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CCNA Certification Prep Guide

Your guide to the Cisco Certified Network Associate (CCNA) and Cisco Certified Internetwork Expert (CCIE) certifications

In this e-guide:

Achieving your Cisco Certified Networking Associate (CCNA) certification requires a true in-depth understanding of network fundamentals and network security technologies. Not only will obtaining this certification expand your career opportunities, but it will also benefit your employer's network.

The CCNA exam has had some curriculum changes over the years, and we want to help you stay on track with your studies.

The following articles explain some of those changes and provide you with a 10-question practice quiz to help you determine if you're ready for your certification.

Not ready to tackle the CCNA exam? We also provide key information on the Cisco Certified Internetwork Expert (CCIE) exam starting on page 14.

In this e-guide

⚑ CCNA changes: Realigning the entry-level Cisco certification

Shamus McGillicuddy, Enterprise Management Associates

Cisco made changes to its CCNA program to help admins become voice, wireless and security specialists faster.

Cisco has streamlined its Cisco Certified Network Associate certifications by reducing the amount of core routing and switching expertise an administrator needs to obtain a CCNA Voice, CCNA Security and CCNA Wireless accreditation. These changes will allow IT pros to use an entry-level Cisco certification to accelerate their careers as specialists in these disciplines, Cisco said.

The Cisco Certified Network Associate (CCNA) has long been Cisco's foundational certification. Administrators had to pass two rigorous exams on routing and switching -- the ICND1 and ICND2 -- to obtain a standard CCNA before taking additional exams on wireless, voice or security to obtain specialist CCNA certifications. This approach has encouraged administrators to get a deep foundation of networking skills before trying to develop expertise in a specific branch of networking.

But employers are looking for more entry-level administrators who can do more than plug in and configure voice, wireless and security systems. They don't necessarily want all their voice, security and wireless administrators to know how to work with routing protocols like BGP and OSPF.

"Job roles are changing," said Ramesh Bijor, product marketing manager at Cisco. "Companies are asking associate-level engineers to do more. They are being asked to troubleshoot and debug system problems with increasing levels of complexity and feature implementations."

More enterprises are creating dedicated job roles in these specialty areas, creating a demand for a more streamlined entry-level Cisco certification program, Bijor said. Cisco commissioned Forrester Research to survey 1,500 enterprises on the subject. It found that 80% of companies will have network administrators dedicated to security in 2013; 69% will have dedicated voice administrators; and 66% will have dedicated wireless administrators.

Of course, entry-level administrators with core routing and switching skills remain just as important to employers, so Cisco will continue to test candidates on these skills with its rebranded CCNA Routing and Switching certification. Cisco will, however, consolidate the exams and test preparation for CCNA Voice, CCNA Security and CCNA Wireless. For these accreditations, administrators will only need to take two exams rather than three. The first exam will evaluate their knowledge of the routing and

switching technologies most relevant to their chosen specialty, and the second exam will test their skills in voice, video or wireless.

Not only will this redesigned CCNA help employers find entry-level specialists, but it will help network administrators differentiate themselves early on in their careers, according to Cushing Anderson, program vice president for IDC.

"When we do surveys on hard-to-find skills, routing and switching, voice and security now appear at the top and wireless isn't far behind that," Anderson said. "We're finding that those skills are teachable to entry-level positions. Some level of certification can help make those candidates more employable and also give employers some known competencies that they should be skilling their staff to."

This realignment of entry-level Cisco certifications will allow administrators to define a career path for themselves earlier than they have in the past.

"It allows a Cisco engineer to decide right up front if they want to specialize in security or unified communications," said Zeus Kerravala, principal analyst and founder of Westminster, Mass.-based ZK Research. Employers want administrators who can quickly fill a specialized role "versus a more jack of all trades administrator."

"Those specialist skills are valuable earlier on in an employee's lifecycle," Anderson said. "They don't need to be generalists and then specialists. Being more knowledgeable in one or several specialty areas makes an employee more valuable."

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New Cisco collaboration certification plan rolls voice, video CCNA into one

Lynn Haber, Senior Writer

Cisco is replacing its CCNA Voice, CCNA Video and CCNP Voice certifications with the CCNA Collaboration and CCNP Collaboration certifications.

Cisco today introduced two industry role-based certifications for collaboration that address the convergence of voice, video, data and mobile applications.

The new Cisco Certified Network Associate (CCNA) Collaboration and Cisco Certified Network Professional (CCNP) Collaboration certifications aim to teach the skills required to help customers meet the growing need for collaboration in a workplace that is geographically diverse with a workforce that is increasingly mobile, according to Cisco.

