DEVELOPING HANDS-ON CYBERSECURITY 'CHALLENGES' TO IMPROVE TRAINING AND ASSESSMENT

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$ whoami
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$ whoami
jarrett
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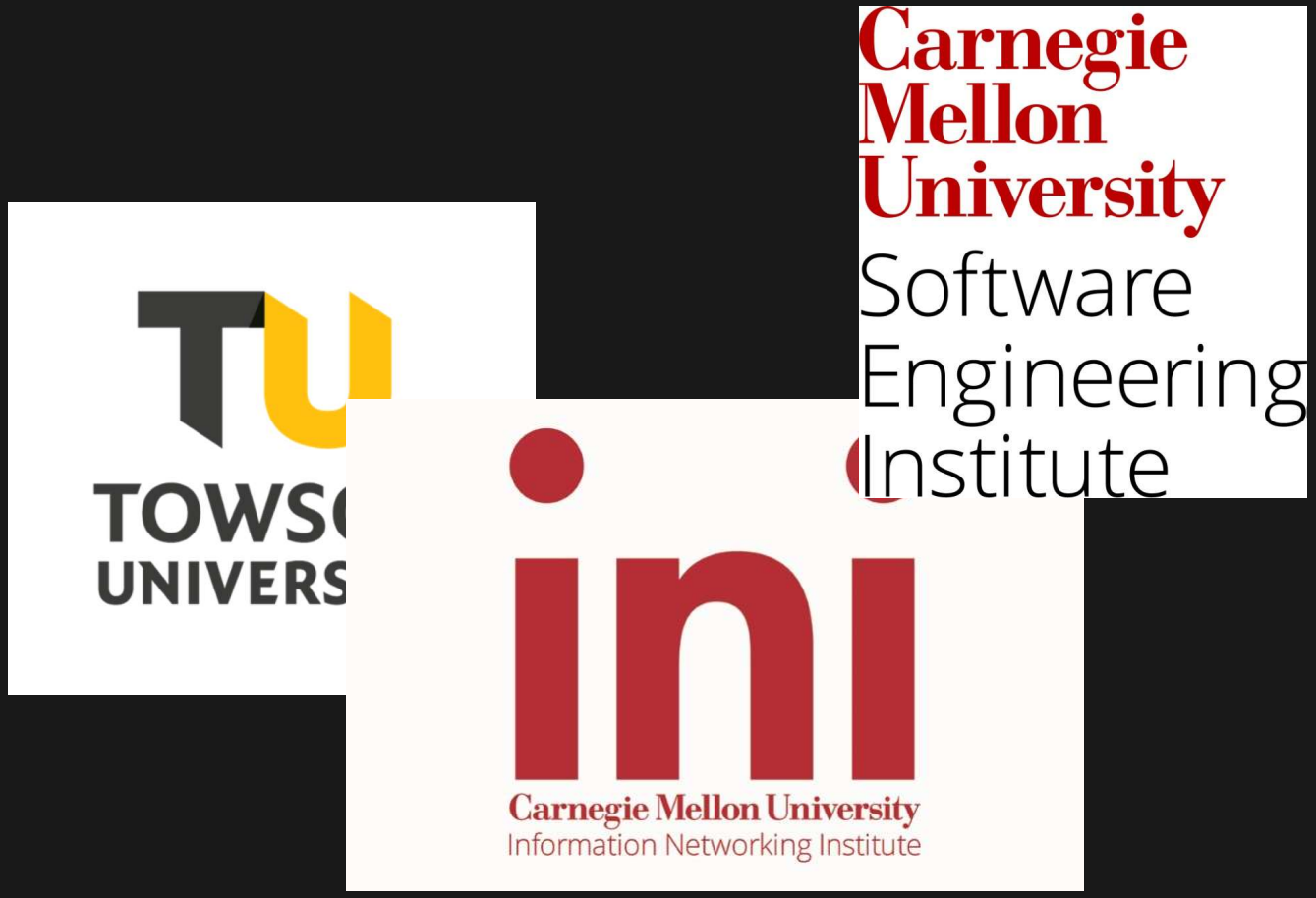

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WHAT'S THE SEI?

- Founded in **1984** as the only software engineering Federally Funded Research and Development Center (FFRDC)
- Leader in **software engineering**, **cybersecurity** and **artificial intelligence** research
- **~730** employees
- Headquarters in **Pittsburgh, PA**; Other offices near strategic partners in CA, MA, MD and VA

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CERT Cyber Workforce Development (CWD)

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CWD DIRECTORATE MISSION

*Provide force-multiplying solutions to rapidly grow and strengthen the nation's cybersecurity workforce—addressing the problems of **time**, **scale**, and **cost**.*

Find the **gap areas** that industry has not addressed *(yet)*.

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What does that look like?

