

Security and Assurance for Researcher Identities

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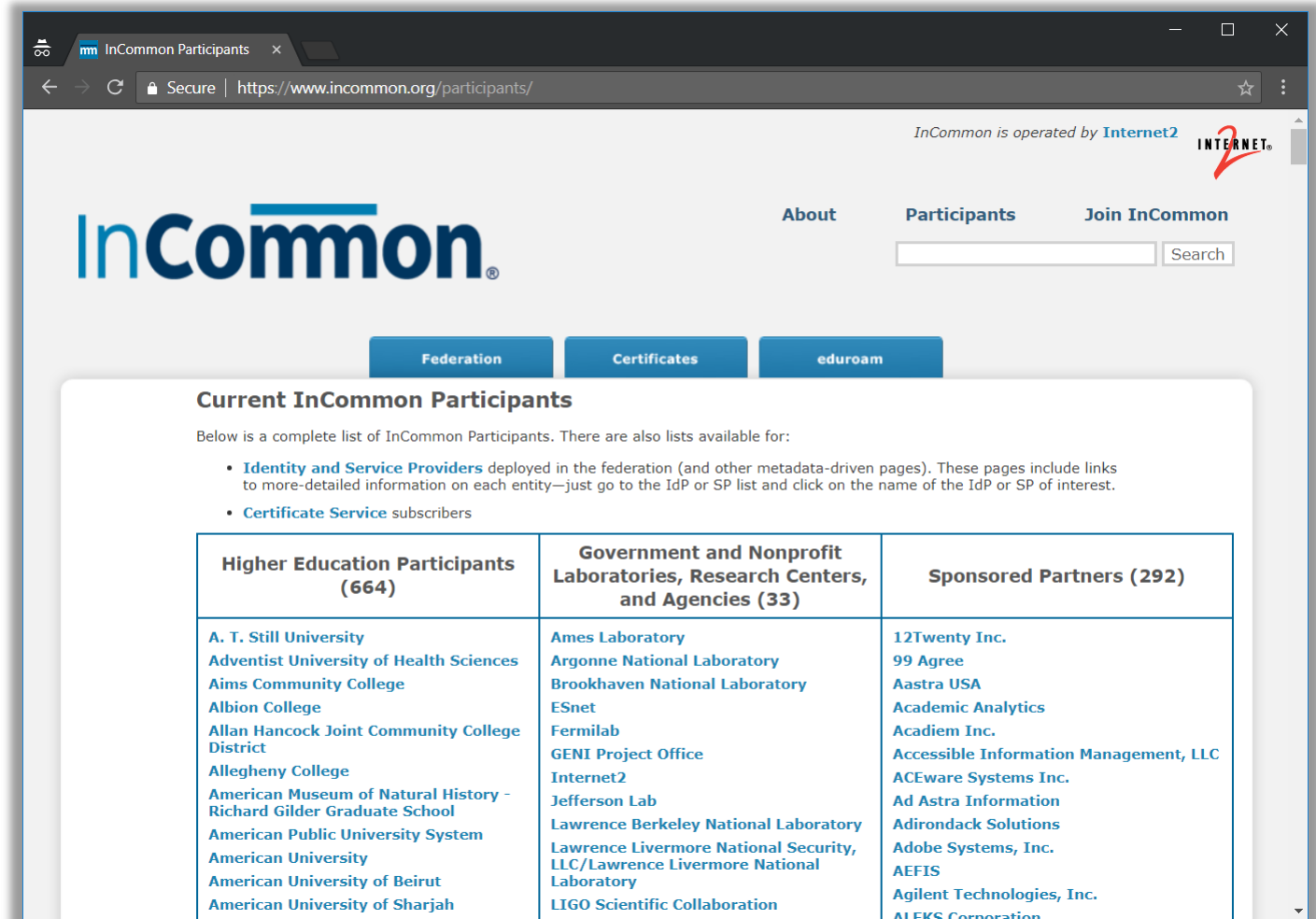
Researcher Identity Management

Example questions for science projects:

- What authentication strength (e.g., password policy, multi-factor) should we require?
- How do we vet researcher identities for access to our assets?
- What operational security standards must our identity providers and applications meet?

Federated Identity Sources

- InCommon:
US R&E SAML federation
- eduGAIN:
Global interoperability for
R&E SAML federations
- OAuth providers:
Google, GitHub, ORCID



The screenshot shows the InCommon website's 'Participants' page. The page features the InCommon logo, navigation links for 'About', 'Participants', and 'Join InCommon', and a search bar. Below the navigation, there are three tabs: 'Federation', 'Certificates', and 'eduroam'. The main content area is titled 'Current InCommon Participants' and includes a list of participants categorized into three groups: Higher Education Participants (664), Government and Nonprofit Laboratories, Research Centers, and Agencies (33), and Sponsored Partners (292). The list of participants is displayed in a table format.

Higher Education Participants (664)	Government and Nonprofit Laboratories, Research Centers, and Agencies (33)	Sponsored Partners (292)
A. T. Still University Adventist University of Health Sciences Aims Community College Albion College Allan Hancock Joint Community College District Allegheny College American Museum of Natural History - Richard Gilder Graduate School American Public University System American University American University of Beirut American University of Sharjah	Ames Laboratory Argonne National Laboratory Brookhaven National Laboratory ESnet Fermilab GENI Project Office Internet2 Jefferson Lab Lawrence Berkeley National Laboratory Lawrence Livermore National Security, LLC/Lawrence Livermore National Laboratory LIGO Scientific Collaboration	12Twenty Inc. 99 Agree Aastra USA Academic Analytics Acadiem Inc. Accessible Information Management, LLC ACEware Systems Inc. Ad Astra Information Adirondack Solutions Adobe Systems, Inc. AEFIS Agilent Technologies, Inc. ALEKS Corporation

