



# Cybersecurity Career Awareness Virtual Workshop

<https://gencyber.buffalostate.edu/>

Diane Dillon  
dillond@buffalostate.edu



## Cybersecurity Career Awareness, Pre-camp Virtual Workshop, March 5,2022, Morning Session

- 9:30 -10:30 Career Awareness Diane Dillon
- 10:30 – 10:45 Break
- 10:45 – 11:30 Guest Speaker, Taylor Kaufmann, CISSP
- 11:30 – 12:00 Cyber.org, Cyber Ranges, Pre-Lunch Activity
- 12:00 – 1:00 Break

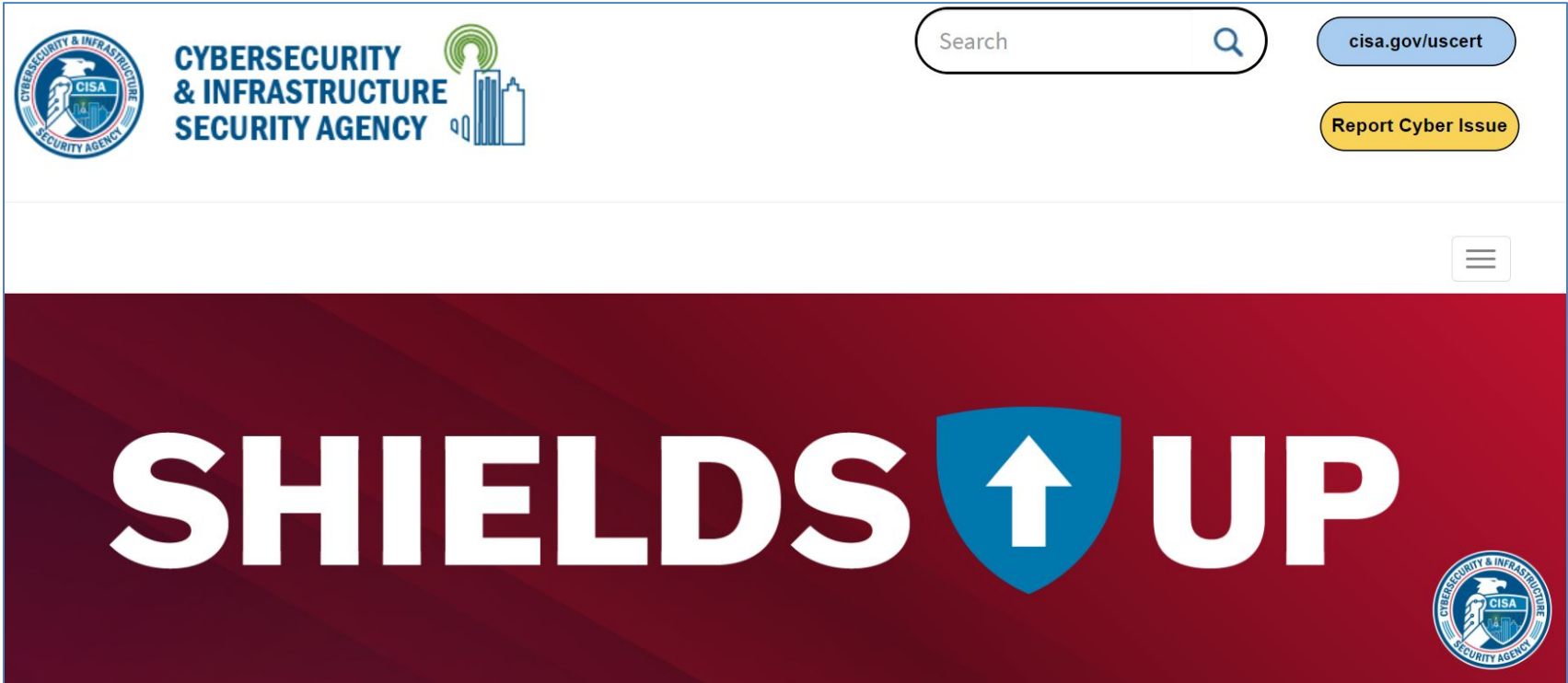


# Cybersecurity Career Awareness Topics

- Skills Gap, Worldwide Job Openings Shortage
- U.S. Bureau of Labor Statistics
  - Job Titles, Education, Experience, Average Salaries
- Changing World of Job Searches
- Cybersecurity as a Second Career
- Typical Cybersecurity Career Path
- Disruptive Technologies, Jobs of the Future
- Demand for Soft Skills
- Programs for High Schoolers



