani, *MCP+I, MCSE*

I recently received my CNE, and it would not have been possible without *Exam Cram*. I found your guides INDISPENSABLE. Thank you, *Exam Cram*.

—Mayesh Nayak

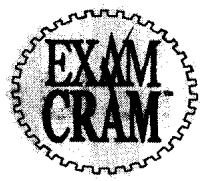
I would like to commend you on the great job you guys did in putting together the materials for the *Core Four Pack*. I have passed all four tests on the first try, and I owe it all to your books. Keep up the good work!

—Kimberly Hall

I just passed my MOUS Access Expert exam. Your books were instrumental in my passing. The layout was easy to follow and the pictures gave confirmation that I was still on track. I am moving on to the Excel exam next. Guess which books are at the top of my shopping list?

—Derek Smith

See for yourself why we're #1 and drop us a line at cipq@coriolis.com—we look forward to hearing about your testing successes!



CCNP Cisco Internetwork Troubleshooting

The Cram Sheet

This Cram Sheet contains the distilled, key facts about the Cisco Internetwork Troubleshooting exam. Review this information last thing before you enter the test room, paying special attention to those areas where you feel you need the most review. You can transfer any of these facts from your head onto a blank piece of paper before beginning the exam.

GENERAL TROUBLESHOOTING RESOURCES

1. **Network monitors** Monitor the network for performance and degradation evaluation.
2. **Protocol analyzers** Provide realtime traffic and packet analysis and dissemination.
3. **Breakout boxes** Verify cable pinouts on serially connected devices.
4. **Cable testers** Check the physical continuity and termination of the cable infrastructure.
5. **Digital multimeters** Take measurements of voltage, current, and resistance.
6. **Time domain reflectors** Send pulses of current on a metallic cable to identify shorts and breaks.
7. **Optical time domain reflectors** Send optical pulses of light to test fiber-optic media.
8. **Oscilloscopes** Can be used to isolate and verify cable shorts, bends, and attenuation.
9. The troubleshooting model:
   - Define the problem
   - Gather facts
   - Consider possibilities
   - Create an action plan
   - Implement action plan
   - Observe results
   - Document solution
10. **System logging messages** System notification and error messages that are sent to the console port by default.

CISCO NETWORK MANAGEMENT SOFTWARE

11. **CiscoWorks 2000** Provides realtime device-level monitoring and fault and configuration management, as well as package integration with third-party products such as HP Openview.
12. **Cisco Resource Manager Essentials** Provides inventory management, change audit reports, and a system log analyzer.
13. **CiscoWorks for Switched Internetworks Campus** Provides a GUI interface for Catalyst switch management.
14. **TrafficDirector** Provides traffic-analysis tools and RMON agent data collection.
15. **VlanDirector** An SNMP-based GUI management interface for configuring Catalyst switch VLANs.
16. **Netsys Baseliner** A simulation and modeling tool that can simulate production network performance.

CISCO CONNECTION ONLINE

17. **Cisco Marketplace** Allows for management and purchasing of product orders, maintenance contracts, and warranty information.
18. **Software Center** Contains major online upgrades and maintenance releases of Cisco software products.
19. **Documentation** Provides complete Cisco product catalogs and configuration manuals.
20. **Technical Assistance Center (TAC)** Provides around-the-clock support for all Cisco products.

21. **Stack Decoder** Helps you to interpret the low-level process information of a Cisco router shown by the **show stack** command.
22. **Bug Navigator II** Allows you to perform keyword searches and create profiles to generate bug reports.
23. **Troubleshooting Assistant** Can be used to diagnose common troubleshooting scenarios.
24. **Open Forum** An online question-and-answer whiteboard for Cisco maintenance contract customers.