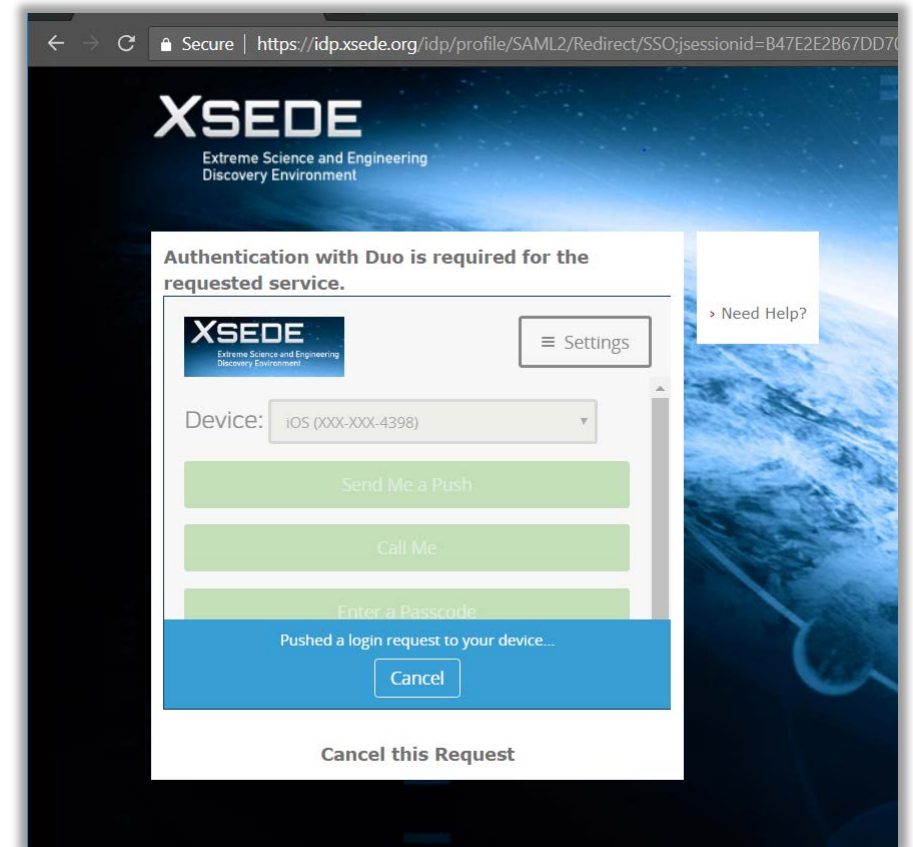
Standards for Federated ID Assurance at Scale

- Interoperable Global Trust Federation (<https://igtf.net/>)
- REFEDS MFA (<https://refeds.org/profile/mfa>)
- REFEDS Assurance Framework
- OpenID Connect Authentication Context Class Reference (acr)
- SAML AuthnContextClassRef and eduPersonAssurance



Example: XSEDE's InCommon IdP

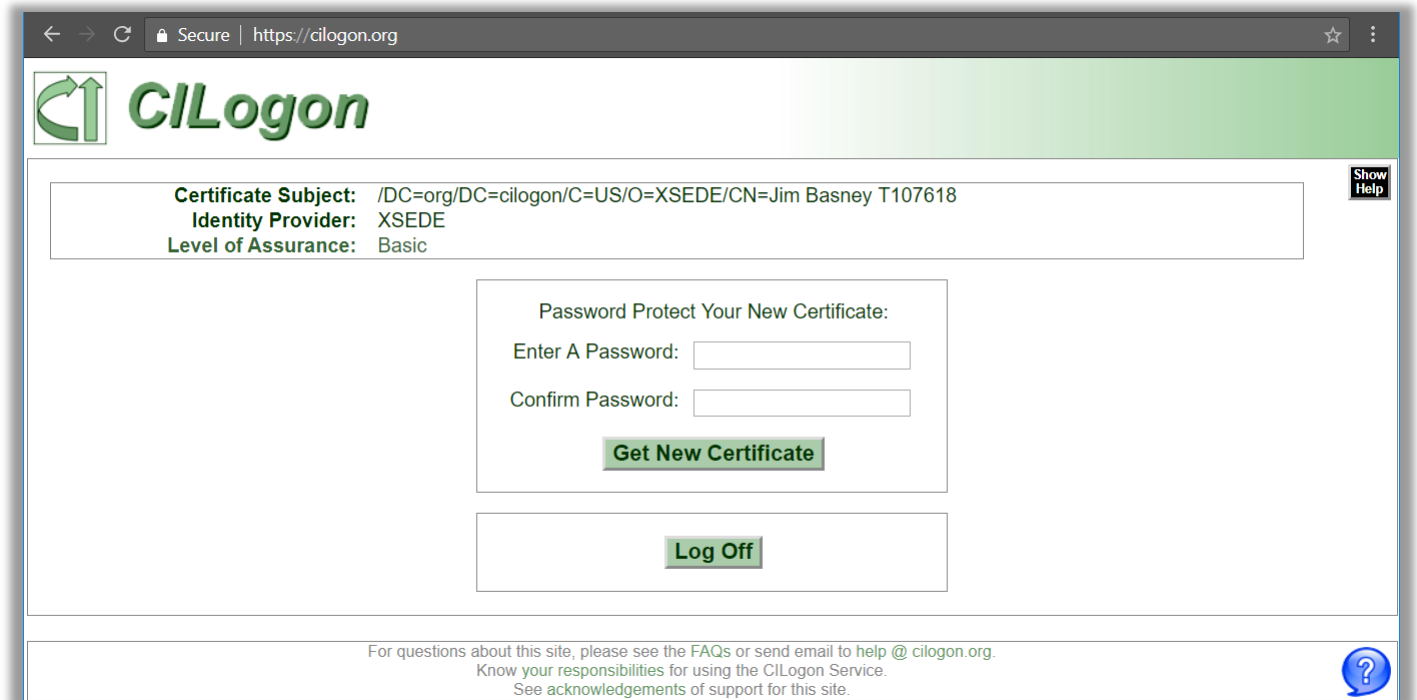
- Requires Duo MFA
 - <https://refeds.org/profile/mfa>
- Supports “vetted” and “unvetted” users
 - Self sign-up for XSEDE User Portal account
 - <https://refeds.org/assurance/IAP/low>
 - Users on peer-reviewed XSEDE allocations
 - <https://refeds.org/assurance/IAP/medium>



Example: CILogon

- Set OpenID Connect acr claim from SAML AuthnContextClassRef
- Certificate LOA based on SAML eduPersonAssurance

```
"iss": "https://cilogon.org",  
"given_name": "Jim",  
"aud": "cilogon:test/surge/prod",  
"acr": "https://refeds.org/profile/mfa",  
"idp": "https://idp.xsede.org/idp/shibboleth",  
"name": "Jim Basney",  
"family_name": "Basney",  
"email": "jbasney@illinois.edu"
```



The screenshot shows a web browser window at <https://cilogon.org>. The page features the CILogon logo and a "Show Help" button. The main content area displays certificate information:

- Certificate Subject:** /DC=org/DC=cilogon/C=US/O=XSEDE/CN=Jim Basney T107618
- Identity Provider:** XSEDE
- Level of Assurance:** Basic

Below this information is a form titled "Password Protect Your New Certificate:" with two input fields: "Enter A Password:" and "Confirm Password:". A green "Get New Certificate" button is positioned below the fields. At the bottom of the page, there is a "Log Off" button and a footer with contact information and a help icon.