- Topics (continued)
- Project based curricula Cyber.org, Self paced Cyber.bot,
- Internships
  - Government
  - Information Technology Vendors
  - Private Sector
- Cybersecurity Certifications
- Current Cybersecurity Job Openings in Western NY
- Guest Speaker, Taylor Kaufmann CISSP, Buffalo State 2015
  - My journey to certification
  - A day in the life of a Threat Hunter
- Cyber.org
- Cyber Range Opportunities
- Pre-lunch Activity



The screenshot shows the top portion of the CISA website. On the left is the CISA logo, which includes a shield with a scale of justice and a sword, surrounded by the text 'CYBERSECURITY & INFRASTRUCTURE SECURITY AGENCY' and 'CISA'. To the right of the logo is the text 'CYBERSECURITY & INFRASTRUCTURE SECURITY AGENCY' and an icon of a city skyline with a signal tower. In the top right corner, there is a search bar with the word 'Search' and a magnifying glass icon, a blue button labeled 'cisa.gov/uscert', and a yellow button labeled 'Report Cyber Issue'. Below the header is a large red banner with the text 'SHIELDS UP' in white, where the 'I' in 'SHIELDS' is replaced by a blue shield icon with a white upward-pointing arrow. A small CISA logo is in the bottom right corner of the banner.

Source: <https://www.cisa.gov/>



# What's In a Name?

- Cybersecurity
- Cyber Security
- Data Security
- Information Security
- Infrastructure Security



- CSO - Chief Security Officer
- CISO - Chief Information Security Officer
- NACE - National Association of Colleges and Employers
- NICE - National Initiative for Cybersecurity Education
- NICCS – National Institute for Cybersecurity Careers and Studies



# Cybersecurity in Organizations

- Cost of Cyber Crime estimated to be \$10.5 Trillion/year in 2025, by Cybersecurity Ventures.com
- Security in public corporations
  - Responsible to Board of Directors
  - Information Security Compliance Requirements
  - Breaches *must be disclosed publically*





Source: *Top Cybersecurity Statistics, Facts and Trends in 2022*, by Max Pitchkites, Cloudwards, March 2, 2022, <https://www.cloudwards.net/cyber-securitystatistics/#:~:text=Cybersecurity%20Ventures%20estimates%20that%20cybercrimewill%20result%20in%20a,until%20it%20reaches%20%2410.5%20trillion%20by%202025.%204>



# Cybersecurity Reporting Relationships

- Report directly to the CEO or President 34%
- Report to Board of Directors 12%
- Part of IT organization 33%
- May report to Finance, Internal Audit, Operations
- Normally based on the size of the organization

Source: *Does It Matter Who the CSO Reports To?*, CSO, by Freuhlinger, Josh, March 23, 2021, <https://www.csoonline.com/article/3278020/does-it-matter-who-the-ciso-reports-to.html>

- 4.1 million Cybersecurity Professionals Worldwide
  - 85% Work from home
  - 37% Must report to work occasionally
- 2.7 million Cybersecurity Professionals still needed **<SKILLS GAP>**

Source: ISC)2, October 26, 2021, [https://blog.isc2.org/isc2\\_blog/2021/10/isc2-cybersecurity-workforce-study-skills-gap-narrows\\_2021.html](https://blog.isc2.org/isc2_blog/2021/10/isc2-cybersecurity-workforce-study-skills-gap-narrows_2021.html)



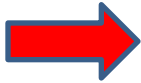
- Skilled professionals to manage, administer and support an organization's security and operations
- Skilled cyber-engineers to design security systems and develop secure software and tools
- General cybersecurity awareness at every organizational level so everyone has a basic knowledge of threats and risks, and what this means in the context of their job function

Source: ISO, The Cybersecurity Skills Gap, by Clare Naden, April 2021, <https://www.iso.org/news/ref2655.html>