CATALYST 5000 TROUBLESHOOTING

25. **POST** Self-diagnostics performed on the internal system architecture.
26. **Module LEDs** Indicate the status of the system.
27. **SPAN** Uses the **set span** command to copy packets to another switch port for analysis.
28. Switching methods:
    - **Fast-forward** Begins forwarding the packets immediately after receiving the destination address.
    - **Fragment-free** Checks for collision fragments prior to sending the packet.
    - **Store-and-forward** Stores the entire packet and checks for consistency before sending it.
29. **show cam dynamic** Displays CAM entries.
30. **show config** Displays the system configuration.
31. **show interface** Displays information about the SC0 and SL0 interfaces.
32. **show log** Displays the errors log.
33. **show modules** Displays installed module information.
34. **show port** Displays port information by individual port, module, or entire system.
35. **show spantree** Displays spanning tree information for a VLAN or port.
36. **show system** Displays system information.
37. **show test** Displays diagnostic test results.
38. **show trunk** Displays trunking information by individual port, module, or entire system.
39. **show version** Displays software and hardware versions.
40. **show vlans** Displays information about configured VLANs.
41. **show vtp domain** Displays VTP domain information.
42. **clear arp** Deletes entries in the ARP cache.
43. **clear cam** Deletes entries in the CAM table.
44. **clear counters** Clears all MAC and port counters.
45. **clear ip route** Clears IP routing table entries.
46. **clear port** Clears all MAC or protocol filters on a port.
47. **clear trunk** Resets all trunk ports and clears all information from the trunking table.
48. **clear vlan** Deletes a VLAN from a VTP management domain.
49. **debug spanning events** Displays information on spanning tree topology changes.
50. **debug vlan packets** Displays packet VLAN errors.

CISCO ROUTER TROUBLESHOOTING COMMANDS

51. **Switching methods** There are six different types of switching methods: Process, Fast, Optimum, Autonomous, Silicon, and NetFlow. To correctly debug a system, Process switching must be enabled.
52. **show buffers** Displays router buffer pool statistics.
53. **show memory** Displays free and allocated memory statistics.
54. **show processes** Displays information about active processes.
55. **show running-config** Lists the current running configuration.
56. **show startup-config** Lists the startup configuration stored in FLASH or NVRAM.
57. **show tech-support** Displays a detailed list of the results of several **show** commands; useful for the TAC.
58. **show version** Displays the Cisco IOS software and hardware information.
59. **write core** Generates a full memory image that can be useful for the TAC.

PHYSICAL AND DATA LINK TROUBLESHOOTING

60. **show cdp neighbors** Displays information about directly connected Cisco devices for layers 1, 2, and 3.
61. **show controllers *device*** Displays the memory handling and error values of the specified device (cbus, fddi, serial, or token).
62. **show interfaces *interface*** Displays the current status and general statistics of the specified interface (atm, bri, ethernet, fddi, serial, tokenring, or vlan).
63. **clear counters *interface*** Resets all counters associated with the specified interface (atm, bri, ethernet, fddi, serial, or tokenring).

64. Distinguishing Ethernet encapsulation:
    - If the type/length field > 0x05dc, the frame is Ethernet II.
    - If the IPX header (0xFFFF) follows the length field, the frame is 802.3 (RAW).
    - If the byte following the length field has a value of 0xAA, the frame is SNAP.
    - Otherwise, the frame is 802.2.

ISDN REFERENCE CONFIGURATION

65. **TE1** ISDN terminal equipment located on the customer's premises.
66. **TE2** Non-ISDN terminal equipment located on the customer's premises.
67. **TA** Terminal adapters are required for non-ISDN (TE2) equipment.
68. **NT1** Network termination 1 performs functions similar to a modem.
69. **LT** Line termination is a physical connection to an ISDN switch.
70. **ET** Exchange termination is the logical connection to the provider's network.
71. **R** A conceptual interface between a TE2 and a TA.
72. **S/T** A conceptual interface between a TE1 and an NT1.
73. **U** A conceptual interface between an NT1 and an LT.
74. **V** The termination point within the local loop between the LT and ET.

