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CENTER FOR TRUSTWORTHY SCIENTIFIC CYBERINFRASTRUCTURE

Cybersecurity for Cyberinfrastructure…

and Science!

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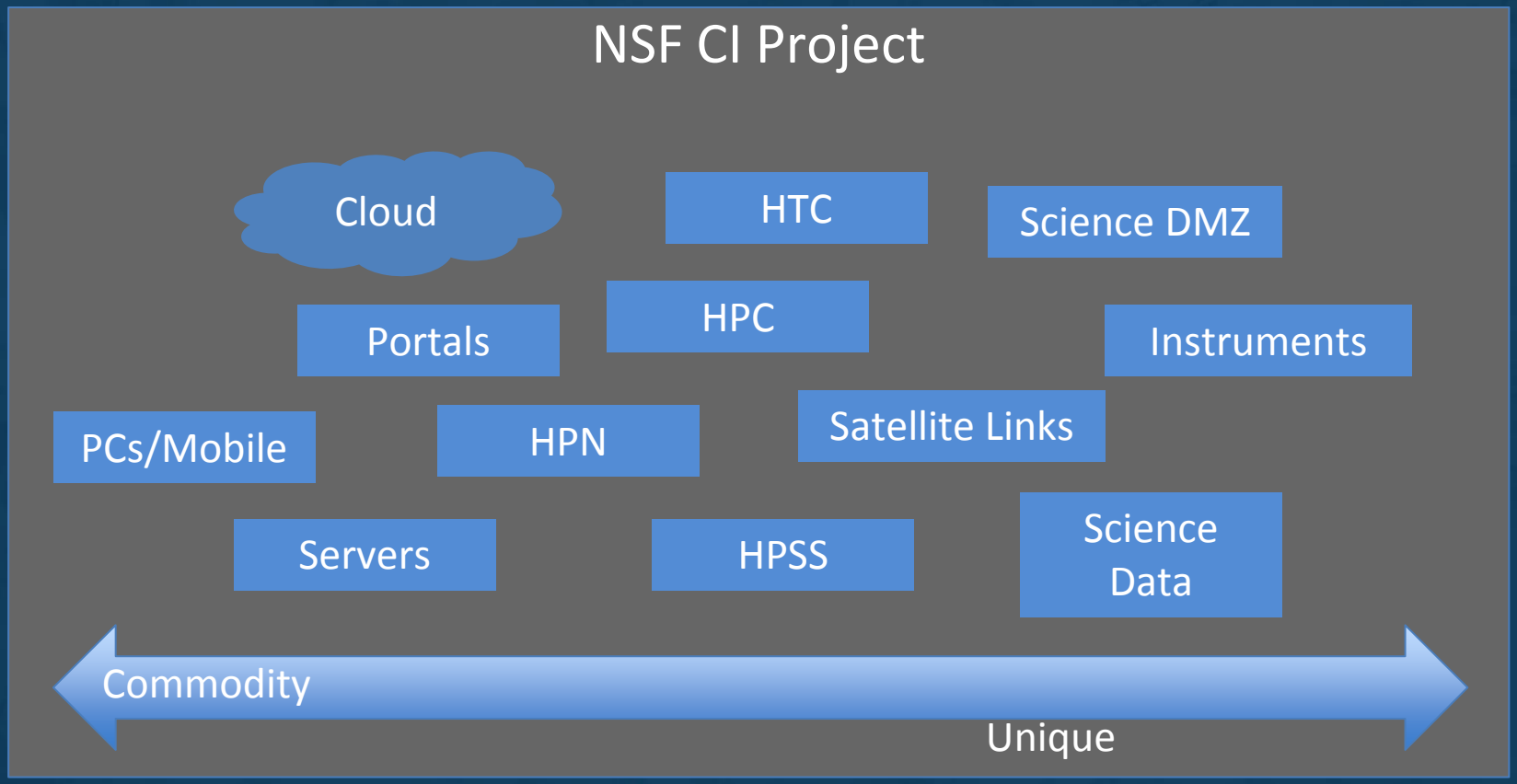
trustedci.org