Operational Standards

- REFEDS Security Incident Response Trust Framework for Federated Identity (SIRTFI)
 - <https://refeds.org/sirtfi>
- InCommon Baseline Expectations
 - <https://www.incommon.org/federation/baseline/>

```
$ git clone -q https://github.internet2.edu/InCommon/md-transforms.git
$ cd md-transforms/lib
$ curl -s -O http://md.incommon.org/InCommon/InCommon-metadata.xml
$ xsltproc baseline_report_csv.xsl InCommon-metadata.xml > report.csv
$ egrep "cilogon.org|idp.xsede.org|idp.ncsa.illinois.edu" report.csv | awk -F "," '{print $11,$1}'
Y https://idp.xsede.org/idp/shibboleth
Y https://cilogon.org/shibboleth
Y https://idp.ncsa.illinois.edu/idp/shibboleth
```



ORCID Researcher Assurance Model


NSF CYBERSECURITY SUMMIT | SECURITY AND ASSURANCE FOR RESEARCHER IDENTITIES

AUGUST 23, 2018

LAURA PAGLIONE

Director, Strategic Initiatives, ORCID

<http://orcid.org/0000-0003-3188-6273>

A background graphic consisting of a complex network of interconnected nodes and lines, resembling a molecular structure or a data network, rendered in a light gray color against a dark gray background.

ORCID'S VISION IS A WORLD WHERE ALL WHO
PARTICIPATE IN RESEARCH, SCHOLARSHIP, AND INNOVATION
ARE UNIQUELY IDENTIFIED AND CONNECTED TO THEIR
CONTRIBUTIONS AND AFFILIATIONS ACROSS TIME,
DISCIPLINES, AND BORDERS.



TOGETHER, WE CAN MAKE OUR VISION A REALITY!

WHAT IS ORCID?

- Open, not-for-profit organization
 - run by & for the research community
- Provider of unique researcher identifiers: ORCID iDs
 - reliably & clearly connect researchers with contributions & affiliations
- Integration point for ORCID iDs
 - 100s of systems integrated: grant applications, manuscript submission, CRIS, repositories, & more!



ORCID BY THE NUMBERS

909 members from 43 countries

527 system connectors

>5.1 million active researcher identifiers

over 2.2 million records with connected information

55 publishers signed open letter

Consortia in

- Italy
- France
- Germany
- Portugal
- Belgium
- Netherlands
- UK
- Finland
- Sweden
- Norway
- United States (2)
- Canada
- Brazil
- South Africa
- Taiwan
- Australia
- New Zealand



ORCID's vision is a world where all who participate in research, scholarship, and innovation are uniquely identified and connected to their contributions and affiliations across disciplines, borders, and time. We provide an identifier for individuals to use with their name as they share their ideas. We provide open tools that enable transparent connections between researchers, and identifiers for their contributions, and affiliations. What may appear to be a humble alphanumeric string in fact offers crucial opportunities to engender trust and support open research.

Confidence and trust is important to us. We have put in place controls, policies, and practices so that these connections are controlled by researchers, and that the source of each connection is openly articulated.

ORCID is a community-built and community-managed organization. We have a dedicated international team that collaborates broadly to build durable and high-fidelity research information infrastructure. We are grounded by [10 principles](#) that guide our work. These principles emphasize our commitment to being a respectful, reliable, inclusive, and accountable partner of the research community. We respect the privacy and information sharing needs of the individuals that hold ORCID iDs, who control whether their information is shared and with whom. As a non-profit organization we are not incentivized to profit from information entrusted to us. We are governed by a volunteer Board elected from our membership - [organizations in the research community](#) - who ensure that we remain true to ORCID principles.

This ORCID Trust Program provides greater transparency into the components that are foundational to our principles. Click on the sections below to learn more.



Individual control

Our tools and services provide you control over your registration, what is connected to your iD, and who can access your information. We provide system security and protection to ensure that user control is maintained.



Reliable registry

We understand that dependability, availability, security, and durability are required of the systems and services we provide for you and the organizations you work with in the research community.



Community accountability

We make ourselves accountable to all who use and support ORCID activities through our non-profit status, our membership-based sustainability model, community governance, and data dispute

ORCID TRUST: POLICY & CONTROLS

Infrastructure that is secure, long-lived & reliable

- **Individual control**
respect privacy, enable control, protect data
- **Reliability**
iD accessibility, infrastructure security, evolve to community needs
- **Accountability**
persist as service, operational transparency
- **Integrity**
high-fidelity connections, clear data interpretation



ORCID Record

Affiliations  Connected by **TALENT STEWARDS**

employment
Brown University: Providence, RI, United States
1929 to present | Professor (Psychoceramics)
LER: [9M13ULPHRP083NGC889](#)
Source: Brown University

education
Brown University: Providence, RI, United States
1966-Jun-6 | M.A. (in absentia)
LER: [9M13ULPHRP083NGC889](#)
Source: Brown University


Affiliations include
Employment • education • qualifications • invited positions • distinctions • membership • service

Awards  Connected by **RESOURCE STEWARDS**

award
The World's Greatest Traveler
1974-Sep-8
URL: <https://nyti.ms/2HfEOED>
Source: New York Times

collection access
Brown jug collection
1957
LER: [9M13ULPHRP083NGC889](#)
Source: Josiah S Carberry

Awards include
Grants • contracts • infrastructure use • equipment use • collection access • service awards

Contributions  Connected by **CONTRIBUTION STEWARDS**

journal-article
The Memory Bus Considered Harmful
2012
DOI: [10.5555/56655554444](#)
Part of ISSN: [0064-3561](#)
Source: Journal of Psychoceramics