FRAME RELAY TROUBLESHOOTING COMMANDS

75. **show frame-relay lmi** Displays LMI statistics.
76. **show frame-relay map** Displays the mappings between Network layer protocols and DLCIs.
77. **show frame-relay pvc** Displays detailed information on each configured DLCI.
78. **debug frame-relay events** Enables logging of transmission or reception events.
79. **debug frame-relay lmi** Enables logging of LMI packets sent between the local and remote FRAD.
80. **debug frame-relay packets** Enables logging of all packets sent to this device within the frame relay network.
81. **debug serial interface** Displays information about events occurring on a serial interface.
82. **clear frame-relay-inarp** Clears all dynamically created frame relay maps.

ISDN TROUBLESHOOTING COMMANDS

83. **show controller bri** Displays the internal variable settings and hardware logic.
84. **show dialer interfaces bri** Displays information about configured DDR settings.
85. **show dialer map** Displays statically and dynamically configured dialer map statements.
86. **show interfaces bri** Displays BRI interface statistics.
87. **show isdn status** Displays the status of the three ISDN layers and the locally configured switch type.
88. **show ppp multilink** Displays the multilink PPP configuration.
89. **debug bri** Displays Physical layer activation of ISDN B channels.
90. **debug dialer events** Displays DDR information.
91. **debug isdn events** Displays Q.931 call establishment information.
92. **debug isdn q921** Displays Q.921 Data Link layer access procedures.
93. **debug isdn q931** Displays Q.931 Network layer call setup and teardown.
94. **debug ppp authentication** Displays CHAP and PAP authentication packets.
95. **debug ppp negotiation** Displays LCP and PPP negotiation packets.
96. **debug ppp packet** Displays all PPP packets.
97. **clear dialer** Resets all dialer statistics.

COMMANDS

98. **show *protocol* access-lists** Displays the contents of all current protocol access lists.
99. **show *protocol* interfaces** Displays the status and statistics for all protocol-configured interfaces.
100. **show *protocol* interfaces brief** Displays a short table of all protocol-configured interfaces.
101. **show *protocol* route** Displays protocol routing table entries.
102. **show *protocol* traffic** Displays protocol traffic statistics.
103. **debug *protocol* packet** Displays protocol packet information.
104. **debug *protocol* routing** Displays protocol routing messages.

IP TROUBLESHOOTING COMMANDS

105. **show ip arp** Displays the internal IP ARP cache.
106. **show ip eigrp interfaces** Displays EIGRP routing protocol information.
107. **show ip mroute** Displays the IP multicast routing table.
108. **show ip ospf interfaces** Lists all interfaces configured within the OSPF routing process.
109. **show ip protocols** Displays all routing protocols, their associated timers and interfaces, and other valuable information.
110. **debug arp** Displays ARP transactions.
111. **debug ip eigrp** Displays EIGRP packets.
112. **debug ip icmp** Displays ICMP transactions.
113. **debug ip igrp events** Displays IGRP routing messages.
114. **debug ip ospf events** Displays OSPF-related events.
115. **debug ip rip** Displays IP RIP messages.
116. **clear arp-cache** Deletes all entries from the local ARP cache.
117. **clear ip route** Deletes the active routing table.

IPX TROUBLESHOOTING COMMANDS

118. **show ipx eigrp interfaces** Displays all EIGRP-enabled interfaces.
119. **show ipx eigrp neighbors** Displays all directly connected EIGRP neighbors.
120. **show ipx nlsp database** Displays the contents of the local router's NLSP database.
121. **show ipx nlsp neighbors** Displays all directly connected NLSP neighbors.
122. **show ipx servers** Displays a list of all SAP services.
123. **debug ipx ipxwan** Displays IPXWAN events.
124. **debug ipx sap** Displays SAP update packet contents.
125. **clear ipx cache** Removes entries from the fast-switching cache.
126. **clear ipx eigrp neighbors** Removes entries from the EIGRP neighbor table.
127. **clear ipx nlsp neighbors** Removes entries from the NLSP neighbor table.
128. **clear ipx route** Deletes the active routing table.

