

Regional Collaboration Awards

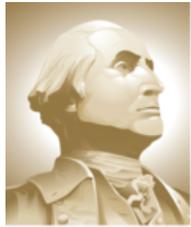
Panel Discussion



Introductions

- Moderator: Paul Schopis, OARnet
- Jaroslav Flidr, George Washington University
- Wendy Huntoon, KINBER
- Yan Luo, University of Massachusetts – Lowell





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Capital Area Advanced Research and Education Network | Powered by GW

CICI: Regional: Substrate for Cybersecurity Education; a Platform for Training, Research and Experimentation (SCEPTRE)

Jaroslav Flidr (PI), The George Washington University

Donald DuRousseau (Co-PI) , The George Washington University

Frederic Lemieux (Co-PI) , The George Washington University



SCEPTRE

Local Education, **Regional** Engagement, and **National** Environment

Substrate for Cybersecurity Education:

- Platform
 - Advance, expand and integrate the underlying technologies
- Training
 - Provide credit bearing courses, practicums, certifications
- Research
 - Investigate aspects of applied Cybersecurity,
 - Transition To Practice
- Experimentation
 - e.g. Industrial Control Systems (SCADA, PLCs)

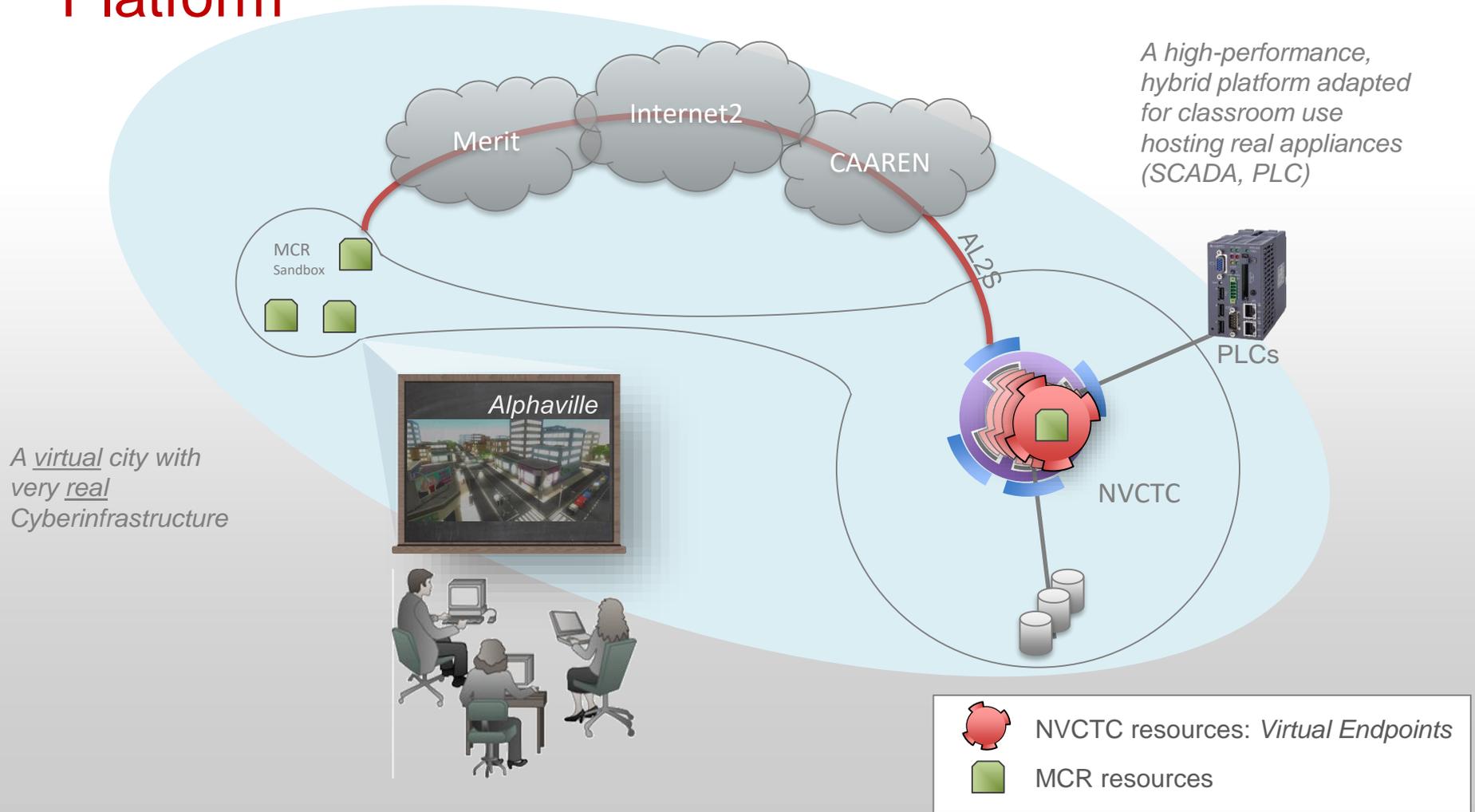


Substrate

- Motivation
 - Workforce shortage: 100,000's
 - Lack of training resources: Cyber Ranges
 - Insufficiently satisfying career paths:
- Collaboration within Region (VA)
 - Academia: GW's College of Professional Studies
 - Industry: Northern Virginia technology sector
 - Government: Incubators, Accelerators and the Military
- Collaboration across Regions (VA – MI)
 - Merit: interconnectivity and impressive Cyber Range resources: Michigan Cyber Range (MCR)
 - CAAREN: interconnectivity and a high-performance, hybrid platform
 - GW: accredited education component



Platform



Training

