“Leveraging Your Organizational Response”

Julia Armstrong, PMP
Mark Bartman, Maj Gen (Ret.)
State Level Cybersecurity Support

- 2015 – Gov Kasich directs TAG to investigate the cybersecurity status of the various state agencies (2016 RNC & Presidential election)
- Adjutant General’s Department leads the charge:
  - Enterprise-wide approach that allows for a statewide cyber governance structure
  - Develop and implement the appropriate authority to provide the capability to respond to and prevent cyber-attacks
- Ohio Cyber Collaboration Committee (OC3) was developed to ensure Ohio’s cyber community is working together to help its citizens and organizations achieve world class cyber security
Ohio Cyber Collaboration Committee (OC3) Structure (2022)

- *Education and Workforce Development Subcommittee* – Chaired by ODHE
- *Ohio Cyber Range Institute* – UC/UA [https://www.ohiocyberrangeinstitute.org](https://www.ohiocyberrangeinstitute.org)
- *Cyber Protection and Preparedness Subcommittee* – Chaired by ODPS/DHS
- *Ohio Cyber Reserve* – ADJ Directed

- 120+ organizations who are active members to support the mission and objectives
- “Whole of government” approach (ODHE, ADJ, ODE, ODAS, ODOT, and ODPS)

POC: Mark Bell, mark.a.bell16.nfg@army.mil, Cyber Security Outreach Coordinator
State of Ohio Adjutant General's Department
OC3 – Education & Workforce Development Subcommittee

- Improve the training and education of users and students in cyber security by:
  - Identifying critically needed skills and developing training and educational paths to provide the needed skilled workers in the cyber security field
  - Encouraging interested students and individuals to become involved in and further develop their cyber security in both K-12 and in higher education.
  - Training users at all levels in good cyber hygiene and best cyber security practices

- *83% of cyber workforce is >35 (majority between 35-54)
- *62% indicated they were significantly or somewhat understaffed
- *Almost 2/3rds have unfilled (open) cybersecurity positions
- *55% do not believe applicants to open positions are well qualified
- *66% believe the largest skill gap is in soft skills (communication, critical thinking, problem-solving, teamwork, attention to detail – Top 5)

* State of Cybersecurity 2022: Global Update on Workforce Efforts, Resources and Cyberoperations - ISACA
OCRI - Ohio Cyber Range Institute

- Learning and teaching tool (curricula & certification) for students and educators at the K-12 and collegiate level
- Workforce development tool
- Cyber incident response team training tool
- Test bed for cyber programs and systems
- Cyber contests & readiness exercises (EMAs & ONG)
- 95% respondents said prior hands-on experience was very (73%) or somewhat (22%) important
  - Student Cyber Portfolio
- 88% - credentials were very (36%) or somewhat (52%) important
- 81% - hands-on training is very (25%) or somewhat (56%) important
  * State of Cybersecurity 2022: Global Update on Workforce Efforts, Resources and Cyberoperations - ISACA
- 20% - University degree was very important
OCRI Ecosystem

RPCs:
- University of Cincinnati
- University of Akron
- Ohio State University
- University of Dayton
- Ohio University
- Río Grande
- Eastern Gateway CC
- Cin-Day Cyber at SOCHE
- Cedarville University
- Owens CC
- Lorain County CC
- Stark State CC
- PAST Foundation
- Cleveland State/Case Western IoT Collaborative
- Tiffin University & Findlay Partners
- Shawnee State University
OC3 - Cyber Protection and Preparedness Subcommittee

- Cyber in emergency preparedness
- Ensuring cyber threats are part of emergency planning at all levels both public and private
- Support small governmental entities (counties/cities/townships)
- Tabletop exercises
- Share threat intelligence between both public and private sector entities
- Identify and share best practices, policies and technologies
- Cyber Hotline (build out underway)
- Safe downloads (under development)

* State of Cybersecurity 2022: Global Update on Workforce Efforts, Resources and Cyberoperations - ISACA
The Ohio Cyber Reserve (ORC Chapter 5922)

❖ While in a volunteer status, the Cyber Response Teams will hone their skills, train as teams, and obtain all necessary certifications and clearances.