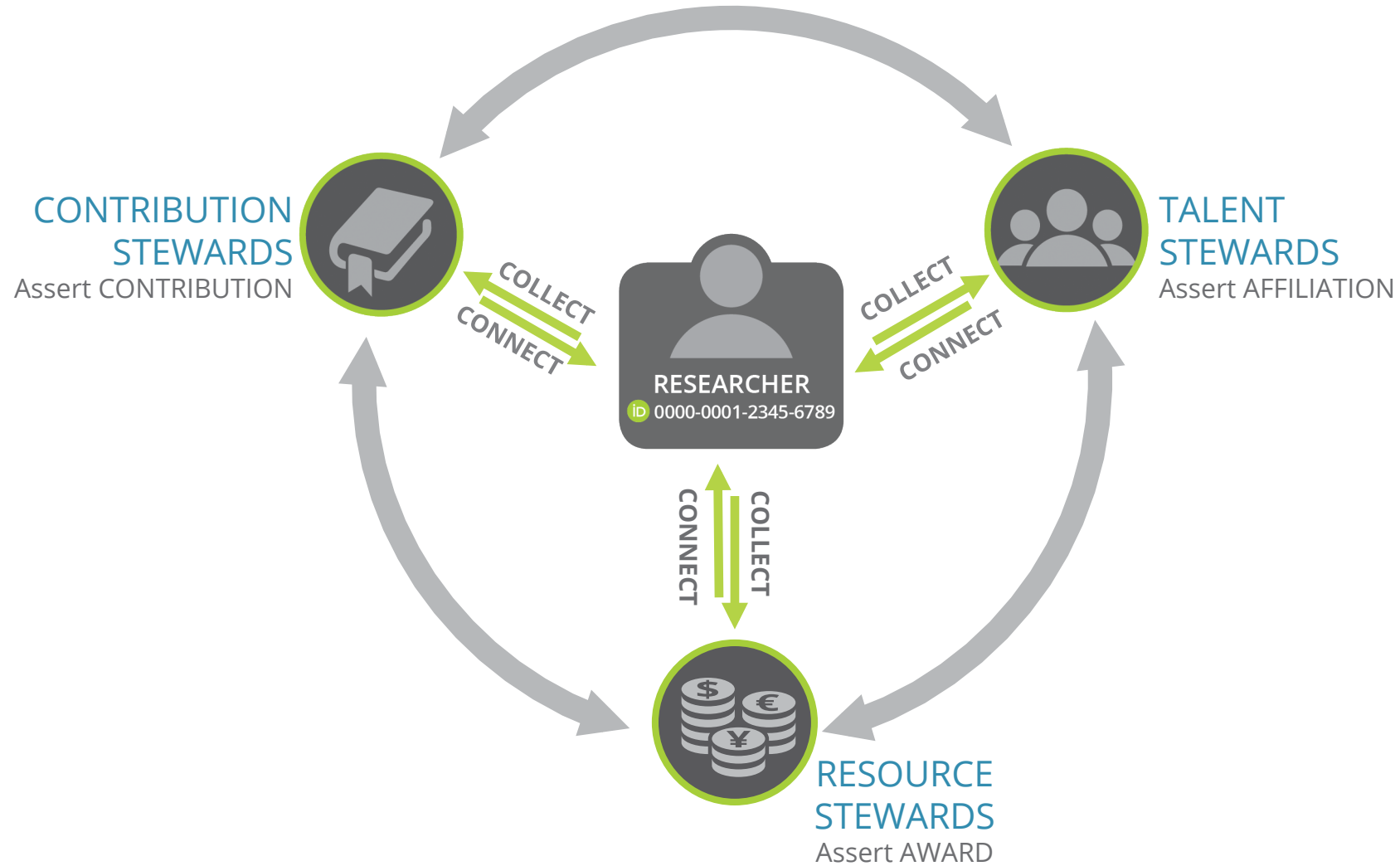
data-set
Solar effective bandwidths by time since 2004
2012
Part of DOI: [10.5555/56655554444](#)
Source: Psychoceramics repository

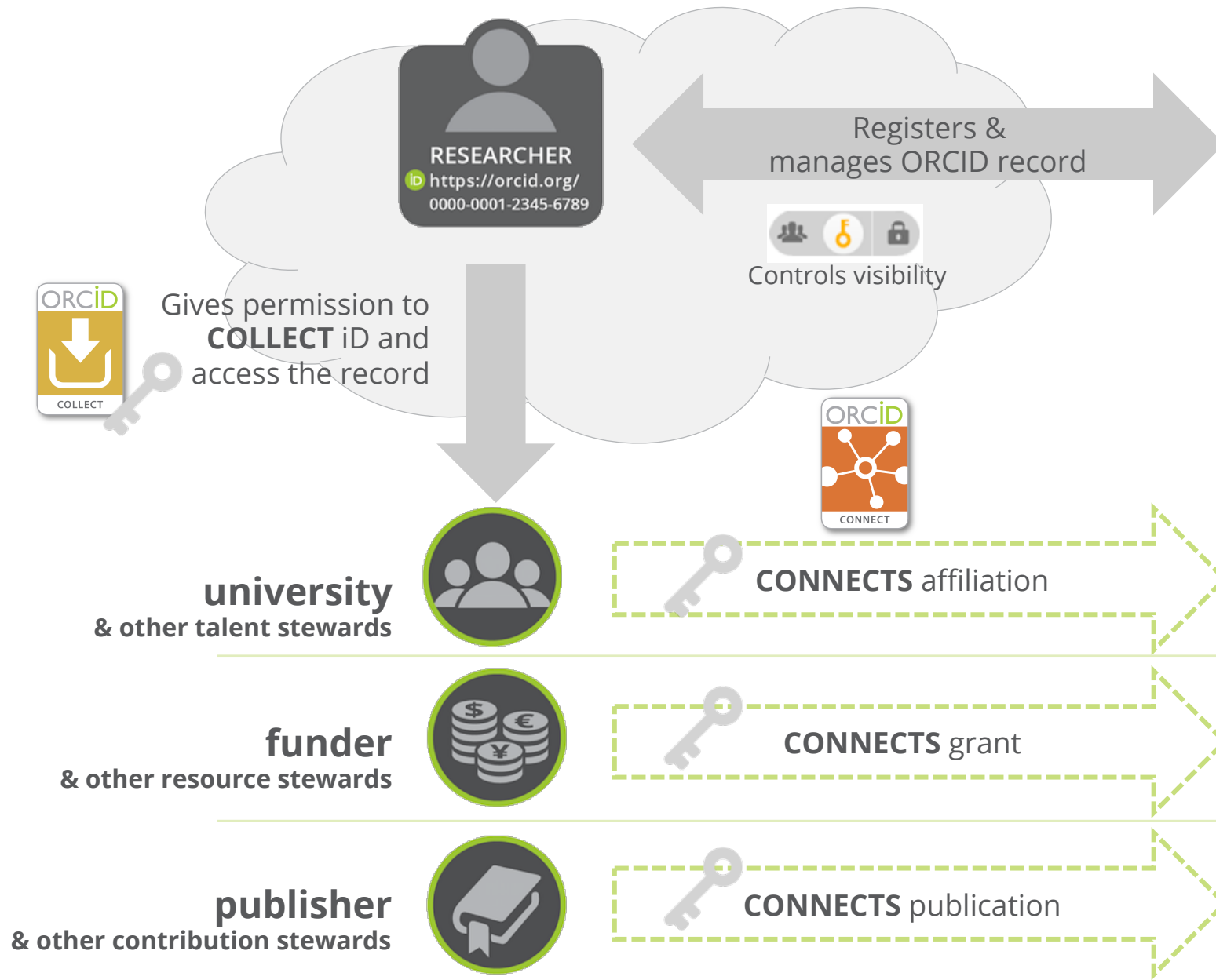
Contributions include
Publications • dissertations • posters • patents • specifications • datasets • software • peer review activity

