Introduction
Cisco certifications cover a lot of technologies and range from entry level to some of the most advanced. In this paper, we will look at where they started and where they are today, including current trends within different certification tracks. Looking at each certification track, we will consider job roles and career paths, and, based on my experience and insight from other industry experts, I’ll speculate about where we may go from here.

A Little History of Cisco Certifications
In 1993, Cisco launched the Cisco Certified Internetwork Expert (CCIE) certification program. The idea was to certify those in the “top echelon of internetworking experts.” The program turned out to be far more popular than anyone at Cisco expected. CCIE candidates of the day would have to go to San Jose to perform a two-day, hands-on exam, where they were presented with stacks of routers, and they had to cable, configure, and then troubleshoot their networks based on minimally described tasks. Trouble arose as many of these candidates were not the target audience for this certification and, therefore, were less than successful.

In 1998, Cisco launched the Career Certification program, which included the Cisco Certified Network Associate (CCNA) and Cisco Certified Network Professional (CCNP). This new Career Certification track had a different target audience: CCNA for entry-level network technicians and CCNP for the more seasoned technicians. The CCIE was still looked at for the most senior and, theoretically, most skilled technicians and engineers.

The certification pyramid was born.

There were no tracks back then, and even today, the CCIE is not really considered internal to Cisco or part of the pyramid. What I mean by that is that while the CCNA is required to obtain the CCNP, there is no such requirement to attempt the CCIE. You can bypass the lower certifications and attempt the CCIE if you choose.

Over the years, the certifications have been modified and updated, and additional Career Certification tracks and pyramids have been added. The original track is considered to be Routing and Switching. Tracks have been added for design, service provider, service provider operations, security, voice (now becoming collaboration), data center, and wireless. Others have come and gone over the years. CCIE is still sought after and still considered the pinnacle of certifications within the networking industry. Today’s certification tracks have four or five certification levels: Entry, Associate, Professional, Expert, and Architect (for the design track). Let’s take a closer look at the tracks.

Cisco Certification Tracks
The certification tracks can be grouped into two major categories: Design and Support. The Design category stands alone, while the Support category is broken into these disciplines:

- Routing and Switching (R&S)
- Data Center
- Security
- Service Provider
- Service Provider Operations
- Collaboration
- Wireless
As I mentioned, there are four or five levels of certification within the tracks. Not all levels are for all people. The appropriate level for you depends on your goals and job requirements.

The five levels of Cisco certifications and their descriptions according to Cisco are:

- **Entry**: Both the CCENT and the CCT certifications serve as starting points for individuals interested in starting a career as a networking professional.

- **Associate**: The Associate level can begin directly with CCNA for network installation, operations, and troubleshooting or CCDA for network design. Think of the Associate level as the foundation level of networking certification.

- **Professional**: The Professional level is an advanced level of certification that designates more expertise with networking skills. Each certification covers a different technology to meet the needs of varying job roles.

- **Expert**: The Cisco Certified Internetwork Expert (CCIE) certification is accepted worldwide as the most prestigious networking certification in the industry.

- **Architect**: Cisco Certified Architect is the highest level of accreditation achievable and recognizes the architectural expertise of network designers who can support the increasingly complex networks of global organizations and effectively translate business strategies into evolutionary technical strategies.

**Routing and Switching**

The R&S track remains the most popular with its four levels of certification. Most other tracks—even the Design track—build from a portion of the R&S track. With the R&S track, you’ll need to work on skills related to IOS-based routers and switches.

The Cisco Certified Entry Networking Technician (CCENT) is a good certification for those who are just starting out in the industry. I like it over the Cisco Certified Technician (CCT), because from CCENT, there are options for progressing to more advanced certifications. The CCT is a stand-alone certification and seems to add little value.

The CCNA R&S is a natural progression from the CCENT and was, for a long time, the base certification for most of the different disciplines in the Cisco certification arena. It is still a good move for those who want to remain in the networking field in the enterprise. If your goal is to stay within the support roll within the enterprise, then this could be your starting point.