APPLETALK TROUBLESHOOTING COMMANDS

129. **show appletalk adjacent-routes** Displays directly connected and neighboring routers' AppleTalk routes.
130. **show appletalk arp** Displays the internal AppleTalk ARP cache.
131. **show appletalk eigrp neighbors** Displays all directly connected EIGRP neighbors.
132. **show appletalk globals** Displays a report of several general AppleTalk settings.
133. **show appletalk nbp** Displays the NBP lookup table.
134. **show appletalk neighbors** Displays a list of all directly connected neighbors learned by AppleTalk routing protocols.
135. **show appletalk zone** Displays a list of AppleTalk zones.
136. **debug apple arp** Displays local AARP requests and replies.
137. **debug apple events** Displays local AppleTalk events.
138. **debug apple nbp** Displays NBP packets.
139. **debug apple zip** Displays ZIP packets.
140. **clear appletalk arp** Deletes all entries from the local ARP cache.
141. **clear appletalk eigrp neighbors** Removes entries from the EIGRP neighbor table.
142. **clear appletalk interface** Resets the software logic of a specific AppleTalk interface.
143. **clear appletalk nbp** Deletes all or a specific NBP table entry.
144. **clear appletalk neighbor** Deletes all entries of a specific neighbor entry.
145. **clear appletalk route** Deletes a specific routing table entry.
146. **clear appletalk route-cache** Removes entries from the fast-switching cache.
147. **clear appletalk traffic** Resets the AppleTalk traffic counters.
148. **test appletalk** Tests NBP lookups and NBP confirms.

I dedicate this book to my brother, Tim, who began laying the groundwork years ago for me through continuous support and guidance year after year. I still remember playing Empire on those "fast" 386 machines and those 10 megabyte file transfers on 9600-baud modems. I am sure glad that mom and dad had to pay for those rather than us. And without your ongoing help, from summer employment to your suffering through my inadvertently performing "format c:" instead of "format a:" on a couple of computers, I would not be where I am today. I also feel bound to mention to everyone that is near and dear to me, thanks for understanding all of the times I had to stay home to work on this book, and miss out on the family events. I would also like to say a special thank you to Jill, a very special woman in my life who has endured the long hours with me.

About The Author

Matthew E. Luallen has earned MCSE+I, CCNP, and A+ Certified Technician certifications. He has also passed the CCIE written examination and is on track to pass the CCIE laboratory later this year.

In 1995, Matthew joined the networking rush and began his own Internet development company, The Pages Online, for which he was the controlling shareholder for two years. He graduated in 1997 from the University of Illinois at Urbana Champaign with a bachelor's degree in Industrial Engineering and a minor in Computer Science. For the past year and a half he has served as a network engineer for Argonne National Laboratory, a U.S. Department of Energy research facility located in Chicago, Illinois.

When Matthew is not internetworking, he spends time enjoying life through several electronic and athletic hobbies. Matthew currently lives in Lombard, Illinois, and continues to be a die-hard Cubs fan and a longstanding Bull's fan, even with the recent retirement of Michael Jordan. You can reach Matthew by email at **meluallen@yahoo.com**.

Acknowledgments

I would like to say thanks to all of the people at The Coriolis Group, without whom I would have never been able to complete this book. Toni, I am not sure if you fully understand the value that you added to this book. I don't think that I can thank you enough for helping me see the light (and we both know that a few times I really needed that). I would also like to say thanks to Bart Reed for catching so many of my mistakes—I bet that you thought I would never format the book correctly. And to everyone at The Coriolis Group that worked on this book behind the scenes, including Wendy Littley, the Production Coordinator; April Nielsen, the Layout Designer; and Jesse Dunn, the Cover Designer—your efforts are greatly appreciated. Also, thanks to Michael Jennings for doing an excellent job technical editing and congratulations on passing the CCIE written exam. Last, but certainly not least, thank you to Shari Jo Hehr for making this book possible and tracking me down to work on it.

