Your Guide to IT Certification and Salary

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CERTIFICATION MAGAZINE

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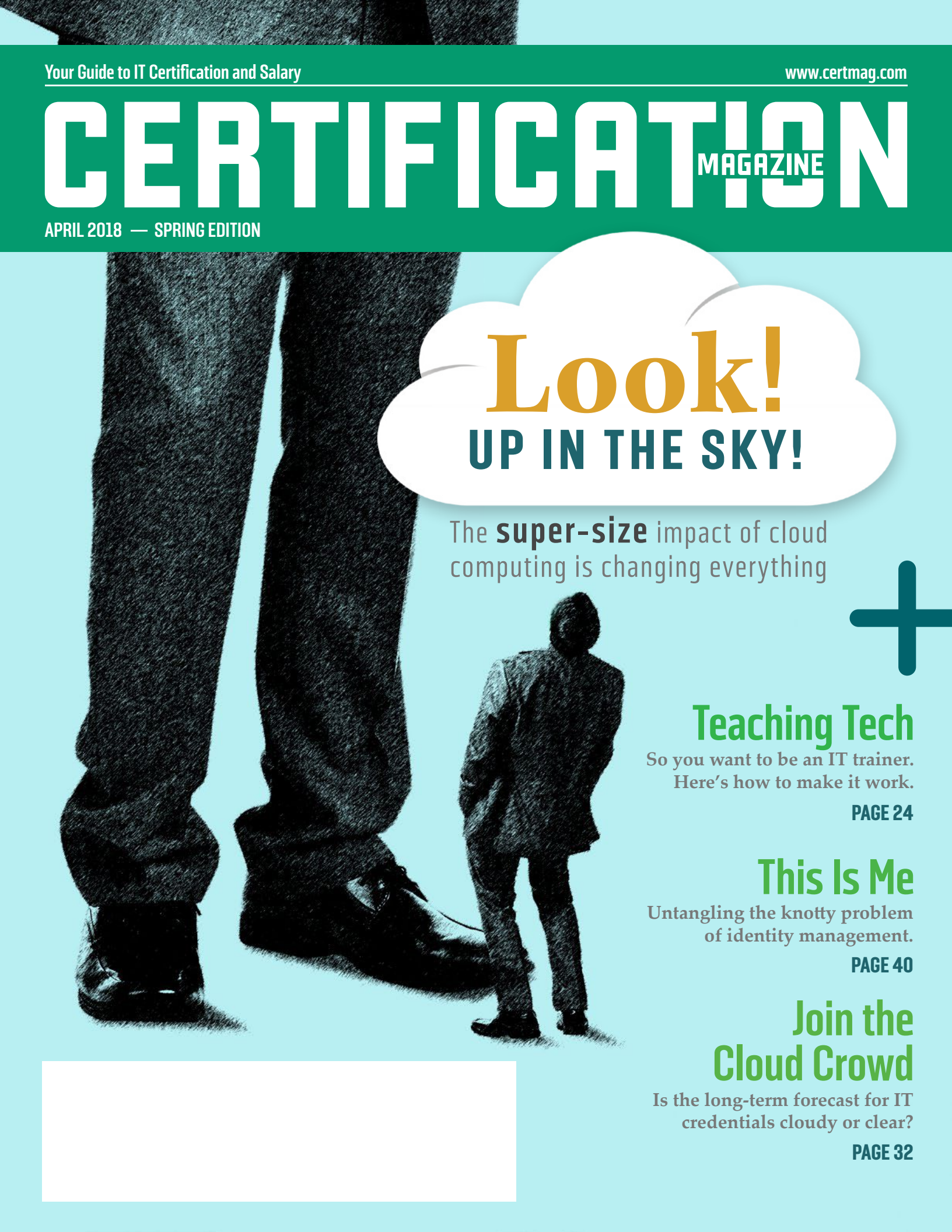

Look! UP IN THE SKY!

The **super-size** impact of cloud computing is changing everything

+

Teaching Tech

So you want to be an IT trainer. Here's how to make it work.

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This Is Me

Untangling the knotty problem of identity management.

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Join the Cloud Crowd

Is the long-term forecast for IT credentials cloudy or clear?

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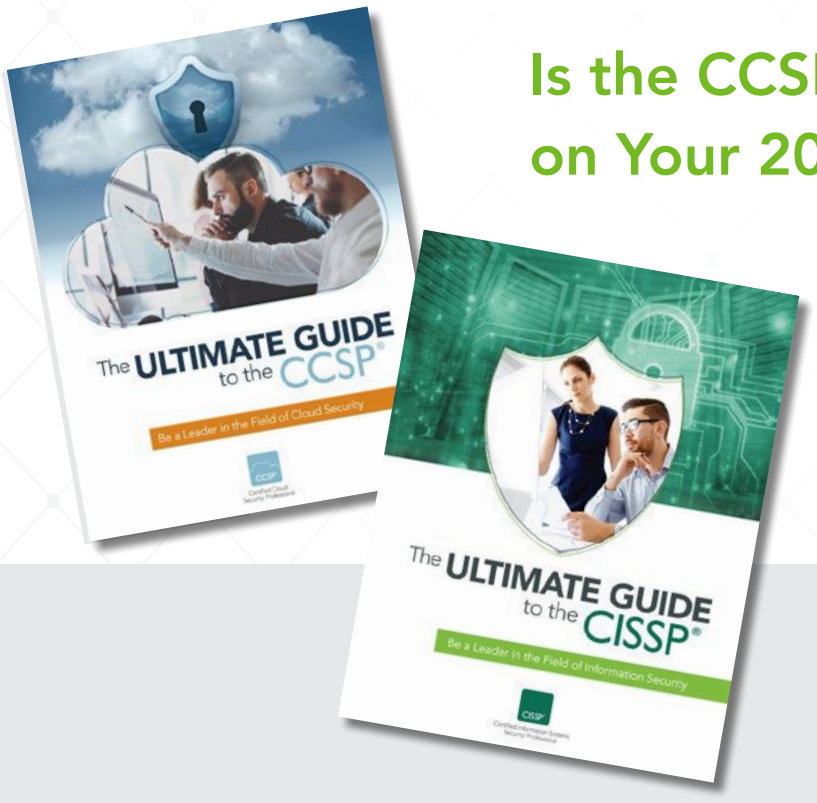
(ISC)² | CCSP | CISSP

THE NEXT BIG THING

CERTIFICATION MAGAZINE
2018 TOP CERTS
CCSP
CISSP
(ISC)²
THE NEXT BIG THING

CCSP and CISSP top "The Next Big Thing" list as the #1 and #2 certifications that CertMag's Annual Salary Survey respondents plan to earn in 2018.



Is the CCSP or CISSP on Your 2018 To-Do List?

Get Your Free Ultimate Guide to Get Started.

Get My CCSP Guide

Get My CISSP Guide

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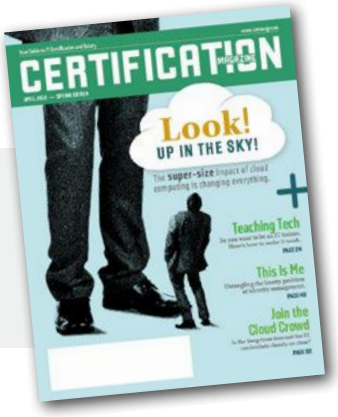
Make of IT What You Will

BY CODY CLARK

Cody Clark is the managing editor of *Certification Magazine*.



There's a memorable scene in the Facebook movie *The Social Network* where Eduardo Saverin recounts a conversation between himself, Mark Zuckerberg, and Sean Parker. Parker, played by singer Justin Timberlake, urges the other two to wait and see what Facebook's true potential is before attempting to monetize it.

"You don't even know what the thing is yet," Parker tells them. "How big it can get, how far it can go." The scene ends with Parker's tantalizing assertion that a billion dollars is much, much cooler than a million.

There's a similar "wait and see" mentality that hovers around a lot of tech innovations. There's a good chance that millions of people who don't even recognize the acronym SaaS — Software as a Service — use Google's Microsoft Office clone Drive. My 13-year-old daughter uses Docs (Word) and Slides (PowerPoint) to do her homework every week.

Is that what Google views as being the best possible use of Drive? Or are they waiting to see what else takes shape? That's just one of the many ways that cloud computing is affecting the development and proliferation of technology. If you have the resources to back your play, you can put something online and see what happens.

The hope is perhaps best summed up in a famous quotation from another movie, the baseball drama *Field of Dreams*: "If you build it they will come."

We've built this issue of *Certification Magazine* with a focus on cloud computing. We've got the results of our latest certification survey (that new thing we introduced at the end of 2017), as well as some cloud certification advice, and a discussion of what the Big G (the aforementioned Google, of course) is doing to catch up to its cloud competition (namely Amazon and Microsoft).

There's more to this issue, however, than just taking the pulse of the cloud computing community. We also examine the resurgence of adaptive testing, give tips for those considering a career in IT training, and discuss the value of certification to tech workers (and tech wannabes).

What are the ways that cloud computing already impacts your life? Certification is just one element of a complicated and ever-changing long-range forecast. Keep certifying, and we hope to see you online at CertMag.com. ■

P.S. Won't you be our neighbor? Look for *Certification Magazine* on Facebook and Twitter (@CertMag).

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What's IT Worth to Me?

There are lots of reasons why a certification can be a valuable career asset

BY PETER MANIJAK

Peter Manijak is a training and certification consultant and also serves as Certification Chair for CEdMA (Computer Education Management Association). An innovator and pioneer of IT certification, Peter specializes in building global, world-class certification and training programs from the ground up. Certification regimes he was worked on include those affiliated with EMC, Storage Networking Industry Association (SNIA), Hitachi Data Systems, Acquia, and Pegasystems. Peter can be contacted at petermanijak@gmail.com.

Many people who have experience with computers and information technology (IT), or even just have an interest in the field, have probably found themselves asking a simple question: Should I get certified or not?

There's essentially no option to enter some professions without obtaining some form or certification or licensure. Most people intending to become a nurse, for example, or a tax accountant, would simply take for granted the requirement to clear certain hurdles that verify knowledge and skills before getting a job.

IT, on the other hand, has plenty of certifications, but none that are considered a baseline for employability. Nobody in the United States would expect to be permitted to practice law without passing a bar exam. There's no comparable minimum standard, however, that establishes one's competency to work in IT.

What, then, is the value of getting a IT certification? Especially when, because there are so many of them out there, it's hard to guarantee that anyone capable of writing you a paycheck will know what that jumble of letters on your résumé even means?

The value of discovery

Let's tackle that question first: If no one has ever heard of your credential, is it worth anything? The short answer is probably yes. In the case of any high stakes exam, some company invested the time, effort, money, resources, and energy to create it. Your Certified Expert in XYZ Technology claim may not make you hot stuff right now, but change in IT often happens fast.

Establishing a certification program around it usually means that a given product or technology is growing and has reached a certain maturity level. Getting in on the ground floor, could be an excellent opportunity to establish yourself as an expert in a niche where demand is about to flourish. Going beyond just attaining the credential is also something to consider.

If the whole program is relatively new or unknown, then becoming an expert early on presents an opportunity to be involved at some level in writing the certification exams. This is a great way to raise your profile and deepen your pool of IT knowledge.

Established programs frequently also update their exams at regular and recurring intervals. Hence, you may encounter opportunities of this sort even when obtaining a long established and widely known certification.

Beyond the importance of simply having a credential, getting established as a thought leader or expert in an area of certification makes you more valuable in the marketplace. And it probably goes without saying that the exam still needs to be passed — even if you helped write it. Even a niche certification just might be more valuable than you think.

The value of relevance

Sometimes certifications are advantageous beyond any immediate importance within the organization that hires you. Let me explain: Many companies have partner programs that designate a certain status or tier for workers with certain credentials. Suppose that you work for a cybersecurity consulting firm. Organizations that hire your firm may want to work with individuals who have, say, a CISSP from (ISC)², or Security+ from CompTIA.

In that instance, the benefits of the credential are most highly valued by the partner or client company, so having certified professionals on staff is critical. That, in turn, means your credential has tremendous value to your company. It may be a key leverage point when asking for raise.

Because this sort of value exists, companies will often pay for you to take and pass a certification exam. They may even pay for your training, which is often more substantial in terms of cost. What an employer might not like is if they pay to get someone trained and certified and then lose them — so you may want to consider paying for a given exam out of your own pocket.

The value of profile

Now let's take a look at certifications from a hiring manager perspective. If a potential employee holds multiple certifications, it shows right off that that individual is willing to learn, a highly desirable trait. If two candidates are similarly qualified, but one holds relevant certifications and the other does not, then the credential holder is often chosen.

Indeed, in some instances, recruiters may not even consider applicants who don't already hold a particular certification. If you're looking for IT work, but aren't getting a lot of interviews, it could be that your applications are being screened because you don't have a certain certification.

Suppose that you want to work in computer networking. If you have a Cisco credential, then your résumé is likely to get extra attention. How many companies, after all, are looking for Cisco expertise, and therefore, someone like you? The same goes for other big-name certifications — though as noted above, you should never dismiss out of hand the potential value of new credentials.

> **"Your Certified Expert in XYZ Technology claim may not make you hot stuff right now, but change in IT often happens fast.**

Do Your Best on the Test

Have an IT certification exam coming up? There are different types of exams and many different kinds of questions. Here are some general rules, however, than can help you think clearly when you get stuck, no matter what kind of test (or question) it is.

1. The correct answer is usually the first one you chose.
2. Trust your instincts, they are often right.
3. When possible, answer long and complicated questions last.
4. Don't overthink it. Often an answer seems obvious because it is, in fact, the right one.

> **Above all else, remember that having certifications signals that you have a determination to gain knowledge in a constantly changing, rapidly evolving career environment.**

Currently attractive credentials for developers include those in security, cloud-based software, e-commerce, and SaaS (software as a service). More online activity at all levels of commerce, and a more wired and/or wireless world, means greater opportunities.

Infrastructure is also a key element, so data storage and networking credentials still have lots of potential. Knowledge of Big Data and analytics is also in demand, and another up-and-coming IT hotspot is AI (artificial intelligence). (Like a lot of things in tech, AI has actually been around for a while, but interest is definitely heating up.)

The value of learning

Don't ever forget, of course, that perhaps the most important and impactful source of value from certification is simply the acquiring of new skills and knowledge. Some of the most effective, most focused, and most up-to-date learning you will do in your IT career comes about while training and preparing to take a certification exam.

Let's say that you have some core developer skills, and are looking to forge a new career path. A great starting point may be to look at programs that offer an associate-level, or foundational certification. An associate-level exam can be tied to training that gets people started, and offers the perfect means of enhancing and focusing the skills you already have.

Beyond just helping you find your footing, a foundational certification can help you get that vital first job. Companies that are looking to hire someone just getting started in a career path will want to see a credential on your résumé, if one is offered. It will make you stand out as a candidate.

