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# Enabling Cyber Range Training through Ecosystem Collaboration

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# MassCyberCenter Overview

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The MassCyberCenter convenes the Massachusetts cybersecurity ecosystem to improve cybersecurity resiliency, workforce development, and public awareness within the state by developing cutting edge programs, organizing engaging events, and leading collaborative working groups.

**Cybersecurity  
Ecosystem  
Development**

**Resiliency for the  
Commonwealth**  
(Public and Private Sectors)

**Communication,  
Collaboration, and  
Outreach**

**Key Imperatives:** *The MassCyberCenter and its public, private, and academic stakeholders identified that the cybersecurity ecosystem faces four critical challenges.*

**UNDERSECURITY**

Organizations across the Commonwealth, especially municipalities and non-profits, are challenged to find affordable resources to defend themselves against growing cybersecurity threats and maintain cyber resiliency

**UNDEREMPLOYMENT**

- There is a supply shortage of trained workers available to meet the cybersecurity industry’s workforce demands
  - *Cyberseek: 12,262 total cybersecurity job openings in Massachusetts from February 2023 through January 2024*
- Colleges and universities could provide students with additional operational skills to secure entry level employment in the cybersecurity industry
- Communities of color and women are underrepresented in the cybersecurity workforce and are frequently overlooked for employment due to a lack of experience
  - *Aspen Institute: 4% of cybersecurity workers nationwide self-identify as Hispanic, 9% as Black, and 24% as women*

**TRAINING**

Businesses across the Commonwealth do not have a location to send their employees to receive cybersecurity training at an affordable rate

**BUSINESS / ECONOMIC DEVELOPMENT**

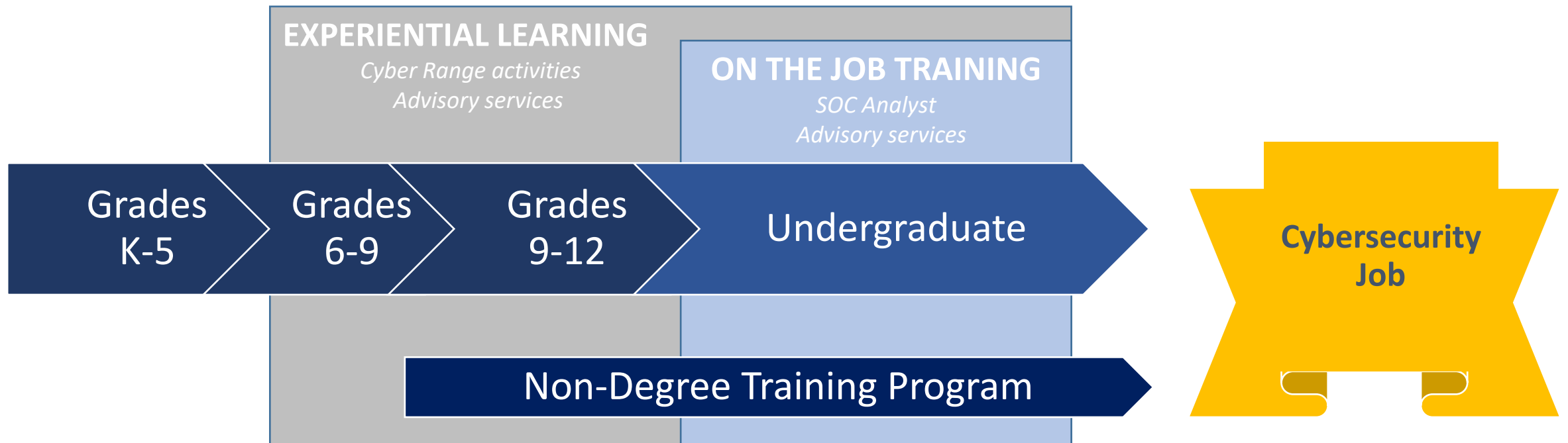
Need to convene regional hubs for business development where cybersecurity entrepreneurs can establish and grow startups or where specific industry segments such as defense contractors can receive specialized support.

