



# CS4HS Cybersecurity Career Awareness

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# Cybersecurity in Organizations

- Cost of Cyber Crime estimated at \$6 Trillion/year by Cybersecurity Ventures.com
- Information Security Compliance Requirements
  - Federal Government, SOX (Sarbanes Oxley Act)
  - Audit Standards
  - Standards Groups, ISO
  - Industry Specific Organizations, Financial, Medical, etc.
  - Risk of Cloud Based Solutions
  - Fed RAMP, Federal Risk and Authorization Management
  - Global Standards
  - Personal Information Standards
- Security in public corporations
- Responsible to board of directors
- Breaches *must be disclosed publically*

# Cybersecurity Reporting Relationships

- Part of IT organization, 45%
- Report directly to the President, 23%
- May report to Finance, Internal Audit, CFO
- May report to Operations, COO
- Normally based on the size of the organization

Source: *Does It Matter Who the CSO Reports To?*, CSO, by Freuhlinger, Josh, April 20, 2019,  
<https://www.csoonline.com/article/3278020/does-it-matter-who-the-ciso-reports-to.html>

## Sample data breach notification



Dear Shepherd Center Family & Friends,



Very recently, we received notice from Blackbaud—our cloud-based database that houses basic constituent and donor information—of a data security incident that took place in May 2020. As Blackbaud is one of the world's largest providers of fundraising management software for non-profits, this incident may affect us and hundreds of hospitals (including many here in Georgia), universities, churches, private schools and other non-profit clients. Out of an abundance of caution, we wanted to notify you of this incident.

Blackbaud has assured all their clients that no credit card, Social Security numbers, or bank account information was compromised. **It is also important to note that the Shepherd Center Foundation does not and will never as a practice store this type of information in our Blackbaud database.**

Based on the information provided to us by Blackbaud, it is our understanding that data regarding our constituents was accessed but not distributed or made public. ~~Regardless, the security of our constituent data remains of utmost~~













# The Changing World of Job Searches

- WFH
- Combo Jobs
- Second Careers
- Bootcamps
- Effects of COVID-19



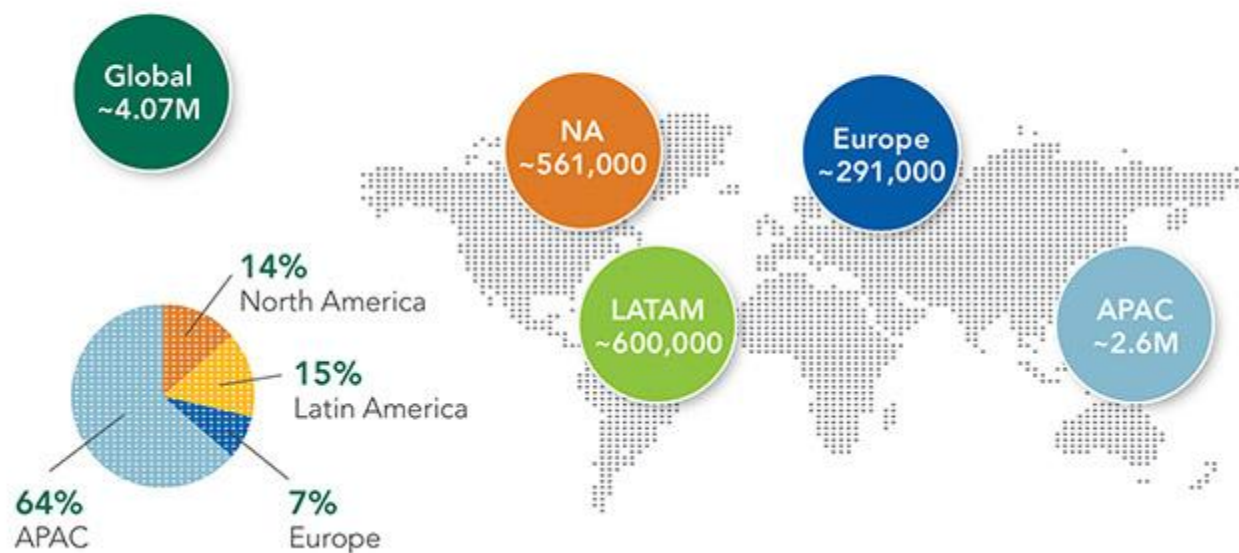
The cyber security implications of COVID-19

