

HOW TO PASS

THE CCIE ROUTING & SWITCHING

Lab Exam

1

Getting
Started

Passing the CCIE R&S Version 4 lab exam proves to be the most challenging endeavor many have sought out to accomplish. I find that it requires great strength in four cornerstones for success. These cornerstones are:

- Technical Knowledge
- Strategy
- Psychology
- Physical Wellness

The first initial mistake students tend to make is to focus too much on the technical knowledge piece as they completely disregard the others. While this paper will recommend you start with an analysis of your technical skills in the various exam areas, you should also begin thinking about how you will approach your study and lab exam strategies, how you will keep the proper psychological mindset for passing the exam, and how you will maintain your physical wellness throughout the process.

When you first start your journey, you should assess your strengths and weaknesses in relation to the technologies and topics covered in the CCIE Lab Exam. It is vital that you are honest with yourself when making this assessment. For this important first step, you should examine each topic provided in our Expanded Blueprint for the CCIE R&S Version 4 exam and rate yourself on a scale of 1 to 5. 1 indicated that you have never heard of the technology or topic before, while 5 indicates you have mastered the Theory, Configuration, Verification, and Troubleshooting of that topic.

Now that you have gone through the checklist, you know where you are at and you know where you are going. Some will have a head start in this journey through on the job networking experience and some will be taking their first step. No matter where you are in your journey, the products and services provided in the INE Version 4.0 Training Program will ensure that you will complete your journey.

• INE TIP

No matter where you are in your journey, the products and services provided in the INE Version 4.0 Training Program will ensure that you will complete your journey.

Do not look for "short cuts" on your journey. Stick to the path we have outlined for you here and it will help you not only in your journey to become a CCIE but also in your career as a networking engineer. During your journey stay away from cheat sheets, brain dumps, gotcha lists, etc. The material you have access to here, combined with the Cisco Documentation, is everything you need to complete your journey. All of the products and services are designed as an important step in your journey. The INE's Version 4.0 Program is not just a bunch of products and services that are bundled together with no rhyme or reason. All of the products and services are developed by the elite instructor team here at INE. We put our names on the front of everything we offer and personally stand behind our products and services.

You may get discouraged at times during your journey and think that it may not be worth it. Don't give up or stray from your path and you will complete the journey as hundreds of our customers have done before you.

The average candidate attempts the CCIE lab 2.7 times before passing. You want to have a personal goal to pass the lab the first time or the second at the latest. If you have properly followed the path we have given you this should be an obtainable goal.

I would like to add a couple more items here before you begin. As I said earlier, you must be honest in your assessment of your knowledge. There isn't a problem in thinking you are knowledgeable about a topic but there is a problem when you think you are more knowledgeable than you really are. I've personally seen people take the CCIE Lab 7 or 8 times before passing because of this single problem. They would never step back to assess where they were and why they failed. They believed they just needed more practice labs and would buy every workbook on the market. You do not want to fall into this trap. You want to pass the CCIE lab exam as a byproduct of learning the technologies and topics covered. You do not want to pass because you can remember seeing a scenario in a practice lab you did.

Congratulations on beginning your journey!

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Three
Step
Learning
Process

The recommended learning process you should take is what I define as a three step learning process. The first step is to get an understanding of what the technology or feature does and why it was implemented. This step should be done from a vendor neutral point of view if possible. This can be done by utilizing the Cisco Documentation, our Volume 1 Workbook, a Core Knowledge Simulator Link, the various books and white papers, or the RFCs freely available on the Internet.

• INE TIP

1. *Understand the Technology*
2. *Learn the Implementation*
3. *Experience the Technology*

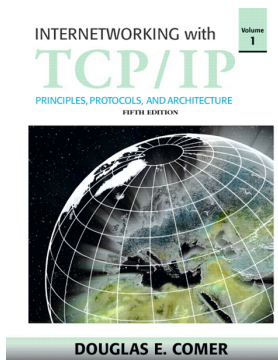
The second step is to learn how Cisco has implemented the particular technology or feature. You can do this by using the numerous configuration examples, tech tips, and documentation available on the Internet and Cisco's website along with Cisco Press books. Do not underestimate the wealth of information available in the Cisco Documentation.