**SOCs and Cyber Ranges:** *The Commonwealth is investing in Security Operations Centers (SOCs) and Cyber Ranges that provide real solutions for protection against cyber threats and promote the growth of a diverse cybersecurity workforce to address these imperatives.*

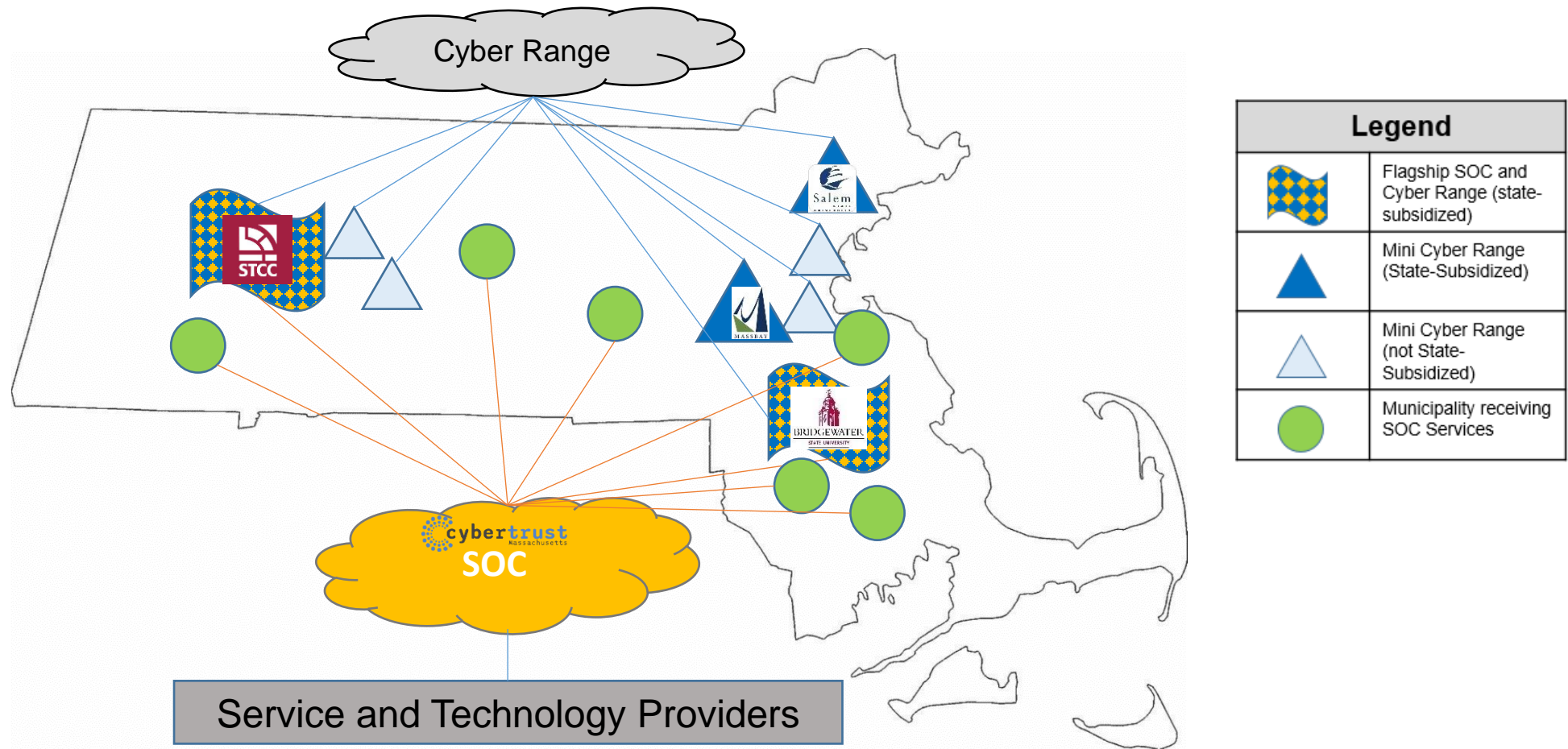
Cyber Range - Definition	Security Operations Center - Definition
<p style="text-align: center;"><b>Training Tool</b></p> <ul style="list-style-type: none"> <li>• Provides a safe place to allow training of personnel, testing of tools, development of software, techniques or hardware (isolated from the internet);</li> <li>• Derives from military Red vs. Blue Teams executing “cyber warfare” in order to hone attack and defense skills of personnel;</li> <li>• Can be physical infrastructure (servers “on premise”) or virtual (cloud-based).</li> </ul>	<p style="text-align: center;"><b>Live operational mission</b></p> <ul style="list-style-type: none"> <li>• SOC monitors network operations and provides a focal point for initial incident detection and response;</li> <li>• Tier 1, Tier 2, and beyond depends on available resources and depth of expertise of personnel;</li> <li>• SOC analyst is usually the entry level job for new cybersecurity workforce;</li> <li>• SOC can be owned by an organization as part of the IT management or provided by a third party vendor.</li> </ul>
<p style="text-align: center;"><b>Target Users/Customers</b></p> <ul style="list-style-type: none"> <li>• Students in cyber programs for workforce pipeline;</li> <li>• Adult learners transitioning careers;</li> <li>• Employees needing cyber training, i.e., municipal employees, small businesses, non-profits, military personnel needing “keyboard time” on a range;</li> <li>• Specialized industry training for businesses needing credentials, i.e., those with DOD contracts.</li> </ul>	<p style="text-align: center;"><b>Target Customers</b></p> <ul style="list-style-type: none"> <li>• Municipalities, Non-profits, small businesses, etc.</li> </ul>