Twitter LinkedIn Facebook RSS YouTube

 <p><b>Are your cyber and fraud controls ready?</b></p> <p>COVID-19 questions to assess your readiness to manage cyber and fraud risk.</p>	 <p><b>The rise of ransomware during COVID-19</b></p> <p>How to adapt to the new threat environment.</p>	 <p><b>Recalibrate your security operations</b></p> <p>COVID-19 requires your security operations to adapt.</p>	 <p><b>Key questions to ask suppliers</b></p> <p>COVID-19 checklist to adapting your supply chain.</p>
 <p><b>7 practices for managing insider threats</b></p> <p>COVID-19 has changed our way of working and intensified insider risks.</p>	 <p><b>Managing the information security impact of COVID-19</b></p> <p>Risk and security threats related to remote working.</p>	 <p><b>Scaling security for remote working</b></p> <p>COVID-19 has forced enterprises to rapidly adapt to new working models.</p>	 <p><b>9 security tips for video-conferencing</b></p> <p>COVID-19 measures are causing organizations to turn to video conferencing applications.</p>
 <p><b>10 considerations for working from home securely</b></p> <p>COVID-19 is turning working from home into the new normal.</p>	 <p><b>Identifying &amp; responding to COVID-19 themed cyber threats</b></p> <p>Staying cyber secure.</p>	 <p><b>Immediate actions for the CIO and CISO</b></p> <p>COVID-19 checklist for the CIO and CISO on the immediate actions to take.</p>	 <p><b>Tips to keep children safe online during COVID-19</b></p> <p>Be cyber smart.</p>

Source: KPMG, Cyber Security Implications of COVID-19, July 2020, <https://home.kpmg/xx/en/home/insights/2020/04/the-cyber-security-implications-of-covid-19.html>

## The Cybersecurity Workforce Gap by Region



Source: Help Net Security, *Cybersecurity Workforce Skills Gap Rises to Over 4 Million*, November 8, 2019, <https://www.helpnetsecurity.com/2019/11/08/cybersecurity-workforce-skills-gap/>

The International Information System Security Certification Consortium, (ISC)<sup>2</sup>, finds that, while there are currently about 2.8 million security professionals working worldwide, another 4 million trained professionals are needed to close the security “skills gap.” That’s an increase of 145 percent.

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/>



# What's In a Name?

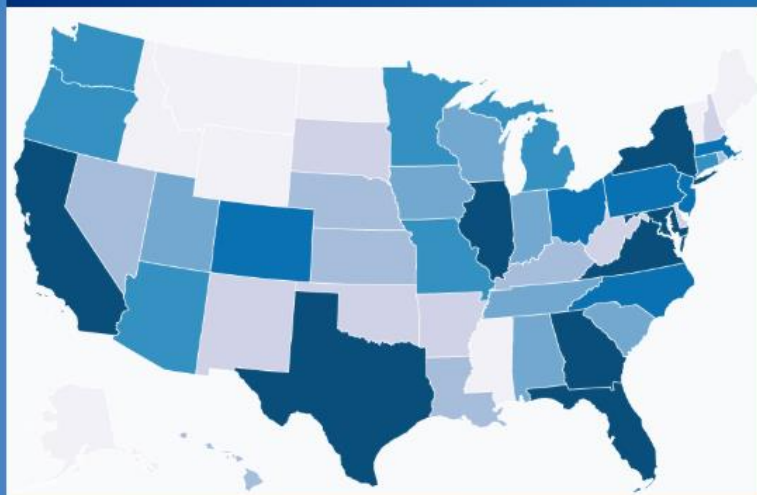
- Cybersecurity
- Data Security
- Information Security