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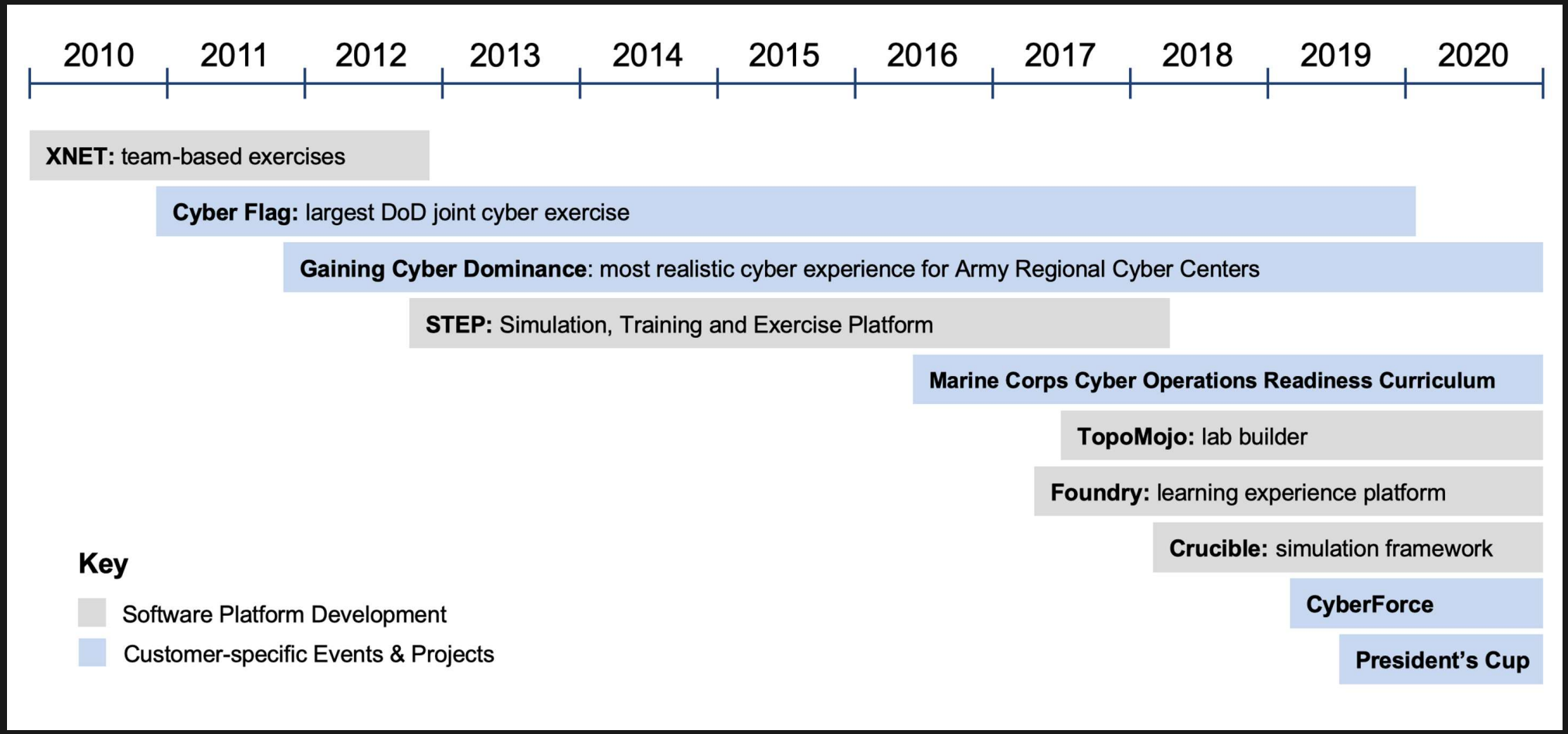

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How **big** is the problem?

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769,736

U.S. CYBERSECURITY JOB OPENINGS

Source: Cyberseek Interactive Map, October 2022

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How do we address this?

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How do we address this?

- Attracting people is half the battle
- Hands-on training and realistic experiences
- Maintain engagement while learning

https://www.dhs.gov/science-and-technology/cybersecurity-competitions

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Competitions

- Learn through hands-on "challenges"

