CTSC

CENTER FOR TRUSTWORTHY
SCIENTIFIC CYBERINFRASTRUCTURE

The NSF Cybersecurity Center of Excellence

The NSF Cybersecurity Center of Excellence

Von Welch
CTSC PI and Director

NSF Cybersecurity Summit
August 17th 2016

trustedci.org

NSF Cybersecurity Center of Excellence (CCoE)

CTSC began with a 3-year NSF grant in 2012.

NSF 2015 Cybersecurity Innovation for Cyberinfrastructure (CICI) solicitation called for an NSF CCoE.

CTSC submitted a proposal to continue its funding as a CCoE and was awarded this honor.

3. Cybersecurity Center of Excellence

NSF-funded cyberinfrastructure presents unique challenges for operational security personnel. The research environment is purposefully built as an "open" one, in which data is freely accessed among collaborators. As such, sites, centers, campuses and institutions that host cyberinfrastructure must find the right balance of security, privacy and usability while maintaining an environment in which data are openly shared. Many research organizations lack expertise in technical and policy security and could benefit from an independent, shared security resource pool.

A Cybersecurity Center of Excellence must:

- Provide leadership to the NSF research community in the continuous building and distribution of a body of knowledge on the topic of trustworthy cyberinfrastructure;
- Conduct security audits and security architecture design reviews for projects at multiple scales, from large Major Research Equipment and Facilities Construction (MREFC) projects to small CI developments;
- Ensure adoption of security best practices in the NSF research community;
- Provide situational awareness of the current cyber threats to the research and education environment, including those that impact scientific instruments;
- Develop a threat model (or multiple threat models if appropriate), identifying the vulnerabilities in NSF-funded cyberinfrastructure and scientific data associated with that cyberinfrastructure and recommending countermeasures to protect the systems; and
- Host an annual workshop in addition to meetings, seminars, training and other events in order to interact with members of the NSF community, industry, government and academia who wish to collaborate on projects and other initiatives.

http://www.nsf.gov/pubs/2015/nsf15549/nsf15549.htm

http://trustedci.org/who-we-are/

CENTER FOR APPLIED CYBERSECURITY RESEARCH
INDIANA UNIVERSITY
Pervasive Technology Institute

NCSA

PITTSBURGH SUPERCOMPUTING CENTER

THE UNIVERSITY of WISCONSIN MADISON

NSF

What Really Matters?
Trusted and Reproducible Science

LIGO Scientific Collaboration

"BLIND INJECTION" STRESS-TESTS LIGO AND VIRGO'S SEARCH FOR GRAVITATIONAL WAVES

Compact Muon Solenoid

Blinding and unblinding analyses

Understanding Science
how science really works

The science checklist applied: Cold fusion

nature International weekly journal of science

Biotech giant publishes failures to confirm high-profile science

Amgen posts three studies at new online channel for discussing reproducibility.

Monya Baker

04 February 2016

A biotechnology firm is releasing data on three failed efforts to confirm findings in high-profile scientific journals — details that the industry usually keeps secret.

Amgen, headquartered in Thousand Oaks, California, says that it hopes the move will encourage others in industry and academia to describe their own replication attempts, and thus help the scientific community to get to the bottom of work that other labs are having trouble verifying.

The data are posted online at a newly launched channel dedicated to quickly publishing efforts to confirm scientific findings. The 'Preclinical Reproducibility and Robustness' channel is hosted by F1000Research, the publishing platform of London-based publishers Faculty of 1000 (F1000). Scientists who are concerned about the irreproducibility of preclinical research say that they welcome the initiative — but are not sure whether it will gain traction.

theoretical ecology

Statistical analysis with blinded data – a way to go for ecology?

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Center for Trustworthy Cyberinfrastructure
The NSF Cybersecurity Center of Excellence

Mission

Provide the NSF community a coherent understanding of cybersecurity's role in producing trustworthy science and the information and know-how required to achieve and maintain effective cybersecurity programs.

Vision for the NSF Science Community

1. For the NSF science community to understand fully the role of cybersecurity in producing trustworthy science.

2. For all NSF projects and facilities to have the information and resources they need to build and maintain effective cybersecurity programs appropriate for their science missions, and responsive to evolving risks and requirements.