# Cyber Security Careers



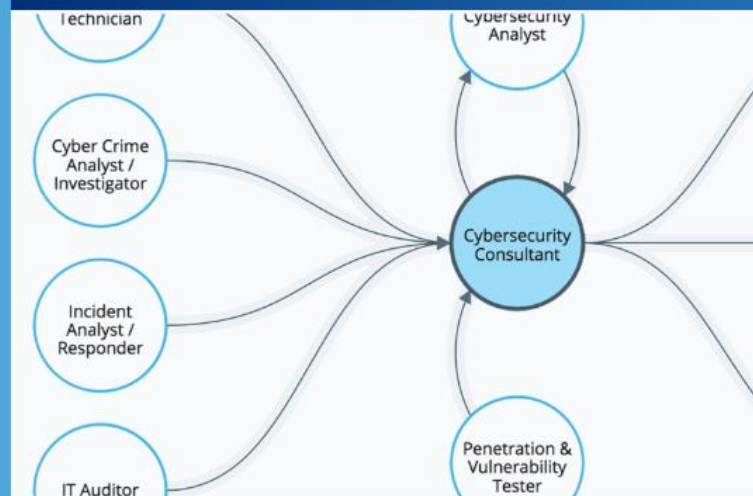
[About](#) [Interactive map](#) [Career pathway](#) [Who this tool is for](#) [Project partners](#) [Links](#)

## 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

Source: *Cybersecurity Supply and Demand, Career Pathway*, Cyber Seek, July 30, 2020 <https://www.cyberseek.org/#>,

# 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.

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## Common Cybersecurity Feeder Roles ⓘ

### Feeder Role

Networking

Software Development

Systems Engineering

Financial and Risk Analysis

Security Intelligence

## Core Cybersecurity Roles ⓘ

### Entry-Level

Cybersecurity Specialist / Technician

Cyber Crime Analyst / Investigator

Incident Analyst / Responder

IT Auditor

### Mid-Level

Cybersecurity Analyst

Cybersecurity Consultant

Penetration & Vulnerability Tester

### Advanced-Level

Cybersecurity Manager / Administrator

Cybersecurity Engineer

Cybersecurity Architect

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



**NICCS**<sup>TM</sup>

NATIONAL INITIATIVE FOR CYBERSECURITY CAREERS AND STUDIES

Training ▾

Formal Education ▾

Workforce Development ▾

About NICCS ▾



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


# OCCUPATIONAL OUTLOOK HANDBOOK

Search Handbook

Go

Occupational Outlook Handbook > Computer and Information Technology >

## Information Security Analysts

PRINTER-FRIENDLY 

Summary

What They Do

Work Environment

How to Become One

Pay

Job Outlook

State & Area Data

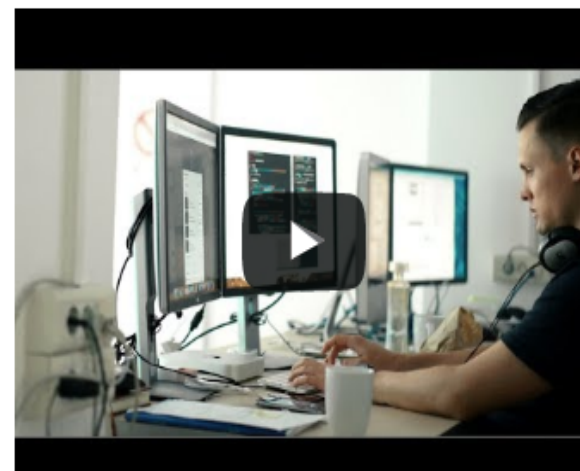
Similar Occupations

More Info

### Summary

#### Quick Facts: Information Security Analysts

2019 Median Pay ?	\$99,730 per year \$47.95 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, 2018 ?	112,300
Job Outlook, 2018-28 ?	32% (Much faster than average)
Employment Change, 2018-28 ?	35,500