Good certification programs will have a registry or directory that you can point people to, and you should definitely post any and all IT credentials, as you acquire them, to any social sharing profiles on sites like LinkedIn. Recruiters often find individuals because of credentials listed at candidate profile sites. Also, keep your credentials up to date — anything more than two years old looks stale.

Be sure to do some looking around of your own, of course, to see who is doing the hiring. If there is a lack of talent in an ecosystem, word will get out, and the desired certification credentials will be posted.

Above all else, remember that having certifications signals that you have a determination to gain knowledge in a constantly changing, rapidly evolving career environment. Demonstrating both that you have a desire to learn and are capable of learning is such a key factor that I cannot emphasize it enough. Good luck with your choices! ■

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PEOPLE IN CERTIFICATION

CHRIS HULTIN
STUDENT

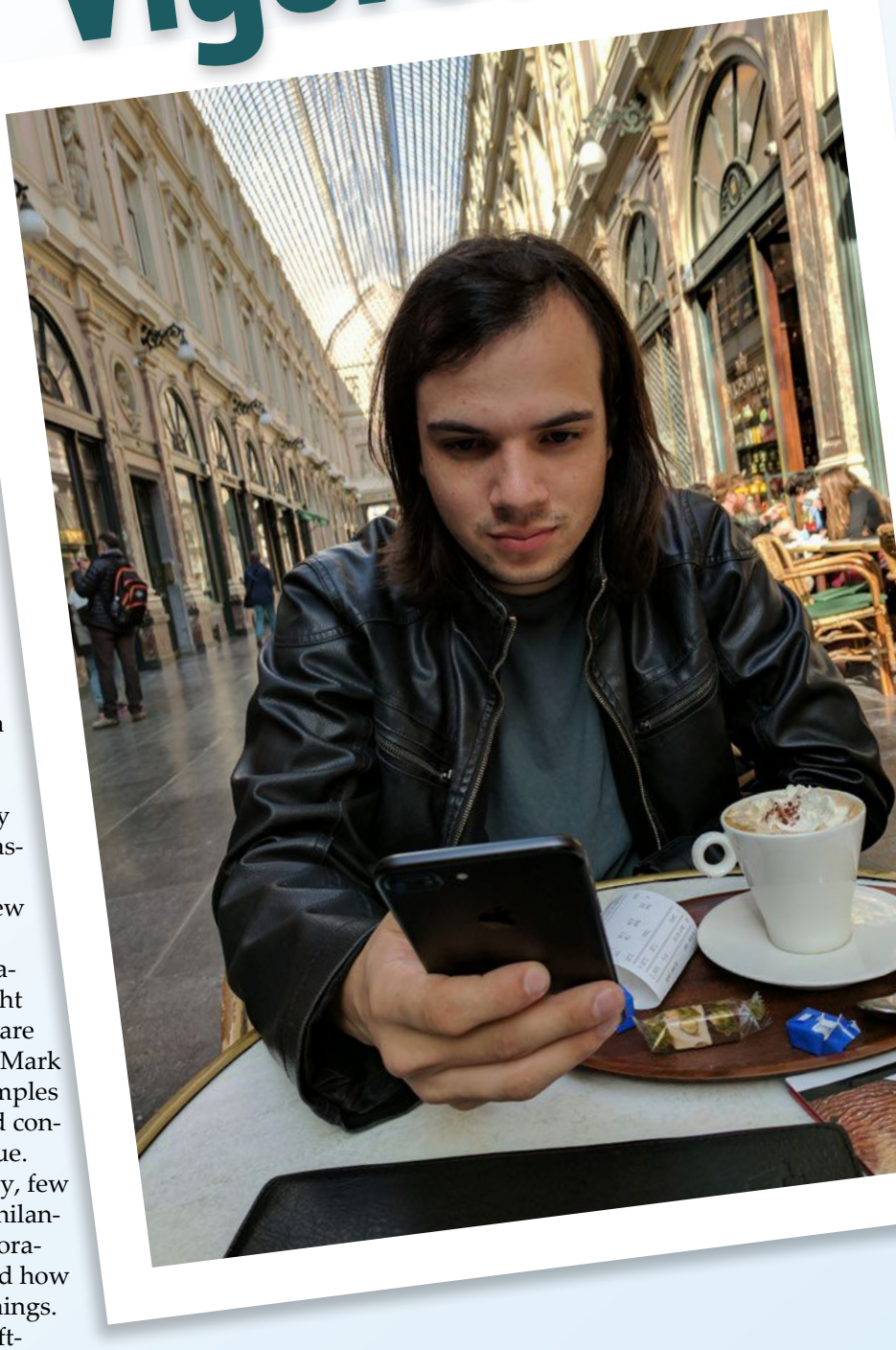
ALEXANDER BELL
IT INSTRUCTOR

The Young and The ~~Restless~~ Vigorous

Certified and driven, tech-savvy young man follows IT from Virginia to Texas

BY CALVIN HARPER

Calvin Harper is an associate editor of *Certification Magazine*, and a veteran of the publishing industry.



Writer and novelist, Pearl Buck wrote, "The young do not know enough to be prudent, and therefore they attempt the impossible — and achieve it, generation after generation."

Youth do seem to have a built-in confidence in their ability to accomplish things. And, fortunately for the rest of us, history has had its share of self-assured young Turks who dared mightily, ignored naysayers, and pushed the world forward with new and better ideas.

This is especially true when it comes to information technology (IT), an industry that moves at light speed, and where inquisitiveness and impatience are among the grandest of virtues. Tech pioneers like Mark Zuckerberg, Steve Jobs, and Evan Spiegel are examples of daring young people who have given the world conveniences and opportunities of immeasurable value.

When it comes to sheer confidence and audacity, few are in a class with Bill Gates, business magnate, philanthropist, and principal founder of Microsoft Corporation. In a 2017 television interview Gates explained how vital it is to have confidence when tackling new things.

As a child, his passion lay in computers and software, but if not for being confident in himself, he may

never have realized it. He advised others that they needed to be confident to find their passion: "You must tap into this self-confidence. Doing so allows you to try out new things, and also gives you room for failure — a necessary precursor to success."

As an ambitious 19-year-old Harvard student in 1975, Gates and a friend, Paul Allen, read of the release of the Altair 8800, the world's first mini-computer. Unfortunately, because it was a kit computer, the 8800 didn't have any practical uses.

The duo contacted the manufacturer, MITS Creative Electronics, and offered to write a programming language for the 8800. The company agreed, but there was a problem — Gates and Allen didn't have access to an 8800.

Undaunted, they grabbed an instruction manual for the computer and, within a mere 30 days, wrote Altair Basic, the first computer language program for a personal computer. MITS liked the way the program performed and purchased it.

Altair Basic was just the first of many successful products from the youthful minds of Gates and Allen, and while the partners would eventually go their own ways, they are an example of youth not knowing enough to be prudent, and instead attempting and achieving the impossible.

Gates especially so: It was his confidence, wedded with a relentless drive, that helped him build a company synonymous with computer software and become the world's richest person before his 40th birthday.

Keeping the drive (to succeed) alive

The siren song of IT continues today and it's being answered by some of our nation's best and brightest — and youngest. One young man making his way in the industry is Chris Hultin, 23, of Dell Vale, Texas. Hultin, an accomplished professional, exudes confidence, but not the braggadocio that one often sees among young people who have yet to tangle with real adversity. Hultin's confidence is proven and sturdy, and he is refreshingly humble about it.

Hultin was raised in Virginia Beach, Va., by parents who valued education and provided him plenty of opportunities to learn and try new things. "My dad was a Navy man," he said. "He worked on radar systems for 20 years, and then did the same work for the Department of Defense, and my mom was a full-time homemaker."

Virginia Beach is known for its thriving defense, data centers, and biomedical industries, so it is easy to see how an inquisitive and bright young man would gravitate toward IT. It also helped that Hultin attended the district's Advanced Technology Center (ATC), where he was immersed in IT.

"I was a member of Future Business Leaders of America and took part in the Scholastic Bowl," said Hultin. "I was also a member of ATC's team in the First Lego League. Using standard Lego pieces and a programmable 'brain-unit,' we built a robot that navigated around a miniature city. We won Best Team in Show."

Hultin also was a member of ATC's team at the FBLA National competitions in 2011 where they earned second place in the Help Desk event. In 2012 the team won first place for network design.

A teacher's influence

When it comes to learning IT, one of the best advantages to have is a highly-skilled and passionate instructor. Hultin was fortunate — his ATC instructor was Linda Lavender and like all great teachers, she left a deep impression on him. "Truthfully, I would not be where I am if not for her," he said. "She is always helpful, always willing to share knowledge, and just a great teacher. I owe her a lot."

At least twice a year, Hultin drops into the center just to say hello, talk to students about IT and take Lavender to a well-deserved lunch.

"Chris is an amazing young man who showed great promise when I first met him," Lavender said. "He took advantage of the opportunities we offered at our school, earning several industry certifications along with developing outstanding technical skills."

Hultin was first introduced to certifications at ATC where he earned several entry-level certs in conjunction with his classes. He was a quick study and even found time to take a shot at Cisco's coveted CCNA credential —

an impressive goal for a high school student.

He missed passing the exam by a mere 33 points out of 1,000. "It was painful," he said. "But it would have been worse if I had actually paid for the cert myself. Fortunately, it was a voucher that was going to expire, so, no harm." (He has since earned his CCNA.)

Hultin credits certifications for helping him land a valuable IT internship with an architectural firm. "Earning certs while in high school is awesome," he said. "While certifications aren't a substitute for experience, they are a great way to get your foot in the door for tech jobs, especially if you don't have any experience.

"Without the knowledge behind the certifications, I probably wouldn't have gotten my internship."

Unfortunately, budget cuts precluded an offer of a permanent position for Hultin. Never one to be discouraged, he used his skills and knowledge to land a temporary position with an IT consulting firm, where he gained valuable Cisco experience working as a network management specialist.

Taking IT to the next level

After high school, Hultin attended Old Dominion University in Norfolk, Va., to study computer science. He was a student employee in the university's computer science department and a self-described "sponge-for-knowledge" who quickly added more arrows to his IT quiver. "I picked up a lot of hands-on experience with Linux and networking because I was the only person on staff with Cisco experience," he said.

It was at Old Dominium that Hultin's story took an unexpected twist. After two years of schooling and while taking capstone classes for his major, he began feeling unfulfilled and unchallenged. "I felt like I wasn't getting anything more out of being there," he said. "Most of what they were teaching was what I had already learned through my certifications. I was also frustrated with my on-campus job."

Not knowing what he wanted to do, but knowing for certain that he was ready for bigger things, he left school and found an entry-level position with Rackspace in Austin, Texas.

"I worked for one year as a Windows System Administrator providing phone and ticket support, among other things. And I learned a lot," he said.

Free now to move at his own pace, Hultin soon began to climb the Rackspace corporate ladder. The company was looking for a Linux Systems Engineer to write automation for public clouds. Realizing that he had no experience in that area, Hultin didn't give the position a second thought. Fortunately for him and the company, another employee appreciated Hultin's skills and submitted him for the position.

> **'Earning certs while in high school is awesome,' Hultin said. 'While certifications aren't a substitute for experience, they are a great way to get your foot in the door for tech jobs, especially if you don't have any experience.'**

"I was really surprised," said Hultin. "This was completely different from what I had been doing for the past year." The company was looking for someone who could learn on the fly — something Hultin is extremely good at — and after some "typical HR stuff," he got the job.

Hultin's adaptability wouldn't surprise his old teacher. Lavender said she remembers that Hultin never stalled out because of what he didn't know. "Instead of asking why, he would investigate and discover answers and solutions on his own," she said. "He jumped into any project, competition or challenge to increase his knowledge and is now enjoying a terrific career and new opportunities."

For the next 18 months, Hultin did automation on Linux and became very good at it. Which led to another upward move to his current position as a Linux Systems Engineer at ObjectRocket, a subsidiary of Rackspace, where he helps with the architecting and automating of new systems and building a foundation for the next generation of products.

A unique temperament

Many young people would be delighted with, and probably a bit boastful of, such rapid career success, but not Hultin. "It's been interesting and surprising. Not where I would have expected to land when I moved to Texas originally," he said.

As one who loves problem solving, Hultin has job satisfaction. His day is filled with an endless stream of IT-related problems that require him to research and test possible solutions. "I do lots of trouble-shooting, always asking why something is behaving the way it is and how can we fix it. A lot of how do we build 'this' to make it better, what are the spots for improvement and what tech can we use to help improve it," he said.

As mentioned above, Hultin is not only humble about his accomplishments, but also self-effacing. When asked about overcoming difficulties in his life, he paused for a moment and responded, "Challenges? I really haven't had a whole lot of significant struggles. I was fortunate to get a good education and my parents helped me through school. I'm just a guy with some talent who got some lucky breaks."

Even lucky and talented guys need down time to recharge their creative batteries, and Hultin does this in some

fun ways. He occasionally zips around town on his Suzuki GS 500F and attends an indoor climbing gym several times a week. He finds climbing to be a handy method of staying physically fit while sharpening his mind. "I don't have the patience to do things for hours on end and for me, climbing is more engaging as a workout than lifting weights or running."

Hultin also enjoys regular hiking in the outdoors and trying new things. He has been in a serious relationship for three years with his girlfriend, Tiffany, who just happens to be a spirited foodie. "We enjoy going to different places and trying exotic foods like granola and caramel popcorn made with whole crickets and cricket flour."

After a busy day the couple like to disconnect from their demanding careers. They enjoy cooking together several times a week. Hultin joked about their "lack of culinary skills," and said, "We haven't managed to make anything inedible … yet. Knock on wood."

They also relax in the company of two "long-haired and extremely fluffy cats," Ivy and Storm. "We aren't sure what breed they are," said Hultin. "We found them at a shelter and they were so cute that we didn't want to split them up, so, we adopted both."

Hultin also relaxes with puzzle games, and by reading sci-fi and fantasy novels. His favorite series is the Discworld novels of Terry Pratchett. "It's serious, but at the same time makes fun of pop culture and fantasy tropes," he said. He is "really into *Star Wars*," and makes every effort to snag opening-night tickets for each movie.

Owning a home — and IT skills

The one accomplishment Hultin can't help speaking of with pride is his home. At an age when most young professionals are more interested in short-term thrills, he takes great satisfaction in the responsibility of being a property holder.

"I am very proud to be a homeowner at age 23," he said. Of course, as a skilled techie, he has given his home all the latest IoT connections. "My home is fully automated with lights, HVAC, security, and even a 3D printer all tied into a single control panel that I can manage from anywhere with an internet connection."

Because he has accomplished a great deal in a short time, other IT pros are often surprised at Hultin's age. "A lot of people say, 'Wow! I didn't realize you were so young.'" He attributes his success to his problem-solving skills, eagerness to dig into any challenge and an attitude to learn new things.

