

Solving the Infosec Shortage

Current Initiatives and What You Can Do

Presented by Scot A. DeWerth, CISSP



- > Over 3.7 billion people worldwide are connected to the internet (with over 2 billion on Facebook alone!)
- > Using over 6.4 to 17.6 billion internet connected devices
- > Creating 2.5 quintillion bytes of data daily (2.5 x10¹⁸ or 1 million trillion)
- > Stored in data centers which have been breach over 7500 times since 2005
- > By one of over 390,000 new malware variants created each day
- > Revealing over 912 million account records to unauthorized users and cybercriminals
- > Resulting in over 2 million cases of identity theft from fraudulent use of stolen account information (2013)
- > Causing financial losses due to cybercrime of over \$3 trillion dollars (2015)



- The ISC(2) report “**2017 Global Information Security Workforce Study**” noted that there is a projected 1.8 million person cybersecurity workforce gap by 2022.
- The BLS noted that there were at least 204,000 unfilled cybersecurity jobs in 2015 with significant growth
- Of polled organizations, 66% of respondents noted that they had “Too few Information Security Workers in My Department”
- The need for Information Security workers has never been greater!

STRADA-Gallup Surveys

- 2017 Strada-Gallup College Student Survey ⁽¹⁾
 - One third of students believe they will graduate with the skills and knowledge to be successful in the job market (34%) and in the workplace (36%)
 - Only 53% believe that their major will lead to a good job
 - Over half (55%) of U.S. adults with some college education but less than a bachelor's degree reported that their informal social network provided advice on a college major.

Why A Career in Information Security?

36%

of Americans would choose a different college major if they had to do it all over again.



- It's a growth industry – projected job growth of 18% thru 2024, with ~50% of the jobs in the U.S. unfilled.
- STEM (Science, Technology, Engineering and Mathematics), Health and business majors are the highest paying annual wages with top paying college majors earning \$3.4 million more over a lifetime.
- It is a transportable skill across industries and across localities.
- It is an evolving field and people that thrive on learning new skills, solving hard problems and implementing real solutions are perfect matches for this career.

Current Government Initiatives

- Executive Order 13800: Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure
 - Signed May 11th, 2017 by President Donald Trump
 - Section 3 Paragraph D: Workforce Development
 - Directs the Secretaries of Commerce, the Department of Homeland Security, Defense, Labor, Education and OPM to
 - Jointly assess the scope and sufficiency of efforts to educate and train America's future cybersecurity workforce
 - Provide a Report to the President (Delivered November 17th, 2017)
 - Employers increasingly are concerned about the relevance of cybersecurity-related education programs in meeting the needs of their organizations.
 - Expanding the pool of cybersecurity candidates by retraining those employed in non-cybersecurity fields and by increasing the participation of women, minorities, and veterans as well as students in primary through secondary school is needed and represents significant opportunities.
 - There is an apparent shortage of knowledgeable and skilled cybersecurity teachers at the primary and secondary levels, faculty in higher education, and training instructors.
 - Comprehensive and reliable data about cybersecurity workforce position needs and education and training programs is lacking—even though the general context and urgency of the situation are obvious.

Current Government Initiatives

- Executive Order 13800: Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure
 - Recommendations
 - The private and public sectors need to transform, elevate, and sustain the learning environment to grow a dynamic and diverse cybersecurity workforce
 - The private and public sectors need to align education and training with employers' cybersecurity workforce needs, improve coordination, and prepare individuals for lifelong careers
 - Developing model career paths for cybersecurity-related positions that can be used in the private and public sectors. (NIST is doing this)
 - Developing interdisciplinary cybersecurity curriculum guidance that incorporates employers' cybersecurity needs. (I was involved in an effort with a Missouri University to do this)
 - Establishing at least one regional alliance or partnership for cybersecurity education and workforce in each state. (We have 4 in Nebraska!)
 - The private and public sectors need to establish and leverage measures that demonstrate the effectiveness and impact of cybersecurity workforce investments.