### 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>



## Employers Rate the Essential Need of Career Readiness Competencies

COMPETENCIES	WEIGHTED AVERAGE RATING*		
	2019	2018	2017
Critical thinking/problem solving	4.66	4.62	4.58
Teamwork/collaboration	4.48	4.56	4.43
Professionalism/work ethic	4.41	4.46	4.56
Oral/written communications	4.30	4.30	4.43
Digital technology	3.84	3.73	3.78**
Leadership	3.65	3.82	3.86
Career management	3.38	3.46	3.47
Global/multi-cultural fluency	2.78	3.01	2.85

Source: *Job Outlook 2019*, National Association of Colleges and Employers. \*5-point scale, where 1=Not essential, 2=Not very essential,

<https://www.nacweb.org/career-readiness/competencies/the-four-career-competencies-employers-value-most/>

CS4HS Cybersecurity Virtual Workshop

Copyright: Diane Dillon August 2020





## 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

## Who's Hiring in Buffalo?





Buffalojobfinder.com , *Buffalo News*

Buffalojobs.com

Dice.com

Glassdoor Jobs

Google for Jobs

Indeed.com

Jobs.com

Monster.com

Careerbuilder.com

Simplyhired.com

Wnyjobs.com

ZipRecruiter

Craigslist.com, often company name is unavailable

Just 'Google' '*Cybersecurity Jobs, Buffalo, NY*'



# See you in 10 minutes

# 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

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

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/>

# Most Recognized Cybersecurity Certification, **CISSP**, Certified Information Systems Security Professional

- Certification Requirements
  - 5 years paid industry experience
  - Proficiency in 8 Categories of the Common Body of Knowledge
    - Assets
    - Identity and Access
    - Communications and Networking
    - Security/ Risk Management
    - Development
    - Security Operations
  - 6 hour test, \$699
  - Must re-certify every 3 years
- Recognized by ISO, International Standards Organization and ANSI
- **This is a profession of continuous learning**

# Competitions

- Rules Vary
  - Who can participate
  - Prerequisites
  - Number of people attacking/defending team
  - Individual or groups
  - Age
  - Experience
  - Time Limits
  - Tools allowed
- Prizes
  - Cash
  - Scholarships



