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GoodCall℠

# California Needs More than 45,000 Cybersecurity Professionals; What About Your State?

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That there is a shortage of information technology professionals is no secret. Any list of most in-demand jobs and hardest to fill positions will include IT workers. That's why these workers enjoy some of the highest starting salaries and job offer rates. However, the specific need for cybersecurity professionals has reached a fever pitch.

According to a Cyberseek report, there are 348,975 total cybersecurity job openings in the U.S. right now. These are the states with the most critical needs:

| STATE | TOTAL CYBERSECURITY JOB OPENINGS |
|---|---|
| | |
| California | 45,062 |
| Virginia | 36,342 |
| Texas | 24,597 |
| New York | 20,223 |
| Maryland | 16,671 |
| Florida | 15,520 |
| Illinois | 15,381 |
| Georgia | 12,783 |

Demand is great in several other states as well. For example, 15 states have between roughly 4,000 to 12,000 job openings, and several others always have unfilled positions.

So what are these jobs, how much do they pay, and what else do students need to know to pursue these careers?

**Entry-Level Cybersecurity Careers**

| CAREER/SALARY/EDUCATION | TOP SKILLS REQUESTED |
|---|---|
| Cybersecurity Specialist/Technician | Information Security, Information Systems, Network Security, Information Assurance, LINUX, UNIX, Troubleshooting, Security Operations, Cryptography |
| Salary: $81,603 | |
| Requested Education: Bachelor’s | |
| | |
| Cyber Crime Analyst/Investigator | Information Security, Computer Forensics, LINUX, UNIX, TCP/IP, Malware Analysis, Python, Network Security, Cryptography |
| Salary: $94,188 | |
| Requested Education: Bachelor’s | |
| | |
| Incident Analyst/Responder | Information Security, Troubleshooting, Information System, LINUX, Quality Assurance and Control, SQL, UNIX, Oracle, Network Security |
| Salary: $70,647 | |
| Requested Education: Bachelor’s | |
| | |
| IT Auditor | Internal Auditing, Audit Planning, Information Systems, Sarbanes-Oxley, |

| CAREER/SALARY/EDUCATION | TOP SKILLS REQUESTED |
|---|---|
| | Accounting, Risk Assessment, Project Mgmt, Business Process, COBIT |
| Salary: $82,664<br>Requested Educaton: Bachelor’s | |

### Mid-level Cybersecurity Careers

| CAREER/SALARY/EDUCATION | TOP SKILLS REQUESTED |
|---|---|
| Cybersecurity Analyst | Information Security, Information Systems, Cryptography, LINUX, Network Security, Troubleshooting, Security Operations, UNIX, TCP/IT |
| Salary: $89,232 | |
| Requested Education: Bachelor’s | |
| | |
| Cybersecurity Consultant | Information Security, Oracle, Troubleshooting, Business Process, Information Systems, SQL, LINUX, Risk Management, JAVA |
| Salary: $107,282 | |
| Requested Education: Master’s | |
| | |
| Penetration & Vulnerability Tester | Information Security, JAVA, LINUX, Information Systems, Python, Software Development, SQL, Troubleshooting, Network Security |
| Salary: $90,590 | |
| Requested Education: Bachelor’s | |

### Advanced-Level Cybersecurity Careers

| CAREER/SALARY/EDUCATION | TOP SKILLS REQUESTED |
|---|---|
| Cybersecurity Manager/Administrator | Information Security, Information Systems, Project Mgmt, LINUX, Network Security, Troubleshooting, Information Assurance, Cryptography, Risk Management |
| Salary: $113,407 | |
| Requested Education: Bachelor’s | |
| | |
| Cybersecurity Engineer | Information Security, Network Security, LINUX, Information Systems, Cisco, Cryptograpphy, UNIX, Project Mgmt, TCP/IT |
| Salary: $107,705 | |

| CAREER/SALARY/EDUCATION | TOP SKILLS REQUESTED |
|---|---|
| Requested Education: Bachelor’s | |
| | |
| Cybersecurity Architect | Information Security, Network Security, Cryptography, LINUX, Information Systems, Project Mgmt, UNIX, Cisco, Troubleshooting |
| Salary: $117,403 | |
| Requested Education: Bachelor’s | |

# SUPPLY AND DEMAND

So what’s fueling the demand for cybersecurity professionals? Bo Yuan, associate professor and chair of the Golisano College of Computing & Information Sciences at Rochester Institute of Technology, tells GoodCall there are several factors.

“As more devices are connected to the Internet, and more business is conducted online, companies need professionals with the proper skills to protect the organization’s information, data, intellectual property and infrastructures,” Yuan says.