The CCENT is a subset of the CCNA R&S, but with the composite test, you can skip the lower certification. CCNA R&S certification is for those who are still early in a junior support technician career. It is often used as a starting point for higher certifications. The CCNA R&S has progressively gotten more difficult over the years. Early on, it had little to no value other than to progress to the CCNP. Cisco has since modified the program, dramatically increasing its credibility. Today, this is a challenging certification. Without keyboard experience, it’s difficult to pass. In fact, I know of some very talented individuals who struggled with this certification. Hiring managers have more respect for the CCNA R&S today than they did a few years back, which is good to see.

The Professional-level R&S certification, CCNP R&S, is for those who have been performing and supporting the network for some time. It’s for the more seasoned support technician.

The CCNP R&S track fits nicely for those supporting the enterprise networks. For many, this may be the highest level of certification that you achieve; for others the goal may be to continue up the certification pyramid or work on other certification disciplines.
CCNP R&S has been modified a few times over the years and is still one of my favorite certifications. I’m a routing and switching guy, and I find the skills that this certification tests fun. There were some issues with the tests after the last refresh of the certification, but they seem to be in fairly good shape now. Like the CCNA R&S, you need keyboard time to pass the CCNP R&S tests.

The certification programs from Cisco have changed from being theory based to being more practical... kind of. They don’t tend to test too much on best practices. In fact, the CCIE is as far from best practices as you can get. Instead they test more on how well you understand the technology. I know some have issue with that, but I’m okay with it. Perhaps that’s because I spend too much time in the CCIE world.

For most, the CCIE is the ultimate goal. This certification is intended for the most senior support technicians. All Expert-level certifications from Cisco require two steps to become certified: a written qualification exam and then the practical exam. No other level of certification below CCIE is required.

This level of certification is not for everyone; there are some who will never pass the CCIE exams. It takes a different mindset than most other certifications. The practical exam does not test for best practices; it tests for depth of knowledge and understanding of technologies. There are some who can’t give up on best practices, so this test is not for them. The CCIE (in any track) is still one of the most respected certifications in our industry and is well worth the effort. For the individual and for the company (depending on their relationship to Cisco), it is of great value.

The CCIE R&S has been around longer than other CCIE certifications—since 1993—and has the highest number of individuals certified. Don’t let that confuse you into thinking it is the easiest, because it’s not. More information and resources exist for the CCIE R&S track, and more people attempt the CCIE R&S than any other track. But, the pass rate for first attempts is still five to seven percent. A while back, Cisco announced that for all attempts (including those that have made multiple attempts at passing this test), the pass rate was 23 percent. Not too tough to do the math: 93 to 95 percent fail on their first attempt, and 77 percent of the time, all candidates fail. Some will pass on their first attempt; some will never pass. Like I said, it’s not for everyone.

One last thing about the CCIE program: passing the written exam does NOT mean you’ve earned a certification. Stop putting that on your resume! The written test is good for three things:

- Qualifying you to take the practical exam (you cannot see the schedule for the lab without passing the CCIE written exam for that track)
- Recertifying your CCIE
- Recertifying the lower-level certifications

R&S tends to be where most people focus in the Cisco certification roadmap. It seems to be the certification of choice for the enterprise, though it’s not restricted to those supporting the enterprise.

With each level of the certification, you gain additional skills that will help in your day-to-day role as a technician. The Entry/Associate level focuses on the small to medium-sized networks and the protocols and technologies that are used. The Professional level goes deeper into the inner workings of those protocols and covers more advanced protocols like OSPF and BGP. It also goes deeper into Spanning Tree and troubleshooting skills. The Expert level forces you to think outside the box by asking how these technologies can be used in a way that they were not intended.
Data Center
The Data Center track is one of the newer certification tracks from Cisco that includes the CCNA, CCNP, and CCIE levels. Data center is a hot topic these days, so the certification is attractive. It’s too soon to say whether this certification will have long-term value, but right now, there is a lot of demand. For those who support the data center network, this is a good certification track, either as a stand-alone track or as an add-on to the R&S track. Anything data center-related on your resume is not a bad thing.

The Data Center track will help build skills with products such as the Nexus Series switches, the MDS and UCS products, and the IOS-based devices. You’ll build skills on how to design, install, maintain, and troubleshoot these products within the data center.