Noting that collaboration is a catalyst for the transformation in the workplace, Tejas Vashi, director for product strategy and marketing with Cisco Services, said that the new Cisco collaboration certifications address

a skills gap and that IT professionals need to be retrained to have a broader picture of collaboration as it's evolving.

The new Cisco collaboration certification strategy targets engineers who implement, configure, deploy and troubleshoot collaboration and communication infrastructures.

Cisco is encouraging partners to pursue the new collaboration certifications but Cisco's partner organization has not announced any timeline or requirements for partners to get the new certifications. The existing CCNA Voice and CCNA Video certifications, as well as the CCNP Voice certification, remain valid. However, partners should stay tuned for such announcements in the coming months.

Cisco plans to merge CCNA Voice and CCNA Video tracks into the new CCNA Collaboration certification, which requires two exams but has no prerequisites, according to Antonella Corno, manager for product strategy with Learning@Cisco.

"Those two exams cover all of the skills for integrating voice, video, the collaboration platform, integrated with the concept of on premise and cloud-based services," Corno said.

The CCNP Voice certification, meanwhile, consisted of five exams. To map to the new CCNP Collaboration certification, the content has been reorganized into four exams, one of which is new.

The migration plan for the new collaboration certifications is a chapter that the company started last year, according to Corno, with the rollout of the Cisco Certified Internetwork Expert (CCIE) Collaboration certification, expert-level track. "Now were offering the CCNP and CCNA Collaboration certifications, completing a certification path," she said.

All of the CCNA Collaboration exams and courseware is currently available. The CCNP Collaboration exams and courseware will follow by the end of April. Cisco will retire the older CCNA Voice and Video certifications and CCNP Voice certification about six months after the new materials are available. So, the CCNA certifications will retire in August and the CCNP certification will retire in the fall.

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Cisco IoT certification upgrades target IT pros

Sonia Groff, Liberty Mutual

Cisco has added IoT and cloud topics to its CCNA and CCNP certification programs

Cisco has expanded its certification program to include topics on the Internet of Things and cloud networking. The new Cisco Certified Network Associate (CCNA) and Cisco Certified Network Professional (CCNP) certifications are available globally. Cisco said the new certifications teach networking professionals how to connect, automate and orchestrate services and provide the infrastructure to support big data analytics. The IoT-focused CCNA certificate concentrates on how to operate converged industrial networks. The curriculum is targeted at plant administrators, as well as control and IT/network engineers working in manufacturing. The cloud-focused CCNP certification teaches professionals how to create infrastructure as a service products to enable the enterprise to control cloud deployments.

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Cisco CCNA exam: Are you ready?

Chris Partsenidis, Firewall.cx

Achieving your Cisco Certified Networking Associate (CCNA) certification requires more than just studying. It requires a true in-depth understanding of network fundamentals and network-security technologies covered in the CCNA curriculum. Our updated CCNA quiz has been completely redesigned to reflect the new CCNA Routing and Switching (200-120) requirements and to help you test your knowledge and understanding of a variety of CCNA topics.

With the new 200-120 CCNA Routing and Switching curriculum, Cisco has made some much-needed changes to steer the exam away from topics covered in other CCNA certifications (e.g. wireless, security) and focus more on the routing and switching technologies.

A few of the major changes include a noticeable reduction of emphasis on IP subnetting coverage -- a very important section in previous CCNA Routing and Switching exams -- and a significant increase of emphasis on IPv6 topics. There is also complete absence of any wireless topics, which are now covered in the CCNA wireless exam.

The new CCNA Routing and Switching exam now focuses more on routing and switching technologies – among them Enhanced Interior Gateway Routing Protocol, open shortest path first (OSPF) virtual LANs (VLANs), and Virtual Router Redundancy Protocol – while high-availability technologies such as VRRP, HSRP and GLBP have made an appearance, as they are now frequently used in today's networks and also occupy an important portion of the next certification level, CCNP Routing and Switching.

We have prepared two 10-question quizzes to help you practice for the exam. See below for some sample questions from each of these quizzes. When you feel prepared, head over to SearchNetworking to see how well you do.

Practice Quiz One: Study Questions

1. Host A receives a frame and discards it after determining that it is corrupt. At which OSI layer are frames checked for errors?

2. Which command is used to verify the encapsulation type on a frame relay link?

3. What is used in standard access lists?

4. What actions does the Dynamic Host Configuration Protocol (DHCP) server take when there is an IP address conflict?

5. What would the result be when the following commands are executed on a Cisco Catalyst switch:

   a. TechTarget-SW1 (config-if)# switchport port-security;

   b. TechTarget-SW1 (config-if)# switchport port-security mac-address sticky

Practice Quiz Two: Study Questions

1. Which command is used to encrypt all plain-text passwords on a Cisco router?

2. Which open standard protocol is used in VPN implementations to ensure secure end-to-end communications?

3. Which command shows the last method used to power cycle a router?

4. Explain the purpose of inverse ARP.

5. Which parameters are used to calculate OSPF cost in Cisco routers?

Now that you know what to expect, and what you may still need to study, you can access our practice quizzes at any time on SearchNetworking:

- Practice Quiz Part 1

- Practice Quiz Part 2

Good luck!