# MassCyberCenter Vision for a Massachusetts Cybersecurity Talent Pipeline

*A strong cybersecurity talent pipeline in Massachusetts would progress students through academic instruction or non-academic training programs and integrate experiential learning and on the job training.*



**CyberTrust Massachusetts:** *The MassCyberCenter established this non-profit to deliver SOC services to municipalities across the Commonwealth with the support of student employees, as well as Cyber Range services to train students to enter the workforce and upskill professionals.*



Mass Cyber Center Provides Startup Funding, Strategic Collaboration



Universities Provide Programs, Training and Access



Corporations Sponsor and Provide Resources



Allies Provide Resources and Amplify the Mission



Students Enroll in the Programs to Obtain Training



Security Operations Centers Provide Real-World Training



State Agencies Support Municipal Cyber Needs



Municipalities Gain Cost Effective Cybersecurity Resources



Trained Students are Ready for Employment at Massachusetts Corporations



**workforce development**

**cyberresiliency**

**economic development**

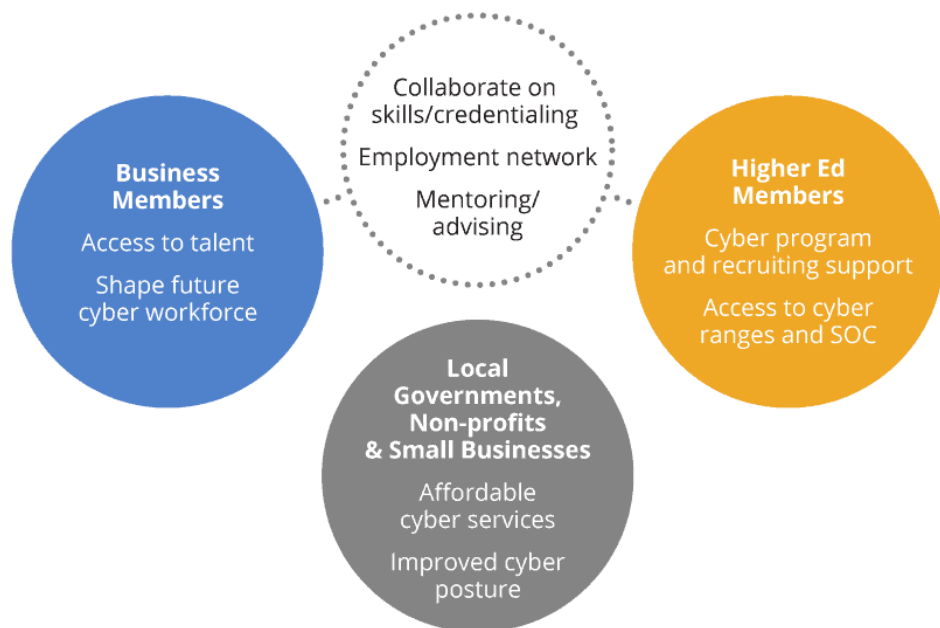
CyberTrust Massachusetts is a non-profit committed to building opportunity and security through a consortium of statewide businesses and colleges.



