Mission

To energize, promote, and coordinate a robust community working together to advance an integrated ecosystem of cybersecurity education, training, and workforce development.
Annual NICE Conference & Expo

SAVE THE DATE

NICE 2022 Conference and Expo

June 6 - 8, 2022
Westin Peachtree Plaza
Atlanta, Georgia

This event is supported by NICE under a Cooperative Agreement (Award# 70NANB18H025).

NICEconference.org
Goals

- NICE Framework
- Learning Process
- Career Discovery
- Talent Management
- Research
NICE Framework: 2020 Revision

- **Title:** Workforce Framework for Cybersecurity
- **Introduction of Competencies**
- **Removed:**
  - Specialty Areas (reflected in Competencies, Work Roles)
  - Ability Statements (incorporated in Skill statements)
- **Appendices:** Moved outside the publication

nist.gov/nice/framework
Competencies Update

• Draft NISTIR 8355, NICE Framework Competencies: Assessing Learners for Cybersecurity Work (Call for Comments: March 17 – May 3)
  – Defining Competencies
  – Developing Competency Statements
  – Example Uses

• Draft List of Competencies
  – Proposed Competency Names and Descriptions
  – TKS association will be next stage work
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.

**National level**

**Total Cybersecurity Job Openings**: 521,617

**Total Employed Cybersecurity Workforce**: 941,904

**Supply of Cybersecurity Workers**

- **Very Low**
- **Average**

**Geographic Concentration**

- National average 1.8
- National average 1.0

**Top Cybersecurity Job Titles**

- Cyber Security Engineer
- Cyber Security Analyst
- Cyber Security Consultant
- Cyber Security Manager / Administrator
- Systems Engineer
- Software Developer / Engineer
- Network Engineer / Architect
- Vulnerability Analyst / Penetration Tester
- Cyber Security Specialist / Technician
<table>
<thead>
<tr>
<th>Certification Holders / Openings Requesting Certification</th>
<th>( Ratio )</th>
</tr>
</thead>
<tbody>
<tr>
<td>CompTIA Security+</td>
<td>177,472</td>
</tr>
<tr>
<td>Certified Information Privacy Professional (CIPP)</td>
<td>6,840</td>
</tr>
<tr>
<td>Global Information Assurance Certification (GIAC)</td>
<td>64,591</td>
</tr>
<tr>
<td>Certified Information Systems Security Professional (CISSP)</td>
<td>90,334</td>
</tr>
<tr>
<td>Certified Information Systems Auditor (CISA)</td>
<td>36,930</td>
</tr>
<tr>
<td>Certified Information Security Manager (CISM)</td>
<td>42,366</td>
</tr>
</tbody>
</table>

Notes: The NICE Workforce Categories are not mutually exclusive— one job could perform multiple roles within the framework. The data shown here are not intended to be aggregated.
Penetration & Vulnerability Tester

AVERAGE SALARY

$104,000

REQUESTED EDUCATION (%)

SubBA Bachelor's/Graduate Degree 9 70 22

COMMON JOB TITLES

- Penetration Tester
- Senior Penetration Tester
- Network Operations Consultant
- Application Security Analyst

TOP SKILLS REQUESTED

1. Information Security
2. Penetration Testing
3. Linux
4. Python
5. Java
6. Vulnerability Assessment
7. Information Systems
8. Software Development
9. Project Management

TOTAL JOB OPENINGS

13,930

TOP CERTIFICATIONS REQUESTED

- Certified Information Systems Security Professional (CISSP)
- SANS/BAC Certification
- Certified Information Security Manager (CISM)
- Certified Information Systems Auditor (CISA)
- CompTIA Security+

COMMON NICE CYBERSECURITY WORKFORCE FRAMEWORK CATEGORIES

- Securely Provision
- Protect and Defend
- Analyze
Cybersecurity Career Awareness Week

Inspiring and promoting awareness and exploration of cybersecurity careers.

• Inspire, engage, and inform the public about the demand, opportunities, and multiple career options
• Raise awareness about pathways to prepare a highly skilled and diverse workforce
• Support successful programs and showcase effective resources, especially those that increase participation of underrepresented populations

nist.gov/nice/ccaw
This event is supported by NICE under a Cooperative Agreement (Award# 70NANB20H144).
Centers of Academic Excellence in Cybersecurity
For More Information

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@NISTcyber
The Challenges of Cyber Security Education as our Socio-Economic System Digitizes...