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CCIE exams: Still worth it?

Jedadiah Casey, Contributor

I started studying for the CCIE exams shortly after passing the three CCNP exams in 2013. During the past three years, my motivations for obtaining the certification and my methods of studying for it have changed significantly. Over time, I began to wonder, is the end goal of achieving the certification even worth it? Does the CCIE still hold relevance today?

The CCIE is one of the most challenging certification programs available to IT professionals such as network engineers, and has been for more than 20 years. Critics have accused the CCIE of testing on corner-case scenarios to the exclusion of real-world situations. Over the course of a career, you may never even see several CCIE topics in a single production network.

Many in our industry wonder if the CCIE exams are still relevant and worth the enormous effort it takes to pass them. After all, if the network is moving toward a virtual, software-defined state, what is the purpose of learning about things like routers and switches? To answer that question, I always like to keep RFC 1925 Rule 11 in mind, which says that ideas and technologies that have been proposed or used previously will inevitably be proposed again, probably in a new form, whether they worked the first time or not.

What does that mean for the computer networks of today and tomorrow? Software-defined networking may present a new approach to networking, but its underlying principles are the same as traditional, "physical" networking. This means that whether a router or switch is a physical device or just a piece of software, the fundamental operations remain the same. This is one of the reasons the CCIE certification is still relevant and will continue to stay that way.

CCIE journey

When I began studying, I knew the CCIE exams were going to be extremely challenging, but I was not yet prepared for the actual amount of effort it takes to acquire the certification. When you read about other people achieving the certification in only a year, it can be intimidating and ultimately very frustrating when you realize that you're not progressing at the pace you think you should be -- especially after that first year of studying has passed.

At first, I envisioned myself achieving the CCIE, with little regard as to how I was actually going to get there. I read many textbooks, I watched many hours of videos and I did some occasional labs. I did not yet realize just how different studying for the CCIE is compared to studying for the lower-level certifications. I finally reached a point where I understood that by only

looking at the end goal, I was missing the entire point of the CCIE, and that is the journey itself.

Nobody becomes an expert in anything overnight. All good things take time. Can you go from zero to expert in only a year? It is certainly possible with the right circumstances and personal dedication. Will you have the experience to back up your newfound knowledge? Most likely not. Not too many organizations want to hire a CCIE with no real-world experience. This realization was key to me being able to relax and not punish myself internally anymore because I felt like I wasn't progressing fast enough. The journey itself has become immensely important to me, as I gain more experience as a network engineer working toward the CCIE, while having the benefit of working in a live production enterprise network.

The most important skill this journey has taught me is how to actually learn things. Everybody has a different way of learning. Some learn best from videos or classroom instruction; others learn best from textbooks and documentation or from still other methods. For many years, my method of studying was to read a textbook and take notes. I watched videos as well, but overall didn't find them as useful as textbooks. I eventually came to the conclusion, however, that none of these methods worked particularly well for me.

Study skills

Finally, I discovered the method that works best with the least amount of effort. Now when I study for the CCIE exams, I arrange the topics in a hierarchical manner using outlining/mind-mapping software, and I put my notes into that format. Then, for each topic, I generate a series of flash cards that are based on a simple question-and-answer format. This has the dual benefit of forcing me to examine the topic and formulate questions about it, as well as creating a way to randomly review the material. Formulating the questions is extremely important to the learning process. If you can't explain something in a simplified manner, then you know that you have not yet mastered the topic. This method therefore serves as a simple self-check.

Though I have not yet taken the CCIE exams, the shift in my motivation and learning methods have profoundly impacted my life. The mere process of studying for the CCIE exam has provided me with the answers to many questions that I now get to apply each day at work, which greatly improves my efficiency and value to the company I work for, which in turn solidifies my career. Seeing the topics I have studied at such a deep level being used in a production network reinforces my personal investment in learning. This is why the CCIE is still relevant and worth the effort and will continue to be so.

🔖 **CCIE certification debate continues despite exam's SDN, cloud updates**

Christopher Heun, Freelance Writer

For the past two decades, the Cisco Certified Internetwork Expert has reigned as the industry's most influential and indisputably prestigious networking certification. Tens of thousands of people around the world have dedicated countless hours of their lives to earning it.