## Competitions

For Beginners

National Cyber League

Bandit War Game



Online CTF (Capture the Flag) Competitions

Kaci Nowadly, Hamburg HS to discuss Friday

CyberPatriot designed for K-12

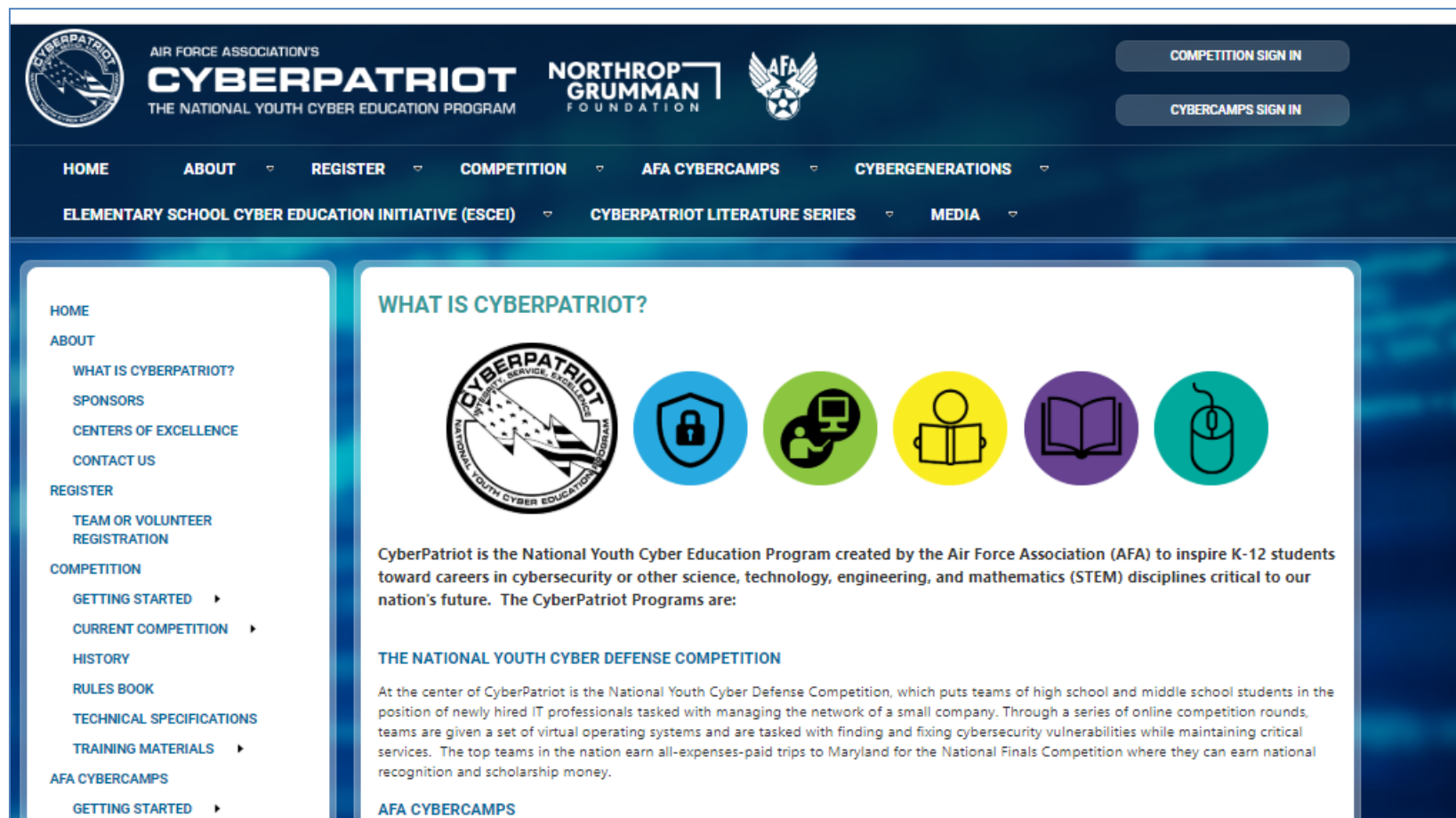
## CyberPatriot

- Sponsored by Air Force Association for K-12
- National Youth Cyber Defense Competition for Middle and HS
  - Manage a network for a small company
  - Fix vulnerabilities
- Scholarships, trip to Maryland for National Competition
- Run Summer Camps

Source: CyberPatriot, August 2020 <https://www.uscyberpatriot.org/Pages/About/What-is-CyberPatriot.aspx>