3. For all NSF Large Facilities to have highly effective cybersecurity programs.

CCoE Thrusts

Building Community

NSF Cybersecurity Summit, Monthly Webinars, Blog, Email Lists, Partnerships, Benchmarking Survey

Sharing Knowledge

Guide to Developing Cybersecurity Programs for NSF Science and Engineering Projects, Identity Management Best Practices, Situational Awareness, Training, OSCTP

Collaboration to Tackle Challenges: Engagements

LIGO, SciGaP, IceCube, Pegasus, CC-NIE peer review, DKIST, LTERNO, DataONE, SEAD, CyberGIS, HUBzero, Globus, LSST, NEON, U. Utah, PSU, OOI, Gemini, Array of Things, IBEIS, SciGaP, US Antarctic Program...

More information at trustedci.org

New Activities This Year

Building Community

NSF Cybersecurity Summit, Monthly Webinars, Blog, Email Lists, Partnerships, Benchmarking Survey

Sharing Knowledge

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Collaboration to Tackle Challenges: Engagements

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Collaboration to Tackle Challenges:
Engagements

Engagements

Focused collaborations with one (or small group) of NSF projects to tackle a project's cybersecurity or identity and access management challenge.

CCoE's time is covered by our NSF grant.

Examples:

Developing a cybersecurity program

Assessing an existing program

Software assurance/evaluation

Custom training

IAM design

Your challenge here...

Any challenge is in scope!

More examples…

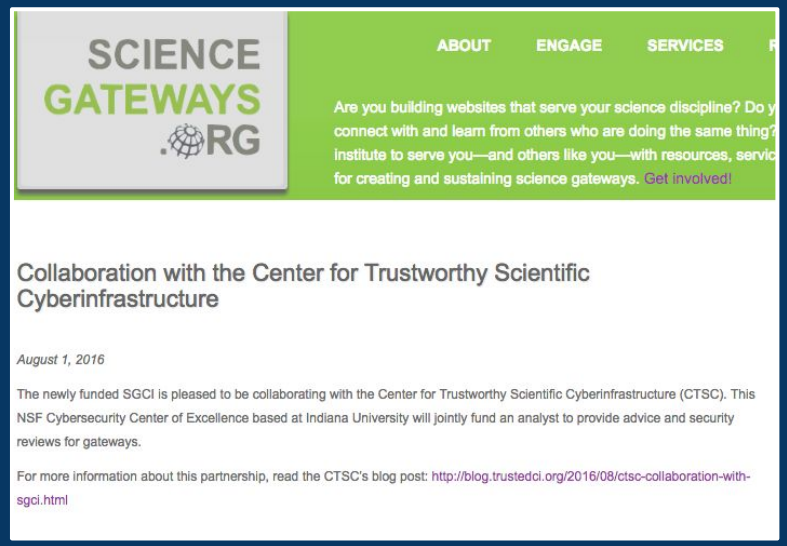
Drafting a Privacy Policy (AoT)

Security Officer search (LIGO)

Identity and Access Management:
http://trustedci.org/iam/

Software Assurance:
http://trustedci.org/software-assurance/

Science Gateways w/SGCI SI2 Institute:
http://sciencegateways.org/news/collaboration-ctsc/



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  - Engagement Application
  - AARC
  - AOT

Apply for a One-on-One Engagement with CTSC

One of CTSC's core activities is conducting one-on-one engagements with NSF projects and facilities. To manage scheduling and learn about prospective engagees, we have instituted an engagement application process. When you are ready to apply, click the link below and complete the online form.

>> Click here to complete the CTSC Engagement Application Form.

Our Application Review Cycle & Current Status

We review applications and plan engagements on a six-month cycle, unless an expedited process is undertaken for a particular application. Most of our engagements are executed over a 1 to 6 month period. If you are seeking a letter of support for a proposal, please contact info@trustedci.org.

Currently, we are accepting applications for Jan-Jun 2017 engagements and Jul-Dec 2017 engagements. We encourage early application (before the deadline) to help us process applications efficiently and thoroughly.