Now that you have an understanding of the why and the how, it's time to take the third step by gaining experience with the technology or feature through hands on practice. Although anything is pretty much theoretically possible, you can not expect to pass the CCIE Lab Exam without hundreds of hours of hands-on practice and/or real world experience on the routers and switches. Many students report that this can add up to 400 to 700 hours of command line practice on the devices. In the CCIE lab they will be trying to test your experience and the main way they test experience is by seeing how familiar you are with the technologies and topics. Generally speaking, someone who is more familiar will also be faster. By faster I do not mean that they can type faster, but that they can do a task faster than someone without the equivalent experience. So do not worry about your keyboard typing speed if it is not the fastest.

If we break these three steps down into time frames, the first step would consume about 15% of total time, the second step about 20%, and the last step about 65% of total time. This means that for every one hour of reading about a technology or topic, you should expect to spend two hours doing hands-on practice.

Recommended Reading Prior to Starting

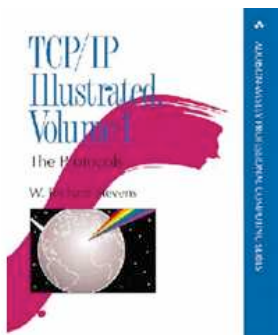
At the CCIE candidate stage, you are assumed to have at least a CCNP level of knowledge and/or experience before starting your lab preparation. Most of this knowledge can also be found in the books in our recommended reading section. The books below are designed to ensure that you solidify your foundation in general networking. As with a real building, the foundation you put down now will determine the height of the building that can be built upon it in the future. Take the time to read these books and solidify your foundation.



Internetworking with TCP/IP, Vol 1 by Douglas E. Comer
The Protocols (TCP/IP Illustrated, Volume 1) by W. Richard Stevens

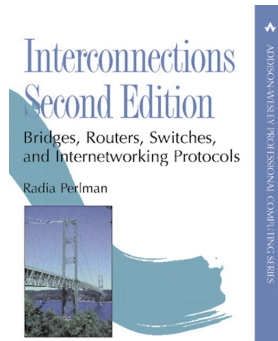
Based on your personal style of learning, you can use either one of these books as a starting point. Ideally you would read both, but just one is sufficient.

Note: If you select "The Protocols" by Stevens you can skip chapter 29 (NFS: Network File System). If you select Internetworking with TCP/IP by Comer (which is my personal choice), you should read it cover to cover.



Another excellent text to consider is:

Interconnections: Bridges, Routers, Switches, and Internetworking Protocols (2nd Edition) by Radia



Perlman

Note: With this text, you can safely skip chapter 4 (Source Route Bridges) and chapter 7 (Connection-oriented Nets: X.25 and ATM).

Step One:

Learn

CCIE Routing & Switching Written Bootcamp

Even if a candidate has passed their written exam recently, most students like to begin here. This fun and interactive, self-paced bootcamp is another tool that can be used to identify major weaknesses in theoretical understanding, and patch these weaknesses quickly and efficiently. Students also report the tremendous value of this tool for the Core Knowledge portion of the R&S Lab examination.

CCIE Routing & Switching Audio Bootcamp

The audio class is designed to ensure that you have a solid understanding of the technologies that will be covered in the CCIE Lab Exam. Again, most students report they like listening to this prior to starting any of the other material.

After listening to these modules, if you feel you have some "gaps" in your basic understanding of the technologies covered, you should fallback and fill in these gaps using the other materials below from INE.



CCIE Routing & Switching Advanced Technologies Class-on-Demand

The Advanced Technologies CoD is an amazing video series that is organized by specific technology topic for the Version 4 R&S exam. It is not uncommon for people to view sections that they are weak on more than once so if you feel you did not fully understand a section, be sure to rewind the CoD and go back over the section.

CCIE Routing & Switching Lab Workbook Volume I - Technology-Based Labs

Use the technology labs of Volume 1 as a means to get an understanding of the implementation for any technologies or features you are not familiar with. These labs are not meant to be done as a whole, but more as a way to fill in any gaps in your knowledge base. After you have finished the required section of this Workbook, you should have a good understanding of the technologies and topics covered in the CCIE Lab Exam. You will have also gained a good understanding of the configuration and verification process.

CCIE Routing & Switching Lab Workbook Volume II

The goal for this part of your journey is to solidify your knowledge while at the same time expanding your knowledge by hands on practice. It is important that you have the knowledge discussed earlier as you will have a much harder time with the labs and will not receive the full benefit of them.

Step Two:

Practice

Start off with the IEWB-RS Volume II Workbook labs 1, 2, 3, and 4. Treat these as more warm-up labs as opposed to true practice labs. What is meant by "warm-up" is use these labs to get familiar and comfortable with doing full eight hour labs and not be concerned if they take you more than 8 hours to complete. Ensure that you gain the knowledge and experience that is conveyed in these labs and not worry about a pass or fail at this point.



