



NSF Campus Cyberinfrastructure PI and Cybersecurity Innovation for Cyberinfrastructure PI Workshop

September 23 – 25, 2019 | Minneapolis, MN

NSF Program (either CC or CICI): CICI

Program Area: SSC

Award Number: 1839746

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Project Title: Development of a Secure and Privacy-Preserving Workflow
Architecture for Dynamic Data Sharing in Scientific Infrastructures



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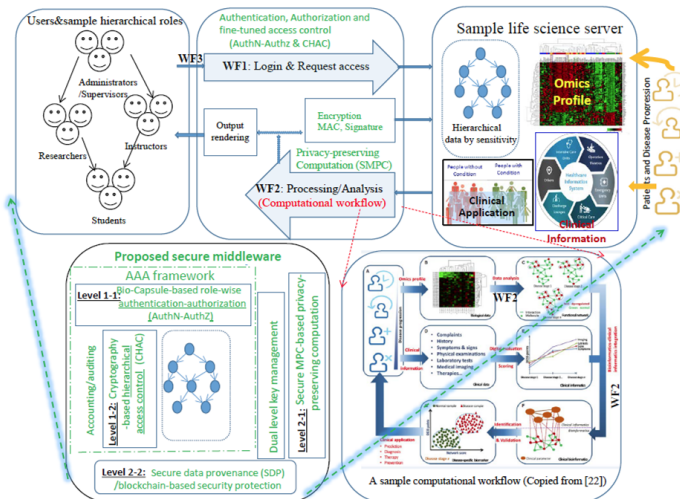
Quad Chart for: *Development of a Secure and Privacy-Preserving Workflow Architecture for Dynamic Data Sharing in Scientific Infrastructures*

Challenge:

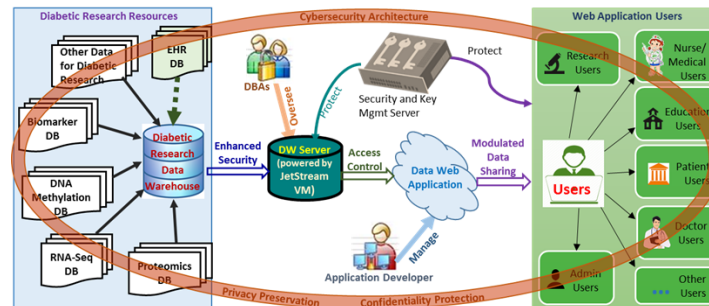
- Guarantee the security, integrity and traceability of scientific data and its workflow in scientific infrastructures.
- Provide flexible, and dynamic data access and sharing in a secure, privacy-preserving, and fine-tuned manner for both local and remote users of different types and different access permissions/rights.

Solution(s):

- Bio-Capsule-based role-wise password-less authentication and authorization (AuthN-AuthZ).
- Cryptography-based fine-tuned hierarchical access control.
- Secure digital provenance-based confidentiality and integrity protection.
- Flexible, elegant and dynamic dual-level key management



The proposed secure scientific infrastructure for sensitive data access and sharing



The research infrastructure, on which the proposed security architecture will be applied and validated

Broader Impact:

- Guarantee the security, privacy, and integrity of scientific workflows and associated data, thus protecting data and computing resources in scientific infrastructures from internal and external attacks.
- Enable sensitive health data to be shared securely, an essential requirement for accelerating life-saving discovery.
- The developed secure architecture is generic and applicable to other data and resource sharing environments, including CICI's research data protection projects.

Metadata tag:

- Seek collaboration with PIs of CICI's Research Data Protection projects to incorporate the proposed secure architecture into their projects.
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