

**Hampton Roads Cybersecurity Education, Workforce, and Economic Development Alliance
(HRCyber)**

RAMPS Meeting

June 7, 2017 8:15am – 10:00am

Program Lead(s):

Principle Investigators – Dr. Brian Payne (PI) and Dr. Mary Sandy (Co-PI)

Project Manager – John Costanzo

Partners

Old Dominion University

College of William and Mary

Norfolk State University

Tidewater Community College

Thomas Nelson Community College

City of Virginia Beach Public Schools –

Advanced Technology Center

Newport News Public Schools

Hampton City Public Schools

ECPI

City of Hampton Economic Development

Reinvent Hampton Roads

Commonwealth of Virginia House of

Delegates Ron Villanueva

Cyber Protection Resources

Hampton Roads Economic Development

Alliance

ISSA-HR

Jefferson Lab

Opportunity, Inc.

Virginia Space Grant Consortium (VSGC)

Virginia Beach Economic Development

Virginia Beach Vision

Virginia Beach Hotel Association

360IT

ABNB FCU

AERMOR

Bon SeCours Health System

Booz Allen Hamilton

C5BDI

CRTN Solutions (LLC)

G2-Ops

Hunting Ingalls, Newport News Shipbuilding

Klett Consulting

Obsidian Technology Group

Packet Forensics

Peregrine Technical Solutions, LLC.

Port of Virginia

SAIC

Sentara Healthcare

Sera-Brynn

StratasCorp Technologies

Towne Bank

Vostrum Holdings, Inc.

VNG Consulting

Summary of K12 Activities:

HRCyber is developing strong partnerships with multiple public school districts within the Hampton Roads region of Virginia. Our primary High School partners include Hampton City Public Schools, Newport News City Public Schools and Virginia Beach City Public Schools. We sponsored and completed several events for public schools faculty and administrators, students, and parents. These events include;

- **Cybersecurity Counselors Workshop.** The Cyber Counselor Workshop was held at the ODU Peninsula Center in Hampton, Va. on February 23, 2017. Twenty-seven school counselors, career coaches, Career and Technical Education (CTE) teachers from the Hampton Roads region attended. During the program, presenters representing our higher education academic

partners (Thomas Nelson Community College, Tidewater Community College, Norfolk State University, and Old Dominion University) provided information specific to their academic settings on education pathways leading to a career in cybersecurity. In addition, presenters from two of our industry partners (Sentara Healthcare and Newport News Shipyard) presented an excellent picture of the state of the cybersecurity job market in the local area. Local school partners from Newport News Public Schools, Hampton City Public Schools, and Virginia Beach Public Schools participated in a panel discussion outlining their school districts' current state of cybersecurity courses in secondary schools. Workshop participants also took part in an engaging hands-on, Dumpster Diving/Identity Theft activity. Finally, participants provided suggestions for improving the five-part cyber security career awareness video series that VSGC is developing.



- **Thomas Nelson Community College Hosted Cyber Saturday.**

On March 11th, Thomas Nelson Community College (TNCC) hosted our first Cyber Saturday program for high school students and their parents. Forty-three students and twenty-two parents attended the event. Students participated in such activities as Raspberry Pi from Scratch (led by Hampton City Public Schools teacher), Footprinting and Port Scanning (Newport News Shipyard), Exploring LAN Technologies (TNCC), Cyber Physical Systems (ODU), Wi-Fi Password Cracking (ODU), and an exciting drone competition (VSGC). While the students were engaged in those activities, parents attended sessions led by the FBI (Norfolk Branch), Sentara Healthcare, admissions information and education pathways (TNCC), and VSGC programs. Parents also participated in the Dumpster Diving/Identity Theft activity led by TNCC.



- **Tidewater Community College Hosted Cyber Saturday.**

On March 25th, VSGC led the second Cyber Saturday event held at the Advanced Technology Center in Virginia Beach hosted by Tidewater Community College (TCC). Forty-nine high school students and nineteen parents attended the exciting event. Industry partners (Packet Forensics and Newport News Shipyard) and academic partners (TCC, Old Dominion University, Virginia Beach Public Schools) led the students in such activities as Wi-Fi Password Cracking, Capture the Flag, Foot Printing and Port Scanning, and Cyber Physical Systems (including the drones again!). Parents held a wonderful question and answer session with a representative from one of our industry partners (Sera-Brynn), and TCC representatives spoke to admissions procedures and cybersecurity programs at the community college. Afterwards, parents were able to join the students in their classrooms. Volunteers from Virginia Beach Public Schools and the Computer Club at TCC as well as others helped with the event.



- **Virginia Beach City Public School 2017 STEM Trifecta: Robotics, Maker and Cybersecurity Challenges.**

HRCyber will participate in the Virginia Beach City Public School 2017 STEM Trifecta: Robotics, Maker and Cybersecurity Challenges on June 8, 2017. The STEM Trifecta is an initiative created by the Office of Technical and Career Education (TCE) that allows elementary through high school students, teachers, mentors, administrators, and industry and community partners to join together to create and promote STEM and Entrepreneurship awareness through project-based learning activities. HRCyber partners are providing judges for various challenges and is providing \$500 to the winning school of the Cybersecurity challenge.