BUILDING REPUTATION OVER TIME THROUGH ACTIONS

- Distributed activity/affiliation claims
- Claims from organizations you trust
 - Research institutions
 - Funders
 - Publishers
- Claims provided over time via workflow activities

PRIMARY ACTION AND BENEFIT BY SECTOR





ORCID record

Researcher Name

ORCID ID

iD orcid.org/xxxx-xxxx-xxxx-xxxx

Basic information

- Other names
- Email addresses
- Biography

Activities & affiliations

Employment:

XXX University
 Source: **XXX University (ID139)**

Funding:

YYY Foundation, Grant #123
 Source: **YYY Foundation (ID45)**

Peer Review:

Journal ZZZ, vol. 45, 2016
 Source: **ZZZ Publishing (ID675)**

IN PRACTICE: CONNECT YOUR INFORMATION TO ORCID



Talent stewards

- Employ or educate researchers
- Have researchers and scholars among their members
- Recognize editorial, project, working group, or other work

➤ connect AFFILIATIONS

Employment • education • qualifications • invited positions • distinctions • membership • service

University of Minnesota: Minneapolis, Minnesota, United States

Source: University of Minnesota



Contribution stewards

- Interact with authors and reviewers to publish work
- Store/ archive data sets and other research materials
- Manage conference submissions

➤ connect CONTRIBUTIONS

Publications • dissertations • conference posters • patents • specifications • data sets • software • peer review activity

Information science. Standards and infrastructure for innovation data exchange.

2012-10 | journal-article

DOI: [10.1126/science.1221840](https://doi.org/10.1126/science.1221840)

PMC: [PMC3774837](https://pubmed.ncbi.nlm.nih.gov/3774837/)

PMID: [23066063](https://pubmed.ncbi.nlm.nih.gov/23066063/)

Source: Europe PubMed Central

✔ Preferred source (of 2)



Resource stewards

- Fund research
- Manage access/ use of user facilities and equipment
- Manage access/ use of collections and research material

➤ connect AWARDS

Grants • contracts • infrastructure use • equipment use • collection access • service awards

Neutron Beam Award at High Flux Isotope Reactor (HFIR) and Spallation Neutron Source (SNS)

Oak Ridge National Laboratory (Oak Ridge, TN, United States)

2017-01 to 2017-06 | Award

Award: [2017-A: PTAX, TOPAZ](#)

Alternate URL: neutrons.ornl.gov

Source: Oak Ridge National Laboratory

✔ Preferred source

Globus for High Assurance Data Management

NSF Cybersecurity Workshop

August 23, 2018

Steve Tuecke

tuecke@globus.org





Globus Auth enables
an integrated ecosystem
of services and applications
for the research community



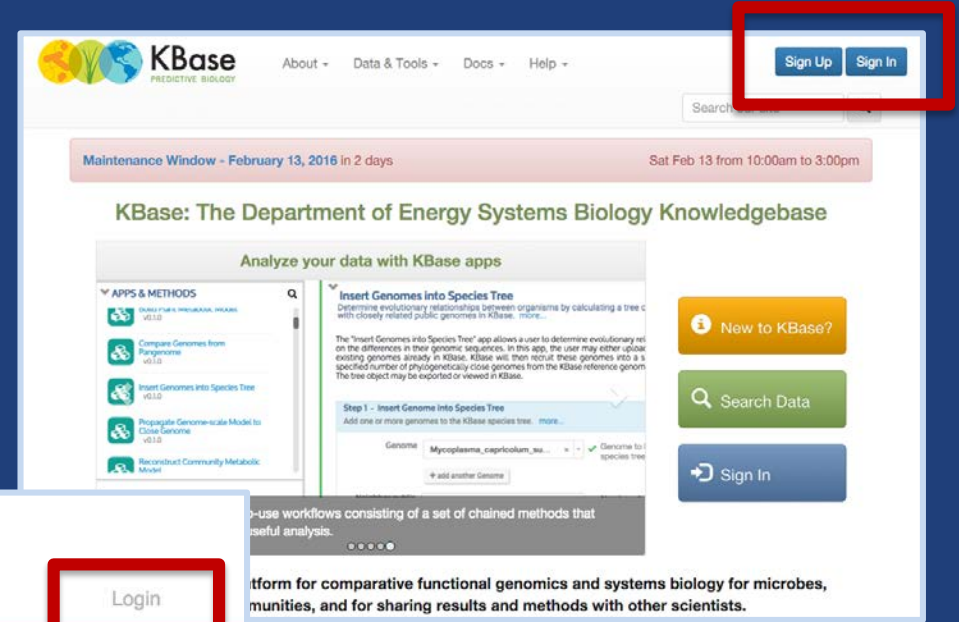
Based on widely used web standards

- **OAuth 2.0 Authorization Framework (a.k.a. OAuth2)**
- **OpenID Connect Core 1.0 (a.k.a. OIDC)**

docs.globus.org/api/auth

Log in with Globus

- Similar to: “Log in with Google”
“Log in with Facebook”
- Using existing identities (e.g., InCommon)
- Providing access to community services



KBase PREDICTIVE BIOLOGY

Sign Up Sign In

Maintenance Window - February 13, 2016 in 2 days Sat Feb 13 from 10:00am to 3:00pm

KBase: The Department of Energy Systems Biology Knowledgebase

Analyze your data with KBase apps

APPS & METHODS

- Compare Genomes from Paired Genomes v0.1.0
- Insert Genomes into Species Tree v0.1.0
- Propagate Genome-scale Model to Close Genome v0.1.0
- Reconstruct Community Metabolic Model

Insert Genomes into Species Tree

The "Insert Genomes into Species Tree" app allows a user to determine evolutionary relationships between organisms by calculating a tree of closely related public genomes in KBase. more...