Introduction

Welcome to the *CCNP Cisco Internetwork Troubleshooting Exam Cram*! This book aims to help you get ready to take—and pass—the Cisco career certification test 640-440, "Cisco Internetwork Troubleshooting (CIT)". This Introduction explains Cisco's certification programs in general and talks about how the Exam Cram series prepare for Cisco's career certification exams.

Exam Cram books help you understand and appreciate the subjects and materials you need to pass Cisco career certification exams. Exam Crams are aimed strictly at test preparation and review. They do not teach you everything you need to know about a topic (such as the ins and outs of managing a Cisco router implementation). Instead, we present and dissect the questions and problems we've found that you're likely to encounter on a test. We've worked from Cisco's own training materials, preparation guides, and tests, and from a battery of third-party test preparation tools. Our aim is to bring together as much information as possible about Cisco certification exams.

Nevertheless, to completely prepare yourself for any Cisco test, we recommend that you begin your studies with some instructor-led classroom training. You should also pick up and read one of the many study guides available from Cisco or third-party vendors, including The Coriolis Group's Exam Prep series. We also strongly recommend that you install, configure, and fool around with the Internetwork Operating System (IOS) software or environment that you'll be tested on, because nothing beats hands-on experience and familiarity when it comes to understanding the questions you're likely to encounter on a certification test. Book learning is essential, but hands-on experience is the best teacher of all!

The Cisco Career Certification Program

The Cisco Career Certification program is relatively new on the internetworking scene. The best place to keep tabs on it is the Cisco Training Web site, at **www.cisco.com/certifications/**. Before Cisco developed this program, Cisco Certified Internetworking Expert (CCIE) certification was the only available

Cisco certification. Although CCIE certification is still the most coveted and prestigious certification that Cisco offers (possibly the most prestigious in the internetworking industry), lower-level certifications are now available as stepping stones on the road to the CCIE. The Cisco Career Certification program includes four certifications in addition to the CCIE, each with its own new acronym (see Table 1). If you're a fan of alphabet soup after your name, you'll like this program:

- **Cisco Certified Network Associate (CCNA)** The CCNA is the first career certification. It consists of a single exam that covers information from the basic-level classes such as Introduction to Cisco Router Configuration (ICRC) and Cisco LAN Switch Configuration (CLSC). Cisco also offers a class aimed at the CCNA certification known as Cisco Routing and LAN Switching (CRLS). You must obtain CCNA certification before you can get any other Cisco certification.

- **Cisco Certified Design Associate (CCDA)** The CCDA is a basic certification aimed at designers of high-level internetworks. The CCDA consists of a single exam that covers information from both the Designing Cisco Networks (DCN) and the Cisco Internetwork Design (CID) courses. You must get CCDA certification before you can move up to the CCDP certification (discussed shortly).

- **Cisco Certified Network Professional (CCNP)** The CCNP is a more advanced certification. It is not an easy certification to obtain. To earn CCNP status, you must be a CCNA in good standing, and you must pass two additional tests. The first is the Foundation Routing/Switching exam (number 640-409), which consists of information from the Advanced Cisco Router Configuration (ACRC) course, Configuring LAN Switch Configuration (CLSC), and Configuring, Maintaining and Troubleshooting Dial-up (CMTD). If you're not up for a long test—this one takes from two to three hours— you can take each of the exams for these classes individually. The second test that you must pass to complete CCNP certification is the Cisco Internetwork Troubleshooting (CIT) exam (covered in this book).

