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CENTERS
OF EXCELLENCE
IN BIOINFORMATICS &
DATA-INTENSIVE SCIENCE

Building federated research communities

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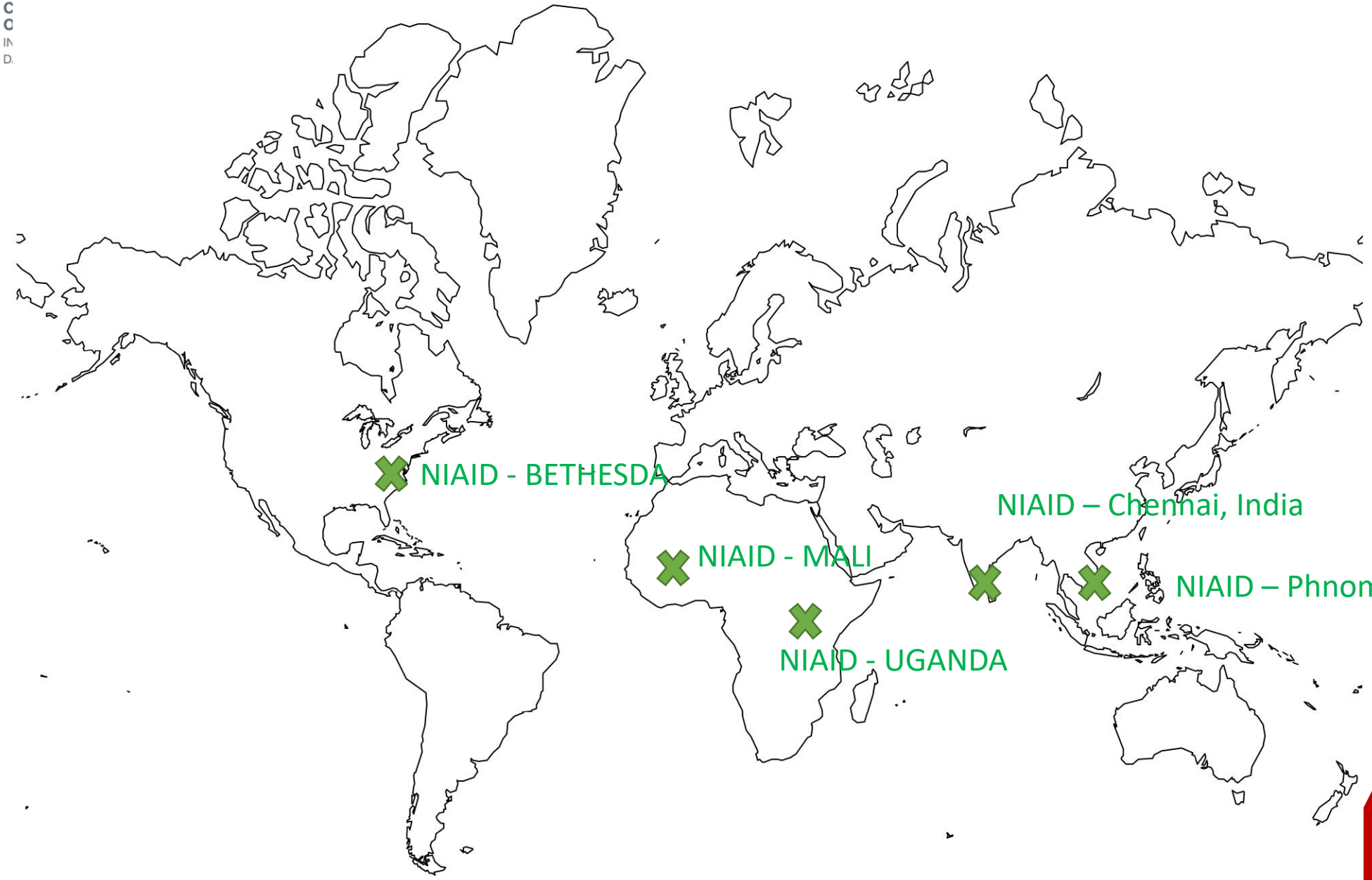
About the NIAID International Program

- **Dual mission:** Conduct research into human diseases, and respond to outbreaks when they occur
- **Partners** with local scientists in disease-endemic countries to expand research capabilities/training of greatest relevance to the local population
- **Develops** laboratory, clinical field site, and information technology infrastructure through long-term collaborations
- **Collaborative research programs** underway at multiple national and international sites
- **Operate Research Infrastructure for the International Centers for Excellence in Research**


NIAID - BETHESDA
NIAID – Chennai, India
NIAID - MALI
NIAID – Phnom Penh, Cambodia
NIAID - UGANDA

