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# National Initiative for Cybersecurity Education (NICE) Workforce Framework for Cybersecurity

Danielle Santos, Karen Wetzel

March 10, 2022

# NICE Strategic Plan and Implementation Plan (2021-2025)

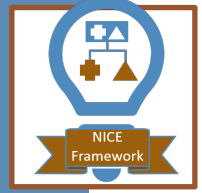
To energize, promote, and coordinate a **robust community** working together to advance an **integrated ecosystem** of cybersecurity **education, training, and workforce development**

[www.nist.gov/itl/applied-cybersecurity/nice/about/strategic-plan](www.nist.gov/itl/applied-cybersecurity/nice/about/strategic-plan)

**Promote the Discovery of Cybersecurity Careers and Multiple Pathways**

**Transform Learning to Build and Sustain a Diverse and Skilled Workforce**

**Modernize the Talent Management Process to Address Cybersecurity Skills Gaps**




**Expand Use of the Workforce Framework for Cybersecurity (NICE Framework)**

**Drive Research on Effective Practices for Cybersecurity Workforce Development**

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# Expand Use of the *Workforce Framework for Cybersecurity* (NICE Framework)

- Document and Disseminate Successful Uses
- Align NICE Framework with Other Cybersecurity and Privacy Guidance
- Establish a Process for Reviews and Updates
- Explore Tools to for Access and Interoperability
- Identify Work Subject to Automation
- Expand International Outreach

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# NICE Workforce Framework for Cybersecurity

- ✔ A common, consistent lexicon to **clearly share information** about cybersecurity work
- ✔ Direct information about **what a workforce needs to know**
- ✔ A **workforce skilled in cybersecurity**, not only a cybersecurity workforce
- ✔ Enables the establishment of **regular processes**
- ✔ For use in **career awareness**, **education and training**, **hiring and career development**, **workforce planning and assessment**

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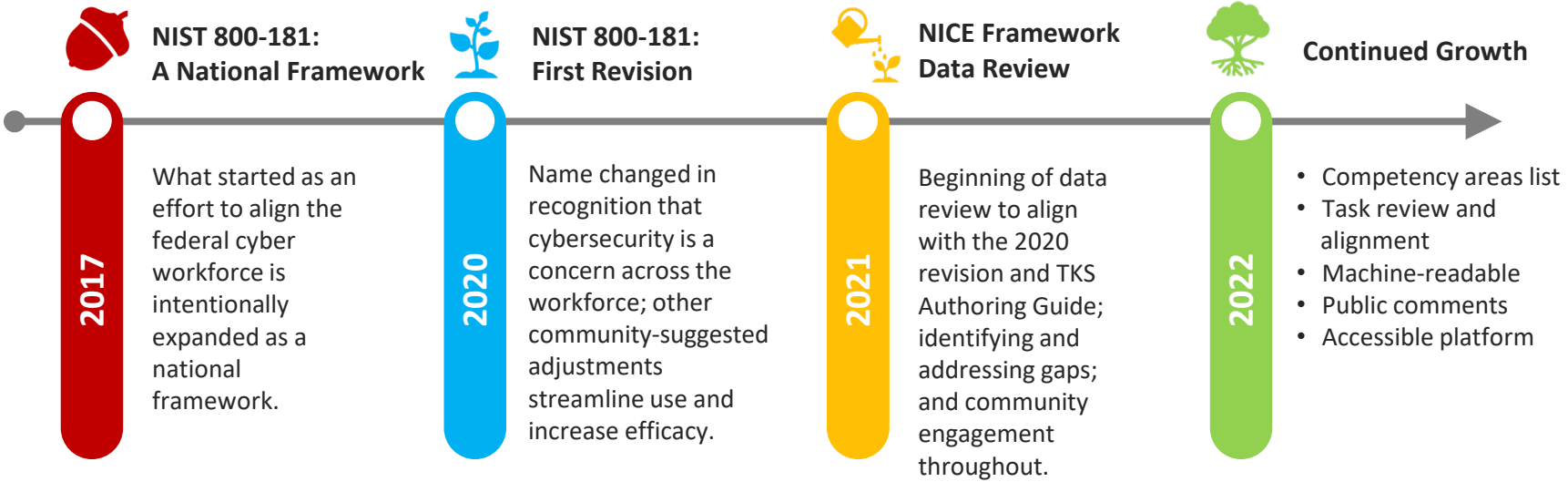
# NICE Framework Evolution

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# NICE Framework: Attributes

**Agility**
People, processes, and technology mature and must adapt to change. The NICE Framework enables organizations to keep pace with a constantly evolving ecosystem.