By Sopra Solutions

# CyberTrust Massachusetts Consortium Overview

CyberTrust has formed a consortium of committed companies and colleges—anchored in community colleges and state universities, where programs can best reach underrepresented groups.



## Academic Members



BRIDGEWATER  
STATE UNIVERSITY



## Corporate Members

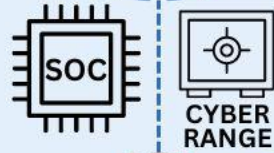




Bridgewater State  
University



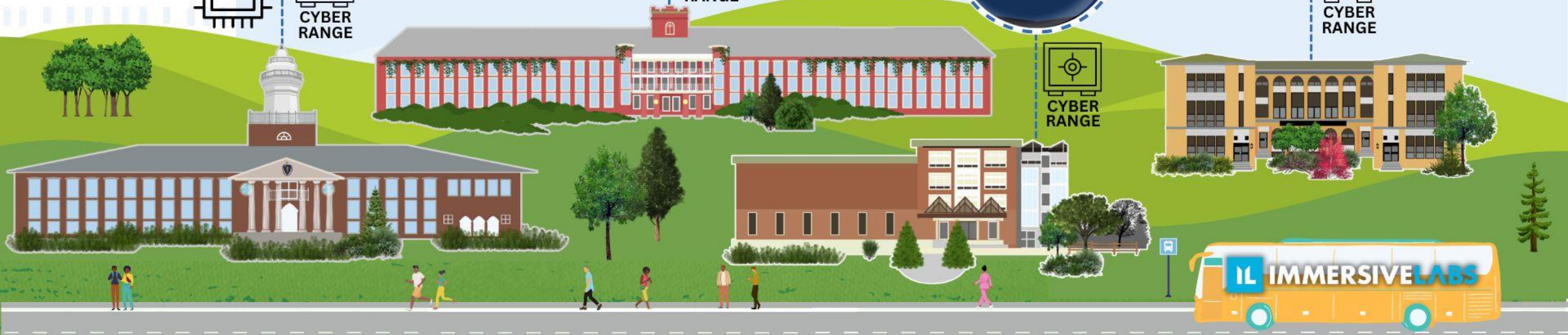
Springfield Technical  
Community College



MassBay Community  
College



Salem State University



# State-of-the-Art Cyber Ranges Open in Massachusetts



*\*Additional SOC/Range facilities at Union Station in Springfield, MA and Salem State University are projected to open in late summer/fall 2024*

# Cyber Range Services



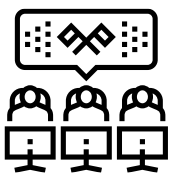
## Labs

Over 2300 labs broken up into topics, career paths, threat actors, CVEs, etc.