## CyberPatriot National Youth Competition



The screenshot shows the CyberPatriot website interface. At the top, there are logos for the Air Force Association's CyberPatriot, Northrop Grumman Foundation, and AFA. Navigation buttons for 'COMPETITION SIGN IN' and 'CYBERCAMPS SIGN IN' are on the right. A main navigation bar includes links for HOME, ABOUT, REGISTER, COMPETITION, AFA CYBERCAMPS, and CYBERGENERATIONS. Below this, there are links for ELEMENTARY SCHOOL CYBER EDUCATION INITIATIVE (ESCEI), CYBERPATRIOT LITERATURE SERIES, and MEDIA. The left sidebar contains a menu with links to HOME, ABOUT, WHAT IS CYBERPATRIOT?, SPONSORS, CENTERS OF EXCELLENCE, CONTACT US, REGISTER, TEAM OR VOLUNTEER REGISTRATION, COMPETITION, GETTING STARTED, CURRENT COMPETITION, HISTORY, RULES BOOK, TECHNICAL SPECIFICATIONS, TRAINING MATERIALS, AFA CYBERCAMPS, and GETTING STARTED. The main content area features the heading 'WHAT IS CYBERPATRIOT?' followed by a row of six icons: the CyberPatriot logo, a shield with a padlock, two interlocking puzzle pieces, an open book, a computer monitor, and a computer mouse. Below the icons, a paragraph explains that CyberPatriot is the National Youth Cyber Education Program created by the Air Force Association (AFA) to inspire K-12 students toward careers in cybersecurity or other science, technology, engineering, and mathematics (STEM) disciplines critical to our nation's future. The text then introduces 'THE NATIONAL YOUTH CYBER DEFENSE COMPETITION', stating that at the center of CyberPatriot is the National Youth Cyber Defense Competition, which puts teams of high school and middle school students in the position of newly hired IT professionals tasked with managing the network of a small company. Through a series of online competition rounds, teams are given a set of virtual operating systems and are tasked with finding and fixing cybersecurity vulnerabilities while maintaining critical services. The top teams in the nation earn all-expenses-paid trips to Maryland for the National Finals Competition where they can earn national recognition and scholarship money. At the bottom of the main content area, there is a link for 'AFA CYBERCAMPS'.

Source: CyberPatriot, August 2020 <https://www.uscyberpatriot.org/Pages/About/What-is-CyberPatriot.aspx>

## Deloitte Cyber Cup Challenge

- Part of National Cyber Summit
- CTF, High School or College Teams of 2 -4
- Cash Prizes, \$2000- \$5000, top three teams
- Huntsville, AL, June 8-10, 2021



Source: National Cyber Summit, *Cyber Cup Challenge*, August, 2020,  
<https://www.nationalcybersummit.com/Program/Cyber-Cup-Challenge>



## NICE Challenge Project

We bring students the workforce experience before the workforce.

The NICE Challenge Project develops real-world cybersecurity challenges within virtualized business environments that bring students the workforce experience before the workforce. Our goal is to provide the most realistic experiences to students, at-scale year-round, while also generating useful assessment data about their knowledge, skills, and abilities for educators.



MORE THAN  
**450**

EDU INSTITUTIONS SERVED



MORE THAN  
**750**

EDU FACULTY SIGNUPS



MORE THAN  
**3,000**

VIRTUAL MACHINES SERVED DAILY



MORE THAN  
**72,500**

CHALLENGE WORKSPACES DEPLOYED

Source: National Initiative for Cybersecurity Education, *NICE Challenge Project*, August, 2020

<https://nice-challenge.com/>

## Competition Preparation Guides

- **Trail of Bits**, Guide for CTF (Capture the Flag) competitions, tips to prepare
- **Practice CTF**, Lists live online CTF games, downloadable offline games, virtual machines
- **Awesome CTF**, Curated list of tutorials, software, resources, frameworks, libraries to help beginners to veterans
- **Vulnhub**, Practice zone with virtual machines and labs for vulnerability penetration testing. Special labs for beginners
- **CTF Resources**, Resource center includes tools and information and explanations for beginners to veterans
- **Reddit's Security CTF**, Realtime questions and answers regarding CTF competitions, strategies and more

Source: Cybersecurity MS Degrees, *Big List of Cybersecurity Competitions and Challenges*, August, 2020,  
<https://computersciencems.com/resources/cyber-security/cyber-security-competitions-list/>

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<https://www.csoonline.com/article/3278020/does-it-matter-who-the-ciso-reports-to.html>



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# Thank You