# Skills Gap



## Tech Jobs That Require Cybersecurity Skills



Occupation	Job Postings Requesting Skill(s)(%)	Projected Growth Within Occupation (%)	Associated Education Level
Cyber / Information Security Engineer / Analyst	76.0%	+28.5%	Bachelor's degree
Software Developer / Engineer	6.3%	+30.7%	Bachelor's degree
Network Engineer / Architect	19.7%	+6.5%	Bachelor's degree
Network / Systems Administrator	23.3%	+6.1%	Bachelor's degree
Computer Systems Engineer / Architect	14.3%	+9.3%	Bachelor's degree
Computer Support Specialist	8.6%	+11.3%	Bachelor's degree
IT Project Manager	5.7%	+9.3%	Bachelor's degree
Business / Management Analyst	3.7%	+14.3%	Bachelor's degree
Systems Analyst	5.7%	+9.1%	Bachelor's degree
Database Administrator	5.8%	+11.5%	Bachelor's degree

Source: Burning Glass





INTERACTIVE MAP

CAREER PATHWAY

EDUCATION AND TRAINING PROVIDERS

ABOUT



## CYBERSECURITY SUPPLY/DEMAND HEAT MAP

All

Public Sector Data

Private Sector...

Total job openings

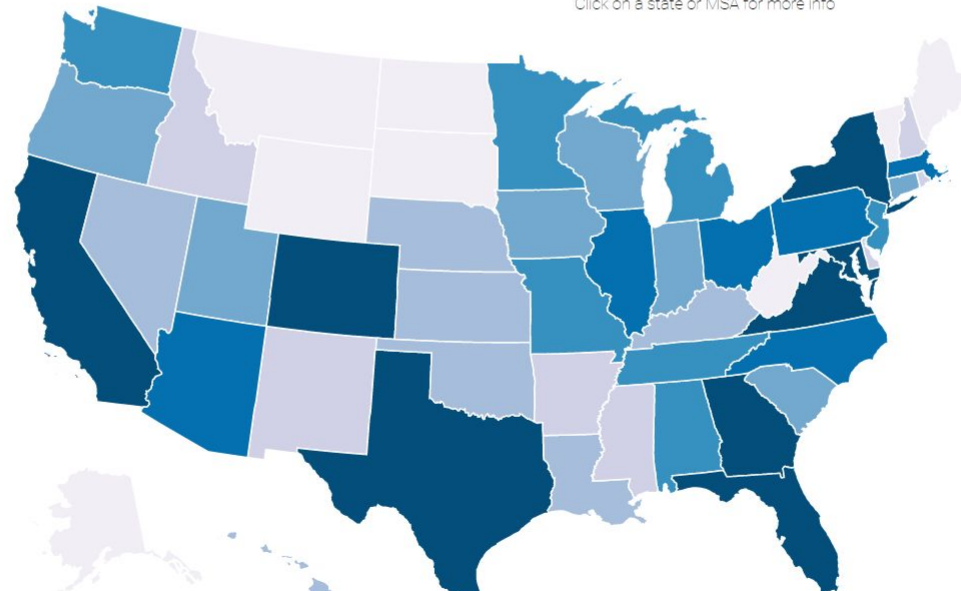
States

Metro Areas

Search State



Click on a state or MSA for more info



### TOTAL JOB OPENINGS

631 - 1,559

1,560 - 3,079

3,080 - 4,330

4,331 - 6,576

6,577 - 14,151

14,152 - 21,745

21,746 - 67,439

<https://www.cyberseek.org/heatmap.html>

# Improving Skills Gap



- Certification Programs
- Bootcamps
- Concentrated efforts to promote Cybersecurity, even as a second career
  
- More professionals from outside IT
  - Unrelated Fields 17%
  - Cybersecurity Education 15%
  - Independent 15%
  - IT Related Fields 47%

Source: *How to Close the Cybersecurity Workforce Gap*, Help New Security, October 27, 2021,  
<https://www.helpnetsecurity.com/2021/10/27/workforce-gap-cybersecurity>

# The Changing World of Job Searches

- Everything is online
- WFH
- Combo Jobs, Job Sharing
- Second Careers
- Effects of COVID-19



# Remote Workforce Challenges



Source: *How to Close the Cybersecurity Workforce Gap*, Help New Security, October 27, 2021, <https://www.helpnetsecurity.com/2021/10/27/workforce-gap-cybersecurity/>