Cyberinfrastructure Ecosystem

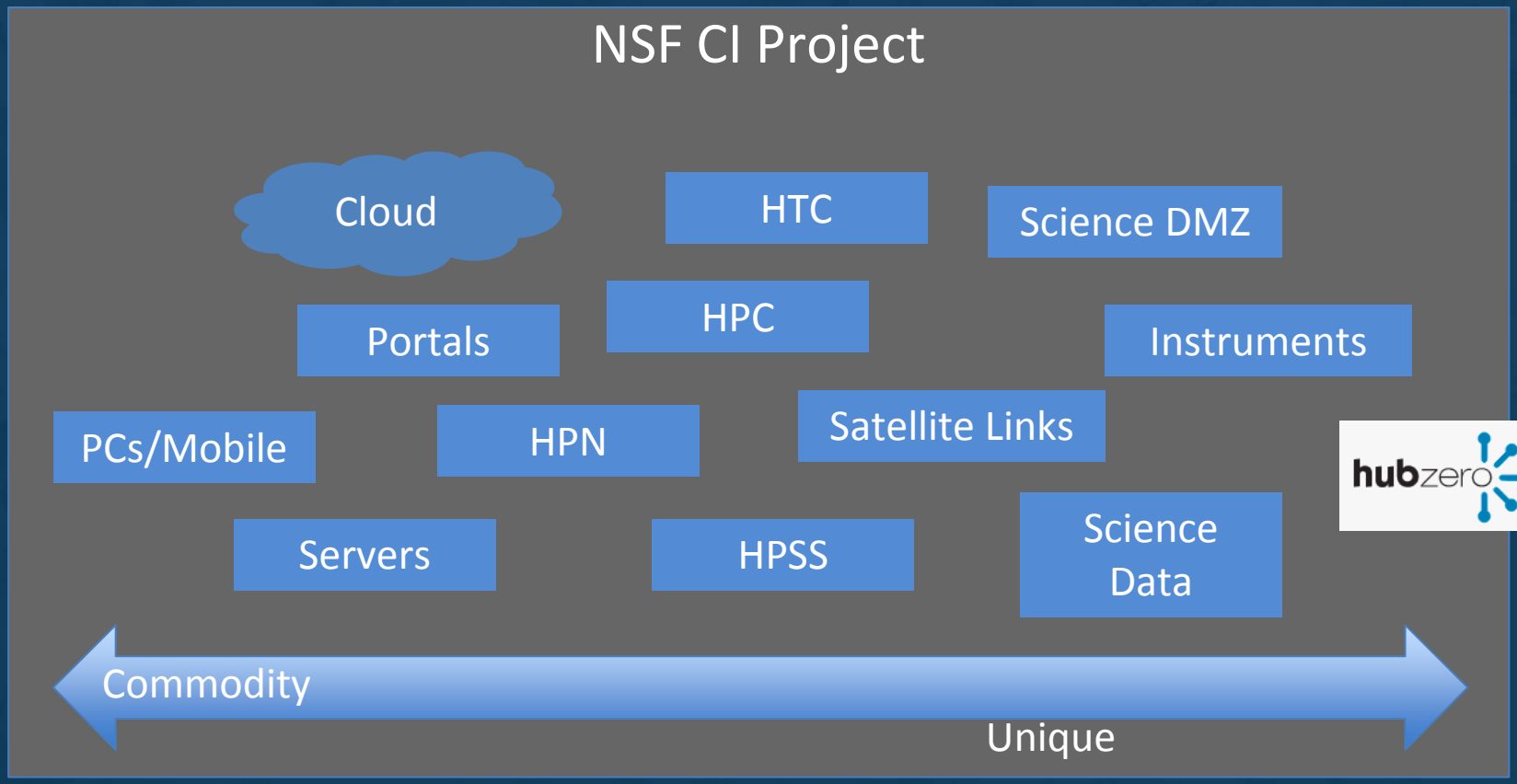
Maintainability, sustainability, and extensibility