Reasonably safe and secure cyberinfrastructures cannot be built and operated without adequately trained human beings. This new workforce cannot be trained outside of realistic and adaptable environments and outside the context of existing policies and politics. Furthermore, due to the complexity of the problem, it is imperative that the trained individuals are well versed in a broad spectrum of related subjects, i.e. trained at an academic institution where they can find instruction in any area of study.

- Goals
 - Educate traditional and nontraditional students (students with associate degrees, students expanding their majors, undergraduates' transition to their postgraduate studies)
 - Make it an integral component of GW Cyber Academy
 - Encourage continuing education
 - Provide rewarding, life-long careers



Research and Experimentation

- heterogeneous environment of:
 - students
 - instructors
 - researchers
 - engineers
 - multiple organizations
 - concepts
 - devices
- facilitates experimentation with and research of:
 - policies
 - implications
 - techniques
 - technologies
 - behavioral patterns



CICI: Regional: New England Cybersecurity Operation and Research Center (CORE)

Xinwen Fu (PI), UMass Lowell

Benyuan Liu (Co-PI) , UMass Lowell

Yan Luo (Co-PI) , UMass Lowell

Lawrence Wilson (Co-PI), UMass President Office

Keith Moran (Consultant), UMass President Office



About CORE

- A Regional New England Cybersecurity Operation and REsearch Center (CORE)
 - University of Massachusetts Lowell (UMass Lowell) and the Office of the President of University of Massachusetts
 - Hosted in the UMass Data Center in Shrewsbury, MA
 - A satellite site at the Center of Internet Security and Forensics Education and Research (iSAFER) of UMass Lowell, a member of National Centers of Academic Excellence in Cyber Defense Research (CAE-R) designated by NSA and DHS
 - A collaboration among regional institutions and industrial partners