## OCCUPATIONAL OUTLOOK HANDBOOK

Search Handbook

Go









### Information Security Analysts

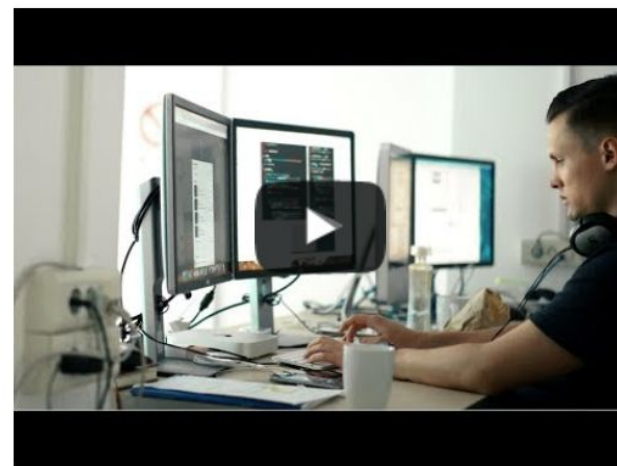
PRINTER-FRIENDLY 

[Summary](#) | 
 [What They Do](#) | 
 [Work Environment](#) | 
 [How to Become One](#) | 
 [Pay](#) | 
 [Job Outlook](#) | 
 [State & Area Data](#) | 
 [Similar Occupations](#) | 
 [More Info](#)

### Summary

#### Quick Facts: Information Security Analysts

2020 Median Pay 	\$103,590 per year \$49.80 per hour
Typical Entry-Level Education 	Bachelor's degree
Work Experience in a Related Occupation 	Less than 5 years
On-the-job Training 	None
Number of Jobs, 2020 	141,200
Job Outlook, 2020-30  	33% (Much faster than average)
Employment Change, 2020-30 	47,100



#### What Information Security Analysts Do

Information security analysts plan and carry out security measures to protect an organization's computer networks and systems.

Source: U.S. Bureau of Labor Statistics, Occupational Outlook, July 2020, <https://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm>

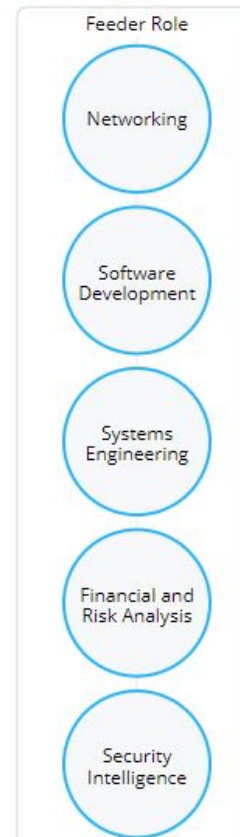


# Cybersecurity Career Pathway

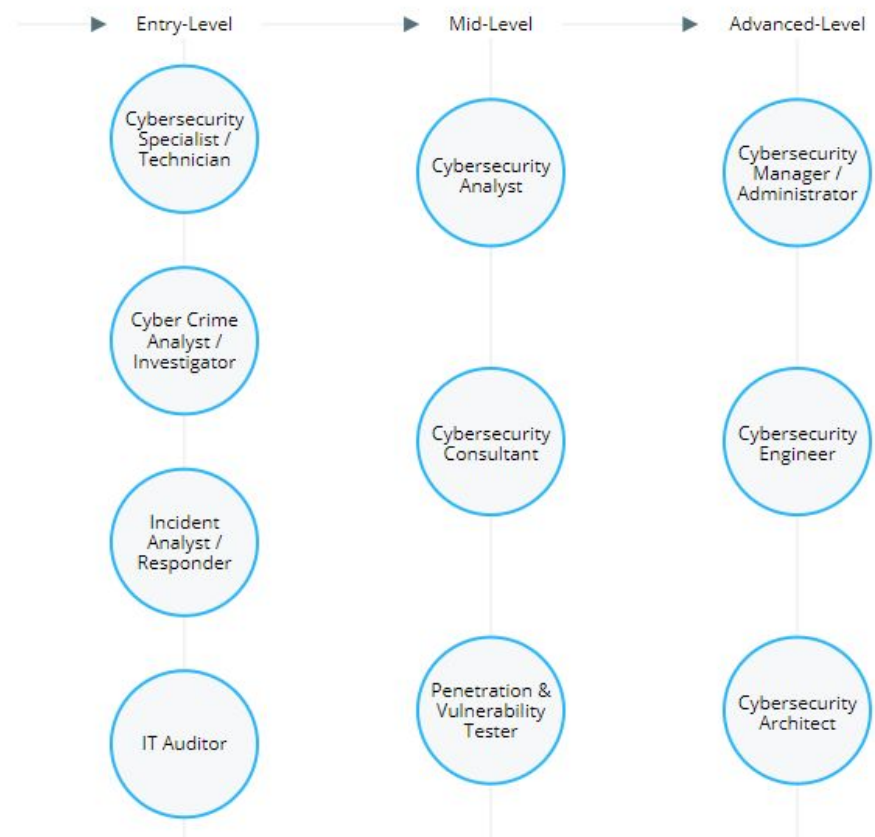
There are many opportunities for workers to start and advance their careers within cybersecurity. This interactive career pathway shows key jobs within cybersecurity, common transition opportunities between them, and detailed information about the salaries, credentials, and skillsets associated with each role.

