Cybersecurity Careers for Everyone

Webinar for School Counselors

Sponsored by the Maryland State Department of Education

UNIVERSITY OF MARYLAND GLOBAL CAMPUS

NATIONAL CRYPTOLOGIC MUSEUM FOUNDATION
CYBER CENTER FOR EDUCATION & INNOVATION
HOME OF THE NATIONAL CRYPTOLOGIC MUSEUM
Welcome!

Mark Loepker
Education Program Manager
Cyber Center for Education & Innovation –
Home of the National Cryptologic Museum
Foundation
“Thank You” to our Sponsor!
Webinar Guests

Dr. Loyce Pailen, Senior Director, Center for Cybersecurity Studies, UMGC

Dr. Greg von Lehmen, Special Assistant to the President, Cybersecurity UMGC

Jeffrey Smith, Targeted Populations Grant Program Manager, Maryland Department of Labor
Key Questions

What is cybersecurity?

What are cybersecurity work roles?

Where can I get detailed information about employment opportunities in cybersecurity?

What are some pathways to cybersecurity jobs?

Concluding take-aways
During the Presentations

Please submit your questions through the chat.

We look forward to addressing them in the Q/A!
“Former National Cybersecurity Center director Rob Beckstrom summarized it this way: (i) anything connected to the internet can be hacked, (ii) everything is being connected to the internet, (iii) as a result, everything is becoming vulnerable.”

Cybersecurity?
Generally speaking, cybersecurity is concerned with an organization’s ability to protect its data and networks, to rebound quickly if networks are compromised, and to operate networks in a manner that respects legal rights and ethical considerations.

The cybersecurity workforce includes both technical and non-technical professionals who contribute to cybersecurity-related aspects of organizations.¹

1. **Foundational Resource**: National Initiative for Cybersecurity Education Cybersecurity Workforce Framework (SP NIST 800-181)

NICE Framework Categories


- **Analyze**
  Performs highly-specialized review and evaluation of incoming cybersecurity information to determine its usefulness for intelligence.

- **Collect and Operate**
  Provides specialized denial and deception operations and collection of cybersecurity information that may be used to develop intelligence.

- **Investigate**
  Investigates cybersecurity events or crimes related to information technology (IT) systems, networks, and digital evidence.

- **Operate and Maintain**
  Provides the support, administration, and maintenance necessary to ensure effective and efficient information technology (IT) system performance and security.

- **Oversee and Govern**
  Provides leadership, management, direction, or development and advocacy so the organization may effectively conduct cybersecurity work.

- **Protect and Defend**
  Identifies, analyzes, and mitigates threats to internal information technology (IT) systems and/or networks.

- **Securely Provision**
  Conceptualizes, designs, procures, and/or builds secure information technology (IT) systems, with responsibility for aspects of system and/or network development.
Categories to Specialty Areas

- **Analyze**
  Performs highly-specialized review and evaluation of incoming cybersecurity information to determine its usefulness for intelligence.

- **Collect and Operate**
  Provides specialized denial and deception operations and collection of cybersecurity information that may be used to develop intelligence.

- **Investigate**
  Investigates cybersecurity events or crimes related to information technology (IT) systems, networks, and digital evidence.
  
  → **Cyber Investigation**
  Applies tactics, techniques, and procedures for a full range of investigative tools and processes to include, but not limited to, interview and interrogation techniques, surveillance, counter surveillance, and surveillance detection, and appropriately balances the benefits of prosecution versus intelligence gathering.

  → **Digital Forensics**
  Collects, processes, preserves, analyzes, and presents computer-related evidence in support of network vulnerability mitigation and/or criminal, fraud, counterintelligence, or law enforcement investigations.

Specialty Area to Work Roles & KSAs

Example: Cyber Crime Investigator
Non-technical Cybersecurity Work Role Examples

Cyber Legal Advisor
(OV-LGA-001)
Provides legal advice and recommendations on relevant topics related to cyber law.

Abilities
- A0046: Ability to monitor and assess the potential impact of emerging technologies on laws, regulations, and/or policies.

Knowledge

Skills

Tasks

Cyber Workforce Developer and Manager
(OV-SPP-001)
Develops cyberspace workforce plans, strategies, and guidance to support cyberspace workforce manpower, personnel, training and education requirements and to address changes to cyberspace policy, doctrine, materiel, force structure, and education and training requirements.

Multi-Disciplined Language Analyst
(AN-LNG-001)
Applies language and culture expertise with target/threat and technical knowledge to process, analyze, and/or disseminate intelligence information derived from language, voice and/or graphic material. Creates and maintains language-specific databases and working aids to support cyber action execution and ensure critical knowledge sharing. Provides subject matter expertise in foreign language-intensive or interdisciplinary projects.
Who should reference the NICE Framework?