Current Government Initiatives

- NICE – National Initiative for Cybersecurity Education
 - Run by the National Institute for Standards and Technology
 - The federal government has funded 4 main projects
 - [NICE Challenge Project](#), to create a flexible set of challenge environments and infrastructure to teach/perform tasks outlined by the NICE Framework
 - [CyberSeek](#), to provide a data visualization tool for employers, job seekers, education and training providers about information security jobs via a heat map
 - [National Integrated Cyber Education Research Center](#) to empower K-12 teachers to develop skills necessary for information security careers
 - ***Regional Alliances and Multistakeholder Partnerships to Stimulate*** provides funding opportunities to cybersecurity education and workforce development (completed)
- Additionally, NIST published the [Cybersecurity Workforce Framework](#) in August 2017 (SP 800-181)

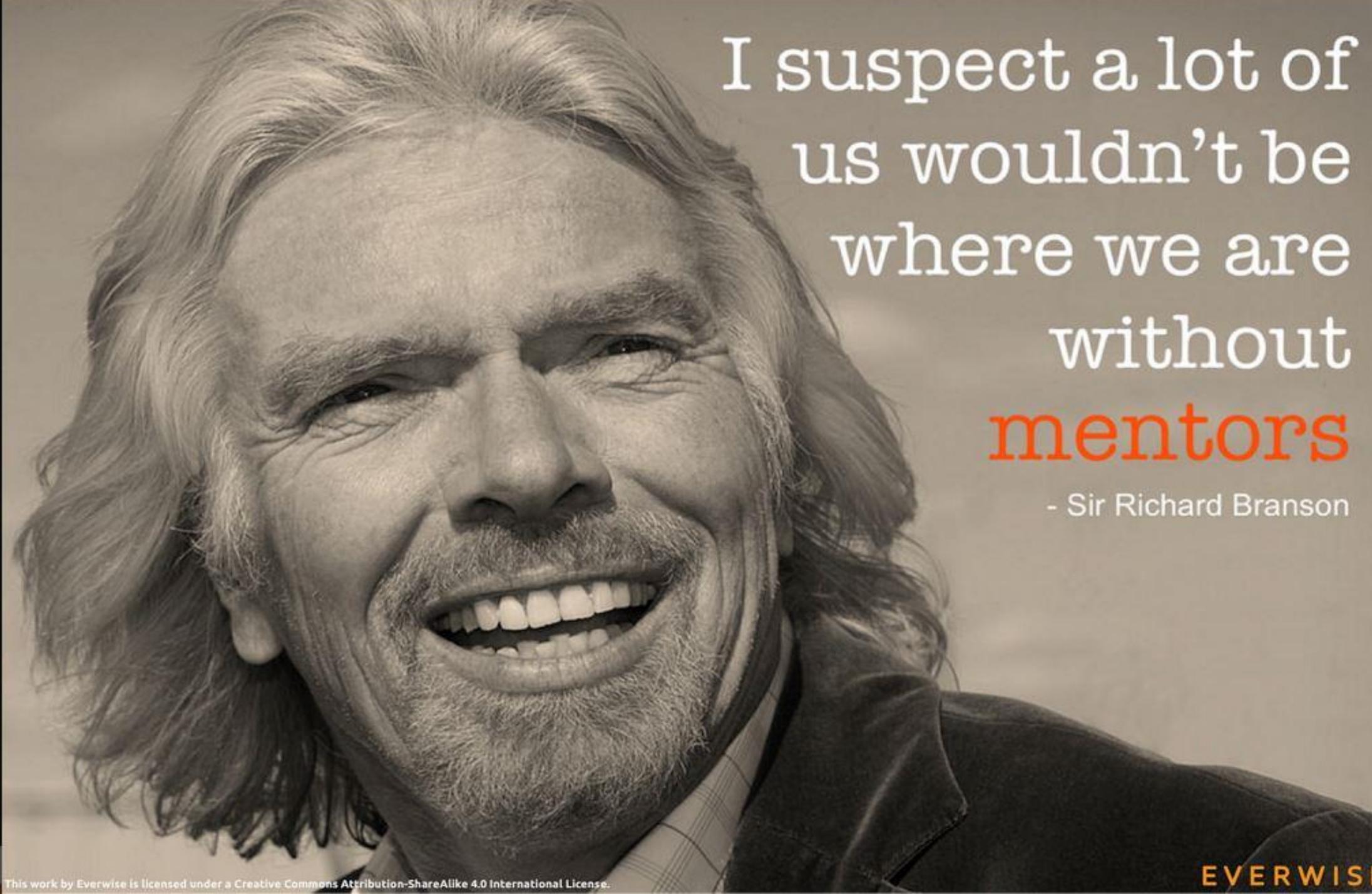
Supporting Government Initiatives

- U.S. Department of Education offered a pilot grant program for Cybersecurity Education Technological Upgrades for Community Colleges (closed 29 August 2018)
- U.S. Dept. of Education issued a Request for Information on Cybersecurity workforce development to ask industry what positions are needed.
- U.S. Department of Homeland Security Cybersecurity Education and Awareness Branch offered Cybersecurity Education and Training Assistance Program (CETAP): Expansion of a Portable Cybersecurity Education Teacher-Focused Model grant (Closed 2 August 2018)
- Department of Labor has published a grant (currently open through 16 October 2018) for community colleges that wish to partner to form an apprenticeship program.

National Security Agency

- Longtime player in the [Cybersecurity education space](#)
- Provides a framework for higher education institutes to match their curriculum to a set standard for accreditation to be recognized as a Center of Academic Excellence
- Has a branch specifically tailored for Information Security and Awareness.

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I suspect a lot of
us wouldn't be
where we are
without
mentors

- Sir Richard Branson

Know Education Resources

- Nebraska has four schools that are NSA Centers of Academic Excellence (CAE) accredited institutions.
- The Omaha Area has three schools that have achieved a Center of Academic Excellence.
 - University of Nebraska, Omaha (CAE – Cyber Defense)
 - Bellevue University (CAE – Cyber Defense)
 - Metropolitan Community College (for 2 year degree as of May 2018)