A North Dakota example of adaptation in Rural-Western States

Dr. Mark Hagerott
Chancellor, North Dakota University System
Deputy Director of US Naval Academy Cyber Center ‘13-15
New America Cyber Fellow ‘15
Commissioner (Western and Mid West Education Consortiums)
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Epic Times...Dual Digital Revolutions

Two Macro Technological Revolutions near simultaneous:

- **Robotic** machines proliferating across the planet...factories, transportation, infrastructure...IoT

- **Cyber Space**...a global digital information nexus in the cloud, connecting people and data with the IoT...

Cyber Security is the ONLY SHOW STOPPER of the Digital Revolutions... Labor Shortage a top problem for Higher Education
Challenge to Leaders: Adapt and Respond

➢ **Create** the Technology, in a competitive race with or against other nations.

➢ **Civilize** the Technology (eg., law, ethics, policy, privacy)

➢ **Control** and secure the Technology (**cyber security**)

*Education of Humans is a SHORT TERM IMPERATIVE but also THE long term source of competitive advantage*
Complicating Factors:

1. Achieving Scale in large, low-density states

2. Academic Poaching in the “market place” by larger, well-funded Universities

Unless these problems are solved... Opportunities of this Digital Age will Decouple from Rural-West Regions
Large Western States: an Imperative for Integration and Collaboration across state, across type of colleges

- Challenges of population density, ability to pay, and distance to physical campuses.
- Necessitated an integrated approach to education, research, and training.
- 11 state institutions: two research universities; five cc; four regional colleges.
- Partnering with Five Tribal Colleges
- Transferability of credits; shared classes

Next Level: In 2020, the creation of State-Wide Dakota Digital Academy to promote collaboration... to achieve Speed and Scale of Response... 11 campuses... MOU in draft with 5 Tribal Colleges
Every Student. Every School. Cyber Educated

➢ Comprehensive statewide approach to cybersecurity
➢ Aligns pillars of K-20 cyber ed, workforce development, and operational security
➢ Representation from more than 20 diverse organizations
➢ NICERC (Natl. Integrated Cyber Education Research Center) and Palo Alto partnering
Unique in Upper Midwest...
Two Centers earn NSA/DHS (CAE) in one year...

National Center of Academic Excellence in Cyber Defense (CAE-CD) in Research
National Center of Academic Excellence in Cyber Defense (CAE-CD) for 2-Year Education

External corporate partners were Key to this success… in the face of massive budget cuts due to collapsing oil prices, our programs were in jeopardy… **Palo Alto** partnered with North Dakota… directly contributed to the successful creation of our cyber programs…
Questions/Comments

- Contact Information: Mark.Hagerott@ndus.edu
Attract, Develop, and Retain Cyber Top Talent

National Cyber Strategy
A highly skilled cybersecurity workforce is a strategic national security advantage
- Develop a superior workforce
- Build & sustain the talent pipeline
- Highlight & award talent

Department of Defense Cyber Strategy
- Provide most skilled cyber personnel w/focused resources & opportunities to develop key skills over the course of their careers
- Identify most capable and empower them to solve the toughest challenges

Recognize & celebrate superb technical achievement and leadership
Inspire technical population to the highest levels of excellence
Leverage corporation’s world-class engineers, scientists, and technologies

Significant Business Impact
Thought Leadership
Mentor Next Gen of Technical Experts
Superb Technical Achievement
Jobs in Cybersecurity
https://www.cyberseek.org/heatmap.html
Prepare Feeders to Feeder Roles in Cyber Workforce Development

Advanced-Level

Mid-Level

Entry-Level

Feeder Roles

Feeders to the Feeder Roles

Cybersecurity Apprenticeship Training Can Bridge the Skills Gap by Leveraging Many Underemployed and Unemployed

Design by Dr. Roger Yin
Closing the Skills Gap Cybersecurity Apprenticeship

- 16 week training
- 600 hours paid, on-the-job component
- Mentorship
- Career development road map
- Focus on diversifying the workforce