[Share](#) [Embed](#)

## Common Cybersecurity Feeder Roles ⓘ



## Core Cybersecurity Roles ⓘ



Source: *Cybersecurity Career Pathway*, Cyber Seek, July 30, 2020, <https://www.cyberseek.org/pathway.html>



NICCS™

NATIONAL INITIATIVE FOR CYBERSECURITY CAREERS AND STUDIES

Training ▾

Formal Education ▾

Workforce Development ▾

About NICCS ▾



INTRODUCING

# THE CYBER CAREER PATHWAYS TOOL

DISCOVER YOUR PATH!



Source: *Cyber Career Pathways Tool*, NICCS, August, 2020, <https://niccs.us-cert.gov/>

# Workforce Framework used by U.S. Government



	<b>Analyze</b> Performs highly-specialized review and evaluation of incoming cybersecurity information to determine its usefulness for intelligence.	Specialty Areas ▼
	<b>Collect and Operate</b> Provides specialized denial and deception operations and collection of cybersecurity information that may be used to develop intelligence.	Specialty Areas ▼
	<b>Investigate</b> Investigates cybersecurity events or crimes related to information technology (IT) systems, networks, and digital evidence.	Specialty Areas ▼
	<b>Operate and Maintain</b> Provides the support, administration, and maintenance necessary to ensure effective and efficient information technology (IT) system performance and security.	Specialty Areas ▼
	<b>Oversee and Govern</b> Provides leadership, management, direction, or development and advocacy so the organization may effectively conduct cybersecurity work.	Specialty Areas ▼
	<b>Protect and Defend</b> Identifies, analyzes, and mitigates threats to internal information technology (IT) systems and/or networks.	Specialty Areas ▼
	<b>Securely Provision</b> Conceptualizes, designs, procures, and/or builds secure information technology (IT) systems, with responsibility for aspects of system and/or network development.	Specialty Areas ▼

Source: *Workforce Framework for Cybersecurity*, NICCS, March 2022, <https://niccs.cisa.gov/workforce-development/cyber-security-workforce-framework>

# Meet Jessica Lee



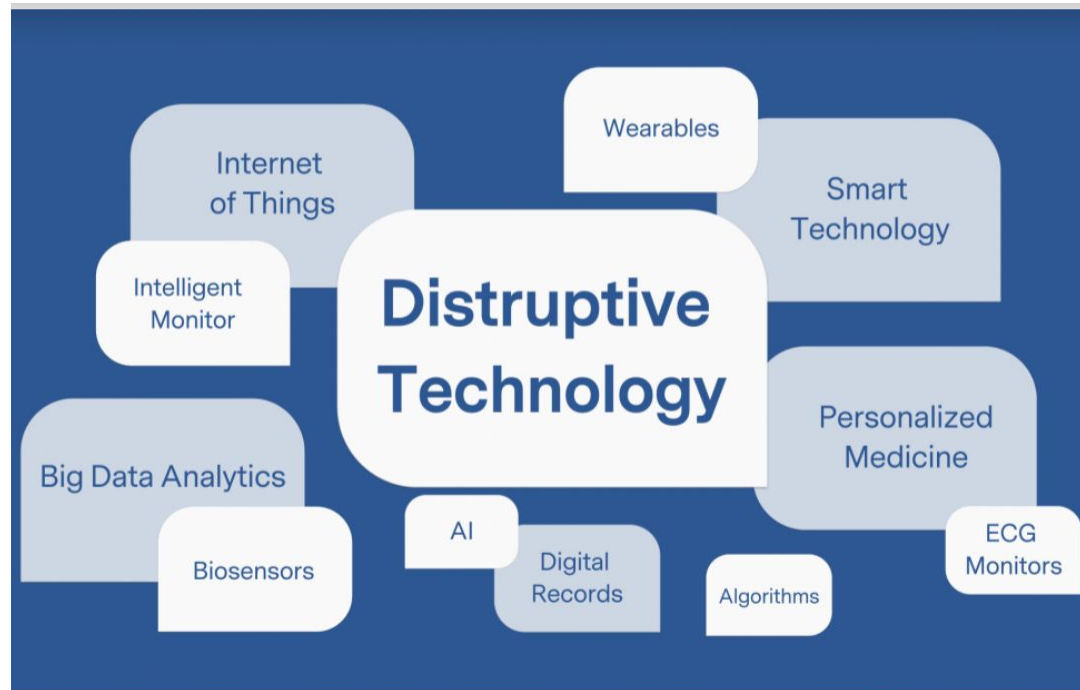
## Cyber Threat Intelligence Analyst at Chevron