 - MCCC is currently offering an IT and Cybersecurity Professional Level 1 Career Placement Program (24 September – 8 November 2018 contact gap@mccneb.edu)

Know Certification Requirements

- Certifications are still important for employers to use as a metric for baselined real-world experience
- Know Information certifications' requirements for education
- ISACA
 - CISA can accept a 1 year experience waiver for (each)
 - A B.S. or M.S. from a university that enforces ISADA model curriculum (currently 13 schools)
 - A Masters in Information Security or Information Technology
 - CISM can accept two year experience waiver for
 - Post-graduate degree in information security or a related field (e.g., business administration, information systems, information assurance)
- ISC(2)
 - CISSP can accept a maximum of 1 year waiver for
 - four-year college degree or regional equivalent or an advanced degree in information security from the U.S. National Center of Academic Excellence in Information Assurance Education (CAE/IAE) ***note** the CAE/IAE nomenclature has been deprecated and has been replaced by the CAE-CD in 2014

Know Employer Requirements

- At least know requirements that YOUR employee looks for when advertising for a candidate.
- However, there are many more requirements that companies look for from job seekers. Some of these can be found at CyberSeek.
- The Department of Defense has a very robust set of requirements set out for individuals that hold Information Assurance job functions ([DOD 8570.01](#)).

Know Student Opportunities

- This is not a comprehensive list!
- Cybersecurity Internships
 - [DHS Cyber Student Volunteer Initiative](#)
 - [Mitre student program](#) (High School and College)
 - Gallup [GetHip](#) High School Internships
 - Gallup College internships
 - Over 67 listings for technology internships in Omaha showed up in a search just prior to this presentation.

Know Student Opportunities

- This is not a comprehensive list!
- Cybersecurity Scholarships
 - [CyberCorps\(R\) Scholarship for Service](#)
 - [Engility CyberWarrior Scholarship](#) (closes Sep 24, 2018)
 - [\(ISC\)² Foundation Women's Cybersecurity Scholarship](#)
 - [\(ISC\)² Undergraduate Cybersecurity Scholarship](#)
 - [\(ISC\)² Graduate Cybersecurity Scholarship](#)
 - [Raytheon's Women Cyber Security Scholarship Program](#)
 - [SWSIS Scholarships for Women Studying Information Security](#)
 - [NAVY INFORMATION ASSURANCE SCHOLARSHIP](#)
 - [THE SCIENCE, MATHEMATICS AND RESEARCH FOR TRANSFORMATION \(SMART\) SCHOLARSHIP FOR SERVICE PROGRAM](#)
 - [CIA UNDERGRADUATE SCHOLARSHIP PROGRAM](#)
 - [THE STOKES PROGRAM](#)
 - [SOURCEFIRE SNORT SCHOLARSHIP](#)