At this point, you may recognize that speed is going to be a major issue for you. Remember, you do need to become extremely fast and efficient at configuration, verification, and troubleshooting in order to pass the Version Routing & Switching exam.

In order to help you to build speed and accuracy in your core configurations of full reachability in the lab exam, the Volume 3 workbook was created.

CCIE Routing & Switching Interactive Video Companion Series for Lab Workbook Volume II

To enhance the bestselling Volume 2 Workbook, INE created an interactive, self-paced, video companion to the product. This compliment to Volume 2 provides detailed walkthroughs of solutions and verifications of select Volume 2 labs, and also creates new content for students to practice with that includes Core Knowledge practice, Configuration Speed Drills, DOC-CD Speed Drills, and Advanced Troubleshooting exercises.

CCIE Routing & Switching Lab Workbook

Volume IV - Troubleshooting Labs

For many students, just troubleshooting their own misconfigurations is not enough to feel confident and ready for the difficult Troubleshooting section of the actual CCIE Routing & Switching lab exam. The Volume 4 workbook was created to address this issue. Students should consider completing this workbook, or only portions of it, if they feel more proficient in this area.

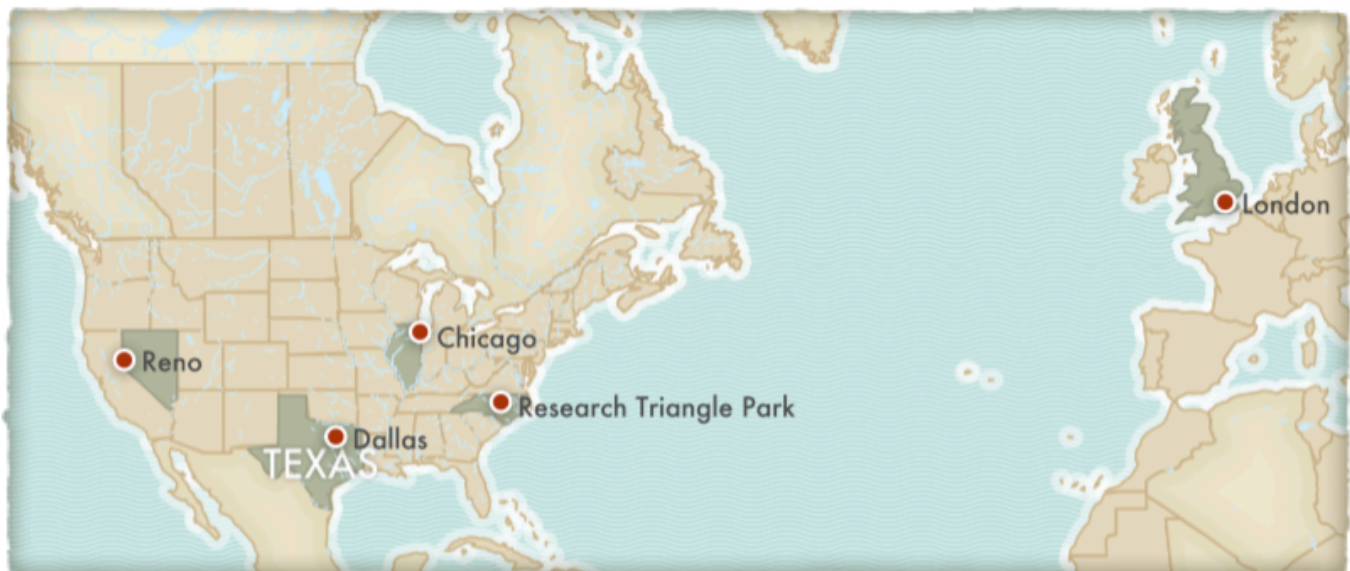
Step Two:

Practice

CCIE Routing & Switching 6-Day Bootcamp

This bootcamp allows students to practice and review all aspects of their preparedness as they work through sample Core Knowledge, Troubleshooting Tickets, and Configuration tasks. Students have near round the clock access to a top-rated INE instructor, and students also have 24x7 equipment access.

Bootcamps available in multiple locations!



Step Three:

Refine

CCIE Routing & Switching Lab Workbook

Volume III - Core Technology Labs

You should use this workbook to ensure you are very fast, accurate, and efficient with your configuration of protocols in the lab exam that provide core reachability. These configurations, if not mastered, will certainly fail a student in their attempt.

