



Understanding Risk in Shared CyberEcosystems
Denver, Colorado - November 11 - 16, 2017

Agenda for URISC@SC17
Halcyon Hotel, 245 N. Columbine Street, Denver, Colorado

Saturday, November 11, 2017:

8:00-9:00: Breakfast Buffet

9:00-10:00 Von Welch (Center for Trustworthy Scientific Cyberinfrastructure):

Welch will provide the initial welcome. His presentation is titled: "Cybersecurity Methodology for Open Science"

Welch is the director of Indiana University's Center for Applied Cybersecurity Research (CACR). He specializes in cybersecurity for distributed systems, particularly scientific collaborations and federated identity. Current roles include PI and director for the Center for Trustworthy Scientific Cyberinfrastructure, a project dedicated to helping U.S. National Science Foundation (NSF) science projects with their cybersecurity needs, and CSO of the Software Assurance Market Place, a U.S. Dept. of Homeland Security (DHS)-funded facility to foster software assurance and software assurance research. Previously he has worked with a range of high-visibility projects to provide cybersecurity to the broader scientific and engineering community, including TeraGrid, Open Science Grid, Ocean Observatory Infrastructure, and GENI. His work in software and standards includes authoring two IETF RFCs and the development of several security systems for distributed computing including CILogon and MyProxy.



10:00-10:20 Tea Break



10:20-11:30: Ryan Kiser (CTSC).

"Log Analysis for Intrusion Detection. "

One of the goals of log analysis is to use the logs collected by systems in order to identify threats and anomalies. Ryan will describe a method for handling logs to be prepared to respond in an incident. He will discuss techniques used by attackers and provide examples of some ways common tools can be used to detect them. He will also cover a way to treat log analysis as a continuously improving process to become more effective over time.

Kiser is the Technology Specialist at the Indiana University Center for Applied Cybersecurity (CACR). He comes to CACR from a system administration and small business consulting background. He has worked on a variety of projects within his role at the center, and his current responsibilities include HIPAA compliance and risk assessment for university IT systems, technical consulting on external projects, and managing the center's technology resources.

11:30 - Noon Housekeeping: Elizabeth Leake, STEM-Trek

12:00 to 1:00 p.m.: Lunch

1:00 – 2:00 p.m. Susan Ramsey, NCAR (MSCIT, GSEC, GMON, GCIH, GCIA, CPT, CEH)

“The Anatomy of a Breach.”

For every organization, it's not a matter of whether your organization will be breached; it's when. Ramsey will present details and lessons learned from a real breach, including recommendations for building and maintaining an Incident Response Plan, Incident Response training and testing, executive communication expectations, and clear reporting responsibilities in a shared risk cyberecosystem.



Ramsey is a Security Engineer and Risk Assessor at the National Center for Atmospheric Research (NCAR). She holds multiple professional certifications, a Master of Science in Computer Information Technology from Regis University, and is pursuing a second MS through SANS Institute, in Information Security Engineering. She has over twenty years of experience in Enterprise IT, from operations and technical support to consulting and project management.



2:00 – 3:10 p.m. Jim Basney (NCSA/CTSC)

“Lightweight Cybersecurity Risk Assessment Tools for Cyberinfrastructure”

Risk assessment provides valuable insights to the cyberinfrastructure security program, but launching a risk assessment process can seem daunting for all but the largest projects. Jim Basney will present risk assessment tools (checklists, spreadsheets, templates) developed by CTSC (trustedci.org) for getting started on a lightweight risk assessment for cyberinfrastructure projects of varying types and sizes.

Jim is a senior research scientist in the cybersecurity group at the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign. He is PI of the CILogon and SciTokens projects and co-PI of the Center for Trustworthy Scientific Cyberinfrastructure and the Software Assurance Marketplace. Jim also contributes to the LIGO, LSST, and XSEDE projects. Jim received his PhD in computer sciences from the University of Wisconsin-Madison.

3:10-3:30 tea break

3:30-4:30 Bart Miller and Elisa Heymann (U-Wisconsin at Madison).

“Secure Coding.”



Drawing from their experience performing vulnerability assessments of critical middleware, Bart Miller and Elisa Heymann will walk participants through the programming practices that can lead to security vulnerabilities and demonstrate how to automate tools for finding security weaknesses. Participants will learn skills critical for software developers and analysts concerned with security.

Barton Miller is a professor of computer sciences at the University of Wisconsin, the chief scientist for the DHS Software Assurance Marketplace research facility, and software assurance lead on the NSF Cybersecurity Center of Excellence. Miller also codirects the MISTsoftware vulnerability assessment project in collaboration with his colleagues at the Autonomous University of Barcelona and leads the Paradyn Parallel Performance Tool project, which is investigating performance and instrumentation technologies for parallel and distributed applications and systems. In 1988, he founded the field of fuzz random software testing—the foundation

of many security and software engineering disciplines. In 1992, Miller founded the field of dynamic binary code instrumentation and coined the term “dynamic instrumentation,” which forms the basis for his current efforts in malware analysis and instrumentation. His research interests include systems security, binary and malicious code analysis and instrumentation of extreme-scale systems, parallel and distributed program measurement and debugging, and mobile computing. Miller’s research is supported by the US Department of Homeland Security, the Department of Energy, the National Science Foundation, NATO, and various corporations.