Important Dates:

- Sep 16, 2016: Applications due for engagements to be executed Jan-Jun 2017
- Nov 4, 2016: Applicants notified
- Jan 2016: Kickoff new engagements for Jan-Jun 2017
- Mar 17, 2017: Applications due for engagement to be executed Jul-Dec 2017
- May 5, 2017: Applicants notified

Application Review Processing & Phases

http://trustedci.org/application

Demand outpacing Supply, apply by September 16th for early 2017 engagements.

Sharing Knowledge

Guides, Best Practices, Situational Awareness, Training

Situational Awareness

Advise NSF CI community about relevant software vulnerabilities and provide guidance on mitigation.

Leverage NIST, US-CERT, XSEDE, REN-ISAC, and other sources of vulnerability information.

Please subscribe to the email list(s) to receive situational awareness notifications of relevance to you.

http://trustedci.org/situational-awareness/

Cybersecurity Guides and Tools

Addressing concerns unique to science

Policy templates:

- Acceptable Use, Access Control, Asset Management, Disaster Recovery, Incident Response, Inventory, Awareness, Physical Security, ...

Risk assessment table

Securing commodity IT

Self-assessment Tool

Identity Management Best Practices

http://trustedci.org/guide

http://trustedci.org/iam

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  - Online Training
  - Training Materials

Training materials

2016 Spring Practical Cybersecurity for Open Science Projects

2015 NSF Cybersecurity Summit Training Materials (August 17, 2015)

- Bro Platform Training Workshop - Johanna Amann (ICSI), Justin Azoff (NCSA) & Adam Slagell (NCSA)
- Developing Cybersecurity Programs for NSF Projects - Bob Cowles, Craig Jackson, Jim Marsteller & Susan Sons (CTSC)
- Vulnerabilities, Threats, and Secure Coding Practices - Barton P. Miller & Elisa Heymann
- Industrial Control Systems, Networking, and Cybersecurity - Phil Salkie (Jenariah Industrial Automation)
- Aligning your Research Cyberinfrastructure with HIPAA and FISMA - Anurag Shankar (Indiana University)
- Incident Response Training - Randy Butler (NCSA)

2014 NSF Cybersecurity Summit Training Materials (August 26, 2014)

- Developing Cybersecurity Programs for NSF Projects (PDF) - Jim Marsteller, Susan Sons, Craig Jackson, Jared Allar (CTSC)
  - Also available as a series of online videos
- Vulnerabilities, Threats, and Secure Coding Practices (PDF) - Barton P. Miller, James A. Kupsch, Elisa Heymann (University of Wisconsin)
- HPC, HIPAA, and FISMA: Meeting the Regulatory Challenge through Effective Risk Management (PowerPoint) - Bill Barnett & Anurag Shankar (Indiana University)
- Incident Response Training (Powerpoint part 1, Powerpoint part 2) - Randy Butler, Warren Raquel, Patrick Duda (NCSA)

NSF Cybersecurity Summit, XSEDE, SuperComputing, other locations by request.

Topics: Cybersecurity Program Development, Incident Response, Secure Coding, Software Engineering...

http://trustedci.org/trainingmaterials/

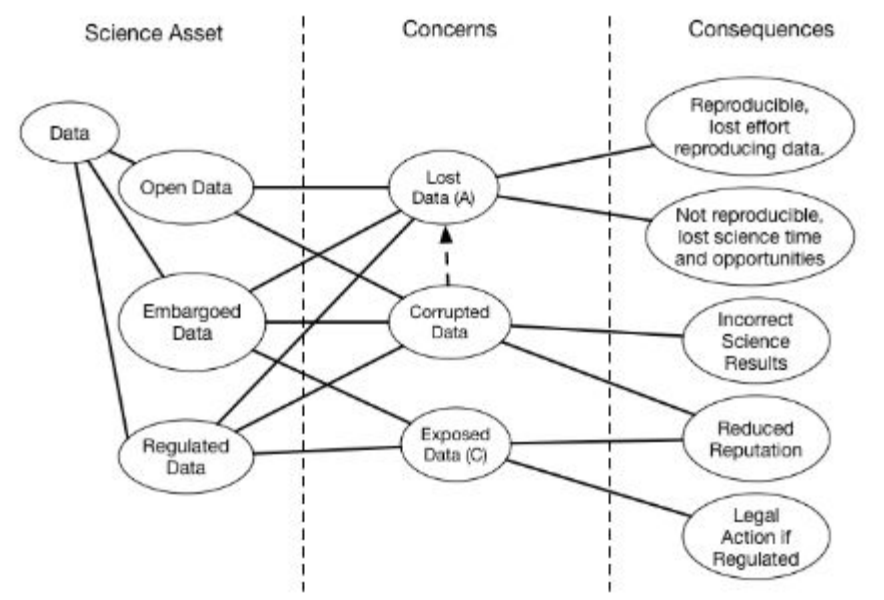
The Open Science Cyberthreat Profile: Understanding the Cybersecurity of Science