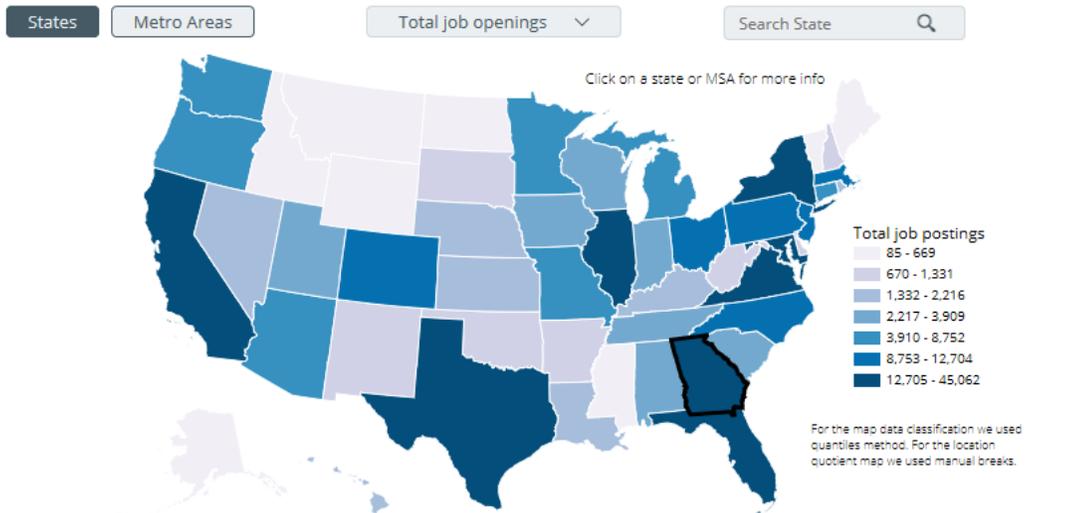
Know Volunteer Opportunities

- Be a counselor for the Girl Scout's new [Cyber Badge](#)
- [U.S. Cyber Challenge](#) (2018 is completed)
- [CyberPatriot](#)
- [SANS Cyber Start](#)
- <https://mitrecyberacademy.org/>
- <http://omahagirlswhocode.com/>
- Volunteer to coach a team of 6th – 9th graders for The National Science Teachers [eCybermission](#)
- November 12 – 17, 2018
 - High Schools can participate in events to teach students about CyberSecurity Careers.
 - <https://www.nsadayofcyber.com/>

Know Their Job Prospects

Cybersecurity Supply/Demand Heat Map

Cybersecurity talent gaps exist across the country. Closing these gaps requires detailed knowledge of the cybersecurity workforce in your region. This interactive heat map provides a granular snapshot of demand and supply data for cybersecurity jobs at the state and metro area levels, and can be used to grasp the challenges and opportunities facing your local cybersecurity workforce.



- The National Institute for Cybersecurity Education commissioned a website to show where jobs are located and the types of jobs required.
- This website hosts an interactive Heat Map that shows the supply and demand of Cyber Security workforce
- This website can be accessed at <http://cyberseek.org>