<https://video.search.yahoo.com/search/video?fr=mcafee&ei=UTF-8&p=cybersecurity+threat+analyst+at+chevron+youtube&type=E211US105G0#id=1&vid=1e35aaa3cec5559ad786a960dbf2f0c7&action=click>

1:50 min



## Creating Jobs of the Future



Source: *3 Disruptive Technologies That Will Advance Patient Care*, by Providertech, October 13, 2021, <https://www.providertech.com/3-disruptive-technologies-to-advance-patient-care/>



## Amazon's voice assistant Alexa to start seeking doctor help

By TOM MURPHY and ANNE D'INNOCENZIO, Associated Press - Monday



© Provided by mySA

FILE - Dave Limp, senior vice president for Amazon devices & services, holds an Echo Dot with Clock device as he speaks Sept. 25, 2019, in Seattle. Amazon and telemedicine provider Teladoc Health are starting a voice-activated virtual care program that lets customers get medical help without picking up their phones. The service, for health issues that aren't emergencies, will be available on Amazon's Echo devices. Customers can tell the voice assistant Alexa that they want to talk to a doctor, and that will prompt a call back on the device from a Teladoc physician. The program, announced Monday, Feb. 28, 2022 marks Amazon's latest health care expansion and another push into telemedicine.

Source: *Amazon's Voice Assistant Alexa to Start Seeking Doctor Help*, by Tom Murphy and Anne D'Innocenzio, Associated Press, March 2, 2022, <https://www.msn.com/en-us/money/other/amazons-voice-assistant-alexa-to-start-seeking-doctor-help/ar-AAUq42h>





## Employers Rate the Essential Need of Career Readiness Competencies

COMPETENCIES	IMPORTANCE: WEIGHTED AVERAGE RATING*	PROFICIENCY: WEIGHTED AVERAGE RATING
Critical Thinking	4.57	3.68
Communication	4.56	3.64
Teamwork	4.49	3.91
Equity & Inclusion	4.33	3.96
Professionalism	4.20	3.46
Technology	4.05	4.07
Career & Self-Development	3.82	3.39
Leadership	3.68	3.31

Source: *Job Outlook 2022*, National Association of Colleges and Employers. 5-point scale, where 1=Not at all important/proficient, 2=Not very important/proficient, 3=Somewhat important/proficient, 4=Very important/proficient, 5=Extremely important/proficient



## LinkedIn: Skills Companies Need Now

- **Creativity**
  - **Persuasion**
  - **Collaboration**
  - **Adaptability**
  - **Time Management**
- \*\* Curiosity ????**

These skills compliment and are in **ADDITION TO** technical skills needed to do a job


Source: <https://www.payscale.com/career-news/2019/03/linkedin-these-are-the-skills-companies-need-right-now>, March 2019



- Teach Cyber teachers need free account to browse <https://teachcyber.org/>
- SANS Institute free posters, cheat sheets, 50+ opensource tools, <https://www.sans.org/security-resources/?msc=main-nav>
- National Student Leadership Conference <https://www.nslcleaders.org/youth-leadership-programs/cybersecurity/#section-5>
- Cyber.org Program Driven Curriculum



The screenshot shows the Amazon Cybersecurity Awareness Training landing page. It features the Amazon logo in the top left, the title "Cybersecurity Awareness training" in large white text, and the subtitle "Fun and impactful cybersecurity training, provided by Amazon." Below this is an orange button that says "Start the free training" with an external link icon. On the right side, there is a white sidebar with three sections: "Raise the bar on cybersecurity" with a brief description, "Share this training" with a "Share training now" link, and "Download Learning Management System package" with a "Download LMS package" link. An "FAQ" link is visible in the top right corner of the page.