Step 1 - Insert Genome into Species Tree

Add one or more genomes to the KBase species tree. more...

Genome: Mycoplasma_capricolum_s... Genome to species tree

+ add another Genome

New to KBase?

Search Data

Sign In

workflows consisting of a set of chained methods that useful analysis.

platform for comparative functional genomics and systems biology for microbes, communities, and for sharing results and methods with other scientists.



Jetstream

Images Help

Login



globus

Products Pricing Developers Support Log In

Research data management simplified.

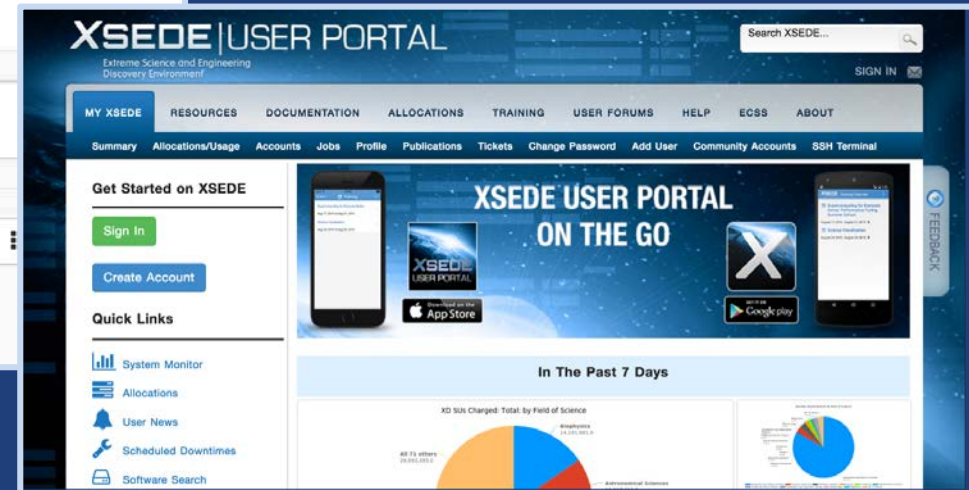
share transfer publish RESEARCH DATA

169,082,876,263 MB TRANSFERRED

Researchers Focus on your research, not IT problems. We make it easy to move, manage, and share big data.

Resource Providers Globus gives you more control over your data infrastructure, while providing excellent ease-of-use for your

Our Users Researchers and resource providers are our greatest inspiration and we love it when they say nice things about



XSEDE USER PORTAL

Extreme Science and Engineering Discovery Environment

Search XSEDE...

SIGN IN

MY XSEDE RESOURCES DOCUMENTATION ALLOCATIONS TRAINING USER FORUMS HELP ECSS ABOUT

Summary Allocations/Usage Accounts Jobs Profile Publications Tickets Change Password Add User Community Accounts SSH Terminal

Get Started on XSEDE

Sign In

Create Account

Quick Links

- System Monitor
- Allocations
- User News
- Scheduled Downtimes
- Software Search

XSEDE USER PORTAL ON THE GO

App Store Google play

In The Past 7 Days

XD I/O Charged: Total: by Field of Science

48.13 others (20.0%)



Integrate apps with Globus services

UCAR NCAR Closures/Emergencies Locations/Directions Find Pe

Hello tuecke@uchicago.edu [dashboard](#) [sign out](#)

NCAR UCAR Research Data Archive Computational & Information Systems Lab weather • data • climate

Go to Dataset:

Home Find Data Ancillary Services About/Contact Data Citation Web Services For Staff

NCEP Climate Forecast System Version 2 (CFSv2) Monthly Products

ds094.2

For assistance, contact Bob Dattore (303-497-1825)

Description Data Access

Mouse over the table headings for detailed descriptions

Data Description	Data File Downloads		Customizable Data Requests	Other Access Methods
	Web Server Holdings	Globus Transfer Service (GridFTP)	Subsetting	THREDDS
Union of Available Products	Web File Listing	Request Globus Invitation	Get a Subset	THREDDS
Diurnal monthly means	Web File Listing		Get a Subset	
Regular monthly means	Web File Listing		Get a Subset	

Data Selection Summary

Signed in as ANANTHAKRISHNANR1

mergesonde1mace c1 @ fkb M1 [Generate Citation](#) 274 file(s) // 6014 MB

2007-04-01

2007-12-31

Order Complete Datastream Extract Specific Measurements

Note: All variables will be delivered for this datastream.

Measurement : Atmospheric temperature
Variable : Temperature // temp

Combine files by datastream

File format

Data Delivery Options

- FTP
- Globus
- THREDDS
- Dropbox

Suspect

"Extract Specific Measurements" is selected.

Cancel Submit Data Request

Sanger Imputation Service Beta

Home About Instructions Resources Status

This is a free genotype **imputation** and **phasing** service provided by the Wellcome Trust Sanger Institute. You can upload GWAS data in VCF or 23andMe format and receive imputed and phased genomes back. [Click here](#) to learn more and [follow us on Twitter](#).

Before you start

Be sure to [read through the instructions](#).

You will need to set up a free account with [Globus](#) and have [Globus Connect](#) running at your institute or on your computer to transfer files to and from the service.

Ready to start?

If you are ready to upload your data, please fill in the details below to **register an imputation and/or phasing job**. If you need more information, see the [about](#) page.

Full name

Organisation

Email address

What is this

News [@sangerimpute](#)

11/05/2016
Thanks to [EAGLE](#), we can now return **phased data**. The HRC panel has been updated to r1.1 to fix a [known issue](#). See [ChangeLog](#) for more details.

15/02/2016
Globus API changed, please see [updated instructions](#).

17/12/2015
New status page and reworked internals. See [ChangeLog](#).

09/11/2015
Pipeline updated to add some features requested by users. See [ChangeLog](#).