  Once you have completed the CCNP certification, you can further your career (not to mention beef up your resume) by branching out and passing one of the CCNP specialization exams. These include:

  - Security (Managing Cisco Network Security—MCNS)
  - LAN ATM (Campus Asynchronous Transfer Mode—CATM)
  - Voice Access (Cisco Voice over Frame Relay, ATM and IP—CVOICE)

Table 1 Cisco CCNA, CCNP, And CCIE Requirements*

CCNA

Only 1 Exam Required	
Exam 640-407	CCNA (Cisco Certified Network Associate)

CCNP

All 5 Of These Are Required	
Exam 640-407	CCNA (Cisco Certified Network Associate)
Exam 640-403	ACRC 11.3 (Advanced Cisco Router Configuration)
Exam 640-404	CLSC (Cisco LAN Switch Configuration)
Exam 640-405	CMTD (Configuring, Monitoring, and Troubleshooting Dial-up Services)
Exam 640-440	CIT (Cisco Internetwork Troubleshooting)

CCIE

1 Written Exam And 1 Lab Exam Required	
Exam 350-001	CCIE Routing and Switching Qualification
Lab Exam	CCIE Routing and Switching Laboratory

* This is not a complete listing. We have included only those tests needed for the Routing and Switching track.

- SNA Solutions (SNA for Multiprotocol Administrators—SNAM—and Data Link Switching plus—DLSW)
- Network Management (Managing Cisco Routed Internetworks—MCRI—and Managing Cisco Switched Internetworks—MCSI)

- **Cisco Certified Design Professional (CCDP)** The CCDP is another advanced certification. It's aimed at high-level internetwork designers who must understand the intricate facets of putting together a well-laid-out network. The first step in the certification process is to obtain the CCNA and CCDA certifications (yes, both). As with the CCNP, you must pass the Foundation Routing/Switching exam or pass the ACRC, CLSC, and CMTD exams individually. Once you meet those objectives, you must pass the CID exam to complete the certification.

- **Cisco Certified Internetworking Expert (CCIE)** The CCIE is possibly the most influential certification in the internetworking industry today. It is famous (or infamous) for its difficulty and for how easily it holds its seekers at bay. The certification requires only one written exam, which qualifies you to schedule time at a Cisco campus to demonstrate your knowledge in a two-day practical laboratory setting. You must pass the lab with a score of at least 80 percent to become a CCIE. Recent statistics have put the passing rates at roughly 2 percent for first attempts and 35

through 50 percent overall. Once you achieve CCIE certification, you must recertify every two years by passing a written exam administered by Cisco.

- **Certified Cisco Systems Instructor (CCSI)** To obtain status as a CCSI, you must be employed (either permanently or by contract) by a Cisco Training Partner in good standing, such as GeoTrain Corporation. That training partner must sponsor you through Cisco's Instructor Certification Program, and you must pass the two-day program that Cisco administers at a Cisco campus. You can expand on CCSI certification on a class-by-class basis. Instructors must demonstrate competency with each class they are to teach thereafter by completing the written exam that goes with each class. Cisco also requires that instructors maintain a high customer satisfaction rating, or they will face decertification.

Taking A Certification Exam

Alas, testing is not free. Each computer-based exam costs between $100 and $200, and the CCIE laboratory exam costs $1,000. If you do not pass, you must pay the testing fee each time you retake the test. In the United States and Canada, computerized tests are administered by Sylvan Prometric. Sylvan Prometric can be reached at (800) 755-3926 or (800) 204-EXAM, any time from 7:00 A.M. to 6:00 P.M., central time, Monday through Friday. You can also try (612) 896-7000 or (612) 820-5707. CCIE laboratory exams are administered by Cisco Systems and can be scheduled by calling the CCIE lab exam administrator for the appropriate location.

To schedule an exam, call at least one day in advance. To cancel or reschedule an exam, you must call at least 24 hours before the scheduled test time (or you may be charged regardless). When calling Sylvan Prometric, have the following information ready for the telesales staffer who handles your call:

- Your name, organization, and mailing address.
- Your Cisco Test ID. (For most U.S. citizens, this is your Social Security number. Citizens of other nations can use their taxpayer IDs or make other arrangements with the order taker.)
- The name and number of the exam you wish to take. For this book, the exam name is "Cisco Internetwork Troubleshooting (CIT)," and the exam number is 640-440.
- A method of payment. The most convenient approach is to supply a valid credit card number with sufficient available credit. Otherwise,

Sylvan Prometric must receive check, money order, or purchase order payments before you can schedule a test. (If you're not paying by credit card, ask your order taker for more details.)