**Flexibility**
There is no one-size-fits-all solution to common challenges. The NICE Framework enables organizations to account for their unique operating context.

**Interoperability**
Solutions to common challenges may be unique, but they must agree upon consistent use of terms. The NICE Framework enables organizations to exchange workforce information using a common language.

**Modularity**
In addition to cybersecurity, organizations manage other risks within the enterprise. The NICE Framework enables communication about these other workforces (e.g., privacy) within the enterprise and across sectors.

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# Where We Have Been…

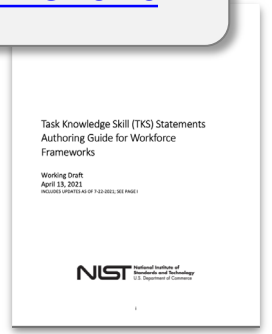
- **Dec 2020**: Revised NICE Framework Published
- **Jan 2021**: NICE Framework Users Group, Success Stories Launched
- **Mar 2021**: TKS Authoring Guide, 1st Draft Competencies NISTIR
- **Mar – Aug 2021**: NICE Community Workshops: Competencies, Education/Training, OT, Awareness
- **Sep 2021 – Mar 2022**: KSA Statement Review & Updates
- **Dec 2021**: Request for Comments: 2nd Draft Competencies NISTIR, Public Comment Process, Refactored Ability Statements
- **Jan – Mar 2022**: Stakeholder Conversations

Where We Are Going.

# NICE Framework: Updates

- **December 2020:** Revision
  - Workforce Framework for Cybersecurity
  - Introduction of Competencies
  - Deprecation of Ability Statements, Specialty Area
- **March 2021:** Draft Competencies NISTIR, List
- **December 2021:** Ability Statements Refactored
- **March 2022:** Knowledge and Skill Statement Updates
- **Spring 2022:** Work Roles & Categories
- **Fall/Winter 2022:** Tasks and K&S Alignment

TKS Authoring Guide for Workforce Frameworks



# NICE Framework: Why Competencies?

- **Evolving Recruiting Practices**
  - Shift from [only] degree-based to [also] competency-based hiring
  - Broader, more qualified applicant pool
  - Candidates for new and emerging technologies, threat vectors, capabilities
- **Assessment-based hiring and promotion**
- **Identify current gaps and anticipate future needs**
- **Align education and training to organizational goals**

NDAA Cybersecurity Proficiencies Report (June 2022)

- scope and sufficiency of current efforts
- recommend effective methods

# Competencies Areas vs. Work Roles

## Competency Areas

- Learner focused
- Help address employer needs
- Assessment is typically based on the area as a whole

## Work Roles

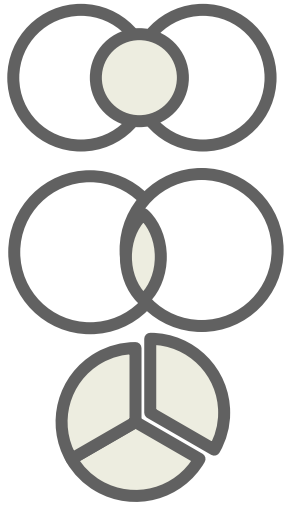
- Work focused
- Help define positions and responsibilities
- Assessment typically occurs at the task level

# NICE Framework Competency Areas

## What are they?

Measurable clusters of related Task, Knowledge, or Skill (TKS) statements in a particular domain that correlates with performance on the job and can be improved through education, training (including on-the-job and via apprenticeships), or other learning experiences.

- ✔ **Title:** Clearly signals the area that will be described.
- ✔ **Description:** Provides simple and clear language that focuses on the learner
- ✔ **Associated TKS Statements**



2nd Draft NISTIR 8355
NICE Framework Competencies: Assessing Learners for Cybersecurity Work
https://doi.org/10.6028/NIST.IR.8355-draft2

# Identifying NICE Framework Competency Areas

01

2011 OPM Competency Model for Cybersecurity

02

Comparison to NICE Framework Work Roles & Specialty Areas

03

Review and alignment with CSF, RMF, certifications, & other related resources

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# NICE Framework: New Platform

**Phase I:**

- Browsable
- Searchable
- Exportable
- Machine-readable

**Future Phases:**

- Tool development and support
- Customizable
- Connection with other workforce frameworks, related NIST content (PWF, RMF, CSF, etc.)
- Integrated mappings (OPM codes, etc.)