- High School Internships.** Virginia Beach City Public Schools' TCE is working to create industry internships for high school students enrolled in ATC classes for Cybersecurity & Network Administration, CISCO Networking, Computer Systems Technology, and Software & Game Development. These internships are professionally and financially supported by HRCyber. HRCyber is providing funds for up to 20 VBCPS high school students to participate in 30 hour cybersecurity internships in the cybersecurity field. Current community partners include NEXCOM, ABS Technology, AECOM, Klett Consulting, and G2Ops. We are in discussions with SAIC, Clark Nexsen, and Endurance IT Services to add additional internship sites. Participating companies will work with TCE teachers to outline a plan of study for assigned interns. Internship students are in their junior or senior year of high school, have or are pursuing certification, and come from one of three programs: Network Administration and Cyber Security, Cisco Network Engineering, and Computer Systems Technology. As of the end of May, seven students have completed the first internships with two of them being asked back by their employer to continue with them over the summer. An additional five students are currently working in their internships. The additional internships will be start with the new school year in September and finish by November 2017.

Summary of Higher Education Activities:

HRCyber is working with several local community colleges and four-year universities in identifying new cybersecurity related classes and programs and in reviewing current curriculum. Some additional activities include;

- Articulation agreements.** Articulation agreements have been finalized allowing the transfer of the Associate in Applied Science Information Systems Technology-Cybersecurity at Tidewater Community College and Thomas Nelson Community College to Old Dominion University



Bachelor of Science Interdisciplinary Studies with a Cybersecurity major. These two agreements were worked out after a series of meetings with transfer advisors and administrators from all involved institutions. The initial degree review showed that students would have needed to take close to 170 hours to receive both the AAS and the BS in Interdisciplinary Studies with a Cybersecurity major. After several meetings, faculty from the institutions crafted an articulation agreement that would allow students to complete both degrees in 121-124 hours. In doing so, this saves students

nearly 50 credit hours (or roughly 1.5 years as a full-time student). The first articulation agreement was signed in February in a ceremony including the governor of Virginia, the secretaries of technology and education in Virginia, and a local state delegates. Using the same process, the articulation agreement between ODU and Thomas Nelson Community College was completed and signed in April with the Secretary of Technology.

- **Survey of Cybersecurity Educators.** To examine how educational partners viewed cybersecurity education, we sent surveys to 34 respondents in February 2017. By March 10th, we received 14 completed surveys. In general, educators demonstrated the following patterns: Risk management, debugging, network detection, and writing skills were less often defined as “very important” than problem solving and communication. Skills rated as somewhat important or unimportant most often included certification, customer service, containers, and internal auditing. Areas most difficult to teach were software reverse engineering, penetration testing, and security clearances. Educators rated the quality of cybersecurity education as good or excellent most often for colleges. Educators were split in their ratings of public schools. For the most part, educators believed cyber students were prepared well for their jobs. Areas identified most often as “somewhat” or not prepared included incident response, collecting information, risk management, investigating threats, security provision, business fundamentals, and overseeing cybersecurity work.
- **Developing a Curriculum (DACUM).** The DACUM panel meeting was held on December 13-14, 2016 in Hampton. Coordinated by VSGC and hosted by Thomas Nelson Community College, the panel identified the tasks and duties for cybersecurity professionals in the Hampton Roads region. Ten currently working cybersecurity professionals from different employment sectors met and discussed their daily work and tasks. Led by a certified DACUM Facilitator, the deliverable from the panel discussion will be a DACUM chart for early career cybersecurity professionals. The DACUM chart was finalized in February. This DACUM chart will inform and serve as a guide to curriculum development and other project components.
- **Virtual Lab.** The ODU cybersecurity virtual laboratory provides a secure and user-friendly environment for distance learning students to remotely do hands-on labs, which are a critical component of many cybersecurity courses. The enterprise Cisco routers, switches, and security appliances in the laboratory provide comprehensive protection for the laboratory as well as shield the campus network from accidental cyber-attacks. The high-end workstations together with the Cisco networking gears enables to create not only virtual networks, but also real world network environments connected by physical routers and switches, to emulate highly realistic cyber-attack and defense. Various hands-on labs, from the entry-level labs to advanced, comprehensive labs, have been developed and deployed in the virtual laboratory, supporting the cybersecurity courses currently offered by ODU. To provide seamless access for our partners in

HRCyber Alliance to the ODU virtual lab, we have worked with ODU ITS (Information Technology Service) to upgrade the equipment in the lab. ODU guest accounts have been created for a list of faculty of TNCC and TCC. The partners are able to utilize only web browsers to log in their ODU guest accounts. The virtual lab can be seamlessly accessed from their guest accounts. A demo session was conducted in May for the faculty of TNCC. The setup of the demo session for the faculty of TCC is expected soon. We will collect feedback from our partners and work together to grow the virtual lab to share and develop more hands-on labs.

Summary of Activities with Employers (industry and/or state/local government):

HRCyber has a large number of local cybersecurity employers and local government partners. Overall the number of total partners has grown from 16 in October 2016 to 44 by May 2017. Our industry partners continue to be very active with working with HRCyber on multiple initiatives.