CCIE Routing & Switching 6-Day Mock Lab Workshop

This extension to the 6-Day Bootcamp for R&S allows you to complete 4 full graded mock labs in the presence of an INE instructor. Two full days of lecture are included in this workshop to review specific lab tasks and discuss the finer and critical points of lab strategy, technology, psychology, and physical wellness.

CCIE Routing & Switching Graded Mock Lab Exams

Now with a good portion of the journey behind you, it is time to take the first two mock labs. The reason you should take two labs over taking just one is to ensure that you can get an accurate assessment. It will depend on the results of your first two mock labs as to how you will move forward.



If you scored 60% or below on both mock labs this is another point in your journey that you should step back and reassess your knowledge and readiness for the real lab. Examine your detailed results report and try to figure out why you scored so low. Here are some of the more common reasons people have a hard time with the mock labs:

1. Do not understand the technologies and topics covered
2. Had problems understanding the requirements from the wording given in the tasks
3. Made too many little mistakes
4. Overwhelmed with all of the tasks and did not have time to complete them all

If you failed because of the first issue cited above, you definitely should step back and fill in the gaps you have in your knowledge. Do not go any further with training until you have done this. Every time I teach the 6 Day R&S Bootcamp class I learn something new, so I can pretty much guarantee that if you watch the CoD or attend the class again you will benefit from it. Remember that we do not require you to fail the real lab before you can audit our classes again. Also, do not hesitate to go back and redo a couple of the Volume 2 Workbook labs that you have done before. You may be surprised at what you can still learn from them.

Step Three:

Refine

If you had problems with task interpretation (number 2 above), it could be a couple of issues. First off you may not understand the technologies and topics enough to grasp the wording of the tasks. If you understand the technologies and topics you should be able to complete the task. Secondly you may be "over thinking" the tasks. Do what the task is asking and nothing more. Do try to apply real world logic or design to the task. Also do not add in "what if's". This means do not worry about "what if" this router goes down or "what if" the Frame Relay circuit is down. If the proctors are looking for redundancy to be taken into consideration they will ask for it. The little mistakes are what personally get me (forgetting to no shut an interface, etc). As you become more of an "expert", you will make fewer mistakes and solve the ones that you do make quickly. You will always make little mistakes as it is just human nature, but with experience you will be better at finding and fixing your own mistakes. For many people that fail the lab, it is the little mistakes that get them into some big problems as you might suspect.

Building speed (number 4 above) is just going to boil down to getting the hands on practice needed to be good at doing these labs. No tips, tricks, or brain-dumps can substitute for the hands on experience you will need with the IOS to pass the real lab exam.

If you scored between 60% and 80% on both mock lab 1 and 2 you will need to get back to the workbook labs. If not, continue on to mock labs 3 and 4. After you complete labs 3 and 4 you should be ready for the real lab!

Additional Resources

Websites to Visit

1. INE
 - 1.1. Access your products electronically
 - 1.2. Get the best training products
 - 1.3. <http://www.ine.com/>
2. IEOC - Internetwork Expert Online Community.
 - 2.1. Product support
 - 2.2. Ask questions, post comments, and interact with your peers
 - 2.3. <http://www.ieoc.com>
3. CCIE Blog
 - 3.1. Content published from our CCIE Instructors
 - 3.2. Exciting challenges and prizes
 - 3.3. Ask INE, dedicated to answering your CCIE questions
 - 3.4. <http://blog.ine.com>
4. INE on Twitter
 - 4.1. Follow us for the latest news
 - 4.2. <http://www.twitter.com/inetraining>
5. INE on Facebook
 - 5.1. Join our fan page
 - 5.2. <http://www.facebook.com/inetraining>
6. INE on LinkedIn
 - 6.1. Add us to your connections
 - 6.2. <http://www.linkedin.com/companies/144650>
7. INE on YouTube
 - 7.1. Subscribe to our channel
 - 7.2. <http://www.youtube.com/INetraining>



About the Author

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Routing & Switching

Anthony Sequeira brings decades of teaching, technical writing, and consulting experience to INE. Anthony began his career as an author and lecturer within the IT community, featuring best-selling titles for Microsoft and Cisco Press. Best known as one of the training voices for the revolutionary e-learning company called KnowledgeNet, Anthony now teaches online and in-classroom exclusively for INE. When not helping his students master Cisco networking, Anthony can be found at the poker tables, or flying the Florida skies in a Cessna.

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Thank you for taking the time to read this document.

Congratulations on starting (or continuing) one of the most rewarding journeys you can take in your lifetime. Remember, while at times you might feel alone in this journey, that is NEVER the case.