- Educators and school counselors
- Employers
- Job seekers
- Students
- Mid-Career changers
- Policy makers
- Technology Developers
- Training and Certification Providers
Cyberseek

Dr. Greg von Lehmen
Market Demand & Career Paths
https://www.cyberseek.org/

Hack the Gap: Close the cybersecurity talent gap with interactive tools and data

About this tool
Cybersecurity workers protect our most important and private information, from bank accounts to nuclear reactions. However, there is a growing shortage of cybersecurity workers in the United States that puts our digital policies and infrastructure at risk.

Since April 2017 through March 2018, there were 123,000 openings for cybersecurity jobs. Not only were cybersecurity workers constantly employed in these positions – an annual talent shortfall of 17,000 workers for cybersecurity’s largest job.

There are nearly 200,000 additional openings requiring cybersecurity skills and employees are struggling to find workers who possess those skills. Jobs requesting public, mass security skills, for example, remain open 79 days on average – longer than any other type of skill.

To help close the cybersecurity skills gap, Cyberseek provides detailed, actionable data about supply and demand in the cybersecurity job market.

Interactive Map
A heat map of cybersecurity supply and demand

Career Pathway
An interactive career pathway showing common roles within cybersecurity and transition opportunities between them
What Cyberseek Provides

• The number of cybersecurity Job openings in the US over a given time period
• Common job titles for cybersecurity-related work
  • mapped to the NICE Framework Categories
• Information about job requirements; e.g. industry certifications
• Salaries
• Career pathways: how one job can lead to more advanced positions in the market
Using the Heatmap: National Market Demand
https://www.cyberseek.org/heatmap.html
Demand in Maryland
Baltimore - Towson

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.

Baltimore-Columbia-Towson, MD

TOTAL CYBERSECURITY JOB OPENINGS
11,930

TOTAL EMPLOYED CYBERSECURITY WORKFORCE
24,263

SUPPLY OF CYBERSECURITY WORKERS
Very Low
CYBERSECURITY WORKFORCE SUPPLY/DEMAND RATIO
Baltimore-Columbia-Towson, MD
2.0

GEOGRAPHIC CONCENTRATION
Very High
LOCATION QUOTIENT
Baltimore-Columbia-Towson, MD
3.1

TOP CYBERSECURITY JOB TITLES
- Cyber Security Engineer
- Systems Engineer
- Cyber Security Manager / Administrator
- Cyber Security Analyst
- Network Engineer / Architect
- Software Developer / Engineer
- Cyber Security Specialist / Technician
- Cyber Security Consultant
- Systems Administrator

Job Openings by NICE Cybersecurity Workforce Framework Category

Certification Holdings / Openings Requesting Certification

Note: The Investigate category usually has fewer openings than other categories and may not be visible in the chart. To view data for the Investigate category, please hover over the thin line in the bar graph.
Cyber Career Pathways

Cybersecurity Career Pathway

There are many opportunities for workers to start and advance their careers within cybersecurity. This interactive career pathway shows key jobs within cybersecurity, common transition opportunities between them, and detailed information about the salaries, credentials, and skillsets associated with each role.
Networking Work Role – Where From There?
Career Progression - Example
Training & Education Pathways

Jeffrey Smith
Educational Pathways to Cyber Work Roles

Traditional degree pathways (AS, BS, MS)

Nontraditional Pathway: Apprenticeships

Nontraditional Pathway: Industry Certifications
Welcome to the CAE in Cybersecurity Community
Apprenticeship is an industry-driven, high-quality career pathway where employers can develop and prepare their future workforce, and individuals can obtain paid work experience, classroom instruction, and a portable, nationally-recognized credential.
Youth Apprenticeship - Maryland Apprenticeship and Training Program (MATP)
Nontraditional Pathway

Industry Certifications

- Software/Hardware-specific. Examples:
  - Microsoft certifications
  - CISCO certifications
- Non-vendor based. Examples:
  - CompTia
  - ISACA
  - (ISC)²
Conclusion

Mark Loepker
Takeaways!

- Cybersecurity is fundamental to the interconnected work that we live in.
- The demand for cybersecurity professionals is off the charts and will to continue to grow.
- Cybersecurity as a field offers a wide range of employment opportunities, including both technical and non-technical jobs.
- There are varied pathways to a cyber job, depending on what someone wants to do and what level they want to work. A college degree is only one of several educational pathways.
Questions?
More Information

Mark Loepker, Education Program Manager, Cyber Center for Education & Innovation – Home of the National Cryptologic Museum
mloepker@cryptologicfoundation.org

Dr. Loyce Pailen, Director, Center for Cybersecurity Studies, University of Maryland Global Campus
loyce.pailen@umgc.edu

Jeffrey Smith, Maryland Department of Labor
Jeffrey.smith1@Maryland.gov

Dr. Greg von Lehmen, Special Assistant to the President, Cybersecurity University of Maryland Global Campus
gregory.vonlehmen@umgc.edu