*"Individuals and companies of all shapes and sizes are grappling with an increase in attempts at social engineering and phishing, tactics that may seem unsophisticated but can actually lead to large incidents. Education is the key to helping people and organizations better identify these threats and keep themselves protected."* 

Source: Cybersecurity Awareness Training, Amazon, March 3, 2022, <https://learnsecurity.amazon.com/>



- Cybersecurity and Infrastructure Security Agency,  
<https://www.cisa.gov/cyber-interns>
  - Paid programs for GS 1-2, Student Trainee
  - Brochure available
- National Security Agency,  
<https://www.intelligencecareers.gov/NSA/nsastudents.html>
  - High School work study for Juniors, Stokes education scholarship
  - Gifted & Talented language program, 12 weeks
- Microsoft High School Discovery Program,  
<https://careers.microsoft.com/students/us/en/job/1276715/Microsoft-Discovery-Program-High-School-Opportunities>
- Private Industry internships for high school students, nationwide,  
<https://www.indeed.com/jobs?q=Cyber+Security+High+School+Summer+Internship&vjk=383dbe293adc4f7a>



# Certifications Towards Professional Advancement

- Industry Certifications, awarded by (ISC)2
  - **CISSP Certified Information Systems Security Professional**
  - CISM Certified Information Security Manager
  - CISA Certified Information Systems Auditor
  - CEH Certified Ethical Hacker
  - CCSP Cloud Security
  - HCISPP Healthcare Security

Source: Dice, "Cybersecurity Certifications: 5 Big Questions You Want Answered", March 2020, <https://insights.dice.com/2020/03/24/cybersecurity-certifications-5-big-questions-you-want-answered/>



# Certifications Towards Professional Advancement

- Vendor Certifications
  - Cisco CCSN (Cisco Certified Network Associate)
  - Microsoft MCSE (Microsoft Certified Systems Engineer)
  - Red Hat
  - Oracle
- Training Organization Certifications
  - ISACA Information Systems Audit and Control Association
  - SANS Institute
  - CompTIA **students can be certified while still in high school**

Source: Dice, "Cybersecurity Certifications: 5 Big Questions You Want Answered", March 2020, <https://insights.dice.com/2020/03/24/cybersecurity-certifications-5-big-questions-you-want-answered/>

# Who's Hiring in Buffalo?



95 openings



Delaware North.







# See you in 15 minutes



**M&T**

# Taylor Kaufman, CISSP

Assistant Vice President,  
Advanced Threat Analyst II, M & T Bank

***Advanced Threat Hunter***

SUNY Buffalo State, CIS Alumnus, 2015



## Resources for Teachers

<https://cyber.org/>



- Virtual training environment
  - Train, test, practice with different tools and configurations
  - Respond to real time situations
  - Manage stress



March 3, 2021 by [Scott Bureau](#) Follow [@scottbureau](#)

## IBM gift to help RIT's Global Cybersecurity Institute enhance workforce development

IBM software and expertise supports GCI Cyber Range and Pentesting Competition



# Cyber Range Sites



There are MANY more, often cloud based

- IBM
- Range Force
- Raytheon Tech
- Simspace
- Accenture
- Cloud Range
- CYRIN
- Tech Data
- U.S Cyber Range (for students) <https://www.uscyberrange.org/>

# QUIZ Time



## Name Qualities or Skills that will lead to success in Cybersecurity

- Think outside the box
- Some of these skills are not IT related
- Some will support disruptive technologies
- Add your responses to the chat
- Responses will be summarized and shared with the group