Security
The Security track has been expanded to be a more complete track than it was in the past. The name for the Professional level has changed from CCSP to CCNP Security, which annoyed some but seems to fit better in the overall Cisco certification scheme. There are three levels building from the CCENT, though CCNA R&S or any CCIE certification can act as a prerequisite. The Security track is for those who are more focused on network security.

There has to be a foundational understanding of routers and switches, but the focus is on security features, policies, and technologies. The Security track has proven to be a winner, as there is good demand for the Professional and Expert level. At the Expert level, the R&S and Security certifications are a good combination for the individual to have.

On the Security track, you will build skills with security protocols, applications, and devices, such as ASA firewalls, VPN concentrators, IPS and IDS sensors, and access control servers. Those skills will help enable you to install, support, and troubleshoot the devices used to secure our networks.

Service Provider
The lower levels of the Service Provider track have recently been updated. The CCNA Service Provider (CCNA SP) was introduced, and CCNP SP replaced Cisco Certified Internetwork Professional (CCIP) certification in 2012. The Service Provider track should not be confused with the Service Provider Operations certification track that we’ll cover next.

The Service Provider track is intended to certify the service provider technicians and engineers supporting the network infrastructure within the provider space. The CCNA and CCNP levels are new, so we’re still waiting and seeing how they will be received in the industry. CCIP was never a very popular certification; the thought was the name wasn’t very descriptive, so hiring managers didn’t know what it was. The hope is that with the name change, there may be better recognition for the program.

The CCIE SP certification is starting to show its age, and I wouldn’t be surprised to see an update in 2014. The delta between the Professional level and Expert level has shrunk for this track. Though you still have to think like a CCIE to pass, the technologies are about the same.

The Service Provider track helps build skills not only on IOS-based devices, but also on IOS-XE and IOS-XR platforms. Similar to the R&S track levels, the skills progress from level to level with more and more complex protocols and technologies used in the modern provider space.
Service Provider Operations
The Service Provider Operations track is geared towards those who are with a Network Operations Center (NOC) or those who support the NOC. Like the Service Provider track, there are three levels of certification within this track, CCNA Service Provider Operations (SPO), CCNP SPO, and CCIE SPO. This track came out before the modification of the Service Provider track, and so far seems to be very niche. This track tends to be more process focused than technology based, especially at the lower end, which makes this track appealing to those who enjoy operational and process-type work.

The SPO certification process helps build skills needed in today’s NOC or by NOC support technicians for providers using Cisco Next-Generation Network products. As you progress through the different levels of certification, you pick up skills on more complex and complicated technologies.

Collaboration
The Collaboration certification track is a recent modification of the Voice certification track, with the CCIE Voice transitioning to the CCIE Collaboration in February 2014, and the CCVP transitioning to the CCNP Voice a few years ago. The CCNA level can be either in voice or video, and then the CCNP builds on top of that. The Voice track was a very popular certification and did very well for the individual. We have yet to see if the Collaboration track will garner the same respect. The topics of voice and video, in general, are very hot, so I expect this to still carry a lot of weight.

The transition from CCIE Voice to CCIE Collaboration is confusing. Still, the Collaboration track seems to be more encompassing, which to me, makes it into a more interesting certification track.

The Collaboration certification track will help you build skills to support the network as it relates to real-time protocols, like voice and video. The further up the track you go, the deeper you’ll go into the technologies that make those protocols work. Those skills translate easily to supporting a live network.

Wireless
The Wireless certification track is for those working with wireless networking equipment, and it has three levels of certification: CCNA Wireless, CCNP Wireless, and CCIE Wireless. So far, I have seen very little interest in this certification track. It seems very niche, and based on input from people in this industry, the Wireless track works better as an addition to an R&S certification instead of as a stand-alone program. Though it’s been around for a while, I could see this certification track being phased out soon.

The Wireless track builds skills in support of wireless networks within many different implementations.

Design
The Design track is intended for those who want to design or architect the network, rather than for those interested in supporting the network, which is the focus of all the other tracks. What’s interesting about this track is that it focuses less on hardware, configuration, and troubleshooting and more on developing solutions for the network topology and design. The Design track is the only one that currently has a fifth level of certification: the Architect.

