Trusted CI Support for Research Infrastructure CI by Jim Basney & Von Welch

NSF Ecosystem Lightning Talks

March 1, 2022
CI Compass Cyberinfrastructure for NSF Major Facilities Workshop
Trusted CI Support for Research Infrastructure CI

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NSF Cyberinfrastructure for Major Facilities Workshop
March 1-2
Trusted CI: The NSF Cybersecurity Center of Excellence

Our mission: to lead in the development of an NSF Cybersecurity Ecosystem with the workforce, knowledge, processes, and cyberinfrastructure that enables trustworthy science and NSF’s vision of a nation that is a global leader in research and innovation.

https://trustedci.org/
CI Compass and Trusted CI

- Two of the premier CoEs funded by NSF/OAC to help the NSF science community.
- Co-founded the Identity Management Working Group
- Share CoE best practices and lessons learned.
- Have standing and open communication and collaboration channels.
Our talk...

A quick overview of Trusted CI resources of interest to the broader CI community.

Introduction of Trusted CI Ambassadors for NSF Major Facilities.

We welcome follow-up with more questions.
Annual Challenge: Operational Technology

• Year 3 focuses on investigating the use of Operational Technology (OT) at NSF major scientific research facilities

• OT is the use of hardware and software to monitor and control physical processes, devices, and infrastructure

• Increasingly important in the context of science and research leveraging instruments like telescopes, biological and chemical reactors, sonar, and even vehicles used in scientific discovery

• Annual Challenge team is engaging with IT and OT personnel discussing operations at a variety of NSF Major Research Facilities

Develop a multi-year roadmap of security recommendations to advance the security of scientific operational technology for NSF facilities

https://blog.trustedci.org/2022/01/announcing-2022-trusted-ci-annual.html
Science DMZ Security

- Partnered with EPOC, University of Arkansas / DART project on Science DMZ focused engagement
- Created reusable template security documents related to Science DMZs
- Published Security of Science DMZ whitepaper
  - https://hdl.handle.net/2022/27007
  - Help senior leadership to understand security of Science DMZs
  - Summarize and expand on security recommendations
  - Provide links to more resources
Open Science Cyber Risk Profile (OSCRP)

OSCRP helps science projects understand cybersecurity risks to their science infrastructure and facilitates discussing those risks with their campus security office.

https://trustedci.org/oscrp/
Science Gateway Security Best Practices

• Based on partnership with SGCI over 4+ years
• Published document on recommendations for improving science gateway security
• Based on individual security engagements with gateways
• Short actionable items for small projects
• References to Trusted CI framework for more info as needed

https://hdl.handle.net/2022/26780
Cyberinfrastructure Vulnerability Alerts

We monitor multiple sources for vulnerability alerts, then determine which ones are of critical interest to the CI community, using the following criteria:

- the affected technology's or software's pervasiveness in the CI community
- the technology's or software's importance to the CI community
- the type and severity of a potential threat, e.g., remote code execution
- the threat's ability to be triggered remotely
- the threat's ability to affect critical core functions
- the availability of mitigations

We also provide guidance on how operators and developers can reduce risks and mitigate threats. We coordinate with XSEDE, Open Science Grid (OSG), the NSF supercomputing centers, and the ResearchSOC on drafting and distributing alerts to minimize duplication of effort and maximize benefit from community expertise.

In 2021 the Cyberinfrastructure Vulnerabilities team discussed 40 vulnerabilities and issued 26 alerts to 183 subscribers.

To subscribe, visit: https://trustedci.org/vulnerabilities/
2021 Annual Challenge

Interviewed six large CI project who develop scientific software to understand their practices surrounded software security. Produced a “Findings” document report on the state of the art.

To provide direction in developing secure software, we produced the initial version of the “Guide to Securing Scientific Software”. This is a living document with ongoing development this year.

Software Secure Training

Free and open online resources (cc’d in English & Spanish), including extensive hands-on exercises and instructor materials:
https://research.cs.wisc.edu/mist/SoftwareSecurityCourse/

Teach tutorials at conferences, workshops, labs, and government agencies.

In-depth vulnerability assessment

Have done multiple project engagements.

Development new techniques to automate such assessments.

Ransomware

Developing comprehensive threat model of ransomware attacks.
Trusted CI Fellows

• In 2019, Trusted CI established the Open Science Cybersecurity Fellows program, now in its fourth cohort.
• This program establishes and supports a network of Fellows with diversity in both geography and scientific discipline.
• These Fellows have access to training and other resources to foster their professional development in cybersecurity.
• The Fellows champion cybersecurity for science in their scientific and geographic communities and communicate challenges and successful practices to Trusted CI.

https://trustedci.org/fellows
Ambassadors to Major Facilities

To better support the cybersecurity needs of the NSF Major Facilities, Trusted CI now assigns a staff member as an "ambassador" to each facility. This helps Trusted CI maintain connections with all the facilities, including an up-to-date understanding of cybersecurity needs.

Current Ambassadors:

Andrew Adams: NCAR, OOI
Kay Avila: NEON
Terry Fleury: LIGO
Josh Drake: GAGE, SAGE
Ryan Kiser: ARF
Mark Krenz: USAP, IceCube
Ranson Ricks: NOIRLab
Mike Simpson: Arecibo, NRAO, NSO
John Zage: IODP, LCCF, NHMFL, NSCL

https://www.trustedci.org/ambassadors
Staying Connected with Trusted CI

Trusted CI Webinars
4th Monday of month at 11am ET.
https://trustedci.org/webinars

Follow Us
https://trustedci.org
https://blog.trustedci.org
@TrustedCI

Slack
Email ask@trustedci.org for an invitation.

Email Lists
Announce and Discuss
https://trustedci.org/trustedci-email-lists

Ask Us Anything
No question too big or too small.
info@trustedci.org

Cyberinfrastructure Vulnerabilities
Latest news on security vulnerabilities tailored for cyberinfrastructure community.
https://trustedci.org/vulnerabilities/
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Trusted CI activities are made possible thanks to the contributions of a multi-institutional team: https://trustedci.org/who-we-are/
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Thanks!

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