Image credit: Alan Blatecky/NSF

NSF Cyberinfrastructure



NSF Cyberinfrastructure



hubzero PLATFORM FOR SCIENTIFIC COLLABORATION

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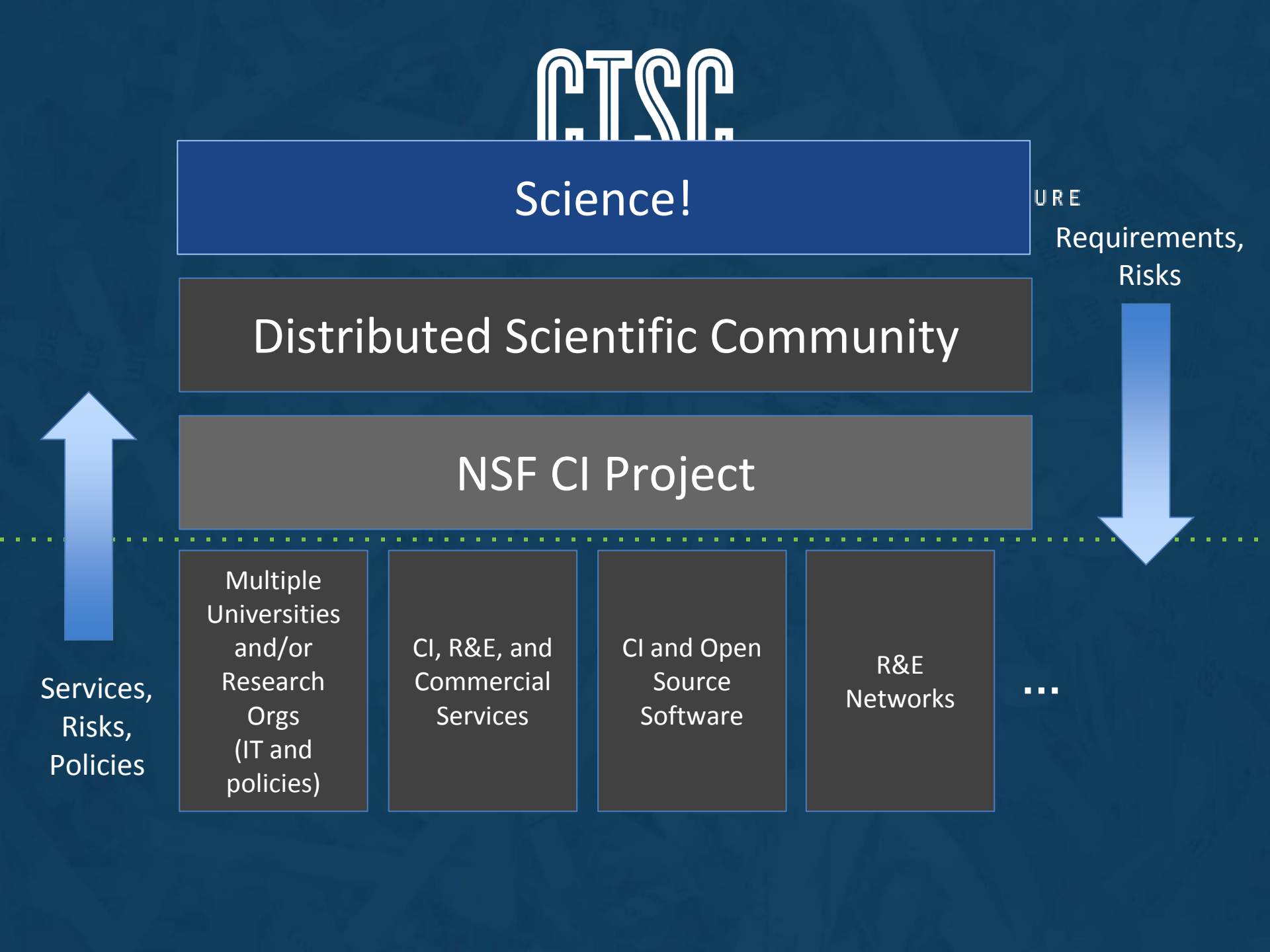
Science!
URE
Requirements,
Risks
Distributed Scientific Community
NSF CI Project
Services,
Risks,
Policies
Multiple Universities and/or Research Orgs (IT and policies)
CI, R&E, and Commercial Services
CI and Open Source Software
R&E Networks
...