The Design track is popular, even at the Cisco Certified Design Associate (CCDA) level. The program is well respected and not a bad thing to have on your resume. Again, for me, the lack of hardware makes this program less attractive, but having a design certification helps people land jobs.

Like the CCIE, the Cisco Certified Design Expert (CCDE) does not require you to have a Professional-level certification before attempting the Expert-level exam. Also like the CCIE, the CCDE certification process consists of
two steps: a written qualification exam and then a practical exam. The CCDE Practical exam is an eight-hour, scenario-based design exam. The CCDE would work with senior company personnel to try to set short- to midterm standards regarding network design for the company.

The high-level Cisco Certified Architect (CCAr) certification is for those network architects who set the standards and predict the needs and direction of the company network five to 10 years down the road. The CCAr would feed ideas to the CCDEs of a company. They are looked at in the industry to set networking trends. The CCDE is a prerequisite for the CCAr. The process to attempt the CCAr starts with you submitting an application summarizing your project experience and other qualifications. An interview with the Cisco Certified Architecture Board team members follows. Once approved, you will be given an architecture challenge and meet live with board members to answer questions and defend your design.

At first, I didn’t understand why Cisco would even have the CCAr. Why would they set up such a program with such a small target audience? It couldn’t have been the $15,000-per-candidate fee. After all, there were only seven CCDEs worldwide at the time this program came out, and not all of those qualified to attempt the CCAr. So why? Then one day it occurred to me—these are the best-of-the-best architects working at the largest companies. They are accustomed to developing new solutions. For Cisco, this is a brain trust that can provide ideas for solutions to problems that they may not have even thought of yet. Plus, Cisco doesn’t have to pay them; these people are paying Cisco to become certified. Brilliant! If you are one of the few who gets this certification, you can write your own ticket. Of all the certifications, this one warrants the highest pay. Of course, it is the most difficult to get.

As you progress through the different levels of certification in the Design track, you will gain knowledge about different design techniques. You will also learn different methodologies and options to solve more and more complex issues and to meet increasingly complex network requirements.

Recertification
The Cisco certification program does not end when you get certified. All Cisco certification tracks and all levels require recertification. After all, this isn’t scuba. You must recertify the Entry-, Associate-, and Professional-level certifications every three years. CCIE-level and specialty certifications must be recertified every two years, and the CCAr must be recertified every five years.

Conclusion
In the networking industry, if you work on Cisco equipment, there is a certification track for you, from the start of your career, through the advanced levels of network design and architecture. For the most part, the skills you gain in the process of obtaining these certifications directly apply to your job. The process of going after a certification will, in the long run, make you a better technician, engineer, designer, or architect.

Achieving certification is interesting, and it’s a challenge. Remember, if it were easy, no one would care. Good luck in your progress!

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About the Author

Johnny Bass has been in the networking industry since the late 1980s, specializing in Cisco products since 1990 and working extensively in the aerospace, health care, and service provider industries while providing network design, education, and technical support expertise. Holding both CCIE and CCSI credentials, Johnny teaches and consults in a variety of Cisco technologies, including routing, switching, design, implementation, and support.

While working as a senior instructor at Global Knowledge, Johnny has acquired extensive experience teaching CCNP, CCNP-SP, CCVP, Cisco Nexus, and CCIE R&S courses. This experience has allowed him to excel in the role of course director and subject matter expert, with technical responsibility for Global Knowledge’s North American CCIE R&S curriculum and service provider technical segment. He is the author of the CCIE Routing & Switching Written Exam Boot Camp that is currently utilized in Europe. Johnny is a Cisco 360 R&S Master Instructor—the first to achieve this level outside of the organization that created the program.

In addition to his teaching engagements, Johnny is the owner and President of Bass Consulting Services, Inc., a network engineering consultancy based outside of Seattle, WA, that specializes in service provider and large enterprise networks for design, configuration, and troubleshooting support. Johnny lives in Gig Harbor Washington with his wife, Tiffany, and their children, Sean and Cayman.