"Tech moves so fast that time in the industry alone isn't enough," Hultin said. "You have to work with the new tech and new ideas."

When it comes to certifications, Hultin strongly favors those that enable one to develop practical skills versus rote memorization. "It's one thing to have a cert — another thing entirely to truly understand the material and put it into practice," he said. "It's amazing how many people are certified, but can't follow through when it comes to doing it."

As to his future career moves and objectives, Hultin admits that they are currently fluid. "I'm really still not sure — I just know that I want to continue to learn and grow. I don't know what exactly I want to do for the rest of my life. I'll stay in tech, but what and where? No idea."

Older people occasionally say that "youth is wasted on the young." Nothing could be further from the truth with Hultin. He is a young man with the ability, desire and just the right amount of imprudence to make a splash in the world.

His advice to others starting out in IT is direct — and bold: "Take advantage of every opportunity you have, even if you think they have small chance to succeed. You never know what's going to happen." ■

ANSWERING THE Bell

Tireless and committed, a tough yet caring NYC tech teacher molds teens for success

BY CALVIN HARPER

Calvin Harper is an associate editor of *Certification Magazine*, and a veteran of the publishing industry.

Career Technical Education (CTE) is a tough job. There are long hours and demanding (as well as distracted) students, coupled with a constant wrestle for funding that can leave even the most dedicated instructor feeling frazzled and questioning his or her sanity.

It takes a certain kind of individual to forge a successful career teaching IT to teenagers. In addition to being knowledgeable, they need to be firm, tough, demanding, able to handle setbacks, and — above all else — dedicated to their students.

One man who exemplifies these traits is Alexander C. Bell ("Bell" or "Mr. Bell" to friends and colleagues), the CTE Instructor at Thomas A. Edison Career and Technical Education High School in the Queens borough of New York City. If you were to ask central casting to send over a "quintessential intense teacher" for your inspirational schoolhouse blockbuster, you'd probably get someone very much like Mr. Bell.

At first glance, he seems, for lack of a better word, intimidating. A large man with a stare that would probably give most people pause, Bell is also a snappy dresser. His tailored suit, carefully matched tie, spit-shined shoes and accompanying cuff-links would make him look at home on the cover of a men's fashion magazine.

A CTE instructor for 34 years, Bell's appearance is no façade. It's a legitimate part of his persona, a carefully crafted statement about the importance of teachers. It reflects a lesson Bell learned years ago from his mentor, Dwight Threepersons.

In 1984, to address a shortage of certified CTE teachers, the City's Department of Education and the Teacher's Union tapped Threepersons to develop an internship program to train promising young individuals as CTE instructors. Bell was a member of the first cohort, training to be an instructor of business machine repair.

Just a year or two older than those he was instructing, Bell, like many first-time teachers, initially permitted the students to be informal toward him — joking with him and calling him by his first name. Threepersons pulled him aside and instructed him on the importance of maintaining an image of authority and respect.

"I told him you need to dress up a bit, put on a tie," said Threepersons. "And, to your students, it's no longer 'Alex.' It's 'Mr. Bell!' "

Energetic and optimistic

Ever eager to learn and improve, Bell changed his style. To this day, he tells Threepersons that that "was the best thing you ever did for me."

Even his "ride," a white Infinity M35X, makes a statement. His license plate, "Bell65" seems to shout out his arrival. An early riser, Bell typically pulls into the school lot each morning at 5:30 a.m. (classes start at 8:00), with the sunroof open and music blasting from a customized stereo system. His choice of "tunes" is eclectic.

"I love my reggae, blues giants like Etta James and B.B. King, and rock and roll from Tom Petty and 'The Boss,' Springsteen," he said. "I like my music loud because I need that to keep me focused on what's ahead in the day."

An intense teacher, Bell is 100 percent committed to the success of his students. By arriving at school so early, he dedicates two hours to writing demos and preparing for the day without interruption.

Visitors entering Bell's classroom immediately notice the walls plastered with mementos, copies of student certifications and achievements, various awards, and an abundance of inspirational quotes, each carefully chosen and displayed for maximum impact. The items are designed to inspire students to achieve.

> **"For the past 17 years, all of (Bell's) graduating seniors, almost 400 of them, have become CompTIA A+ certified computer service technicians.**

As Bell put it, "Everything in my room has a story behind it. There is so much of happiness to talk about in here. They are all motivational tools. Students see them and they know something positive is taking place in here. They really make a difference."

The quotes aren't just wall-hangings; Bell lives by them, peppering his conversations with adages of faith in a higher power, hard work and stick-to-it-iveness that never fail to motivate. One of his favorites is by civil rights activist Fanny Lou Hamer: "You can pray until you faint, but if you don't up and try to do something, God's not going to put it in your lap."

Bell lives by those words. A religious man, he said, "I pray every day, and then I get up and get to work."

Tech skills for life

Bell is a demanding teacher, pushing students to achieve and learn all they can. His constant refrain to new students is, "Follow my lead and you'll leave here happy, skilled, and ready to succeed." In his classes, students learn and train for the CompTIA IT Fundamentals and A+ certifications, because that prepares students to fill entry-level IT positions.

And, as with many demanding and caring teachers, Bell's students appreciate and even love him because of what he did for them.

His primary focus for students is to "get them certified," because certs will help them find a job. His secondary focus is for them to "be the best techs they can be." Bell sees knowledge of the craft as being more important than a piece of paper.

"I teach them the difference between a mechanic and a technician," he said. "A mechanic can open a machine up and fiddle with it, size it up, but a technician is someone who knows how and why something works."

When it comes to IT skills, Bell favors performance through hands-on simulations. "Throughout the year they do several 'hands-on' performance exams that illustrate to me that they have mastered the task — or not," he said.

One classic example (out of many) is a test that determined whether students have the ability to set up, connect, and configure a "network printer" using its IP address. To achieve full success, they must first explain the process and requirements needed, then perform the demo.

Bell refers to his students as "young leaders" because, "They will be leaders. I'm teaching technical and real-life skills that will enable them to provide for themselves and to help others."

Setting the tone

When it comes to discipline, Bell's students don't have many issues. If they do, they don't have them for long. Bell used to look forward to removing a disruptive student on the first day of school to "set the tone for the year that poor behavior will not be tolerated." He hasn't had to do that for some time, he said with a laugh, because older students tell the new ones right off "what Mr. Bell expects in his classroom."

Bell's teaching methods and high expectations have borne a lot of fruit. For the past 17 years, all of his graduating seniors, almost 400 of them, have become CompTIA A+ certified computer service technicians. "And come May, it's going to be 18 consecutive years," he stated.

A significant number of former students have completed New York City's prestigious Success Via Apprenticeship (SVA) program (formerly the Substitute Vocational Assistant program that Bell himself completed). In fact, three of his former students who completed this program are currently working at Thomas Edison:

One is the sitting principal, one is the CTE department coordinator, and the other is a CTE teacher. Another former student is a CTE teacher at a different high school, and three others are currently enrolled in the SVA program.

Bell does more than just equip his young charges with IT skills. If they don't go on to seek higher education, then he wants to see them employed as IT techs. And as part of preparing them for the workforce, he teaches soft skills — so that they can fit into a professional work environment — and uses his business contacts to help them land job interviews.

Bell regularly writes letters of recommendation for students, and even goes the extra mile by embedding a photo of him and the student working together on a project.

A special payoff for Bell is when former students drop by to say hello. These visits give him great joy when he hears how well his former charges are doing.

"I'm giddy when they come back to visit," he said. "They show up looking great, feeling great, taking care of themselves, and helping Mom at home with the bills. In large part, because they consciously chose to trust and follow my lead which began their employment in IT."

Do the right thing

In addition to IT and interpersonal skills, Bell's most crucial lesson is the importance of being moral.

"I want my students to do more than prepare for a job. I want them to know the adventure that life brings if they follow a moral compass," he said. "If you're morally grounded and do the right thing, the money will follow. You may not be rich, but you'll be happy. Nobody can take away from you the things you accumulate as you help change people's lives."

Speaking with Bell, one quickly realizes that it is morality that most defines him. He thoroughly believes his purpose is to help change people's lives through teaching, and that to achieve that purpose, he must undeviatingly follow his moral compass.

Bell's constant refrain to students is, "What is easy isn't always right, and what is right isn't always easy — but you can't go wrong if you keep your moral base."

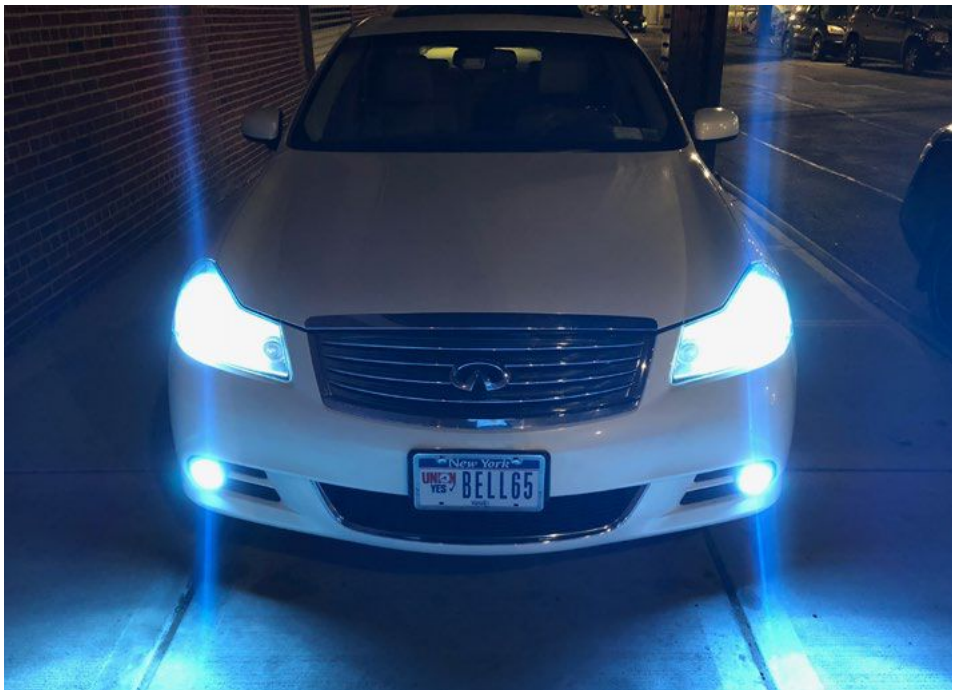
A straight shooter, Bell is never afraid to "rock the boat" on behalf of his students. The kids are worth any backlash he catches for speaking out when higher-ups fail to make an important decision affecting their education, especially if he feels funding isn't being divided fairly.

Fairness is another Bell touchstone, particularly when it comes to misbehaving students. "I see some students in other classes causing problems and breaking rules and still being rewarded with class trips and other special events. It's a slap in the face to all Edison students who do everything right," he said.

A hard road to success

Bell's sense of morality and fair play came early in life. He grew up in the projects in a home with its share of dysfunction. Through desire and the help of others, he rejected that life, choosing instead a more difficult path of education, hard work, and sacrifice.

His road wasn't easy. As a fifth-grader, he ran afoul of a teacher and was eventually kicked out



of school. Another of Bell's favorite quotes is from Adam Clayton Powell: "God works in mysterious ways and has wonders to perform." Being removed from school was just the first of many of God's wonders for Bell.

Eventually allowed to return, he was placed with a more understanding teacher, Ms. Kenchief. "Wish I could find and thank her. Through positive reinforcement, she changed my life forever," said Bell.

Kenchief embodied fairness and made learning enjoyable. "She took us on the most fun school trips. We would learn when we least expected it," he said. "We had to behave and complete all our work to go on class trips, and I never missed doing my homework."

Lessons of responsibility and hard work continued in high-school with his office machine repair teacher, Joe Licata, whom Bell affectionately describes as a "crazy Italian guy." An old school educator, Licata would yell, scream, and keep students' noses to the grindstone.

Nevertheless, Bell said, "he always treated us fairly and made us do the work correctly. He wanted us to be greater than we were. I learned a lot from him."

On his own as a teenager, Bell worked in a car wash to make ends meet. Starting on the lowest rung, he applied the lessons learned from his teachers and worked his way to a manager position. "I stayed positive, because like Gen. Colin Powell says, 'Optimism is a force multiplier.' "

Bell isn't shy about his humble beginnings: "I want my students to know that I was once below them, and my intention is to help them get to my level and even surpass me."

Upon graduation, "Crazy Joe Licata" nominated Bell for a five-year internship in the City's SVA program for aspiring teachers. After completing his field work with the Xerox Corporation, Bell became a licensed NYC teacher.

Soldiering on

Even hard-driving IT teachers occasionally relax, and Bell does it in his own way. A fitness devotee, he enjoys progressive weight training — he can do sets with 120-pound dumbbells on the incline bench — power walking on the StairMaster, and takes pains to follow a healthy diet consisting of vegetables, fish, and drinking lots of water to prevent toxins from building up in his body.

"Eating clean means, I usually don't get sick," he said. "I'm so busy that I can't afford to get sick."

Over the years Bell has received his share of accolades for teaching, leadership and community service. Several of the more prominent ones include the NYC Most Innovative Technology Program Award, ACTE Region 1 teacher of the Year, The Big Apple Outstanding Teacher Award, The Learnkey Business & Education Partnership Award, and an Outstanding SVA Mentor Award.

Despite all the formal awards, Bell said he is most pleased with two "unofficial" recognitions. The first took place at an Edison High commencement, and was entirely engineered by his students. Called to the lectern and met by a group of students and the president of CES Industries, Long Island, Bell was given the Outstanding Teacher Appreciation Award.

The second unofficial recognition occurred last year at the Barclays Center sports arena, home of the NBA's Brooklyn Nets, who gave Bell a "Teacher Excellence Award." What pleased him more than being feted by the Nets was being recognized by a former student, Marcus Plaza, who graduated from his class 24 years ago. Plaza is an executive with the arena.

As Bell was being led to the floor, Plaza yelled out, "Mr. Bell! Mr. Bell! Do you remember me?" They made eye contact and instantly knew their past. Teacher and former student later connected for photos with several other students from years past also in attendance.

"It was a great night," said Bell. "We all get tired trying to do the right things. Sometimes it's so hard, but that night, I felt it was God giving me a sign that He knows I'm tired, but to keep on going."

Bell has reason to be tired. He is a busy man involved in an important task, helping to change people's lives for the better, and teaching students the skills they need to succeed in IT and more importantly in life.

As a reminder to himself to keep believing and striving, Bell's business card includes a quote from talk show host and activist Joe Madison:

"Never allow yourself to be … undervalued, underestimated, or marginalized." Three adjectives no one has ever applied to Bell.