# NICE Framework: Public Commenting Tool

**Who:** Public stakeholders and subject matter experts

**What:** NICE Framework data

**When:** Open throughout the year; defined review and publication periods

- Additive to existing update processes (calls for comment, SME/stakeholder engagement, etc.)
- NIST principles for standards and guidelines development

# What to Expect in 2022

- March: Knowledge and Skill statements out for comment
- April/May: Updated Competency Areas list for comment
- April/May: Cybersecurity awareness role for comment
- May/June: OT content integration for comment
- June: NDAA Proficiencies Report
- June: Updated Work Roles and Categories for comment
- June: Online platform (phase 1)
- Fall/Winter: Task review & TKS alignment
- Winter: Public comment platform
- 2022: Resource development
- 2022: Resource Center updates

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# Stakeholder Engagement

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# NICE Framework Resource Center

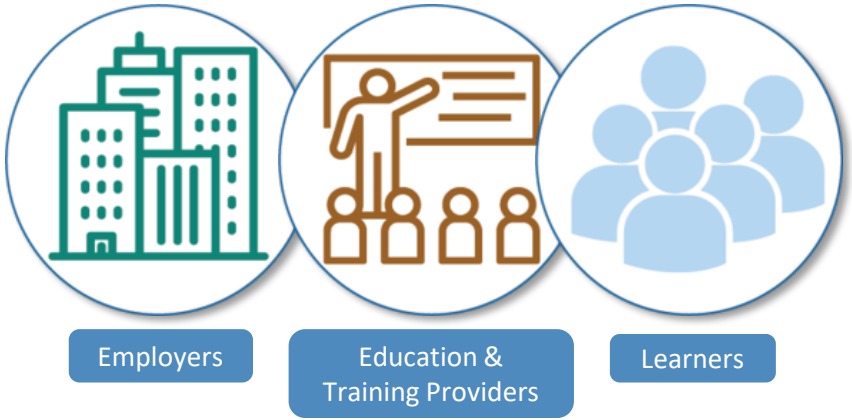
**Current Version & Latest Updates**

- NIST Special Publication
- NICE Framework Data
- Supplemental Materials
  - Playbook for Workforce Frameworks
  - TKS Authoring Guide
  - Data Update Process (draft)

**Tools**

**Resources by Audience**

**Example Applications and Uses**

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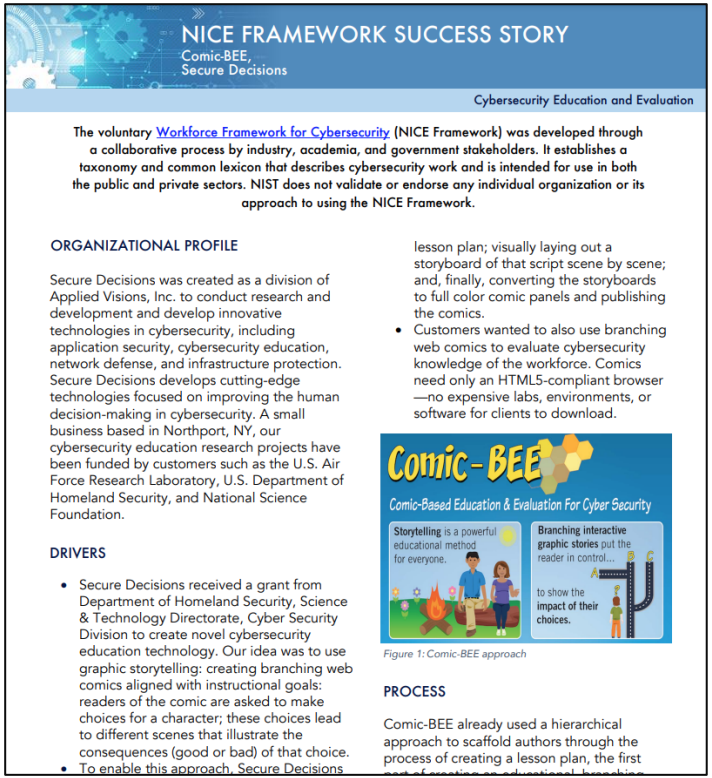
# Example Applications and Uses

## Success Stories



NICE FRAMEWORK SUCCESS STORY

Comic-BEE,
Secure Decisions

Cybersecurity Education and Evaluation

The voluntary Workforce Framework for Cybersecurity (NICE Framework) was developed through a collaborative process by industry, academia, and government stakeholders. It establishes a taxonomy and common lexicon that describes cybersecurity work and is intended for use in both the public and private sectors. NIST does not validate or endorse any individual organization or its approach to using the NICE Framework.