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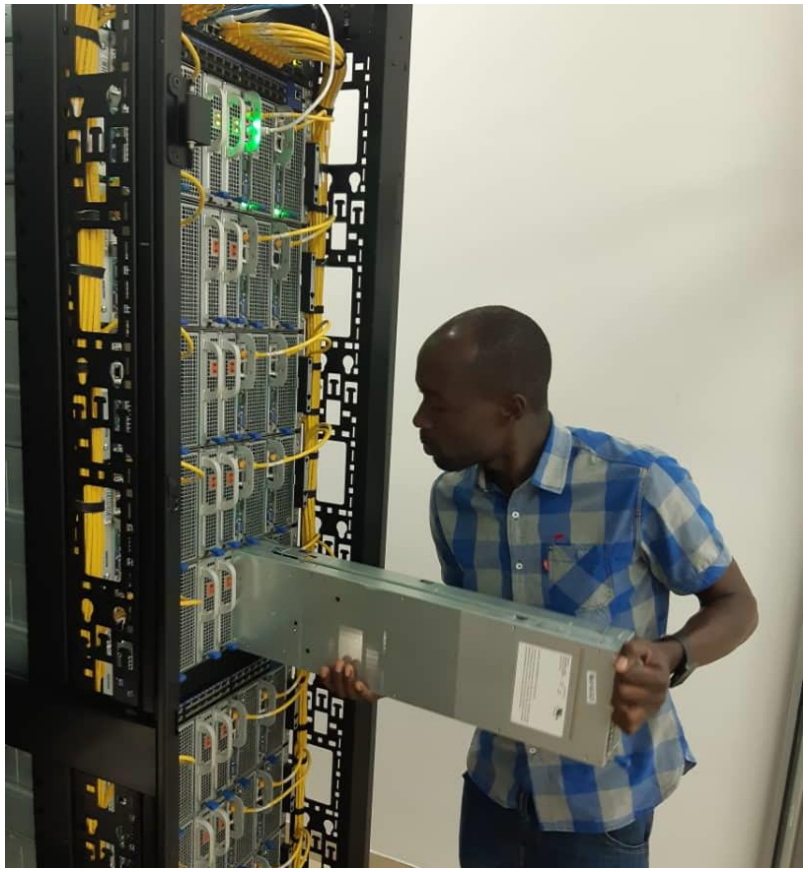
International Centers of Excellence in Research - ICERs

- Collaborative centers with a host institution
- NIH Grants have no indirect funding
- Cyberinfrastructure can’t be built or maintained with direct grant funding
- ~2000 researchers and supporting staff



ACE-Uganda Compute Core

One Rack of Stampede Servers from the TACC

Retired to Sunny Uganda from Austin, Texas

- 40 8-core Xeon E5-2680 servers per rack
- ~12 kilowatts of power
- ~40,000 BTUs per hour

ACE Mali Cluster

- Combination of Proxmox for virtual machines and HPC for analysis
- 20 Server Nodes
- HPC - 696 total cores - 2028 GB RAM total
- Synology Storage Array - 150 TB
- Vmware platform: elwazi Gen3 platform funded by the NIH Data Science in Africa grants

Collaboration

Are you sharing data with a dog or a scientist?

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All ICERs -

- Built authentication infrastructure
- Established identity assurance
- Multi-factor authentication
- Providing those to the federations
- Encouraged building of Federation in Uganda
- Encouraged building eduroam at the centers
- Encouraged use of the R&S Profile in India

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Objective of the NDCP (NIAID VRO)

- **Researchers need access** to research protocol documentation, clinical information systems, outbreak monitoring tools, and more.

- External user accounts were extremely difficult to support, particularly in an international operational context (e.g., identity proofing, password resets).

- **Key insights:** Transition to campus identities, where local IT resources are already in place to handle credentialing and authenticator support. Decorate campus IDs with authorization data for use by multiple scientific applications.

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Recent Accomplishments

- Dynamic MFA
- Implemented RAF 1.0 identity proofing at NIAID ICERs in Uganda, Mali
- Assisted RAF 2.0 development—international ID proofing framework https://refeds.org/assurance
- Expanded collaborative research services—
  - Study data visualization (Tableau)
  - Specimen management (FreezerPro, Freezerworks)
  - Environmental monitoring (DicksonOne)
  - ORCID iD integration

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Challenges

- **Provision scientists quickly** as part of pandemic response.
- **Handle variations** in campus IAM standards and practices.
- **Enroll users in MFA** when not supported by campus IT.
- **Integrate systems** from a wide variety of vendors.
- **Building Trust** at the top of the organization
  - Mapping international standards to the local regulations and bureaucracy

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Next Steps

- Rebranding after pilot
- Begin accepting subject ID/pairwise ID and RAF 2.0 IAP High
- Migrate select SPs from SAML to OIDC
- Develop automated validation for the NDCP and integrated research applications
- Install and operate open-on demand for HPC at the centers in Mali and Uganda

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Building the community requires constant investment

- RAF Working Group
- Baseline Expectations 1 & 2
- CTAB
- TAC
- FIM4R

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enduvo

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BRecA

FNIH
Foundation for the National Institutes of Health

NIH Fogarty

DS-I Africa
Data Science for Health Discovery and Innovation in Africa

RENU

TACC
TEXAS ADVANCED COMPUTING CENTER

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COAST

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Université des Sciences, des Techniques et des Technologies de Bamako
U.S.T.T-B

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Academy for Health Innovation Uganda

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