NSF Campus Cyberinfrastructure PI and Cybersecurity Innovation for Cyberinfrastructure PI Workshop

October 18-20, 2016 | Philadelphia, PA

CTSC
CENTER FOR TRUSTWORTHY SCIENTIFIC CYBERINFRASTRUCTURE
The NSF Cybersecurity Center of Excellence

CICI: Center of Excellence: Center for Trustworthy Scientific Cyberinfrastructure

Award# 1547272

trustedci.org

NCSA

PSC

Computer Sciences
UNIVERSITY OF WISCONSIN — MADISON

SWIP
Scientific Workflow Integrity with Pegasus

CICI: Secure and Resilient Architecture: Scientific Workflow Integrity with Pegasus

Awards #1642070, 1642053, and 1642090

cacr.iu.edu/projects/swip/

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INDIANA UNIVERSITY
PERVASIVE TECHNOLOGY INSTITUTE

NSF Campus Cyberinfrastructure PI and Cybersecurity Innovation for Cyberinfrastructure PI Workshop

October 3-4, 2017 | Albuquerque, NM

CENTER FOR TRUSTWORTHY SCIENTIFIC CYBERINFRASTRUCTURE
The NSF Cybersecurity Center of Excellence

Center for Trustworthy Scientific Cyberinfrastructure (CTSC)
The NSF Cybersecurity Center of Excellence
(1547272)

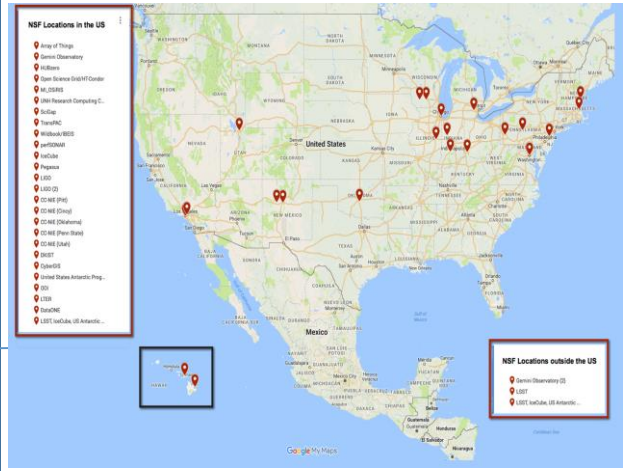
Challenge:

- NSF funds over $7 billion of research each year highly dependent on computing for scientific productivity.
- How to apply cybersecurity to assure scientific infrastructure and the science product, while maintaining scientific productivity is a complex technical and organizational challenge.

Project Goals:

- For the NSF science community to understand fully the role of cybersecurity in producing trustworthy science.
- 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.
- For all Large Facilities to have highly effective cybersecurity programs.

CTSC NSF Project Engagements



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Computer Sciences
UNIVERSITY OF WISCONSIN — MADISON

Scientific Impact:

- Engaged with over two NSF dozen projects (see map at center.)
- Trained hundreds of members of NSF community in secure coding, federated identity management, developing a cybersecurity program, incident response, etc.
- Training, templates, suggested practices freely available.

More information

- *trustedci.org*
- *Trustedci*
- *ask@trustedci.org*

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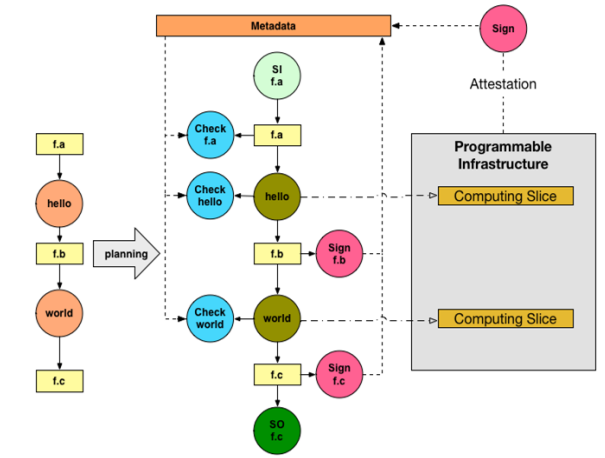
Scientific Workflow Integrity with Pegasus

Challenge:

- Modern IT systems are not perfect data managers – errors creep in – and are vulnerable to malicious actors.
- TCP, RAIDS, etc. have integrity protections, but aren't end-to-end.
- Stronger assurances against data corruption heighten society's trust in computational science.

Our Solution:

- Integrate integrity protections into Pegasus workflow management system as it understands end-to-end context, data use and creation.
- Develop "Chaos Jungle" virtualized infrastructure to test out protections.



SWIP
Scientific Workflow Integrity with Pegasus

Scientific Impact:

- Pegasus WMS is already broadly used in scientific community.
- Initial partners include Chameleon, NSFCloud, OSG, LIGO, CyberShake, FreeSurfer, SPLINTER.
- Cryptography and virtualized infrastructure experts on team to ensure good, tested implementation.

For more information:

cacr.iu.edu/projects/swip/

Got data integrity needs?

We're finishing year one of our project and are looking for community use cases to refine our requirements. Please contact vwelch@iu.edu if interested.

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