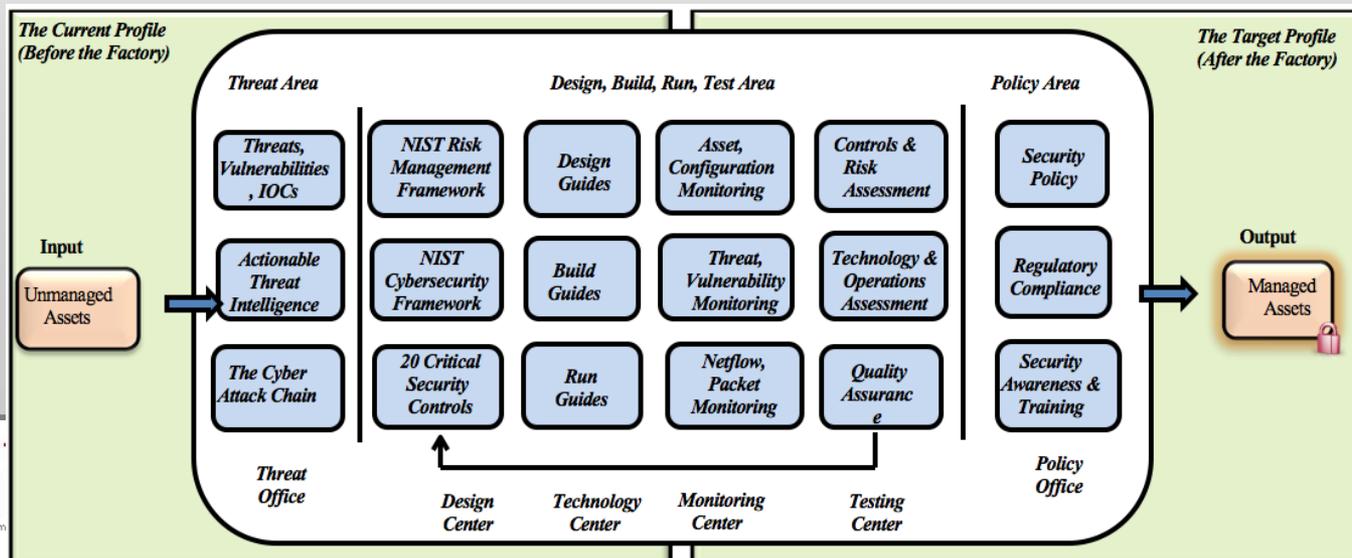
Services of CORE

- The focus on under-resourced colleges and universities & collaboration with government and industry partners
 - Cybersecurity education/certification, security consulting/design reviews and assessments, cybersecurity implementation/professional services, cybersecurity operations/managed security services and cybersecurity research on emerging threats, trends and defense.
- A long list of partnerships with local IT and cybersecurity related organizations and consortia
 - Advanced Cyber Security Center (ACSC), Boston Consortium for Higher Education, Information Systems Audit and Control Association (ISACA)



Open Cybersecurity Program for Regional Support

- Based on the NIST Cybersecurity Framework
- An organization first discovers their current security framework profile and subsequently determine their target profile.
- Security controls are then applied to corresponding assets to implement the target profile.
- The controls program factory: the input = unmanaged asset with weak controls or without controls; the output:= is a managed asset with strong controls.



No.	Cybersecurity Service	Service Description
1	Threat and Vulnerability Management Practice	Provide our partners with the latest threat and vulnerability intelligence information through collaboration and sharing with our service partners.
2	Cybersecurity Program Design and Build Service	Help our customers design, implement and maintain their cybersecurity program based on the NIST Cybersecurity Framework [NIST14] and 20 Critical Security Controls (CSC).
3	Cybersecurity Operations and Incident Response Service	Provide 24×7 continuous security monitoring, alerting and escalation; ensuring incidents are detected, investigated, communicated, remediated and reported.
4	Cybersecurity Risk Management Practice	Help our customers identify, understand and address risks to their assets [DHS11].
5	Cybersecurity Education, Training, Awareness	Include CAE-CDE (National Centers of Academic Excellence in Cyber Defense Education), CAE-2Y (National Centers of Academic Excellence in Cyber Defense 2-Year Education), CAE-R (National Centers of Academic Excellence in Cyber Defense Research), Industry Certification training with ISACA (Information Systems Audit and Control Association) and ISC2 (IT Certification and Security Experts), Designing and Building a Cybersecurity Program based on the NIST Framework, Cybersecurity Awareness and Skills Training.
6	Sponsored Projects, Testing, Student Internships	Sponsor projects from ACSC (Advanced Cyber Security Center) members and other industry partners defined and delivered through a Statement of Work (SOW). Provide University security lab services, delivered and managed by students internships under supervision of the University President's Office and campus IT departments.

Research, Education and Outreach

- Research
 - Derive baseline truth of cyber attacks and trends
 - Scaling firewall performance with Apache Spark
 - Behavior based methodology to analyze malware and attacks to IoT
- Education
 - Help developing cybersecurity workforce
 - Internships, co-ops in security operation and research center
- Outreach
 - Direct support to under-resourced institutions
 - Workshops, tutorials, seminars to regional organizations