❖ While in a volunteer status, the Cyber Response Teams will provide outreach, training, education, and security assessments to eligible governmental entities and critical infrastructure to reduce cyber vulnerability and increase resiliency.

❖ While in a volunteer status, the Cyber Response Teams will assist K-12 educational efforts supporting cyber clubs and mentoring students in support of the Ohio Cyber Collaboration Committee’s (OC3) Education and Workforce Development efforts.

❖ When called to paid state active-duty status, the Cyber Response Teams, under the direction of the Adjutant General’s Department will be available to respond to cyber incidents at eligible governmental entities and critical infrastructure.

https://www.ong.ohio.gov/special-units/cyber/ohcr/index.html
The Founding of the Institute for Cybersecurity and Digital Trust

- **When:** Summer/Fall of 2019
- **Who:** Hesham El Gamal (Chair ECE), Helen Patton (CISO), and Morley Stone (SVP of Research)
- **Why:** To fulfill the dual lanes of cybersecurity education and research at a major R1 institution
- **Mission:**
  - Foster collaboration among researchers from multiple academic disciplines to collaboratively develop solutions to complex cybersecurity and digital trust issues.
  - Prepare the next generation of workers, scholars and leaders to develop robust and effective cyber trust solutions.
  - Partner with other educational institutions, government, military and industry to identify emerging cybersecurity issues and find ways to address those needs through research, education and collaboration.
Our Pillars

Advanced Research  
Education & Workforce Development  
Community Engagement
Research

- 20+ faculty & staff from 8 colleges/centers representing 14+ departments
  - College of Engineering: CSE, ECE, ISE, MAE
  - College of Arts & Sciences: Psychology, International Studies, Physics, Poli Sci
  - Glenn College of Public Affairs
  - Moritz College of Law
  - Center for Design and Manufacturing Excellence
  - Center for Automotive Research
  - NSF AI Institutes
  - Office of the Chief Information Officer at Ohio State
- Sponsored by Ohio Cyber Range Institute (as RPC)
- Government opportunities (NSA, NSF, AFRL, etc.)
- Corporate support for specific projects (or possible consortium model)
Education: current offerings

❖ Minor in Information Security 9 (CA&S)
  ❖ 10 hours required, plus 6 hours of electives
❖ Specialization in Information & Computation Assurance (BS in CSE)
  ❖ Recognized as an NCAE-CD program of study
  ❖ Requires 6 related courses, 3 others recommended
❖ Corporate CSE capstone projects available to CSE & CIS majors
❖ Elective courses offered in various departments for graduates and undergraduates
Education: current offerings

❖ Minor in Information Security 9 (CA&S)
  ❖ 10 hours required, plus 6 hours of electives
❖ Specialization in Information & Computation Assurance (BS in CSE)
  ❖ Recognized as an NCAE-CD program of study
  ❖ Requires 6 related courses, 3 others recommended
❖ Corporate CSE capstone projects available to CSE & CIS majors
❖ Elective courses offered in various departments for graduates and undergraduates

future

Establish as a Minor? (majors?)
Offer a Masters in Cybersecurity? ...in progress!
Create Cyber Capstone Course?
Education: Online Professional Masters in Cybersecurity

- Built upon a Stackable Certificate model: 2 Certificates + Ethics + Group Project