Georgia

TOTAL CYBERSECURITY JOB OPENINGS ⓘ

12,783

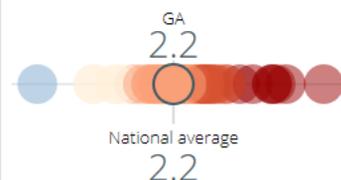
TOTAL EMPLOYED CYBERSECURITY WORKFORCE

28,368

SUPPLY OF CYBERSECURITY WORKERS ⓘ

Very Low

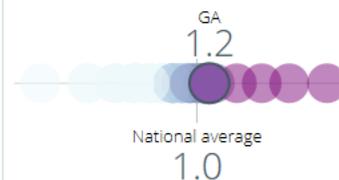
CYBERSECURITY WORKFORCE SUPPLY/DEMAND RATIO



GEOGRAPHIC CONCENTRATION ⓘ

High

LOCATION QUOTIENT

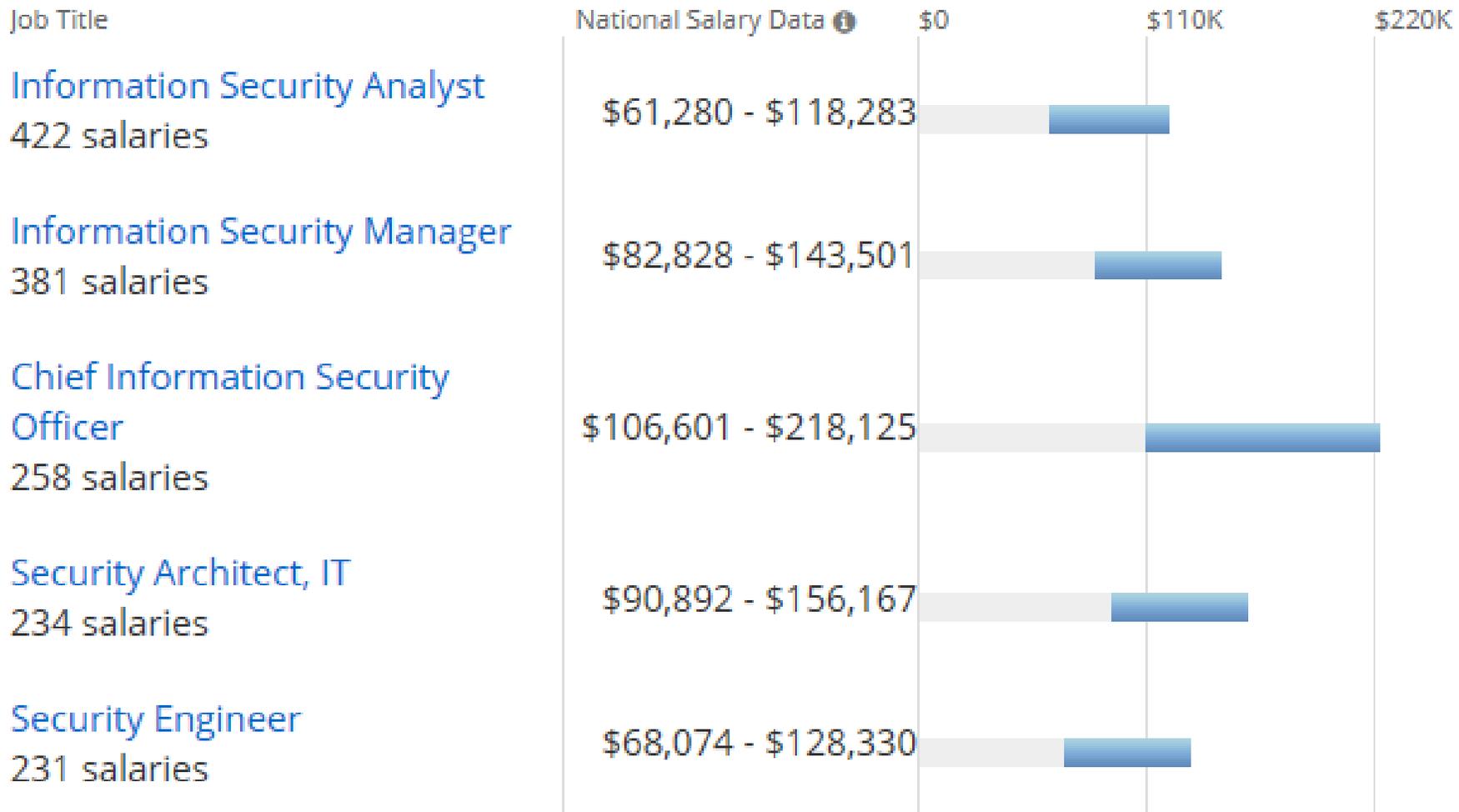


TOP CYBERSECURITY JOB TITLES ⓘ

- Cyber Security Analyst / Specialist
- Cyber Security Engineer
- Systems Engineer
- Systems Administrator
- Risk Manager / Analyst
- IT Project Manager
- Computer Support Specialist
- IT Manager
- IT Director

Employees with a Certified Information Systems Security Professional (CISSP) Certification

Salary Ranges by Job



Country: United States | Currency: USD | Updated: 1 Jul 2017 | Individuals Reporting: 6,115

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