It's understandable that Bell draws strength from the quotes lining his classroom. Perhaps the one that best sums up the man and his philosophy is from Albert Einstein: "Try not to become a man of success, but rather try to become a man of value."

Based on the way he lives his life and the success of his students; Alexander C. Bell is indeed a valuable man. ■

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– Carl Hallberg, Wells Fargo, GIAC Reverse Engineering Malware (GREM)

OPPORTUNITY in the forecast

As the cloud computing boom continues, employement is everywhere

BY CODY CLARK

Cody Clark is the managing editor of *Certification Magazine*.

Like the proverbial cumulonimbus high in the sky on a sunny afternoon that looks like a fire-breathing dragon to one kid lying on his back in the grass, and like a plate of spaghetti and meatballs to a playmate looking up from the same spot, the Cloud often has a different profile when seen by different people.

An individual user may see unlimited storage for family photos or digital music, or a tool to stream blockbuster movies like *Black Panther* (in another month or two) or *Jumanji: Welcome to the Jungle* (right now). A corporate manager might see a valuable backup server that mirrors critical business records, or a resource-maximizing platform that seamlessly replaces on-site software and hardware.

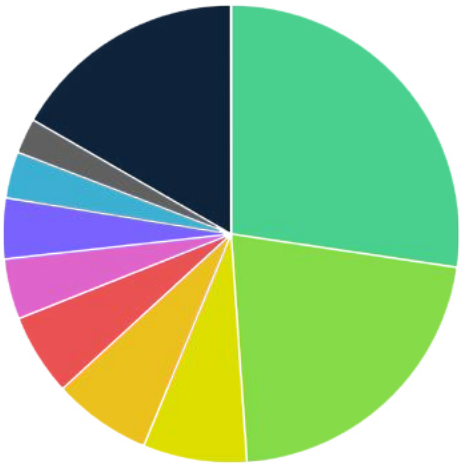
An IT security professional could pick out the contours of a challenging new frontier ripe for exploration and discovery — or picture a nightmarish new perimeter rife with exploitable vulnerabilities.

The All Things to All People malleability of cloud computing technology means that we're probably only scratching the surface of what the Cloud can be and do, and probably still on the rising slope of an employment curve that could eventually encompass nearly all IT disciplines. There are already cloud certs specific to networking, security, data storage, Linux, and more.

Tech Roots

What area of IT were you most heavily involved in prior to pursuing cloud computing?

Information Security — 27.5 percent
Systems Administration — 21.7 percent
I did not work in IT before pursuing cloud computing. — 7.4 percent
Virtualization — 7 percent
Networking — 5.8 percent
Helpdesk — 4.3 percent
Programming — 4.3 percent
Big Data — 3.3 percent
Web Development — 2.5 percent
Other — 16.2 percent



Market analysis firm Forrester Research projects that total spending on cloud services worldwide will rise to $178 billion this year — up from $148 billion in 2017 — and robust growth is projected to continue into the future.

Through our own recently completed 2018 Salary Survey, *Certification Magazine* picked out an obvious indicator of energetic and rising interest in cloud computing professionals. The top-salaried certification on our Salary Survey 75 list was Amazon Web Services Certified Solutions Architect – Associate, a mid-level credential for the industry's top cloud services provider with an average annual salary of $146,960.

Whatever you make of the Cloud as an IT professional yourself, getting a piece of the action is likely be good for your career.

Inhibiting progress

In keeping with our revised survey strategy, introduced in the final *Certification Magazine* of 2017, our recently conducted Cloud Certification Survey pivoted away from salary to focus on other aspects of cloud computing certification. One area of interest to many is sorting through the various obstacles to the increasingly widespread integration and adoption of cloud computing technology.

Our results indicate that, out of all the potentially entangling perils of charging whole hog into cloud everything, certified professionals are most concerned about data security. When data of great consequence both to individuals and organizations is stored remotely in vast server warehouses, of course, there's an obvious vector of attack for malefactors.

A related issue generated the next-highest level of concern: availability of skilled personnel. Like Han Solo once pointed out to Luke Skywalker, having a modified Corellian light freighter at your sevice is great, as long as you also have someone to fly it for you. And as often happens with new technology, it would seem that the current supply of starships — so to speak — outstrips the availability of qualified pilots.

A skills gap, of course, can portend good things for both skilled professionals and those working toward becoming skilled professionals (whether through certification or by other means). You might not quite have the freedom to name your salary, but you are likely to find plenty of employment offers out there.

Data ownership also rated a high level of concern. Among the vast hordes of users who communicate, shop, and transact business via "free" e-mail accounts, for example, what level of discretion does the service provider have to mine and sell personal information? Less concerning at present are such down-the-road landmines as standardization across cloud platforms, and capacity management.

It's probably also worth noting that the least of anyone's concerns is the pointed issue of monetization. For now, at any rate, it would seem that getting money out of cloud computing is a given in the eyes of many, if not most, certified professionals.

Why Certify?

People get certified for a variety of reasons. Two of the most common are to gain knowledge (education) or to improve compensation (salary). There are other rationales, however, for earning and maintaining a certification. We asked survey respondents to choose two that have been most influential in guiding their certification decision making.

1) Gain qualifications for a future job — 59.7 percent
2) Improve or confirm my qualifications for my current job — 49.3 percent
3) Gain greater confidence in my own skills — 47.8 percent
4) Gain prestige and recognition among colleagues — 40.3 percent
5) Enjoy belonging to a community of certified professionals — 38.8 percent
6) Become eligible for positions of greater responsibilty with my current employer — 26.9 percent
7) Gain advanced access to technical data — 22.4 percent
8) Enjoy receiving increased support from IT vendors — 16.4 percent
9) My employer requires this certification — 14.9 percent

Cloud computing forecast

We also looked into which of all the various cloud technology applications holds the most potential for future growth. In the eyes of certified cloud professionals, it's a dead heat, with Software as a Service (SaaS) ever so slightly ahead of data analytics.

Using cloud tech to unify, centralize, and simplify business operations and other large-scale endeavors is probably where there's the most heat in cloud computing right now. In addition to SaaS being seen (even if only narrowly) as holding the greatest growth potential, there's also the fact that Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) generated the third- and fourth-highest levels of response.

Data storage rated a distant fifth, followed by the even less trendy applications of backup/disaster recovery and research and development.

That should offer at least some indication of what skills to emphasize for cloud professionals or aspiring cloud professionals who are eyeballing continuing education and career development opportunities. And if you are in that boat, then it may be worth asking your employer about compensation for training and certification.

While about half of survey respondents (47.6 percent) paid the total cost of their most recent cloud computing certification, roughly one-third (33 percent) got the company they work for to foot the entire bill, and a further 15.9 percent worked out some kind of cost split between themselves and their employer.

Who's got a certification?

There's some evidence that certification is still catching on in the cloud computing arena. For as much as there may be rising demand for skilled cloud computing professionals, there's not much to suggest that employers are asking for specific cloud credentials by name. Just 16 percent of survey respondents were required to hold one or more cloud certs in order to accept their current job.

What's more, a notable 42 percent of those surveyed got their first cloud computing certification just last year. And if you move that timeline back only three years to 2014, then you capture an additional 35 percent of the survey group. In other words, as recently as 2013, more than 77 percent of respondents had yet to earn their first cloud computing cert.

When you additionally factor in that 76 percent of those surveyed hold either just one (50.6 percent) or two (25.3 percent) cloud certs altogether, it seems clear that there's a lot of room for growth in the field.

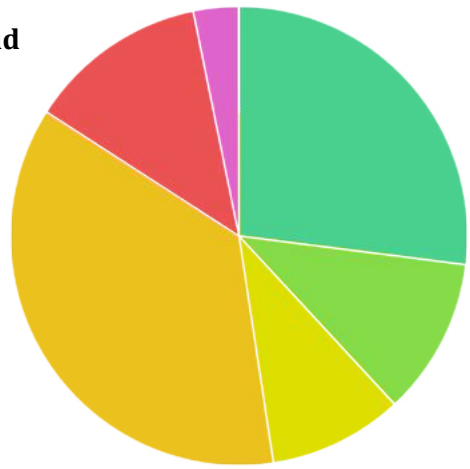
There's also some indication, however, that certification is vital to long-term employment in cloud computing. You can break into the industry and start flexing your IT muscle, but the odds are high that you won't be there long before the degree of difficulty points you toward certification.

Among survey respondents, 73 percent worked in the field for three or fewer years before getting a certification, and 30 percent didn't even make it an entire year before getting a cert.

Opening the Wallet

About how much money did you spend on training materials to complete your most recent cloud computing certification?

Spent nothing — 27 percent
$49 or less — 11.1 percent
$50 to $99 — 9.5 percent
$100 to $499 — 36.5 percent
$500 to $999 — 12.7 percent
$1,000 to $9,999 — 3.2 percent
$10,000 or more — [No responses]



Workplace and education

There's a fair amount of freedom to move around in cloud computing. We asked survey respondents to identify the industry in which they are currently employed, and no one field captured even 20 percent of the overall group.

Popular employment sectors include computer and network consulting, which claims 18.2 percent of those surveyed; local, state, and federal government (16.7 percent); software (12.1 percent); finance (10.6 percent); education (6.1 percent); and business services (6.1 percent).

For teens and young adults who are considering cloud computing as a potential career, definitely don't rule out higher education. Among survey respondents, 81 percent pursued their education far enough to hold some level of university degree, including 36.7 percent who topped out with a bachelor's degree, and 35.6 percent who went one step further and claimed a master's degree.

There's more information to come from our survey. Over the coming months, we'll be posting additional findings online at CertMag.com, where you can also find ongoing dispatches from our 2018 Salary Survey.

Certification Report Card

Many individuals looking to enter a new field, or expand the scope of their expertise, turn to certification. A certain amount of what exam candidates do to prepare is beyond the scope of a typical certification program, but the sponsoring organization is directly responsible for some aspects of the overall experience, and involved in many others. Are cloud computing certification programs meeting the needs of aspiring IT professionals? We asked survey respondents to assess their most recent certification experience and tell us how certification providers are doing in a variety of areas.

VALUE FOR THE PRICE PAID

- Excellent: 21 percent
- Very Good: 33.9 percent
- Good: 25.8 percent
- Fair: 8 percent
- Poor: 3.2 percent
- Does Not Apply: 8.1 percent

QUALITY OF YOUR TEST/EXAM

- Excellent: 25.8 percent
- Very Good: 29 percent
- Good: 29 percent
- Fair: 9.7 percent
- Poor: 3.5 percent
- Does Not Apply: 3 percent

QUALITY OF YOUR INSTRUCTORS

- Excellent: 17.7 percent
- Very Good: 14.5 percent
- Good: 16.2 percent
- Fair: 3.2 percent
- Poor: 1.6 percent
- Does Not Apply: 46.8 percent

QUALITY OF THE LEARNING MATERIALS

- Excellent: 27.4 percent
- Very Good: 35.5 percent
- Good: 19.4 percent
- Fair: 8.1 percent
- Poor: 1.6 percent
- Does Not Apply: 8 percent

COMPREHENSIVENESS OF THE PROGRAM

- Excellent: 14.5 percent
- Very Good: 22.6 percent
- Good: 29 percent
- Fair: 8.1 percent
- Poor: 3.2 percent
- Does Not Apply: 22.6 percent

OVERALL QUALITY OF THE EDUCATIONAL EXPERIENCE

- Excellent: 16.1 percent
- Very Good: 40.3 percent
- Good: 16.1 percent
- Fair: 6.5 percent
- Poor: 1.6 percent
- Does Not Apply: 19.4 percent

Can You Teach Tech to Others?

Three keys to becoming a highly effective technical trainer

BY TIM WARNER

Timothy L. Warner is an IT professional and technical trainer based in Nashville, Tenn. A computer enthusiast who authored his first BASIC program in 1981 on the Radio Shack TRS-80 Model III, Tim has worked in nearly every facet of IT, from systems administration and software architecture to technical writing and training. He can be reached via LinkedIn.

My daughter Zoey and I enjoy discussing philosophical questions. One topic we both enjoy is the old chestnut "Is the ability to keep musical time (or sing, or play an instrument competently) a skill people are 'born with,' or can it be taught?"

I wish I had a definitive answer to that question, because it applies to today's subject matter: What does it take to be a technical trainer? In my career, a "technical trainer" is a person who teaches others how to make the best use of computer and networking technology.

My 20-year career as an IT professional and technical trainer has been both happy and fruitful. When I was a boy, my Grandpa Cook told me, "Timmy, if you can find work that you enjoy so much you'd do it even if you weren't getting paid for it, then you know you've found your professional passion."

For me, technical training — specifically the blending of information technology (IT) with education — is indeed my professional passion, and it shows. Let me share with you three core skills that, to me, anyway, are required of any effective technical trainer.

1) The ability to see the Big Picture in your subject matter

If you skimmed this article, you may have noticed that I don't have "subject matter mastery" as a core skill. In my experience, the acquisition of subject matter knowledge has many levels:

- You overcome your initial barrier(s)/learning curve with the material.
- You develop a baseline understanding.
- You understand the material deeply enough to teach it to someone else.
- After teaching it a few times, you develop deep understanding.

Let's say I'm tasked with teaching Windows Server installation to a group of IT newcomers. Unless I'm working from "canned," or pre-made materials, it's up to me to decide which concepts are most important, and in which order I should deliver them for maximum learner gain.

This means that studying to teach is fundamentally different from studying to learn. The "big picture" in subject matter refers to the presentation of potentially complex subject matter in an easy-to-digest (or at least easier-to-digest) way.

To me, the most effective educators are those who work from a student-centered orientation. If I get up in front of that group of IT newcomers to stroke my ego and spout profundities, then I'm sunk — any knowledge transfer is likely to be minimal.

Instead, it's incumbent on me to think about the subject matter from the learner's point of view, and ensure that I organize the material in a logical, stepwise manner that mirror's the student's own concept discovery process.

2) The ability to explain concepts clearly, in the learner's language

Whereas seeking the "big picture" in the subject matter refers to organization and presentation, you need to be able to actually explain the concepts — deliver the goods — to be a quality technical trainer.

This is where Zoey and I get a bit intense in our philosophical musings. For example, you can probably think of people in your life who create more confusion than clarity with their instructions. On the other hand, other people may deliver instructions in a way that a 5-year-old can understand immediately.

Looking back over my life, I've been an educator since I was a pre-adolescent. In fact, I can remember teaching most of the neighborhood kids how to play a guitar. At 10, I discovered I had natural aptitude for the instrument, and of course this attracted the attention of my peers.

Before long, I was conducting informal seminars at my home, their homes, on the street. I've had the ability to explain concepts clearly since my earliest days of life; this is one of the confirmations that I am in the best possible career for my natural skill set.