[See older news...](#)





Supports Native Apps

- **Non-browser apps:**
 - Command Line
 - Mobile
 - Desktop

```
$ globus
Usage: globus [OPTIONS] COMMAND [ARGS]...

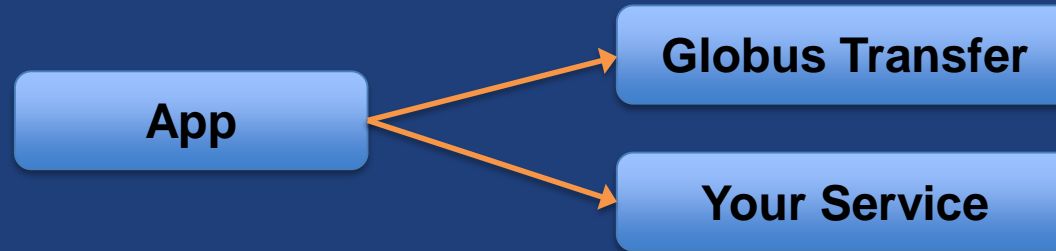
Options:
  -v, --verbose           Control level of output
  -h, --help             Show this message and exit.
  -F, --format [json|text] Output format for stdout. Defaults to text
  --jmespath, --jq TEXT  A JMESPath expression to apply to json output.
                        Takes precedence over any specified '--format' and
                        forces the format to be json processed by this
                        expression
  --map-http-status TEXT Map HTTP statuses to any of these exit codes:
                        0,1,50-99. e.g. "404=50,403=51"

Commands:
  bookmark      Manage Endpoint Bookmarks
  config        Modify, view, and manage your Globus CLI config.
  delete        Submit a Delete Task
  endpoint      Manage Globus Endpoint definitions
  get-identities Lookup Globus Auth Identities
  list-commands List all CLI Commands
  login         Login to Globus to get credentials for the Globus CLI
  logout        Logout of the Globus CLI
  ls            List Endpoint directory contents
  mkdir         Make a directory on an Endpoint
  rename        Rename a file or directory on an Endpoint
  task          Manage asynchronous Tasks
  transfer      Submit a Transfer Task
  version       Show the version and exit
  whoami        Show the currently logged-in identity.
```

docs.globus.org/cli

Authenticate your REST APIs

- Build services with secure REST APIs



- Services can leverage other services securely



Globus for high assurance data management

- **Restricted data handling**
 - PHI (Protected Health Information)
 - PII (Personally identifiable information)
 - Controlled Unclassified Information
- **University of Chicago security controls**
 - NIST 800-53 Low
 - NIST 800-171 Low
- **Business Associate Agreements (BAA) between University of Chicago and our subscribers**
 - University of Chicago has a BAA with Amazon





Restricted data disclosure to Globus

- **With High Assurance and BAA tiers, PHI data can be moved and shared**
- **Globus never sees file contents**
 - File contents can have restricted data
- **File paths/name can have restricted data (e.g. PHI)**
- **None of the other elements (endpoint definitions, labels, collection definitions) can contain restricted data**



High Assurance features

- **Additional authentication assurance**
 - Per storage gateway policy on frequency of authentication with specific identity for access to data
 - Ensure that user authenticates with the specific identity that gives them access within session (decoupling linked identities)
- **Session/device isolation**
 - Authentication context is per application, per session (~browser session)
- **Enforces encryption of all user data in transit**
- **Audit logging**



Globus operations

- **Secure operations**
 - Intrusion detection and prevention
 - Performance and health monitoring
 - Logging
 - Secure remote access, access control
 - Uniform configuration management and change control
 - Backups and disaster recovery
 - All data stored by Globus is encrypted at rest
- **Use AWS best practices for securing environment**
 - Virtual Private Clouds – host security
 - AWS security groups – network security
 - AWS IAM (identity and access management) best practices – individual security