Elisa Heymann is a senior scientist within the NSF Cybersecurity Center of Excellence at the University of Wisconsin and an associate professor at the Autonomous University of Barcelona, where she codirects the MIST software vulnerability assessment. Heymann was also in charge of the Grid/Cloud security group at the UAB and participated in two major European grid projects: EGI-InSPIRE and the European Middleware Initiative (EMI). Her research interests include security and resource management for grid and cloud environments. Heymann’s research is supported by the NSF, the Spanish government, the European Commission, and NATO.



4:30 – 5:15 p.m. Nick Roy (InCommon/Internet2)

“Federated Trust: One Benefit of Regional Alliance Membership”

Nick Roy manages the U.S. National Research and Educational SAML Federation, InCommon, which supports global federated identity for researchers. He will provide an overview of the history and experience supporting research identities within InCommon, challenges faced by federation operators in their support of e-research, and how such challenges are addressed. Relevant topics will be discussed, such as eduGAIN, Sirtfi incident handling, eduroam and the TIER program.

Nick is the Director of Technology and Strategy for InCommon, the U.S. national research and education federated identity trust fabric. Before working at InCommon, he was an Identity and Access Management practitioner at Penn State and The University of Iowa.

5:15 – 6:00 p.m. Social Break (Sponsored by STEM-Trek and Constellation Brands)

6:00-8:00 dinner and presentation



Thomas Sterling (Indiana University, CREST) will share highlights of his new book: High Performance Computing: Modern Systems and Practices, first edition which is scheduled for release in December, 2017.

NSF supported the development of this online HPC course by IU that will be available via Morgan Kaufmann Publishing for less than \$99.00-US. It will be available in an on-demand format that includes video and slides, and will provide hands-on education with MPI and OpenMP (including downloadable video content). It will offer a strong foundation for systems administration in a range of environments, including commodity Linux clusters. There will be a full-support package option that includes tests, problem sets, Skype meetings with support personnel, grading, and the option to have formal credit hours transferred to any university in the world.

From the IU-CREST web site: Sterling holds the position of Professor of Intelligent Systems Engineering at the IU School of Informatics, Computing, and Engineering as well as the Chief Scientist and Associate Director of the Center for Research in Extreme Scale Technologies (CREST). Since receiving his Ph.D. from MIT in 1984 as a Hertz Fellow, Sterling has engaged in applied research in fields associated with parallel computing system structures, semantics, and operation in industry, government labs, and academia. Sterling is best known as the "Father of Beowulf" for his pioneering research in commodity/Linux cluster computing. He was awarded the Gordon Bell Prize in 1997 with his collaborators

for this work. He was the PI of the HTMT Project sponsored by NSF, DARPA, NSA, and NASA to explore advanced technologies and their implication for high-end system architectures. Other research projects included the DARPA DIVA PIM architecture project with USC-ISI, the Cray Cascade Petaflops architecture project sponsored by the DARPA HPCS Program, and the Gilgamesh high-density computing project at NASA JPL.

Sterling is currently engaged in research associated with the innovative ParalleX execution model for extreme scale computing to establish the foundation principles to guide the co-design for the development of future generation Exascale computing systems by the end of this decade. ParalleX is currently the conceptual centerpiece of the XPRESS project as part of the DOE X-stack program and has been demonstrated in proof-of-concept in the HPX runtime system software. He is co-author of six books and holds six patents. In 2013, Sterling was the recipient of the Vanguard Award, and in 2014, he was named a fellow of the American Association for the Advancement of Science.

Thursday, November 16, 2017



8:00-8:20 a.m. Marumo "Happy" Sithole (Director, South African Meraka Institute and Centre for High Performance Computing, CHPC).

Dr. Sithole will provide a brief welcome, and overview of the performance technology initiatives supported by the South African Council on Scientific and Industrial Research (CSIR), including the Meraka Institute, CHPC, and the Southern African Development Community (SADC) HPC Ecosystems project.

Sithole earned a PhD from the University of Limpopo (Physics; Atomistic and Electronic Simulation of Sulphide Minerals). Before founding the CHPC in 2007, he served in a variety of professional roles, including senior lecturer and researcher in the Materials Modelling Center at University of Limpopo, research scientist for De Beers Consolidated Mines and senior process engineer for the Pebble Bed-Modular Reactor Company.

In addition to leading South Africa's HPC program, and providing vision for the SADC HPC Ecosystems Project, Sithole serves on a number of HPC industry committees and advisory boards, including the International Supercomputing Conference (ISC) committee and the STEM-Trek Nonprofit advisory board.