<table>
<thead>
<tr>
<th>Offense &amp; Defense</th>
<th>Design &amp; Implementation</th>
<th>Law, Policy &amp; Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro to Cybersecurity</td>
<td>Intro to Cybersecurity</td>
<td>Policy</td>
</tr>
<tr>
<td>Information Security</td>
<td>Intro to Hardware Security</td>
<td>Admin Law</td>
</tr>
<tr>
<td>Software Security</td>
<td>Security Autonomous Systems</td>
<td>Management</td>
</tr>
<tr>
<td>Offensive Security</td>
<td>Software Security</td>
<td>Innovation and Policy in a Global Economy</td>
</tr>
<tr>
<td>Reverse Engineering &amp; Malware</td>
<td>Reverse Engineering &amp; Malware Analysis</td>
<td>International Cybersecurity Skills</td>
</tr>
<tr>
<td>Network Security</td>
<td>Offensive Computing</td>
<td>Risk and Decision Analysis</td>
</tr>
<tr>
<td>Intro to Cryptography</td>
<td></td>
<td>Data Governance and Cybersecurity</td>
</tr>
</tbody>
</table>

| Offensive Security                | Software Security                        | International Trade                         |
| Reverse Engineering & Malware     | Reverse Engineering & Malware Analysis   | Performan Management                        |
| Network Security                  | Offensive Computing                      | Project Mgmt in the Public Sector          |

| Information Security              | Intro to Hardware Security               | Big Data Lay & Policy Seminar             |
| Software Security                 | Security Autonomous Systems              |                                              |
| Reverse Engineering & Malware     | Reverse Engineering & Malware Analysis   |                                              |
| Network Security                  | Offensive Computing                      |                                              |
| Intro to Cryptography             |                                          |                                              |

| Offensive Security                | Software Security                        | Innovation and Policy in a Global Economy   |
| Reverse Engineering & Malware     | Reverse Engineering & Malware Analysis   | International Cybersecurity Skills          |
| Network Security                  | Offensive Computing                      | Risk and Decision Analysis                  |
| Intro to Cryptography             |                                          | Data Governance and Cybersecurity          |

| Offensive Security                | Software Security                        |                                              |
| Reverse Engineering & Malware     | Reverse Engineering & Malware Analysis   |                                              |
| Network Security                  | Offensive Computing                      |                                              |
| Intro to Cryptography             |                                          |                                              |

| Offensive Security                | Software Security                        |                                              |
| Reverse Engineering & Malware     | Reverse Engineering & Malware Analysis   |                                              |
| Network Security                  | Offensive Computing                      |                                              |
| Intro to Cryptography             |                                          |                                              |
Community Engagement

❖ On campus events:
  ❖ BuckeyeCTF
  ❖ CTF at High School I/O (hackathon)
  ❖ Distinguished Speaker Series (Online)
  ❖ Support for WiCyS and annual conference
❖ Cybersecurity Canon (international committee to review & induct to the Hall of Fame)
❖ Workforce development: Cybersecurity Bootcamp course
❖ Integrations with formal learning (capstones) and emerging research areas
❖ Supporting off-campus events: K12 through professional

...plus...
Community Engagement: Industry Partners

Offer our existing resources to those off campus:

- Distinguished Speaker Series
- Cybersecurity Canon
- BuckeyeCTF
- Student capstones and faculty research
- Master’s Program – Stackable certificates
- Refactor the ICDT Listserv for on- vs. off-campus audience
Community Engagement: Industry Partners

**In progress**: codify the Industry Advisory Board & Corporate Partners program

- Research agreements to address specific topics of interest
- Consortium of Research Partners to invest in areas of mutual interest

- Collegiate curricular programs: identify common desires for the industry so to adapt curricular, co-curricular and extra-curricular student opportunities

- Broader Reach: find convergent goals to work towards in the K12 “outreach“ space, re-skilling adult workforce, and developing your existing employed workforce
Today's Engagement:

Task overview: seek information on what your needs are in today’s workplace, identify where ICDT may help meet goals and alleviate pain points

❖ Part 1 – current gripes
❖ Part 2 – big dreams
❖ Part 3 – quick wins

To stay up to date with our happenings and to get involved:

http://go.osu.edu/icdtinfo