Scientists and cybersecurity professionals need to communicate to understand the risks related to science assets to the science mission.

OSCTP working group is developing a profile of open science assets and their common risks to aid risk management for open science.

Presentations from ATLAS, IBEIS, LSST, and OOI (& DataONE in Sep.)

Initial draft in late 2016. Will be living document for community.



Members: Altintas (SDSC), Bevier (Caltech), Cuff (Harvard), LeDuc (Northwestern), Meunier (Purdue/ HUBzero), Moore (iRods), Schwab (ISI), Stocks (UCSD)

Organizers: Adams (CTSC), Dopheide (ESnet), Peisert (ESnet), Welch (CTSC).

Building Community

NSF Cybersecurity Summit, Webinars, Blog, Email Lists, Partnerships

NSF Cybersecurity Summit

- Inaugural summit in 2004 in response to cyber attack affecting many NSF funded projects
- CTSC Relaunched Summit in 2013 after 4 year hiatus
- Growing! 90 registrants last year, >120 this year.
- Opportunity for LFs, CI projects, MREFCs to collaborate: build connections, identify and solve common challenges, develop best practices, share experiences, receive training.
- Address the changing threat landscape for NSF CI.

Past Reports at http://trustedci.org/useful-links/

Summit Recommendations turn into Actions

2015 Summit Recommendations

- *Recommendation 1: The NSF CI and Large Facility community should develop a broadly applicable strategy for information security budgets, including how, why, and where it does what it does in terms of spending*
- *Recommendation 2: The NSF CI and Large Facility community should support research on metrics that indicate whether spending on information security is sufficient and appropriately balanced with a project's science mission*
- *Recommendation 3: The NSF CI and Large Facility community should develop a common understanding among all stakeholders of how accountability, risk responsibility, and risk acceptance practices are most efficiently and appropriately distributed among project leadership, project personnel, and other stakeholders*
- *Recommendation 4: The NSF CI and Large Facility community should determine its software assurance, quality, and supply chain requirements*

Reflected in this year's Call for Participation and the activities of the CCoE.

Recommendations from 2016 will similarly carry over into action.

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Building Consensus: Software Assurance

Recommendation 4: The NSF CI and Large Facility community should determine its software assurance, quality, and supply chain requirements

Our plan:

Work with Large Facilities and other NSF large projects to determine software expectations.

Disseminate expectations, with implementation guidance and help, to software developers (e.g. NSF SI2 community).

Leverage community resources
e.g. Software Assurance Marketplace.

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CTSC Webinar Series

trustedci.org/webinars

Upcoming:

- *August 22nd, 2016: The Science DMZ as a Security Architecture by Michael Sinatra, ESnet*
- *September 26th: Risks of Infrastructure Neglect and the Road Ahead by David Nalley*
- *October 24th: Science or Security by George Strawn*

Contact info@trustedci.org if have a suggestion for a presentation or would like to present.

Suggestion: CICI projects and RCNs, CC, etc.*

Partnerships

Interoperability with and best practices from our global collaborators.

ESnet: Open Science Cyberthreat Profile

AARC: Identity Management with the EU

SGCI SI2 Institute: Science Gateway cybersecurity

Bro CoE: Training, network security

REN-ISAC: Situational Awareness

http://trustedci.org/partners/

Your Input Requested!
Community Benchmarking Survey

Goal: To produce a report on the aggregated state of cybersecurity across the community and track the improvement of that state over time.

trustedci.org/survey

Staying in contact with the CCoE

Join our email lists for discussions and updates:
http://trustedci.org/ctsc-email-lists/

Blog: http://blog.trustedci.org/

Twitter: @TrustedCI

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Thank You

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