8:20-9:30 a.m. Elizabeth Leake (STEM-Trek).

"The Softer Side of Cybersecurity"

Leake will share external relations and communications tips for campus tech facilitators, including:

- How to foster administrative and legislative buy-in for a greater campus cybersecurity investment (despite competing priorities for limited funds).
- Tips for mastering a proactive (vs. reactive) crisis communications effort.



Leake has more than 20 years of experience with university public affairs and technology administration. She was first exposed to advanced cyberinfrastructure through her work for Northern Illinois University and Phase One of the NIUNet project (2000-2008).

As the NSF TeraGrid project's external relations coordinator, she led a nationally-distributed team of communications specialists who chronicled the science and engineering discoveries enabled by the U.S. taxpayer investment in advanced cyberinfrastructure.

She has served as a correspondent or program facilitator for activities sponsored by Sustainable Horizons Institute, XSEDE/PEARC, the European Grid Infrastructure (EGI), Partnership for Advanced Computing in Europe (PRACE), Centre for HPC in South Africa, and the Southern African Development Community HPC Forum. In 2016, she presented at the Advancing Research Computing on Campuses (ARCC) conference at the National Center for Supercomputing Applications on the topic of HPC

Workforce Development (recruiting/retention), and at the First International Conference on the Internet, Cyber Security and Information Systems in Gaborone, Botswana on the topic of campus enterprise cybersecurity. She has served on nine Supercomputing Conference (SC) program committees or subcommittees since 2008.

Leake founded STEM-Trek Nonprofit in 2012, a global, grassroots public charity that supports conference travel for HPC-curious scholars from under-served groups and regions. Her articles and blog posts are often featured by popular HPC industry journals, and she was honored that STEM-Trek received the 2016 and 2017 *HPCwire* Editors' Choice Awards for Workforce Diversity Leadership.

9:30-9:50 Tea Break

9:50-11:00 a.m. **Bryan Johnston & Meshack Ndala** (South African CHPC).

"Learn to be Cyber-Secure before you're Cyber-Sorry"



Johnston (left) will provide an overview of the African HPC Ecosystems Project, including what's currently available in their software stack (and what's on the horizon).

Ndala will lead a hands-on exercise where three US/African teams will have 30 minutes in which to draft brief mitigation and communication strategies for hypothetical cybersecurity scenarios; three unique threats or situations.

Johnston is a Senior Technologist in the Advanced Computer Engineering (ACE) Lab at the Centre for High Performance Computing, South Africa. He leads the HPC Ecosystems Project which focuses on redistributing first-tier HPC infrastructure to smaller, usually resource-constrained, institutions throughout the Southern African Development Community (SADC) region; with clusters in seven South African sites, and seven other sub-Saharan nations. His team not only deploys the physical systems, but develops the shared software stack and trains system administrators.

Since Johnston has served as both a site recipient (at University of KwaZulu-Natal University before joining CHPC in 2016), and as the Ecosystems project lead, he will share unique perspectives from "both sides of the fence" including challenges faced by those who manage decommissioned hardware in a resource-constrained environment, and strategies for mobilizing a small, young, and widely-distributed community of practice. Prior to joining the CHPC, Johnston worked as the Principal support technician for advanced computing in the School of Maths, Stats and Computer Science at the University of KwaZulu-Natal, South Africa.



Ndala is the Senior Cyber Security Engineer at the South African Centre for High performance computing. He is also a Cisco Network Academy Instructor at Cape Penninsular University of Technology, a facilitator for CS interactive training through the Cyber Security Institute of South Africa, and holds advanced Cisco and Cyber Security certifications. At CS interactive, Meshack specializes in Advanced Penetration Testing.



11:00 to 12:00 noon: [Florence Hudson](#), Senior Vice President and Chief Innovation Officer, Internet2.

"IoT Security Challenges and Risk in Shared Cyberecosystems."

From the Internet2 web site: Hudson serves as the primary focal point to activate the tremendous innovative capacity of the entire Internet2 community. Through technology-driven initiatives across and beyond advanced networking and infrastructure, federated identity management and cloud services, she broadens the scope and value of Internet2 for its members by proactively and collaboratively working with the research and education (R&E) community to develop and implement new, leading-edge concepts.

Hudson has more than 33 years in leadership positions at IBM, including director of Internet of Things Business Development, vice president and director in Corporate Strategy, vice president in the Systems and Technology Group, and vice president and acting chief technology officer of the IBM Global Industrial Sector. She has led the development of business and technical growth strategies, partnerships and execution plans for the Internet of Things, analytics, energy and environment, cloud computing, hardware, software and services. She brings a unique integration of business and technical experience to senior strategic leadership—both for Internet2 and the broader research and higher education community—in the areas of innovation, advanced technologies and new services.

12:00 noon: adjournment.

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Thank you!!!