I mentioned this earlier, but it bears repeating: an effective technical trainer speaks his or her student's language, not their own. The way I would present, say, performing a mail merge in Microsoft Word to an audience of information workers, versus how I would explain it to an audience of programmers, is quite different indeed.

The information workers care about the "click click next" procedures, so I would emphasize the under-the-hood mechanics less. By contrast, most programmers want to understand the underlying algorithms first, and then how those algorithms are manifested in the user interface.

I cringe every time I see a technical trainer pontificate on their subject matter and seem so pleased with themselves, while the audiences sits with glazed eyes and befuddled facial expressions. This isn't meaningful knowledge exchange — it's a waste of the leaners' valuable time!

3) The ability to adapt your teaching to the environment

Whoa — I cannot overstate the importance flexibility plays in becoming an effective technical trainer. You are familiar with good ol' Murphy of Murphy's Law, correct? Let me tell you, Murphy WILL show up at the majority of your training engagements to perform hijinks like:

- Your audience isn't who you expected. Their skills are either too high or too low for your subject matter.
- Multimedia failures abound. There's no projector, or there is one, but it uses a video adapter port you don't have on your laptop.
- The previous speaker runs overtime and encroaches on your session time.
- You must compete with environmental noise, possibly from HVAC, or from a boisterous nearby conference session, etc.

In my opinion, your success as a technical trainer hinges on your ability to pivot your presentation at a moment's notice. This is one reason why I liken technical training to improvisational comedy, or acting. Teaching truly is performance art, more often than not.

The role of degrees and certifications

My mentor and friend Don Jones, who is one of the world's foremost technical trainers, is a high school graduate who never attended college. You might call Don an exception — he is, indeed, an exceptional person — but I want to stress that you may not need to go back to school to become an engaging and effective technical trainer.

I hold a master's degree in education from Cornell University. While it was a stellar education, the most important lesson I received from that training was the necessity of teaching from a student-centered perspective. And I already told you all about that earlier in this article. See, I just saved you tens of thousands of dollars!

"In my opinion, your success as a technical trainer hinges on your ability to pivot your presentation at a moment's notice. This is one reason why I liken technical training to improvisational comedy, or acting.

That said, CompTIA offers a vendor neutral instructional credential called Certified Technical Trainer (CTT+) that can validate your teaching skills, and even help you up your game. Indeed, studying for this certification instills some good "nuts and bolts" educational theory and curriculum design best practices.

The CTT+ certification presents a sort of "chicken and egg" conundrum, however, for technical training newcomers: part of the certification requirements involve documentation of your teaching skills! In other words you can't just jump in without ever having attempted to teach or train before.

Along those lines, here are some vendor-specific technical training credentials that may be of interest:

- Microsoft Certified Trainer (MCT)
- Certified Cisco Systems Instructor (CCSI)
- Apple Certified Trainer (ACT)

Perform an 'acid test'

People often approach me at tech conferences or other training engagements and ask, "How can I find out whether I have the right aptitude to be a successful trainer?" My answer is quite simple, actually: Find a local technology user group that matches your skill set, and pitch session topics to the group's organizers.

Figuratively, an "acid test" is any definitive test for some attribute of a person's character. In my experience, the only way you can determine whether you have teaching aptitude is to try teaching, followed by soliciting honest feedback from your audience.

I want to stress there is no shame in thinking that you have natural teaching ability, but then discovering that teaching may not be the best fit for you. I myself spent four years in undergraduate studies thinking I had a strong aptitude for medical science, only to learn in my senior year that I do not. That was an expensive lesson, but one I'm grateful for in hindsight.

If, after all this to and fro, you find that you do have the aptitude, interest, and time to invest in technical training, then prepare for a lucrative and fruitful career. In information technology, we have a lot of people who "know their stuff," but not very many people at all who know how to transfer that knowledge to others efficiently. ■

The Case for Microsoft Office Certification

Everyone knows how to use Word, or Excel, or Outlook — why get certified?

BY JEFF RANDALL

Jeff Randall is a product manager at TestOut Corporation. He has worked in the IT certification industry for nearly a decade.

Have you ever wondered how to use some of the Microsoft Office command buttons, or even what their purpose is? You're not alone. Most features of Microsoft Office are simple enough to use but not everyone takes the time or initiative to explore the product beyond their comfort zone. An average user, in fact, is only familiar with around 10 percent of its features!

It's amazing what a person can accomplish using only that 10 percent. But what if you could do more? The ability to use Microsoft Office is important for both students and office workers. Hiring managers rank using Microsoft Office as their third-most sought-after skill when screening applicants.

There is a big difference, however, between using Microsoft Office they way that most people use it, and knowing how to dig down and really take full advantage of its many features. When I started my first office job, I didn't really realize how much I didn't know — and how that would impact my performance.

In-and-out training

One of my first professional assignments was to create a sales report with some analysis of growth and trends. It had been a few years since I had used Excel, but I felt like I was good with numbers, and in a few days finished the report.

When my boss reviewed the report, he called me into his office. He found the numbers to be correct, but couldn't find the formula I had used. I responded that I didn't know how to write the correct formula, so I had just used a calculator on each line. Thankfully, he smiled and took the time to show me how I could have finished the report in a few minutes, instead of a few days. I was embarrassed.

My boss told me I needed to become proficient with Excel, and enrolled me in a three-day course at a local training center. At the time, training seemed like the logical answer, but I needed something more. The center covered the objectives and, at the end of the training, our instructor handed us a certificate. It had our names on it, along with a few words of congratulations for completing the training.

I asked the instructor what the certificate was for. He said to give it to my boss so that my boss would know I had completed the course, and didn't skip out. Oh. Well, OK. Then I said, "But how will he know I learned anything?" Or more to the point, how would I know?

> “I asked the instructor what the certificate was for. He said to give it to my boss so that my boss would know I had completed the course, and didn't skip out.

Show me more

Training wasn’t enough for me. Because of the speed required to push through Excel in just three days, I left my three-day “drinking from the fire-hose” gauntlet lacking confidence. I didn’t feel that I had mastered enough of the course content to be effective and productive in my new job, and I was right.

It took several more months of asking questions of others around me, as well as doing my own trial-and-error fiddling with things, before I felt comfortable. Looking back at that experience, I can see that there were five key elements missing from my rushed training course that would have helped me be more successful:

- More time
- More practice
- Remediation
- Confidence-building
- Testing to verify knowledge and skills

Without proving knowledge and skills, any type of skills-based training can be less effective. Schools rarely hand out participation certificates to students — every grade and degree is earned by completing assignments and passing exams.

When it comes to Microsoft Office, using the Microsoft Office Specialist (MOS) certification exams to demonstrate mastery of Office programs and tools is a perfect standard. Schools and businesses can both agree that these exams will verify whether someone has actually gained a working knowledge of Microsoft Office and is prepared to succeed in the workforce.

Does it work?

While it may be a good standard to prove skills, however, students may wonder if employers value the MOS certifications and whether those credentials will help them stand out over other candidates in getting a job. Employers may wonder whether there is any difference in the performance of employees with certifications compared to those who don’t have them.

And it’s fair for both employers and students/job candidates to wonder whether MOS certifications are worth the cost in time and dollars? Let’s run through some common questions:

1) Do employers value candidates who have MOS certifications?
2) Does having MOS certifications help job candidates get hired?

The simple answer is YES. One powerful argument can be found on Certiport's Microsoft Office Specialist website, where it states that 91 percent of hiring managers consider certification as a criterion for hiring, while 81 percent feel that certified individuals perform better on the job. Certification alone doesn't guarantee anyone a job, but it certainly helps attract attention — and it definitely demonstrates the level of dedication needed for any individual to both pursue and complete a goal.

3) Do employees who have MOS certifications perform better than those who don't?

A study reported by Credentio found that 82 percent of MOS-certified employees had more confidence in their abilities as a worker, as well as better use of the knowledge and skills gained through certification, often or all of the time.

The same study found that 88 percent of certified employees said the MOS certification made them more effective in their work. Knowing how to use Office features and tools effectively brings confidence to complete assignments and projects, and can save valuable time.

4) Are MOS certifications worth the cost, in time and dollars, of earning them?

Earning any certification requires an investment of time — an average person could spend 30 hours or more learning a single application. And the actual cost of taking the exams can vary. Schools receive a discount, and often include free retakes. Generally speaking, however, no one should pay more than $96 to take one of the exams.

The value of any certification ultimately rests with the learner, and learners have a lot of different reasons for becoming certified. For anyone who wants to stand out from peers, however, or be more productive using Microsoft Office, or be more effective using Microsoft Office, certification will more than likely be worth the investment.

> **"Perhaps the most important question to consider when selecting a Microsoft Office training option is this: Will the learner enjoy using it?**

The right training solution

The hard part may be finding and deciding on the right training solution. Putting cost aside for the moment, nearly all training solutions will cover the same skills — the big difference is how the training is put together. For example, how simple is it to use? Does it offer a variety of learning materials? Is there plenty of practice with detailed remediation and feedback?

Perhaps the most important question to consider when selecting a Microsoft Office training option is this: Will the learner enjoy using it?

Of the many possible options, one that works for schools, employers, and individual learners is Desktop Pro Plus from TestOut. Desktop Pro Plus is loaded with features and includes everything a student or an individual learner could ask for to both acquire knowledge of, and become proficient at using, Microsoft Office applications.

Desktop Pro Plus includes instructional videos, progressive training labs that build on one another, practice tests for the MOS certification exams, and even TestOut's own Pro certification. Among the many bells and whistles that make Desktop Pro Plus unique, however, perhaps the most important feature is the challenge lab.

The lab helps you drill on knowledge and practice your skills. Content changes each time the lab is started, which keeps the learner from memorizing questions. The lab is timed, and tracks both accuracy and efficiency. As the learner attempts the lab over and over again, they should see their score, confidence, and long-term proficiency improve.

There are hints available throughout the lab, if you become befuddled. So if you get stuck in the middle, there are tools in place to help you fight through to the end. In order to pass the lab, you will need to complete all tasks correctly without using hints. That's the essence of learning: You try things over again until they become second nature.

Honestly, this is exactly what I needed many years ago when I was learning Excel. It would have made a huge difference in the first several months of that first job.

Is the MOS certification worth it? If a student or job candidate is looking to stand out, save time, be more productive and effective in their work, and be more confident in using Microsoft Office applications, then the answer is yes. ■

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Soar Into Relevance

These six cutting-edge cloud certifications will give your IT career wings

BY NATHAN KIMPEL

Nathan Kimpel is a seasoned information technology and operations executive with a diverse background in all areas of company functionality, and a keen focus on all aspects of IT operations and security. Over his 20 years in the industry, he has held nearly every job in IT and currently serves as a Project Manager in the St. Louis (Missouri) area, overseeing 50-plus projects. His certifications include PMP, CISSP and CEH.

If the IT landscape were like an actual landscape, people in tech would be reaching for their umbrellas right about now, because the sky would be filled with clouds, from horizon to horizon. Spending on cloud services rose by almost 19 percent last year, with businesses and organizations around the world shelling out an estimated $260 billion, up from $219 billion in 2016.

It's no surprise that some of the hottest certifications in IT right now are cloud certifications. Public and private organizations are in a blazing hurry to move to the cloud, with investment in Infrastructure as a Service (IaaS) and Software as a Service (SaaS) leading the way. There has never been a better time than right now to jump into cloud computing with both feet.

To help you map out your personal path to cloud tech acuity, here is a list of six certifications sure to catch the attention of employers eager to hire top-shelf talent.

AWS Certified Sysops Administrator – Associate

Amazon Web Services is leading the charge with their cloud computing platform, and this a great cert to have under your belt. Every day that I spend doing anything on AWS reminds me of hand-building servers in a small shop when I began my career many years ago. The AWS platform combines cutting-edge technology with the old-school cool of hands-on malleability.

This certification is unique and impactful because its primary focus is on migrating existing infrastructure to the cloud, and locking in your knowledge of how to get that done. The bottom line for employers looking to migrate their operations to the cloud is employees who can do it on time, under budget, and seamlessly.

While you can go hog wild on AWS certs, getting a dozen or more, I strongly advise you to start with this one. It will cost you a few hundred dollars, require you to really understand the material, and — rather than just pay a fee to keep the credential current — you will need to recertify annually. The annual recertification alone is a strong validation that your skills are up-to-date, and that you can successfully migrate any company's business to the cloud.

Microsoft Certified Solutions Expert (MCSE): Cloud Platform and Infrastructure

Microsoft's competing cloud platform, Azure, is perhaps the foremost challenger to AWS, and I recommend this be your next credential after AWS

Certified Sysops Administrator – Associate. Practitioners of this platform and obtainers of this certification can fully utilize Azure and its myriad components.

The unique aspect of this certification is that you will have to become certified in a few other domains beforehand. For example, you can pick the MCSA: Windows 2016 track and receive your cloud certification after you earn your 2016 server cert. Employers love MCSEs because they know that their knowledge and skills are more broad-based than just knowing the ins-and-outs of Azure.

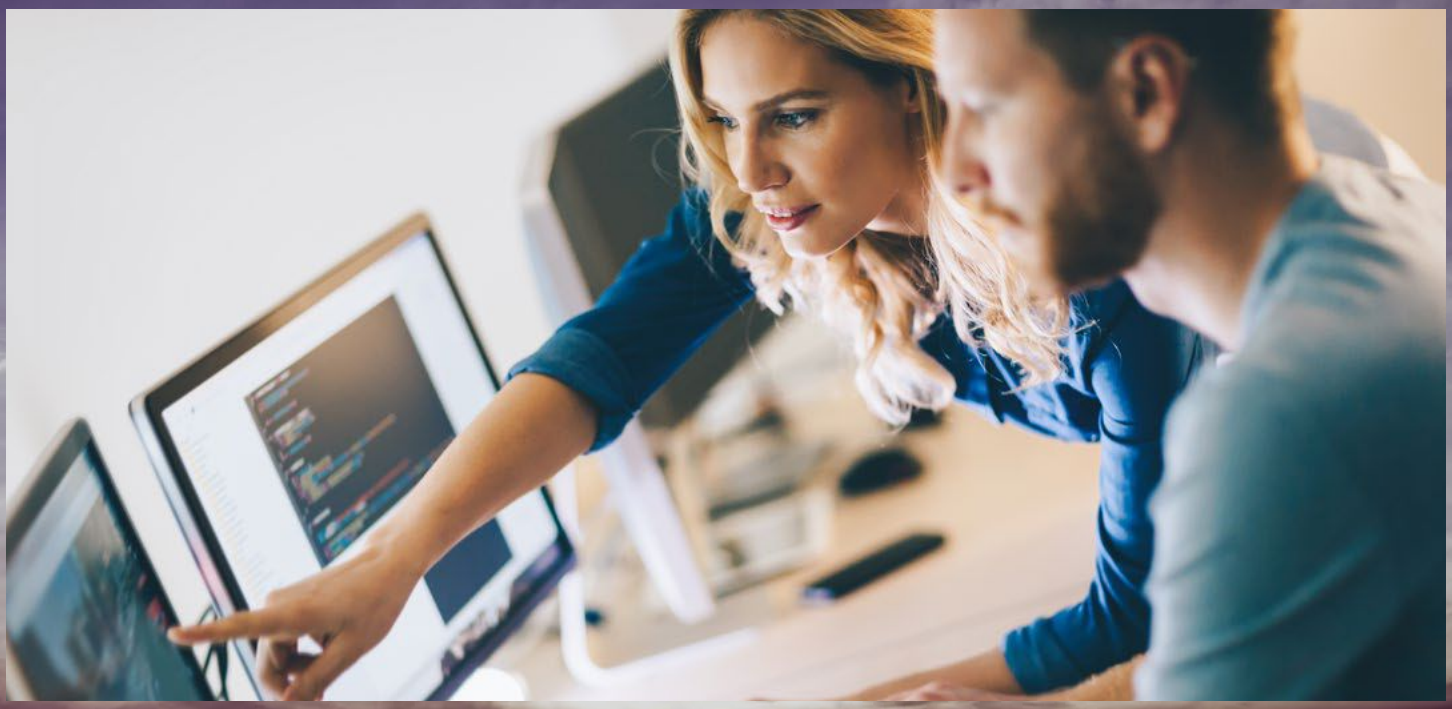
I personally find Azure to be less user-friendly than AWS, but who doesn't run Microsoft on their server side? My advice is to get certified at the MCSA level, the prerequisite for Cloud Platform and Infrastructure, and then decide whether you want to continue on. At worst, you'll be certified in something almost everyone uses already, and poised to quickly take advantage of that ubiquity.