There has long existed a debate about the value of the CCIE certification, however, which -- despite a new exam section covering emerging technologies -- is only intensifying in the age of software-defined networking, cloud and the internet of things (IoT).

Critics charge that the certification doesn't test real-world scenarios, but focuses instead on obscure "corner cases" that produce engineers who are overqualified and underskilled. Add to that a series of evolving industry trends buffeting the exam's prestige: software-defined networking and the proliferation of open standards, challenges to Cisco's share of the Ethernet switching and routing market, and competing certification programs from vendors such as VMware and Juniper. Does the CCIE still have the same influence it has long boasted, or is it losing relevance?

"The CCIE is certainly the most prestigious and respected networking certification in the industry today by a wide margin," says Andrew Lerner, a vice president at Gartner Research. "Moving forward, it will be interesting to see if the CCIE can survive as we move toward a heavily software-centric and much more open and vendor-agnostic world."

Just in (corner) case

Kevin Dooley, an IT consultant who served as the CTO of CNG Unicom in Ontario, Canada, for more than a decade, decided to let his CCIE certification lapse a few years ago after calling it "the hardest test of my life."

Dooley says he was frustrated that "the exam devotes far too much attention to situations that will rarely arise in real networks." As evidence, he points out that the exam covers topics like route manipulation techniques -- where prefix list syntax has replaced access lists for route redistribution -- and certain split horizon issues in frame relay and X.25 networks.

"It's not meaningful to test people on these legacy techniques because it would be wrong to use them in just about all modern networks," Dooley says.

When it comes to software-defined network infrastructure, Dooley believes there are few chances for a "corner case" to pop up in the real world. The

task of creating a new virtual environment, using a web-based graphical user interface, shouldn't demand deep knowledge of networking; building the underlying structure, and making sure layered virtual networks are stable and reliable, requires caution. But that's not something that really needs a test.

"If you are using the Cisco Application Centric Infrastructure paradigm, then you should be religiously following the reference designs, building it exactly according to the documentation," he says. "There might be strange and interesting things to troubleshoot if an unusual problem develops, but I don't know how you could build an exam around that."

The idea of obscure problems on the CCIE certification exam doesn't bother everyone, however.

"That's the point -- that you know how to find the weird stuff. They want it to be elite," says Josh Lawrence, a senior network engineer for Education Networks of America, a communication services provider for K–12 schools, who is studying for the CCIE. "They want to make sure [you] have the corner case experience."

CCIE Certification Exam changes

For its part, Cisco has added a new "evolving technologies" section to the written exam for the CCIE and Cisco Certified Design Expert. The section covers cloud, network programmability and IoT, and accounts for 10% of the total score; it first appeared in exams in July 2016.

Tejas Vashi, senior director of product strategy and marketing for Cisco Services, points to these changes, along with the requirement that those who have earned a CCIE must recertify every two years, as the best example of how the certification stays current and retains its status and prestige.

"We work very diligently to identify the cases and scenarios that are most relevant in the industry at any given point," Vashi says. "Our certifications are job- [and] role-based, not product-based. That makes them more valid in the industry."

The industry isn't short on certification programs -- network engineers have plenty of choices.

"Because the markets for storage, virtualization and security are so diverse, there's no one vendor's certification you can go get and call it a day," says Lee Doyle, principal analyst at Doyle Research. "You need to get more

cross-training to understand broader concepts in the IT industry. Networking guys can't just live in isolation. You can't say, 'The network's up; we're done.' It's a broad range of training."

But chasing so many different certifications can be time-consuming, not to mention expensive. Dooley estimates he spent more than $10,000 to $15,000 on everything from study equipment to airfare and hotel expenses to CCIE test fees.

Lawrence -- who has 15 years of IT experience and holds multiple certifications, including the Cisco Certified Network Professional (CCNP) -- considers himself fortunate that his employer is helping to pay for some of his CCIE study materials. Still, he spent about $700 of his own money on a server, which he uses to host virtual routers.

He says he feels like he's on a "certification treadmill," spending about 10 hours a week studying for the CCIE certification -- and often much longer than that.

"I'm leery of getting other certifications that are not lifetime," Lawrence says. "I can't go and study multiple vendors and take tests all the time. I have to go actually do work."

A 'necessary evil'

Sometimes a new job or a different point in a career can bring a corresponding change in perspective about the CCIE. A good example is Mike Lossmann, who holds multiple CCNP certifications.

On the right track: CCIE certifications

CCIE Collaboration

CCIE Data Center

CCIE Routing & Switching

CCIE Security

CCIE Service Provider

CCIE Wireless

CCIE Service Provider Operations
(retired 2015)

SOURCE: "CCIE CERTIFICATION TRACK INFORMATION,"
CISCO, 2016

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