- **Industry Internships.** Through the VSGC’s Commonwealth STEM Industry Internship program (CSIIP) HRCyber is working with local cybersecurity employers to identify internship opportunities and to place interns within their companies. We are also assisting with CSIIP registrations and determining specific needs for targeted recruitment for ideal student candidates for the internships. We have provided a number of cyber security classroom and information sessions with students and faculty from Hampton Roads schools and others, member and non-member. We anticipate over 10 internship placements for summer 2017. To date we have placed eight students Sentara Healthcare. We are also working very closely with APEX as well in partnership with Sentara.
- **Cybersecurity Apprenticeships.** HRCyber’s partner Peregrine Technical Solutions has developed the first cybersecurity apprenticeship program in Virginia. They currently have two cyber apprentices, one in Alaska and one in Virginia, completing this program. They are completing their course work with Tidewater Community College online AAS in Information Systems Technology. We are working with other employers to expand this apprenticeship within the region.
- **Survey of Cybersecurity Employers.** Using the results of the focus group as a guide, the ODU Social Science Research Center developed a draft survey and shared it with members of HRCyber. After the survey was finalized, email invitations to complete the survey of cyber were sent to over 200 business, educational partners and other contacts in November, 2016. Those initial contacts were also asked to forward the survey link to others who might have cyber hiring needs. By December 12th, a total of 29 business representatives completed the survey. Data collection is completed at this time. We received 34 completed surveys. In general, these findings show:
 - Two-thirds of the respondents came from for-profit companies.
 - Of the companies surveyed, more than half of them reported employing cybersecurity analysts, technicians, managers, engineers, and consultants.

- The most positions were in the areas of consulting, cybercrime analysts, and technicians.
- The most vacancies were in the areas of consultants, analysts, and incident responders.
- Direct referrals and job seeker web services were the most effective recruitment methods.
- The positions hardest to fill were engineering and analysts positions.
- Communications and problem solving skills were reported as the most important skills. Technological skills were not reported as being as important as these skills (or as important as writing skills and customer service).
- Communication skills were the skills most difficult to find in an applicant followed by problem solving skills, penetration testing skills, and CISSP certification.
- Only 15% percent of the respondents indicated they were very familiar with the cybersecurity education programs in the region.
- More than a third of the respondents rated the community colleges and universities as fair or poor in their cybersecurity education.
- Internships, apprenticeships, and co-ops were rated favorably by respondents.
- Employers rated students' preparation in identification, protection, detection, responding, and recovery most often as fair or poor.
- For the most part, new hires were rated as somewhat prepared in workplace competencies.
- Employers pointed to the need for communication skills, problem solving skills, and experiential learning.

Other Highlights or Accomplishments since Nov 2016:

- **Monthly HRCyber meetings.** Since receiving this grant in October 2016, HRCyber has hosted a monthly meeting of partners and stakeholders to review the progress of the project and to highlight various accomplishments.
- **Website Development.** In our efforts to generate awareness about the alliance and its activities a website was created. The address of the website is: <http://securitybehavior.com/hrcyber/>. Material on the website was updated on an as needed basis over the past quarter. Information on the website includes current events, news stories, links to alliance partners, cybersecurity resources, and a link to our HRCyber Workforce Needs Survey. Future updates will be provided as accomplishments occur.
- **Cyber Video Series.** The VSGC developed five videos related to various cybersecurity career fields and workforce development. These videos are posted at www.vsgc.odu.edu/cyber and are available to the public. These videos were developed

over several months and after 19 interviews were conducted with partners and key stakeholders. Partners interviewed for the video series included NIST, NASA Langley Research Center, Peregrine Technical Solutions, Packet Forensics, G2-Ops, AERMOR, Newport News Shipyard, Sentara Healthcare, and Langley Federal Credit Union. Each video is approximately 10 minutes in length. Topics include Cybersecurity – The Big Picture; Career Pathways; Accessing the Cybersecurity Job Field; The Cybersecurity of Things; and Protecting and Serving.

- **City of Virginia Beach Economic Development Cybersecurity Round Table Discussions.** One positive outcome of this project is the linking of multiple cybersecurity stakeholders within the region together at various meetings and events. In November 2016, HRCyber was invited to participate in a series of round table discussions related to growing the cybersecurity workforce in the region. These discussions are hosted by the City of Virginia Beach Economic Development and the office of State Delegate Ronald Villanueva. As a result of these meetings several new employers became involved with HRCyber.
- **Additional grant and funding opportunities.** As result of the positive impact that the HRCyber Alliance is having across the region it is being viewed as a means to develop additional funding opportunities. A small sub-group was merged with HRCyber to prepare a proposal to capture Virginia State funds via the Go Virginia Initiative. This group consists of HRCyber partners and is looking at partnering with Southwest Virginia to expand cybersecurity workforce development initiatives across the state.

For additional information on our accomplishments please visit our webpage at <http://securitybehavior.com/hrcyber/> or contact Dr. Brian Payne (bpayne@odu.edu) or John Costanzo (jcostanz@odu.edu).