VMware Certified Associate 6 – Cloud Management and Automation (VCA6-CMA)

First to market with the software-defined datacenter, VMware has created the VCA6-CMA certification to help skilled professionals manage their tech. Individuals who hold this credential are sure to have a positive impact, and any organization that acquires them will consider themselves lucky.

VCA6-CMA validates that you have gold standard skills and are capable of not only running, but also migrating a company's entire business to a cloud environment, both internal and external. Achieving this certification will put your career on a steep upward trajectory.

You can then move on to VMware Certified Advanced Professional 7 – Cloud Management and Automation Design, followed by VMware Certified Design Expert 7 – Cloud Management and Automation, and find yourself at the pinnacle of VMWare certification. No more job applications to fill out — employers will come looking for you.



Cisco Certified Network Professional (CCNP) Cloud

Speaking of pinnacles, a daring soul might want to get into the infrastructure side of the house with the CCNP Cloud credential. This cream-of-the-crop Cisco certification, which requires successfully passing four tests, can't be attempted unless you first earn its junior counterpart, CCNA Cloud, which has two tests of its own.

Per Cisco Learning Network, the certification and training arm of the company, "The CCNP Cloud certification is a lab-based training and certification program targeted at Cloud Engineers, Cloud Administrators, Cloud Designers, and Architects working in Data Centers. This program delivers the knowledge and skills necessary to design, provision, automate and manage Cloud and Infrastructure-as-a-Service deployments."

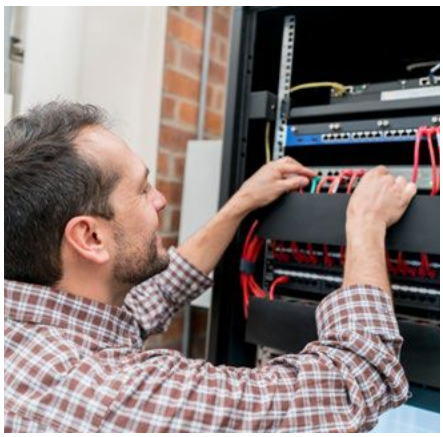
Individuals with this certification are likely to have a major positive impact for any organization, as they will bring with them the ability to design, grow, move and administer all cloud solutions.

Splunk Certified Architect

One deficit I see in cloud technology is the insufficient number of highly skilled people working in monitoring and automation. Making those areas more robust is essential to a healthy IT ecosystem and a growing bottom line.

Splunk is fast becoming the main tool of choice for any organization's enterprise monitoring and automation needs: "Splunk captures, indexes, and correlates real-time data in a searchable repository from which it can generate graphs, reports, alerts, dashboards, and visualizations." In other words, it turns data into knowledge.

A skilled individual can use Splunk to automate common functionality and dive deep into any cloud computing issues within their company. It allows you to have data driven insights into every part of your business, not just IT. Monitoring and automation has moved beyond just "pinging a server" to see if it's up and running.



"One deficit I see in cloud technology is the insufficient number of highly skilled people working in monitoring and automation. Making those areas more robust is essential to a healthy IT ecosystem(.)

Branding yourself a Splunk Certified Architect will allow you to master this software. From design to installation and operation, you'll have the skills to positively impact the monitoring and automation at your current company … or your next company.

Splunk Certified Architects are in demand. A quick Glassdoor search for the keyword "Splunk" lists more than 4,600 openings. This is a highly sought-after certification and skillset that is well worth pursuing.

TOGAF

Sponsored by The Open Group, TOGAF is a useful certification to have for making an impression on employers. I personally like the Level I and II certifications. When it comes to enterprise architecture and enabling global enterprises, the TOGAF framework is the accepted standard.

It assures that everyone speaks the same IT language and "avoids lock-in to proprietary solutions by standardizing on open methods for Enterprise Architecture." A TOGAF specialist can utilize resources efficiently to save time and money while achieving demonstrable ROI.

As an advanced cert, TOGAF is tough to achieve, but well worth your time and effort. The credential validates your ability to handle whatever cloud-related computing you'll run up against.

Make IT work for you

Cloud computing is opening all sorts of new avenues for data sharing and opportunities for skilled cloud pros. Setting and achieving your certification goal is the most important thing for your career. Whatever certification you choose to achieve in 2018, I recommend you be aggressive and shoot for the stars.

Don't disappoint yourself now or in the future. As always, happy certifying. ■

Ralf Kirchgaessner and Sheri Schaaf of SAP Global Certification with ITCC Chair Kristin Wall Gibson

Google wants a piece of the cloud

Competitors have a big lead, but Google may have the tools and certification offerings to catch up

According to IDC FutureScape, global spending on cloud-based technologies will account for at least half of total IT expenditures in 2018. By 2020, cloud spending will account for 60 percent of IT infrastructure expenditures, and between 60 and 70 percent of software, services, and technology IT expenditures.

The major public cloud services vendors are Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform, and IBM Cloud. All four offer Infrastructure-as-a-Service (IaaS), Software-as-a-Service (SaaS), and Platform-as-a-Service (PaaS).

With all of those heavy hitters in the game, this is a good time for companies investing in cloud services. The 500-pound gorillas are all competing with each other to provide more transparent, secure, and cost-effective services, even as they keep adding new tools and features.

Google's suite of public cloud computing services is known as Google Cloud Platform. Although Google is primarily a public cloud provider, it is also in the hybrid private cloud space.

While some companies still rely on a single platform, more and more organizations are taking multi-platform approaches. There is a growing tendency in the Industry to combine a major public cloud platform with specifics from a specialist. For example, both AWS and Google Cloud Platform are in partnerships with Salesforce.

Google enters the cloud

Google's cloud foray began modestly in 2008 with Google App Engine, a PaaS tool geared toward web applica-tion developers. Although the market for web applications was growing, App Engine did not do well initially because it lacked compatibility with certain important programming languages.

In 2010, the company added a storage layer, Google Cloud Storage. Two years later, Google launched its cloud partner program, followed by the tools BigQuery, CloudSQL, DataFlow, and the IaaS tool Cloud Compute Engine.

This collection of tools and services eventually became Google Cloud Platform. Initially aimed at start-ups and SMBs, Google Cloud Platform would soon evolve into a solid option for the enterprise segment as well. Their enterprise clients include Coca-Cola, Apple, Spotify, and The Walt Disney Company.

BY REENA GHOSH

Reena Ghosh is an independent professional writer who creates promotional, developmental and explanatory content for individuals and businesses. She came to professional writing with work experience in financial services operations and corporate communication. Reena speaks three languages and hopes to learn Sanskrit

Google's near-term forecast

Currently, Google Cloud Platform is way behind Amazon Web Services (AWS). Amazon was the first major player to enter the market and is still the clear leader, with Microsoft having a pretty solid grip on the next rung down the ladder.

Google Cloud Platform's market share did grow from 10 percent to 12 percent during the fourth quarter of 2017, and the company hopes to catch up with the big two by helping enterprises investing in artificial intelligence to develop machine-learning systems.

Drawing on publicly reported information for 2017, Google CEO Sundar Pichai recently said he believes Google Cloud Platform "is the fastest growing major public cloud provider in the world."

Google's strengths are in AI technologies, Big Data tools, and container infrastructure, such as Kubernetes. At the Google Cloud Next 2017 conference, the company launched a new machine learning API Video Intelligence, a video-cataloguing API. Google's Cloud Machine Learning Engine is now in general availability.

Using Google's TensorFlow, coders can build machine-learning software that has universal compatibility with — and is easily transferable to — Google Cloud Platform. TensorFlow is the most popular tool among developers, researchers, and students who work on machine-learning systems.

Google is banking on TensorFlow to enable it to capture a larger chunk of the $40 billion plus market. In April 2017, Diane Greene, Google's cloud business head, said she hoped that Google would lead the market in five years.

Google has also invested heavily in global cloud infrastructure and data centers. According to Infoworld, however, Google's comparatively narrow range of services in serverless computing, where AWS and Microsoft are far ahead, may prove an obstacle in its race for the No. 1 spot.

Bet on Google with Google Cloud certifications

If you suspect that Google has the wherewithal to make good on its bid to dominate the cloud computing market, then the still-fledgling Google Cloud certification program, Google Cloud Certified, should be of interest. This is where you can go to get a piece of the action for yourself. There are four certifications:

> **The 500-pound gorillas are all competing with each other to provide more transparent, secure, and cost-effective services, even as they keep adding new tools and features.**

Google Cloud Certified Professional Cloud Architect

A Google Cloud Certified Professional Cloud Architect understands cloud architecture and the Google Cloud Platform. These highly skilled professionals are able to "design, develop, and manage robust, secure, scalable, highly available, and dynamic solutions to drive business objectives." A Google Cloud Architect can guide prospective clients on how to implement solutions and handle migrations on the Google Cloud Platform.

While there are currently no prerequisites to sit for the certification exam, it is helpful to have at least a few months experience working with Google Cloud Platform. The exam is multiple-choice, lasts two hours and is available in English and Japanese.

It tests proficiency in designing, planning, managing and provisioning cloud solution infrastructure, analysis and optimisation of technical and business processes, designing for security and compliance, implementing and managing cloud architecture, and ensuring reliability of operations and solutions.

As Google emphasizes, work experience is an important part of preparing for the exam. Additionally, Google recommends the exam guide, sample case studies, training courses, hands-on-practice with Qwiklabs, and practice exams.

Google Cloud Certified Professional Data Engineer

A Google-certified Professional Data Engineer has the skills to design, develop, maintain, and troubleshoot systems for data processing. GCCPDEs are able to deploy data-processing technologies to gather, transform and picture data.

Data analysis skills enable a professional data engineer to discern probable business outcomes and develop statistical models to facilitate decision-making. They also have the expertise to build machine learning patterns in order to enable automation and streamlining of business processes.

This certification is designed for data analysts and scientists, business analysts, and other data professionals working in decision-making roles. It validates the ability to develop secure, reliable, highly efficient and scalable systems.

To become a Professional Data Engineer, you will need to pass a two-hour multiple-choice exam, available in English and Japanese. The exam has

no prerequisites and it is necessary to take this exam in person at one of Google's official testing center locations.

Either work experience in a query language, such as SQL, Python programming, machine learning, extracting, transforming and loading, or data modelling should be helpful. To prepare for the exam, rely on your work experience in combination with the exam guide, sample case studies, training courses, hands-on practice with Qwiklabs, documentation, and practice tests.

Google Cloud Certified G Suite Administrator

A Google-certified G Suite Administrator is able to configure and administer a G Suite domain. This includes managing users and groups, controlling access to cloud-based services, and ensuring the security of the domain.

The exam was available in beta, but is now closed for registration. According to Google, the certification exam will soon be globally available. For exam-specific updates, keep your eyes on cloud.google.com/certification. The exam has no prerequisites, but work experience with Google Cloud Platform is helpful.

As Google advises, the best way to prepare is to combine recommended study resources, such as the exam guide, self-study courses, and the video library of feature updates, with real-world experience.

Google Cloud Certified G Suite

A Google-certified G Suite professional has the know-how to operate and collaborate successfully in the modern digital workplace. This certification demonstrates expertise in using cloud-based tools to communicate via e-mail or online conference apps, and to create and share files, spreadsheets, documents, and slides.

According to Jefferies Group analyst Brent Thill, Google earns around half of its cloud revenue from G Suite. So earning this certification is likely to improve your job prospects sooner rather than later. The remotely proctored online exam was available in beta, but is now closed to new registration.

According to Google, the final certification exam will be available soon. Candidates will sit for the two-hour multiple choice and performance-based exam in a live G Suite domain.

Like other Google Cloud certification exams, this one has no prerequisite. Experience working on Google Cloud Platform, however, is an advantage. To prepare for this exam, Google recommends that candidates combine hands-on experience in the workplace with the G Suite Learning Center resources, interactive G Suite lessons, and Applied Digital Skills, Google's free computer literacy course.

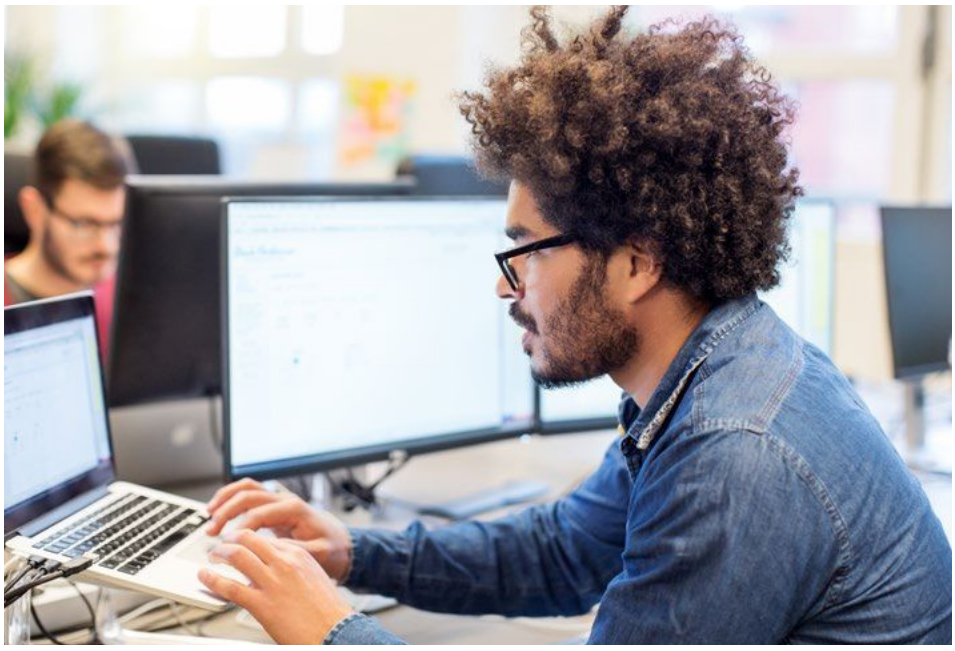
Measuring Google against the competition

Google is relatively new as a certification provider. Cloud computing has grown faster than expected, however, and there is currently a skills gap — meaning that qualified cloud professionals are in short supply

The demand for AWS certs is currently greater than demand for Google credentials, because AWS has the largest share of the market. The number of organizations looking for skilled and certified Google Cloud Platform professionals, on the other hand, is increasing. Given that Google is growing fast and focusing on improving its offerings in AI and big data, demand for Google certifications is sure to rise.