- *(ISC)2 Blog*. (2021, October 21). Retrieved from Cybersecurity Workforce Study Skills Gap Narrows But More Help Is Needed: [https://blog.isc2.org/isc2\\_blog/2021/10/isc2-cybersecurity-workforce-study-skills-gap-narrows\\_2021.html](https://blog.isc2.org/isc2_blog/2021/10/isc2-cybersecurity-workforce-study-skills-gap-narrows_2021.html)
- Bureau, S. (2021, March 3). *IBM Gift to help RIT's Global Cybersecurity Institute Workforce Development*. Retrieved from Rochester Institute of Technology: <https://www.rit.edu/news/ibm-gift-help-rits-global-cybersecurity-institute-enhance-workforce-development>
- *Cyber and IT Interns*. (2022, March 3). Retrieved from Cybersecurity and Infrastructure Security Agency: <https://www.cisa.gov/cyber-interns>
- *Cybersecurity*. (2022, March 4). Retrieved from National Student Leadership Council: <https://www.nslcleaders.org/youth-leadership-programs/cybersecurity/#section-5>
- *Cybersecurity Awareness Training*. (2022, March 3). Retrieved from Amazon.com: <https://learnsecurity.amazon.com/>





- *Cybersecurity Certification: Which is the Best and Will Help You Be In Demand.* (2020, March 20). Retrieved from Dice:  
<https://insights.dice.com/2020/03/24/cybersecurity-certifications-5-big-questions-you-want-answered/>
- *Cybersecurity Internship.* (2022, March 3). Retrieved from Indeed:  
<https://www.indeed.com/jobs?q=Cyber+Security+High+School+Summer+Internship&vjk=383dbe293adc4f7a>
- *Cybersecurity Resources.* (2022, March 4). Retrieved from SANS Institute:  
<https://www.sans.org/security-resources/?msc=main-nav>
- *CyberSeek.* (2022, March 2). Retrieved from CyberSeek Cybersecurity Supply/Demand Heat Map: <https://www.cyberseek.org/heatmap.html>
- Fruhlinger, J. (2021, March 23). *CSO.* Retrieved from Does It Matter Who the CISO Reports To?:  
<https://www.csoonline.com/article/3278020/does-it-matter-who-the-ciso-reports-to.html>



- Gray, K. (2021, December 3). *National Association of Colleges and Employers*. Retrieved from Competencies: Employers Weigh Importance Versus New Grad Proficiency: <https://www.naceweb.org/career-readiness/competencies/competencies-employers-weigh-importance-versus-new-grad-proficiency/>
- *High School Programs at NSA*. (2022, March 3). Retrieved from National Security Agency: <https://www.intelligencecareers.gov/NSA/nsastudents.html>
- Morgan, S. (2020, November 13). *Cybercrime to Cost the World \$10.5 Trillion Annually by 2025* . Retrieved from Cyber Crime Magazine: <https://cybersecurityventures.com/cybercrime-damages-6-trillion-by-2021/#:~:text=Cybersecurity%20Ventures%20expects%20global%20cybercrime,%243%20trillion%20USD%20in%202015.>
- Murphy, T., & D'Innocenzio, A. (2022, March 2). *msn*. Retrieved from Amazon's Voice Assistant Alexa to Start Seeking Doctor Help : <https://www.msn.com/en-us/money/other/amazons-voice-assistant-alexa-to-start-seeking-doctor-help/ar-AAUq42h>
- Naden, C. (2021, April 15). *The Cybersecurity Skills Gap: Why Education is Our Best Weapon Against Cybercrime*. Retrieved from ISO: <https://www.iso.org/news/ref2655.html>
- *Net Help Security*. (2021, October 27). Retrieved from How To Close the Cybersecurity Workforce Gap: <https://www.helpnetsecurity.com/2021/10/27/workforce-gap-cybersecurity/>



- Pitchkites, M. (2022, March 2). *Cloudwards*. Retrieved from Top Cybersecurity Statistics, Facts and Trends in 2022 :  
<https://www.cloudwards.net/cyber-security-statistics/#:~:text=Cybersecurity%20Ventures%20estimates%20that%20cybercrimewill%20result%20in%20a,until%20it%20reaches%20%2410.5%20trillion%20by%202025.%204>
- *Providertech*. (2021, October 13). Retrieved from 3 Disruptive Technologies That Will Advance Patient Care:  
<https://www.providertech.com/3-disruptive-technologies-to-advance-patient-care/>
- *Teach Cybersecurity, Change the Future*. (2022, March 4). Retrieved from Teach Cyber:  
<https://teachcyber.org/>
- *Workforce Framework for Cybersecurity (NICE Framework)*. (2022, March 3). Retrieved from Cybersecurity and Infrastructure Security Agency:  
<https://niccs.cisa.gov/workforce-development/cyber-security-workforce-framework>



# Break Time



See you at 1:00 pm