When you show up to take a test, try to arrive at least 15 minutes before the scheduled time slot. You must bring and supply two forms of identification, one of which must be a photo ID.

All exams are completely closed book. In fact, you will not be permitted to take anything with you into the testing area. However, you are furnished with a blank sheet of paper and a pen. We suggest that you immediately write down on that sheet of paper all the information you've memorized for the test. Although the amount of time you have to actually take the exam is limited, it does not start until you tell it to, so you can spend as much time as necessary writing notes on the provided paper. If you think you will need more paper than what is provided, ask the test center administrator before entering the exam room. You must return all pages prior to exiting the testing center.

In Exam Cram books, the information that we suggest you write down appears on a tear-out sheet inside the front cover of each book. You will have some time to compose yourself, to record this information, and even to take a sample orientation exam before you must begin the real thing. We suggest you take the orientation test before taking your first exam, but because they're all more or less identical in layout, behavior, and controls, you probably won't need to do this more than once.

When you complete a Cisco certification exam, the software will tell you whether you've passed or failed. All tests are scored on a basis of 100 percent, and results are broken into several topic areas. Even if you fail, we suggest you ask for—and keep—the detailed report that the test administrator should print for you. You can use this report to help you prepare for another go-round, if needed. Once you see your score, you have the option of printing additional copies of the score report. It is a good idea to have it print twice.

If you need to retake an exam, you'll have to call Sylvan Prometric, schedule a new test date, and pay another testing fee. Cisco has recently implemented a new policy regarding failed tests. The first time you fail a test, you can retake the test the next day. However, if you fail a second time, you must wait 14 days before retaking that test. The 14-day waiting period is in effect for all tests after the first failure.

Tracking Cisco Certification Status

As soon as you pass any Cisco exam (congratulations!), you must complete a certification agreement. You can do so online at the Certification Tracking Web site (**www.galton.com/~cisco/**), or you can mail a hard copy of the agreement to Cisco's certification authority. You will not be certified until you complete a certification agreement and Cisco receives it in one form or the other.

The Certification Tracking Web site also allows you to view your certification information. Cisco will contact you via email and explain it and its use. Once you are registered into one of the career certification tracks, you will be given a login on this site, which is administered by Galton, a third-party company that has no in-depth affiliation with Cisco or its products. Galton's information comes directly from Sylvan Prometric, the exam-administration company for much of the computing industry.

Once you pass the necessary exam(s) for a particular certification and complete the certification agreement, you'll be certified. Official certification normally takes anywhere from four to six weeks, so don't expect to get your credentials overnight. When the package arrives, it will include a Welcome Kit that contains a number of elements, including:

- A Cisco certificate stating that you have completed the certification requirements, suitable for framing, along with a laminated Cisco Career Certification identification card with your certification number on it.
- A promotional item, which varies based on the certification. For example, for CCNA, you will receive a CCNA shirt, whereas a CCDA gets you a leather (or reasonable facsimile thereof) organizer folder.

Many people believe that the benefits of the Cisco career certifications go well beyond the perks that Cisco provides to newly anointed members of this elite group. There seem to be more and more job listings that request or require applicants to have a CCNA, CCDA, CCNP, CCDP, and so on, and many individuals who complete the program can qualify for increases in pay or responsibility. In fact, Cisco has started to implement requirements for its Value Added Resellers: To attain and keep silver, gold, or higher status, they must maintain a certain number of CCNA, CCDA, CCNP, CCDP, and CCIE employees on staff. There's a very high demand and low supply of Cisco talent in the industry overall. As an official recognition of hard work and broad knowledge, a Cisco career certification credential is a badge of honor in many IT organizations.