Consulting companies and vendors benefit from having Google Cloud-certified architects and data engineers on their payrolls, because this enhances their customer support capabilities. In the future, we are likely to see more Google Cloud certified instructors.

According to CIO and Firebrand Training, Google Cloud Certified Professional Cloud Architect is one of the 12 most valuable cloud credentials available today. As Google Cloud Platform becomes more accessible to organizations, the demand for Google cloud certifications is expected to grow. ■



One Identity to Rule Them All

Cloud identity management helps you do you across multiple applications under the same umbrella

BY NATHAN KIMPEL

Nathan Kimpel is a seasoned information technology and operations executive with a diverse background in all areas of company functionality, and a keen focus on all aspects of IT operations and security. Over his 20 years in the industry, he has held nearly every job in IT and currently serves as a Project Manager in the St. Louis (Missouri) area, overseeing 50-plus projects. His certifications include PMP, CISSP and CEH.

It seems that lately everyone is talking about online anonymity. But what about the other side of that equation? What about "proving" that you are who you say you are. One of the best ways of doing that is the technology at the lies at the heart of the emerging field of "cloud identity" management.

Cloud identity refers to your username, password, and usually an additional security item, like a secret question, all bundled into one package and tracked across different environments. It's how secure organizations like banks and retail outlets recognize and interact with you online.

Identity management across cloud or hybrid environments is called Identity as a Service (IDaaS) or Access Identity Management (IAM). A lot of vendors are looking to capitalize on it and a lot of companies see it as a robust, scalable solution for managing all their users' cloud identities. Currently, most services offer Single-Sign-On (SSO) using the same multifactor authentication (MFA) login IDs for all their systems.

How did we get here?

Say you manage an environment with 500 users. You run a large Windows network with approximately 200 servers, some in the cloud and some on-site. You're running between eight and 10 SaaS applications, like S/4 Hana, AWS, and so forth. It's a Windows shop, so you run Microsoft's Active Directory and every user has a username and password to access the computer and the network.

You hire a consultant to beef up your security and, because of all the reports in the news, he recommends multifactor authentication. MFA works by adding a layer of security to a username and password, such as a text to your phone with a code you need to enter, or a secret question to answer after entering your username and password. MFA is the base item you need to start on your road to a cloud identity service.

SSO uses a single username, password, and MFA for everything and is what most people associate with cloud identity. SSO permits a user to use one set of login credentials to access multiple applications. The service authenticates the end user for all applications. It grants users rights on all systems, so it passes all the way through. On the provider's side, SSO is helpful for logging user activities as well as monitoring business accounts.

Although many organizations may understand what cloud identity is — sort of — some still find it hard to see where it fits with their current environment. It's much more than SSO or MFA; it is the complete management of your virtual persona across your public facing landscape.

“Although many organizations may understand what cloud identity is — sort of — some still find it hard to see where it fits with their current environment.

Understanding the new environment

In today's workplace, and with the distribution of systems everywhere, the need for MFA and a central cloud identity is paramount. You cannot expect to remain unhacked if you do not have a service managing your MFA and your cloud identity.

I will talk more about the available services in a bit, but remember that you have some SaaS environments. Your business is probably running S/4 Hana, SAP's cloud offering. Business personnel have remote access to the services via a virtual private network (VPN). There are all these varied applications and tons of open gateways easily accessible with just a username and password.

The top vector of attack right now is through username and password access. Most users know the length trick, to make your password very long, and complexity trick, to load up your password with funky characters or random numbers. Very few, however, know or understand how a cloud

identity management system works or why you would need one.

If you want to kick off a project or effort to get this service into your organization, you need to start with education. The bosses, the users, the engineers all need to know what you intend to do and why it's being done. Since cybersecurity is for everyone, this should not require a lengthy learning curve or in-depth justification.

Ready, set … IDaaS

This is where an IDaaS really shines. Once you sign up with the service, there will be a setup to attach their cloud to your on-premises active directory, and then you can use the username, password, and MFA functionality to sign onto ANYTHING you own. It forwards your credentials to anything, whether in the Cloud or on-premises.

Many companies ask whether managing cloud identity is generally viewed as being the responsibility of a cloud services provider, or the responsibility of the business or organization that is using cloud services? Traditionally, each cloud application and the provider had a separate cloud identity for each application offering.

> **If you want to kick off a project or effort to get this service into your organization, you need to start with education.**

With the services now on the market, however, you no longer have to have separate cloud identities. A single cloud provider holds all the users' credentials and is integrated into each of your other cloud providers. This is a marked change from the traditional view of responsibility being on each cloud provider to the business organization to responsibly manage their own cloud identity.

Know your options

Managing your and/or everyone in your company's cloud identity is no light task. Fortunately, most Windows engineers can understand the setup and operation of an IDaaS. Many IDaaS applications will handhold you through the setup.

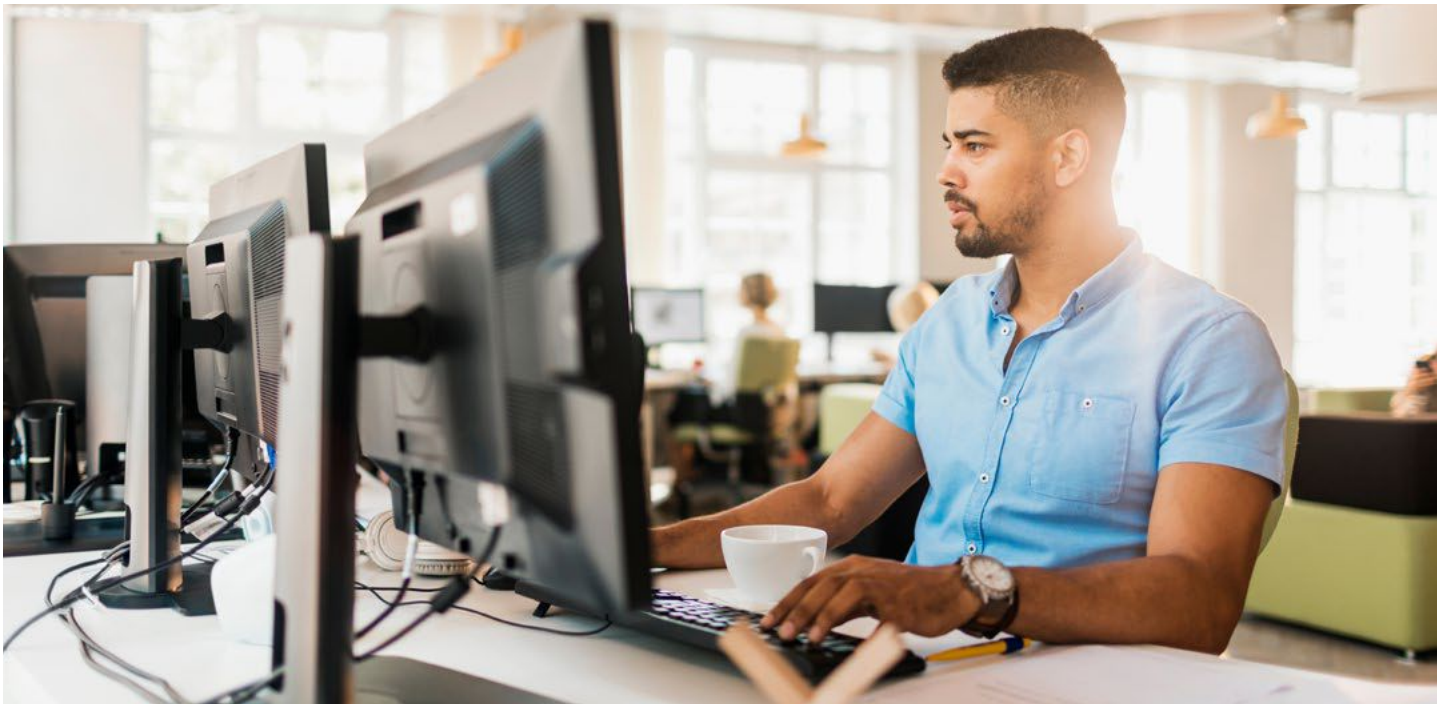
There are plenty of service providers that, for a fee, will completely integrate your environment. Okta's "always on" tag line is perfect. It touts a single sign-on and MFA for as many cloud environments, such as Jira, Slack, GitHub, and Webx, as you need to integrate. I've seen Okta in action and it is everything that it claims to be.

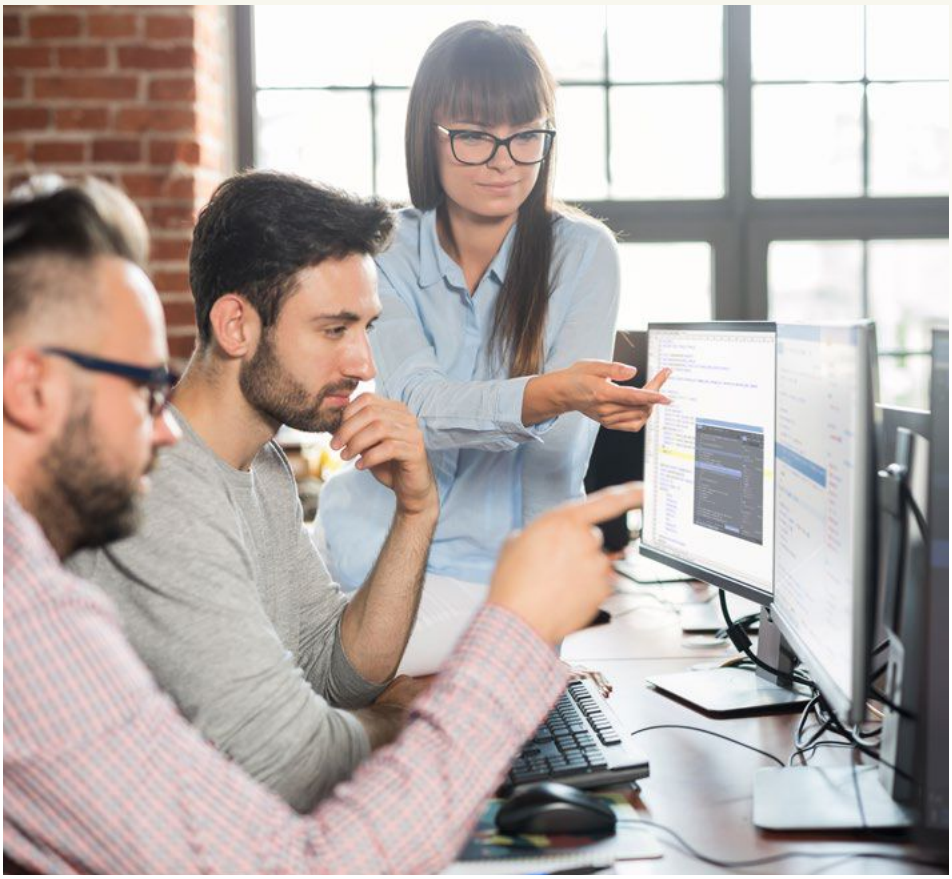
For those who want to wade out into deeper waters, Okta even has a certification program, with three certifications:

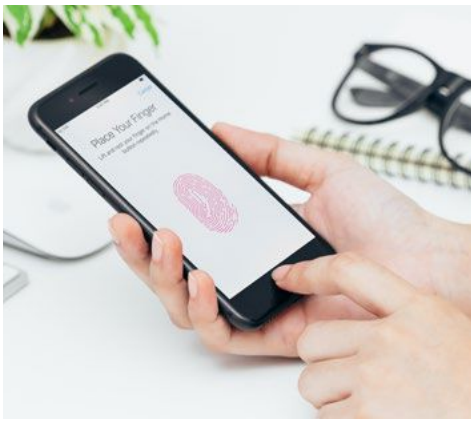
Okta Certified Professional covers hands-on day-to-day professional support.

Okta Certified Administrator encompasses the complete life-cycle management of Okta and its services.

Okta Certified Consultant certifies that recipients are ready to fully integrate all services in any organization.







Another company that offers a full range of IDaaS Services is Centrify. I've worked with this product and can say that its designers give every indication of being experts in the cloud identity space. Centrify offers a wide range of products including IDaaS, SSO, and Mobile Device Management (MDM).

MDM is a way to ensure that employees stay productive and in compliance with corporate policies. Many organizations control the activities of company phones issued to their employees. Using MDM products and services, an employer can secure e-mails, approve apps, and dictate the overall functionality of company-issued devices.

Some companies permit their employees to "Bring Your Own Device" (BYOD) and connect to the organizational network. Centrify's MDM functionality can include over-the-air distribution of applications, as well as data and configuration settings for all types of mobile devices, including mobile phones, smartphones, tablet computers, and so forth. The possibilities are endless.

Centrify also has options for certification that are self-directed and offer a really nice change of pace from exams where you have a physical observer and 12 cameras on you during testing. Several topics related to IDaaS are also covered in the Mother of All Security Certifications, (ISC)²'s CISSP. Preparing for the CISSP exam is not specific to IDaaS, but it will help you learn some crucial security functions.

A new frontier

It is important to understand all the challenges facing IT managers when it comes to managing cloud identity. With the exponential growth of virtualization, SaaS architectures, and cloud computing in general, everyone who wants to stay relevant will have to adopt these new technologies in this area.

Security and compliance issues exist in every facet of business today, and choosing the correct vendor, service, and direction is the key to success. Start small, with services that won't upset users or cause them to balk, before you move into a full-blown cloud identity solution.