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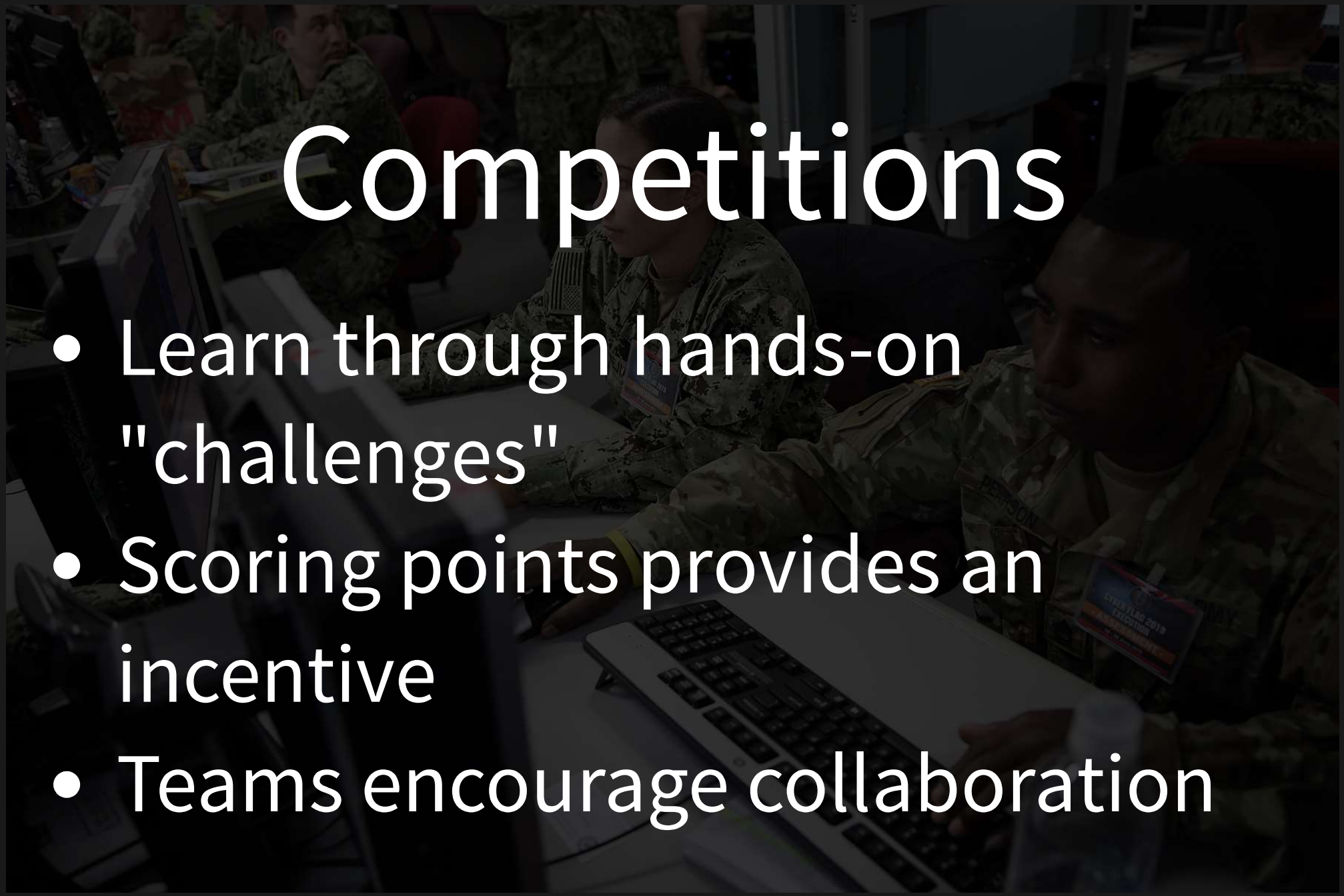

Competitions

- Learn through hands-on "challenges"
- Scoring points provides an incentive
- Teams encourage collaboration

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Our Competition Experience

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- Established in 2019 by E.O. 13870
- 4th year of yearly competition
- 1500 federal gov participants yearly

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What is a "Challenge"?

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What is a "Challenge"?

- Hands-on labs to test or teach a skill(s)
- Targeted exercises test applicable skills

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NICE APPLICABLE SKILLS

- NICE Framework publishes gov standard Work Roles, Tasks, Skills, etc.
- Ensure each challenge assesses a NICE Work Role/Task/Skill (e.g., Cyber Defense Analyst)

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Challenge Planning

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Challenge Planning

- Challenge Difficulty
- Technical Planning
- Scenario Planning

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Challenge Development

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Best Practices

- Testing Applicable Skills
- Required Tools are available/free to use
- Multiple Solution Options
- Clean up after development

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Challenge Grading

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Challenge Grading

- Token Discovery
- Question and Answer
- Environment Verification

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Challenge Variation

- Allows for replay without knowledge of answers
- Discourages answer sharing

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Solution Guides

- Detailed instructions on a possible solution
- Include explanations for each step

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Open Source Challenges

- github.com/cisagov/prescup-challenges
- presidentscup.cisa.gov/archive

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Challenge Development White Paper

https://resources.sei.cmu.edu/library/asset-view.cfm?assetid=888592

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THANKS!

To continue the conversation…

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