Wendy Huntoon

- **NSF Project Title: CC*IIE Region: Accelerating the Adoption of Campus Cyberinfrastructure Technologies in Pennsylvania**
- **Objectives and Goals**
 - Develop leadership activities that will improve the ability of PA colleges and universities to better understand and utilize their network infrastructure to support cyberinfrastructure based scientific applications and research
 - Expand the community understanding of network capabilities, technologies and resources
 - Focus on the understanding, deployment, integration and support of campus cyberinfrastructure technologies, such as perfSONAR, campus science DMZ, end-to-end performance monitoring and campus cybersecurity
 - Foster collaboration



Wendy Huntoon

- **Accomplishments to date (and since the 2015 PI Workshop)**
 - KINBER has integrated into all of its outreach activities information regarding the importance of integrating cyberinfrastructure, its role in supporting research, science and education applications for all types of campuses and the need to integrate it into campus IT strategic plans, not just the CC*IIE program specific events.
 - In doing so, KINBER is expects to raise the overall awareness of the value of cyberinfrastructure, encouraging all campuses within the commonwealth to consider its role in their campus infrastructure.
 - Hosted in collaboration with Franklin & Marshall College a Operating Innovative Networks Workshop lead by Indiana University, ESNet and Internet2.
 - Revised its annual conference to include a day of half or full day workshops including: preparing Cyberinfrastructure proposals; perfSONAR and IPv6.



Wendy Huntoon

- **Ongoing Plans**

- Complete deployment of perfSONAR platforms as part of the perfSONAR pilot program.
- Provide more in-depth material for those organizations that have already begun to understand and adopt cyberinfrastructure technologies and support for research applications.
- Continue to encourage the development and then support of collaborative projects, for example:
 - NSF funded DIBBS Virtual Data Collaboratory: A Regional Cyberinfrastructure for Collaborative Data Intensive Science (Manish Parashar – Rutgers, Vasant Hanovar – Penn State)
 - NSF funded CICI: Regional: SAC-PA: Towards Security Assured Cyberinfrastructure in Pennsylvania (James Joshi et al University of Pittsburgh)



Paul Schopis

- **NSF Project Title: Transforming a Regional Network and the Regional Community to Serve Diverse and Emerging Research Needs**
- **Three Key Goals**
 - #1 Host a series of workshops focusing on enabling Science and Science DMZ, workshop series include perfSONAR, Operating Innovation Networks and a workshop creating OARperf, a regional forum to support advanced networking efforts
 - #2 Deploy perfSONAR widely throughout OARnet at both backbone and campus locations
 - #3 Build a network of a “Coalition of the Willing” to support ongoing community support of one another; OARperf
- **Science Drivers**
 - Ohio has huge medical research facilities; significant aerospace and materials research efforts
 - State Government has recognized potential and invested in 100G architecture



Leveraging the Investment

- **Building on success of OSU's CC*NIE infrastructure grant**
 - Shared knowledge with others in community
 - Wrote letters of support
 - Budgeted CI engineer for entire region in post award; we see it as necessary to support campuses
- **Used position of regional network to act as convener and advocate for members**



Status

- **Goal 1: Host a series of workshops focusing on enabling Science and Science DMZ, workshop series include perfSONAR, Operating Innovation Networks and a workshop creating OARperf, a regional forum to support advanced networking efforts**
 - FTW at OARnet: perfSONAR Deployment Best Practices, Architecture, and Moving the Needle
 - OIN cosponsored with 3ROX and University of Pittsburgh
 - Held workshop at February OARtech to form OARperf (see goal #2)
 - perfSONAR workshop being held in November 2016
- **Goal 2: Deploy perfSONAR widely throughout OARnet at both backbone and campus locations**
 - Have deployed all round one units
 - Currently deploying round 2 units
 - Round 3 units have arrived



OARnet

An OH·TECH Consortium Member



Status

Goal 3: Build a network of a “Coalition of the Willing” to support ongoing community support of one another; OARperf

- Launched February 2016, have held 3 meetings so far (May and October)
- Will meet 4 times a year, 2 in person, 2 via WebEx
- Charter
 - The OARperf charter is to provide a community forum to enhance community participation of issues of network performance in support of the academic and research missions of OARnet constituent schools. Matters of testing, monitoring, architecture and best practice are within the purview of group



Panel Discussion Questions

- Can you offer the impact of project on scientific research or a specific outcome you'd like to share?
- Can you address the opportunities and challenges associated with a regional collaboration, including the target region or groups associated with your project.
- Is there anything particularly interesting or novel approaches in your project implementation?
- What have you learned that may transfer to others either individually or make generally available?