No matter what solution, service, program, or approach you take, everyone agrees that the need to manage your cloud identity, your public-facing credentials, is one of the most important challenges every business must confront. ■

New Questions, Old Test

You can't put new wine into old bottles, but an old exam format is making a certification comeback

BY MIKE CHAPPLE

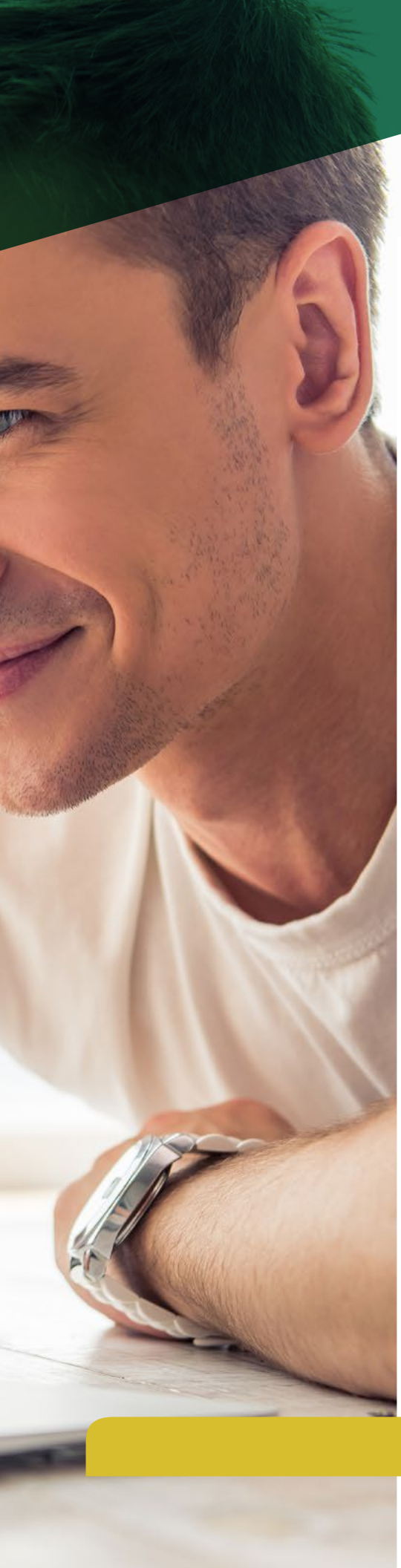
Mike Chapple is Senior Director for IT Service Delivery at the University of Notre Dame. Mike is CISSP certified and holds bachelor's and doctoral degrees in computer science and engineering from Notre Dame, with a master's degree in computer science from the University of Idaho and an MBA from Auburn University.

In a quiet announcement last year, cybersecurity industry association (ISC)² made a major change to its long-established flagship testing program. Starting in December of 2017, the Certified Information Systems Security Professional (CISSP) exam moved to a new testing format: adaptive testing. This change took effect in December for all test-takers sitting for the English-language version of the CISSP exam.

Social media immediately lit up with concern, as test-takers tried to figure out what effect the announcement would have on their test-taking experience, as well as how the changes to the CISSP exam would affect the difficulty and content of the exam. Let's take a look at adaptive testing in general, discuss ways that you might prepare for an adaptive certification exam, and then talk about how this change might affect the IT certification industry over the coming years.

What is adaptive testing?

Adaptive testing is a time-honored approach for delivering certification exams. Traditional exams, otherwise known as "linear format" exams, consist of a fixed number of questions delivered in an order that is predetermined before a candidate sits for the exam. Each candidate may receive different questions, possibly in a different order, but the computer selects those questions before the exam and the candidate sits down and progresses through those questions in order.



In an adaptive test, the questions are not predetermined when you sit down to take the exam. Instead, the computer analyzes your response to each question and determines how well you're performing on the exam. It then uses a mathematical algorithm to choose the next question that you'll receive.

If you're doing well in a particular domain of knowledge, then the algorithm may decide not to ask you any additional questions on that domain, once it's satisfied that you've mastered the material. Similarly, if you're struggling in a particular area, then you may receive additional questions on that subject as the exam software attempts to determine your scope of knowledge.

From a test-taker's perspective, adaptive testing may lead to a somewhat frustrating experience. As you continue to answer questions correctly, the difficulty of future questions will increase. This is by design, as the algorithm already determined that you're capable of answering the easier questions and is trying to identify the limits of your knowledge.

As you sit taking the exam, you may feel like the test is extremely difficult and that you're not doing well. Rest assured that the fact that the questions are increasing in difficulty is actually a good sign. If it appeared that the exam were getting easier as you moved on, that could be an indication that you'd been answering questions incorrectly.

How are adaptive tests scored?

The scoring process for an adaptive exam is a little unusual. Rather than the typical percentage of questions answered correctly, adaptive tests must take the nature of those questions into account. For example, the adaptive test scoring process used on the CISSP exam follows three rules:

Confidence Interval Rule — This rule draws its name from the statistical concept of confidence intervals. It says that once you've answered the minimum number of questions, which is 100 on the CISSP exam, the algorithm will stop the exam when it is 95 percent sure that you've either passed or failed.

Maximum Length Rule — This says that the exam will stop when you've answered the maximum number of questions. For the CISSP exam, this means that you've answered 150 questions.

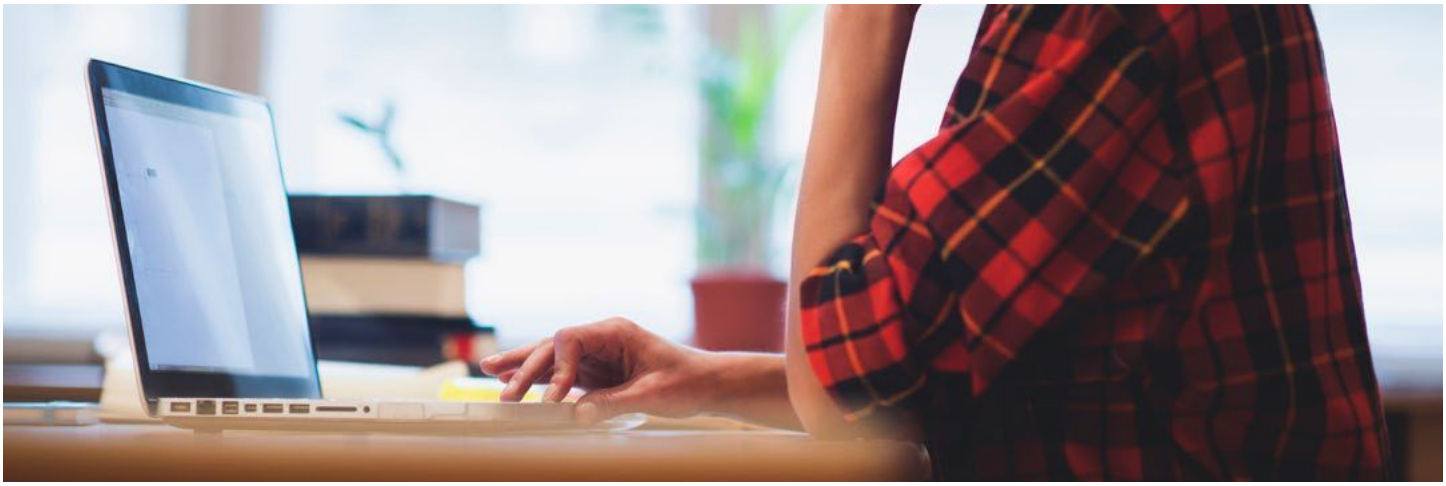
If you make it to question 150, the algorithm looks at the last 75 questions that you answered. If your score was above the passing threshold for the entire time that you answered those questions, you will pass. If your score dips below the passing threshold, even once, you will fail the exam.

Run Out Of Time (ROOT) Rule — This rule says that the exam will stop when you've used up all of the time available to you. On the CISSP exam, the exam will stop once three hours have elapsed. If you've answered at least 75 questions, the algorithm applies the same procedure as the maximum length rule:

If your score was above the passing threshold for the last 75 questions, then you will pass the exam. If your score dipped below the passing threshold at least once during the last 75 questions, then you will fail the exam. If you do not answer 75 questions, then you automatically fail the exam.

Those scoring rules are fairly complicated and, in reality, you shouldn't worry about them as a test-taker. It's not worth your time to sit and try to guess what the algorithm is doing. Just tackle each question to the best of your ability as it is presented to you.

This scoring process also means that you will no longer receive a straightforward score on the exam. Remember, the algorithm is not trying to determine exactly how well you know the material. It's simply trying to ask you enough questions so that it can be reasonably certain that you've either passed or failed the exam.



There are no gold stars for earning an A on the CISSP exam! Instead of a scaled score, you will simply receive a notice that you've either passed or failed the test. If you fail, you'll also receive advice on the areas of the exam where you did not perform well. This can help you focus your study for future exams.

How should I approach an adaptive exam?

I've heard from many candidates preparing for the CISSP exam over the past few months, all asking a similar question: how should I change my preparation for the new exam? Do I need to purchase new books, or watch new courses online?

The short answer is no. Adaptive testing is just a different way of determining the questions that you'll receive on the exam. The content remains the same, as do the questions. You should prepare for an adaptive exam exactly the same way you would for a traditional linear exam.

In addition to the shorter exam length, the biggest change that you'll see when you sit down for the exam is that you can no longer move back and forth between questions during the exam. This particular quirk of adaptive testing does warrant a change in test-taking strategy.

I used to recommend that candidates take at least three passes through the exam, quickly answering the easy questions, moving back to tackle the more difficult questions, and then reviewing their work. Without a back button, however, this approach is no longer possible. Once you click the button to advance to the next question, your answer is locked in and you can't see the question again.

In addition to the shorter exam length, the biggest change that you'll see when you sit down for the exam is that you can no longer move back and forth between questions during the exam.

This means that it's now very important to pace yourself as you sit for the exam. Don't spend an inordinate amount of time stuck on a single question, but be sure to read the question carefully and check your work before moving forward. You won't have another chance to correct any mistakes.

One final note on the CISSP exam. While it's true that the move to adaptive testing in Dec. 2017 didn't change the content on the exam, there is a revision to the CISSP Body of Knowledge coming out in April. If you're taking the exam in April 2018 or later, then be sure that you're using study materials that were revised to cover the 2018 version of the test!

What's Next for Adaptive Testing?

Computerized adaptive tests aren't new. They've been used for over a decade across a variety of fields. Notably, the Graduate Record Exam (GRE) and Graduate Management Admissions Test (GMAT) have used adaptive testing for several years in a very high-stakes environment.

Adaptive testing also isn't new to the IT certification field. Novell was using adaptive testing for certification exams as early as 1999, and Microsoft rolled out a series of adaptive tests about a decade ago. While those exams have since gone by the wayside, it's not surprising that adaptive testing is making a comeback, because it shortens the amount of time used in the testing center.

I'm certain that other IT certification providers are closely watching the CISSP adaptive testing experiment. If this process works well for (ISC)², we will probably see others follow their lead and adopt this technology.

While that may seem like an intimidating change, I am confident that the change to adaptive testing benefits everyone involved. Candidates get to take shorter exams, testing centers can fit in more students, and certification providers lower their costs. Stay tuned! ■

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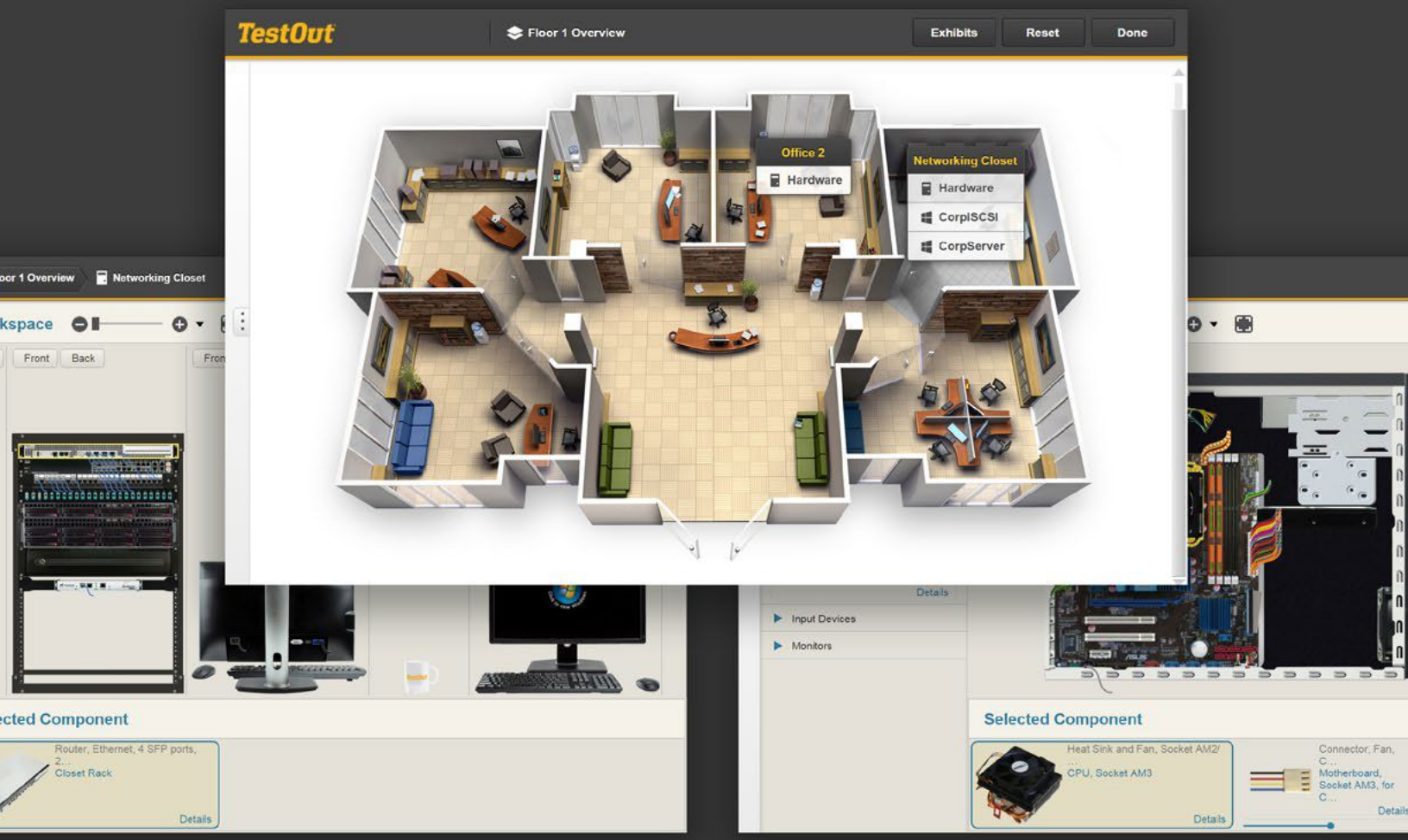

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