ORGANIZATIONAL PROFILE

Secure Decisions was created as a division of Applied Visions, Inc. to conduct research and development and develop innovative technologies in cybersecurity, including application security, cybersecurity education, network defense, and infrastructure protection. Secure Decisions develops cutting-edge technologies focused on improving the human decision-making in cybersecurity. A small business based in Northport, NY, our cybersecurity education research projects have been funded by customers such as the U.S. Air Force Research Laboratory, U.S. Department of Homeland Security, and National Science Foundation.

DRIVERS

- Secure Decisions received a grant from Department of Homeland Security, Science & Technology Directorate, Cyber Security Division to create novel cybersecurity education technology. Our idea was to use graphic storytelling: creating branching web comics aligned with instructional goals: readers of the comic are asked to make choices for a character; these choices lead to different scenes that illustrate the consequences (good or bad) of that choice.
- To enable this approach, Secure Decisions

lesson plan; visually laying out a storyboard of that script scene by scene; and, finally, converting the storyboards to full color comic panels and publishing the comics.

- Customers wanted to also use branching web comics to evaluate cybersecurity knowledge of the workforce. Comics need only an HTML5-compliant browser —no expensive labs, environments, or software for clients to download.



Figure 1: Comic-BEE approach

PROCESS

Comic-BEE already used a hierarchical approach to scaffold authors through the process of creating a lesson plan, the first

## Framework in Focus Interviews

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# Community Engagement

**NICE Interagency Coordinating Council**

Open to all federal employees with responsibilities to grow and sustain the Nation's cybersecurity workforce from the Executive Offices of the President and other federal departments, agencies, or bureaus

**NICE Community Coordinating Council**

Open to all public and private sector participants interested in pursuing actions that advance cybersecurity education, training, and workforce development.

- NICE Framework Feature (monthly meeting topic)
- NICE Framework Users Group

**As needed meetings with stakeholders**

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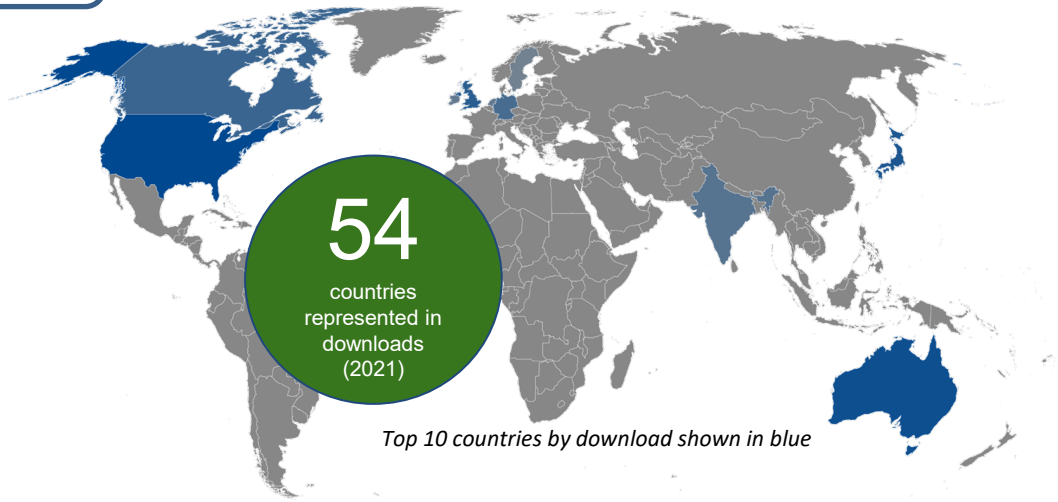
# International Engagement

**Translations**

- Spanish
- Portuguese
- Others in progress




**Activities**

- Ongoing meetings
- International Cybersecurity Competition and US Cyber Team
- Regional Initiative for Cybersecurity Education (RICET)
- George C Marshall Center: International Workshops on Cybersecurity Education and Workforce Development Capacity Building (2 workshops)

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# Other Ways to Get Engaged

## EVENTS

- NICE Webinars (monthly)
- Annual NICE Conference & Expo (Jun 6-8 - Atlanta, GA)
- Cybersecurity Career Awareness Week (Oct 17-22)
- NICE K12 Cybersecurity Education Conference (Dec 5-7 - St. Louis, MO)
- Federal Cybersecurity Workforce Summit and Webinar Series (Apr 26)
- Federal Information Security Educators (FISSEA) (quarterly)

## FEEDBACK LOOPS

- Public Comment Periods
- NICE Framework Users Group

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# Thank You

www.nist.gov/nice/framework

karen.wetzel@nist.gov
danielle.santos@nist.gov

**Upcoming Webinar:**

The NICE Framework at Work - Use Cases from Industry

March 16, 2022
2:00-2:25pm ET

nist.gov/nice/webinars