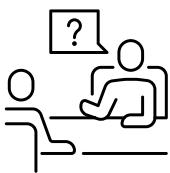
## Crisis Simulation

Over 60 gamified table-top scenarios for executive audiences



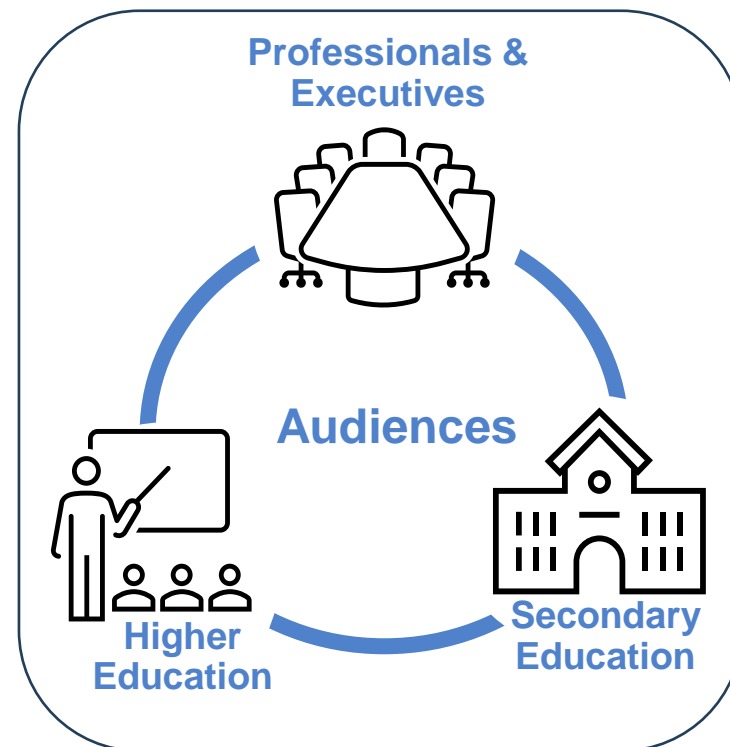
## Team Cyber Simulation

20 end-to-end attack scenarios (offensive and defensive) to exercise team synergy and technical acumen



## Candidate Screening

Baseline a potential candidate's proficiency or promotion readiness, or use as a way to assign specific content to a one-time audience (e.g. high school students)



# Cyber Range Services: Workforce Journey

## Workforce Development

**Specific Certification  
Preparation**

**Skills-based Career  
Pathways**

### **Team/Skill Building**

- Build technical acumen
- Team cohesion and communication
- Report writing

### **Executive/Leadership Development**

- Key decision points
- Testing escalation triggers
- Identifying gaps in cyber incident response plans

# Cyber Range Services: Student Journey

## High School

STEM/CS

- Career talks
- Cyber pathways and programs
- Cyber ethics
- Cyber range exercises

## Higher Education

Community College / 4-Year Programs / Workforce Development

### Curriculum Mapping

Work with our instructors and range partners to bake range activities into classroom

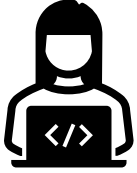
### Program Enhancement

- Technical CTFs
- Powerskills development
- Cybersecurity clubs
- K-12 program development

### SOC Internship Training

As students dive deeper into hands-on experiences in the SOC, they can leverage additional training pathways through the range

# Cyber Range Services: Capture-the-Flag



## Capture the Flag



### Fall 2023:

- 24 students
- 8 teams
- 4 institutions



### Spring 2024:

- 16 students
- 5 teams
- 4 institutions



## Executive Briefing

### Spring 2024:

- 5 students
- 2 teams
- 2 institutions

**Goal:** Deliver an incident briefing to C-Suite executives:


- Content
- Organization/Clarity
- Delivery
- Presentation Aids
- Time Management



cybertrust  
Massachusetts

# SOC Range Program Outcomes

In just its first year, the CyberTrust consortium has grown to 8 higher ed institution members, representing a large and growing source of future cyber workers.



Students enrolled in cyber-adjacent programs: 678

Students enrolled in accelerated workforce development programs: 59

Students enrolled in cyber programs: 571

**STUDENT PATHWAYS**


CyberTrust member school cyber programs are creating career opportunities for students from economically disadvantaged households

**APPROVED**



**49%** Percentage of students who are Pell Grant eligible

CyberTrust member school cyber programs serve a student demographic that is more diverse than the cyber industry today.



7% Asian    17% Black    26% Hispanic    39% White

The Cyber Range offered to member schools has already reached a large number of students with hands-on engagement on a wide range of cyber topics.

**391** Students served in classrooms, competitions and other activities