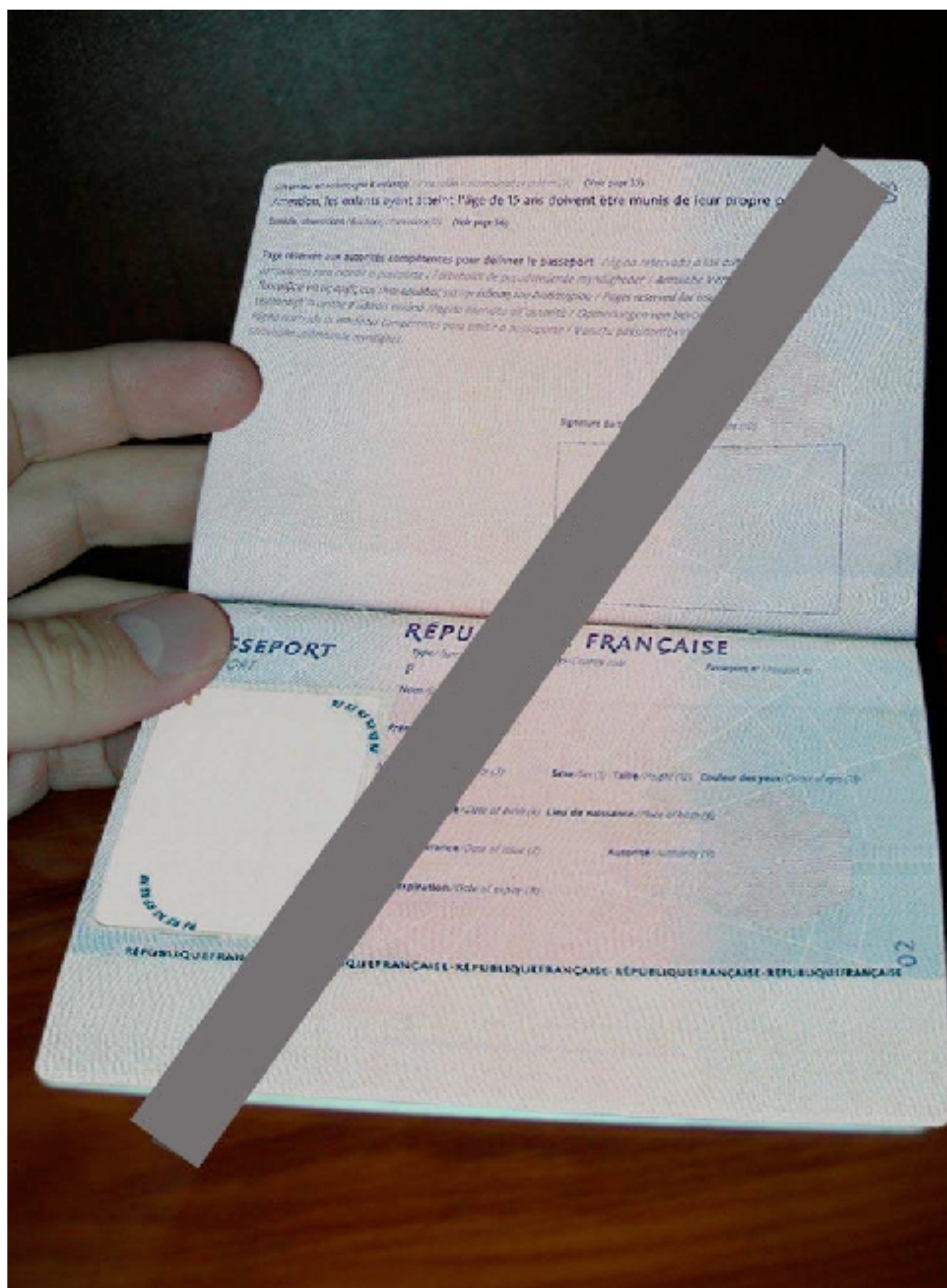
Summary

- **Globus Auth add higher authentication assurance for applications and services**
- **Foundation for application with high assurance requirements, such as for restricted data**



Identities are worth \$\$\$

- Typical price online:
 - Social Security number: \$1
 - Drivers license: \$20
 - Paypal/Banking account: \$20-\$500
 - Credit card: \$10-\$100
 - Medical record: \$1-\$1000



Passports



Product	Price	Quantity
Lithuanian Passport	2650 EUR = 8.669 ₺	<input type="text" value="1"/> X Buy now
Netherlands Passport	3150 EUR = 10.305 ₺	<input type="text" value="1"/> X Buy now
Denmark Passport	3150 EUR = 10.305 ₺	<input type="text" value="1"/> X Buy now
Great Britain Passport	4000 EUR = 13.086 ₺	<input type="text" value="1"/> X Buy now
Canada Passport	2500 EUR = 8.179 ₺	<input type="text" value="1"/> X Buy now



Identities are worth \$\$\$

LISTING OPTIONS

- Contact Seller
- Favorite Listing
- Favorite Seller
- Alert when restock
- Report Listing

BROWSE CATEGORIES

- Fraud 10657
- Drugs & Chemicals 37472
- Guides & Tutorials 4732
- Counterfeit Items 1952
- Digital Products 4410
- Jewels & Gold 590
- Weapons 636



Netflix Accounts [LIFETIME + FREEBIES]

Get your Netflix accounts here now for a fraction of the price!

Sold by DrawkwarD - 3144 sold since May 4, 2015 **Vendor Level 5** **Trust Level 5**
459 items available for auto-dispatch

	Features		Features
Product class	Digital goods	Origin country	Worldwide
Quantity left	Unlimited	Ships to	Worldwide
Ends in	Never	Payment	Escrow

Default - 1 days - USD +0.00 / Item

Purchase price: USD 0.50

Qty: 1 **Buy Now** **Queue**

0.0014 BTC

Description **Bids** Feedback Refund Policy

Product Description



Identities are worth \$\$\$

Dear users online store «AKAUNTY.ru» this site is specifically designed just for you! We are quite a unique site that **not only sells the accounts, and buys them** In stock accounts have all the social networks on the ideal prices. If you can not find any accounts that you need, you can make an order for their registration in our online store.

Our accounts are benign. For convenience and product warranty with the purchase you have 20 minutes to check the accounts, so that you have verified their robot. Here you can find accounts for every taste: Facebook, Odnoklassniki, Vkontakte, etc.

Preparation of accounts is carried out instantly thanks to the automatic payment: Kiwi, Webmoney and Yandex.

Pleasant to use!)

Product	Number of	For 1 piece.
Accounts of social networks		



Identities are worth \$\$\$

A new, modern store fresh

akaunty.ru/?attempt=1

Akaunty.ru eduGAIN InCommon
COMING SOON

Dear users online store «AKAUNTY.ru», this site is specifically designed just for you! We are quite a unique site that not only sells the accounts, and buys them. In stock accounts have all the social networks on the ideal prices. If you can not find any accounts that you need, you can make an order for their registration in our online store.

Our accounts are benign. For convenience and product warranty with the purchase you have 20 minutes to check the accounts, so that you have verified their robot. Here you can find accounts for every taste: Facebook, Odnoklassniki, V Kontakte, etc.

Preparation of accounts is carried out instantly thanks to the automatic payment: Kiwi, Webmoney and Yandex.

Pleasant to use!)

Product	Number of	For 1 piece.
Accounts of social networks		

Connecting...



Key challenge: enable federated incident response

- Compromised identities
 - Top security risk identified as part of the WLCG risk assessment
 - *“Compromised identities are the most common intrusion vector for the security incidents that have affected WLCG.”*
- Incident response is a crucial part of our trust model
 - Great metrics for collaboration, trust and security
- International projects = International incident response
 - Significant experience (~10 events per year for the last 10 years in WLCG)
 - Self-contained: identities issued by highly vetted participants or trusted parties
 - All under the same set of policies or memorandum of understanding



Key challenge: enable federated incident response

- Federated identities change this model
 - No pre-established authority, trust relationship or collaboration agreement with identity providers
- A new realm for collaboration, trust and incident response
 - Incident response depends on multiple actors, across multiple administrative domains
 - Completely different **controls** and **trust model**
 - Yet we need to retain similar level of security/assurance
- If security is undermined, so will be trust, and global security collaboration
- Federated identities have a profound impact on collaboration & incident response:
 - All participants must have the will and capability to collaborate and to trust each other with sensitive information on a global scale. Huge challenge.

Panel Discussion

What is the primary challenge that we currently face for security and assurance for researcher identities?

Additional Panel Questions

- What are your experiences with incident response for federated identities?
- What are the next steps for multi-factor authentication?
- What are the options and needs for researcher identity vetting (e.g., ORCID iDs in publications, XSEDE allocations process, CERN credentialing process)?
- What assurance standards do/should we support/use (e.g., eduPersonAssurance)?
- What operational security requirements do/should federated identity providers and service providers meet (e.g., InCommon Baseline Expectations, REFEDS SIRTFI)?