So, what is cybersecurity for NSF science?

Cybersecurity Historically: Technology

Firewalls, IDS, encryption, logs, passwords, etc.

Cybersecurity Contemporarily

Cybersecurity supports an organization's mission by managing risks to information assets.

Translating to NSF projects...

Cybersecurity manages risks to the performance and integrity of computational science.

June 9, 2014

US Researcher Caught Mining for Bitcoins on NSF Iron

Tiffany Trader

The National Science Foundation has banned a researcher for using agency-funded supercomputers to mine bitcoins, a virtual currency that can be converted into traditional currencies through exchange markets. According to a recently surfaced report from the National Science Foundation Office of the Inspector General, the NSF banned the unnamed researcher after receiving reports that NSF systems at two universities had been used for personal gain.

Bitcoin mining refers to how the virtual currency is

Risks

C CYBERINFRASTRUCTURE

Postdoc and Mentor Perpetuate Data Falsification and Fabrication In a Series of Published Articles

A former postdoctoral researcher and his mentor at a Colorado university perpetuated the apparent validity of research data after the postdoc had intentionally falsified and fabricated the original study. After coauthors on the original study were unable to replicate the postdoc's research results, the mentor's college—without informing university-level administration—conducted an informal inquiry and recommended that the issue be worked out in the literature rather than through a formal investigation. Although the mentor's lab members had been able to repeat the results when the postdoc was there, after he left they could not do so.

http://www.hpcwire.com/2014/06/09/us-researcher-caught-mining-bitcoins-nsf-iron/
http://www.nsf.gov/pubs/2014/oig14002/oig14002.pdf
http://www.isgtw.org/spotlight/federated-trust-expands-internationally-edugain-declaration

Center for Trustworthy Cyberinfrastructure

The goal of CTSC is to provide the NSF community with a coherent understanding of cybersecurity, it's importance to computational science, and the resources to achieve and maintain an appropriate cybersecurity program.

CTSC Activities

Engagements

LIGO, SciGAP, IceCube, Pegasus, CC-NIE peer review, DKIST, LTERNO, DataONE, SEAD, CyberGIS, HUBzero, Globus….

Education, Outreach and Training

Guide to Developing Cybersecurity Programs for NSF Science and Engineering Projects, Securing Commodity IT in Scientific CI Projects Baseline Controls and Best Practices, Training for CI professionals.

Leadership

Organized 2013, 2014 & 2015 Cybersecurity Summits for Large Facilities and CI, Incident response, IdM Best Practices.

CTSC and HUBzero Engagement

HUBzero and cybersecurity

Used by 60+ communities, some with 10s or 100s of thousands of users.

Export control (ITAR) and HIPAA compliance requirements.

HUBzero approached CTSC to assess and improve their cybersecurity.

HUBzero/CTSC “Cybercheckup”

Initial week-long “cybercheckup” of existing HUBzero cybersecurity program.

Finding was a mature, robust cybersecurity program.

Identified places for improvement and further review: better documented physical security, use of two-factor authentication, access control, disaster/incident response plan, and vulnerability scan handling.

In-depth Review

- Web Server Security Model
  Covers security measures--both technological and procedural--implemented by the HUBzero operations team.

- Disaster Recovery Plan
  Covers operational safeguards that ensure resiliency in case of a major failure, such as a hub hardware failure, and procedures for doing recovery operations.

New Initiatives: Formalizing Procedures

- CMS Security Model
  Codifies the design of access control and other security features of HUBzero's CMS software for program longevity and so that they can be reviewed and improved upon.

- Vulnerability Management
  Formalizing the procedures for managing vulnerabilities discovered both in the CMS software and in HUBzero's operations environment.

Guide to Developing Cybersecurity Programs for NSF Science and Engineering Projects

http://trustedci.org/guide

Basis for CTSC evaluation.

Will be extended with vulnerability management as part of HUBzero engagement.

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Thank You

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