High profile breaches and the recent election cyber threats have actually spurred interest in cybersecurity careers, and according to Domini Clark, director of strategy at InfoSec Connect and senior recruiter at national recruiting firm Decision Toolbox, cyber breaches are increasing in quantity and impact. “The most recent Ponemon Institute Breach Report indicates that the average cost per breach over a period of three years for U.S. organizations has reached an all-time high of $7 million in 2016,” Clark says.

As these breaches are exposed to the public, companies are taking a hit. “The same report indicates that U.S. businesses suffered the greatest business losses — $3.97 million — due to higher than global average customer turnover and reputation losses post-breach,” Clark says.

But at the same time that there’s a need for more experienced cyber professionals, the country is experiencing a shortage of qualified workers. Yuan says our schools can’t churn out graduates fast enough to keep up with demand: “There can be a steep learning curve to studying cybersecurity, because it requires a massive breadth and depth of knowledge and skills.”

But that’s just one of the issues. Yuan says there aren’t enough students in K-12 who have an interest in pursuing STEM-related degrees. And he adds, “The quality of mathematics teaching needs improvement, especially in elementary school.”

In addition, Yuan believes that diversity in cybersecurity is an issue and companies need professionals from a variety of backgrounds and styles of thinking to provide the most comprehensive cybersecurity coverage. “The demand for diversity of the cybersecurity workforce is a huge issue—less than 10% of the cybersecurity workforce is female and an even smaller percentage are minorities,” Yuan explains.

# ORGANIZATIONS LOOKING FOR CYBERSECURITY PROFESSIONALS

Another reason for the high demand is that various types of companies need cybersecurity professionals. “If an organization is connected to the internet – which nearly all of them are – then they need to keep cybersecurity in mind,” Yuan warns.

While he believes that companies with sensitive information – such as healthcare organizations and also those in the industrial fields that have the ability to affect large segments of the populations – have a particular need for cybersecurity, Yuan says, “Almost all types of businesses and organizations need to staff cybersecurity professionals to protect their business operations.”

Clark agrees that both large and small companies need these experts. “While large businesses often have more to protect, they also have stronger defenses in place, and this has created a ‘low hanging fruit’ situation for many small to medium-sized businesses with fewer internal security resources,” Clark says.

In fact, hackers tend to consider these types of organizations easier targets, assuming they won’t have the best defense mechanisms in place. “Phishing campaigns targeted small businesses 43 percent of the time, up 9 percent from the year before,” Clark reveals. And while small and mid-sized companies expect managed security providers to defend them, Clark says these providers are often experiencing the same talent shortages as everyone else.

# EDUCATION AND CERTIFICATIONS

As indicated in the report most companies want employees with a bachelor’s degree, but since the talent gap is growing, Clark says some of them may have to relax their standards. She warns that companies may miss out on qualified talent if they’re too rigid in their educational requirements. “Many cyber professionals have chosen to skip the university track all together and are finding new ways to get hacking experience,” Clark says.

Certifications are also important to employers, and there are a lot of certifications that cybersecurity professionals can obtain. “The most common, including the CISSP (Certified Information Systems Security Professional), are offered through (ICS)2,” Clark says. According to the report, other certifications popular among employers include Certified Information Systems Auditor (CISA), Certified Information Security Manager (CISM), SECURITY+, and Certified Information Privacy Professional (CIPP).

# WHY SHOULD STUDENTS CONSIDER A CAREER IN CYBERSECURITY?

Yuan provides 6 reasons:

1. Cybersecurity is a challenging, constantly evolving field that requires professionals to continuously learn new things and update their knowledge and skills.

2. Unlike generic IT jobs, cybersecurity jobs usually cannot be outsourced to countries abroad, due to the sensitivity of data, regulations and laws.
3. Cybersecurity is a very broad field and everyone can find his or her role or position to utilize and maximize their strengths.
4. Cybersecurity will be a societal problem for a while. There is currently no silver bullet or panacea for cybersecurity problems.
5. There are currently a lot of unfilled positions in cybersecurity, and the gap will continue to grow. There is a conservative estimate that at least a million cybersecurity positions will go unfilled by 2020.
6. Top talents in cybersecurity can write their own tickets. The top students from RIT's computing security programs often receive multiple job offers, from places such as Google, Cisco and the federal government.

**TERRI WILLIAMS**

Terri Williams graduated with a B.A. in English from the University of Alabama at Birmingham. Her education, career, and business articles have been featured on Yahoo! Education, U.S. News & World Report, The Houston Chronicle, and in the print edition of USA Today Special Edition. Terri is also a contributing author to "A Practical Guide to Digital Journalism Ethics," a book published by the Center for Digital Ethics and Policy at Loyola University Chicago.