

Building the Model Research Data Portal

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Developer Workshop: Building the Modern Research Data Portal

New high-speed networks make it possible, in principle, to transfer and share research data at tremendous speeds and scales—but have also proved challenging to use in practice. Two new technologies now allow us to translate this potential into reality: Science DMZ architectures provide frictionless end-to-end network paths; and Globus APIs allow programmers to create powerful research data portals that leverage these paths for data distribution, synchronization, and other useful purposes.

Come to Chicago in April to learn more!

Introduction, Concepts, and Components

IMPERIAL 2

Led by: TBD

We will introduce the Modern Research Data Portal and set the context for how Globus and the ScienceDMZ combine to deliver unique data management capabilities. This will include:

- Overview of use cases: Common patterns like data publication/distribution, orchestration of data flows, etc.
- Overview of the Globus platform: Architecture and brief overview of available services
- Introduction to the Globus Auth API: Authenticating and authorizing a client
- Introduction to the Globus Transfer API: Make your first call and move data with Globus
- Introduction to the Python SDK for using Globus Auth and Transfer



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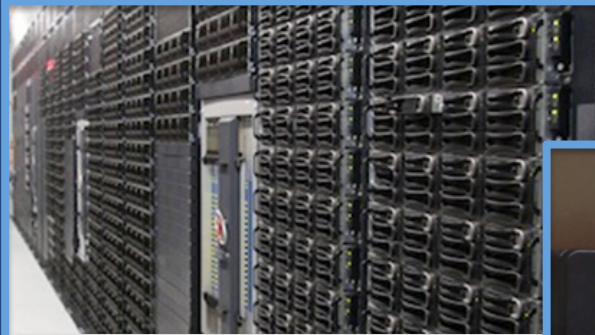


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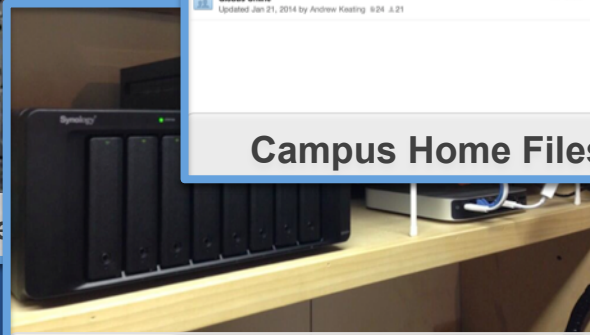




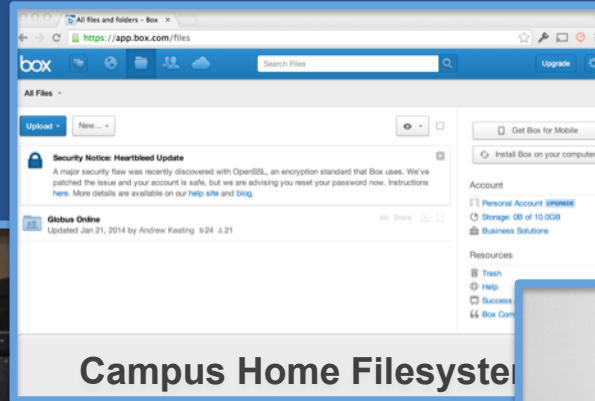
“I need to easily, quickly, & reliably move portions of my data to other locations.”



Research Computing HPC Cluster



Lab Server



Campus Home Filesystem



Personal Laptop



Desktop Workstation



XSEDE Resource



Public Cloud

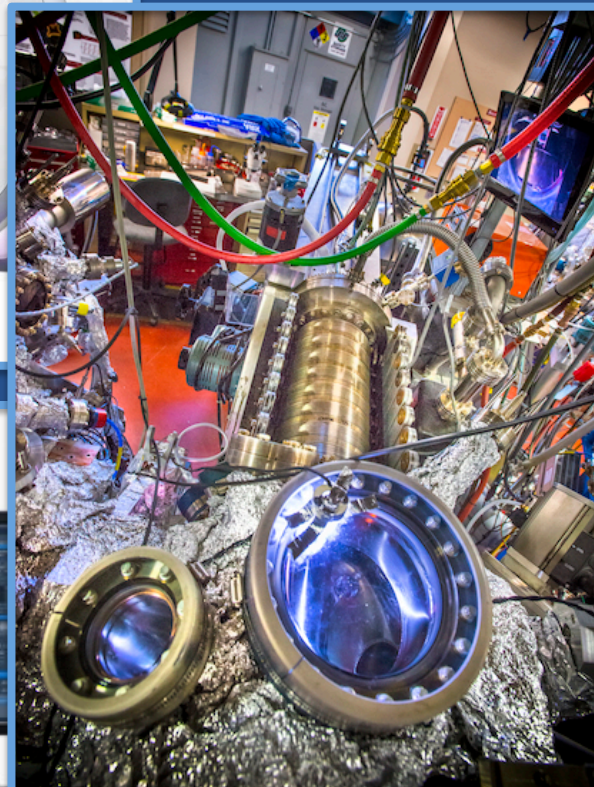


“I need to get data from a scientific instrument to my analysis system.”

MRI



Advanced
Light Source



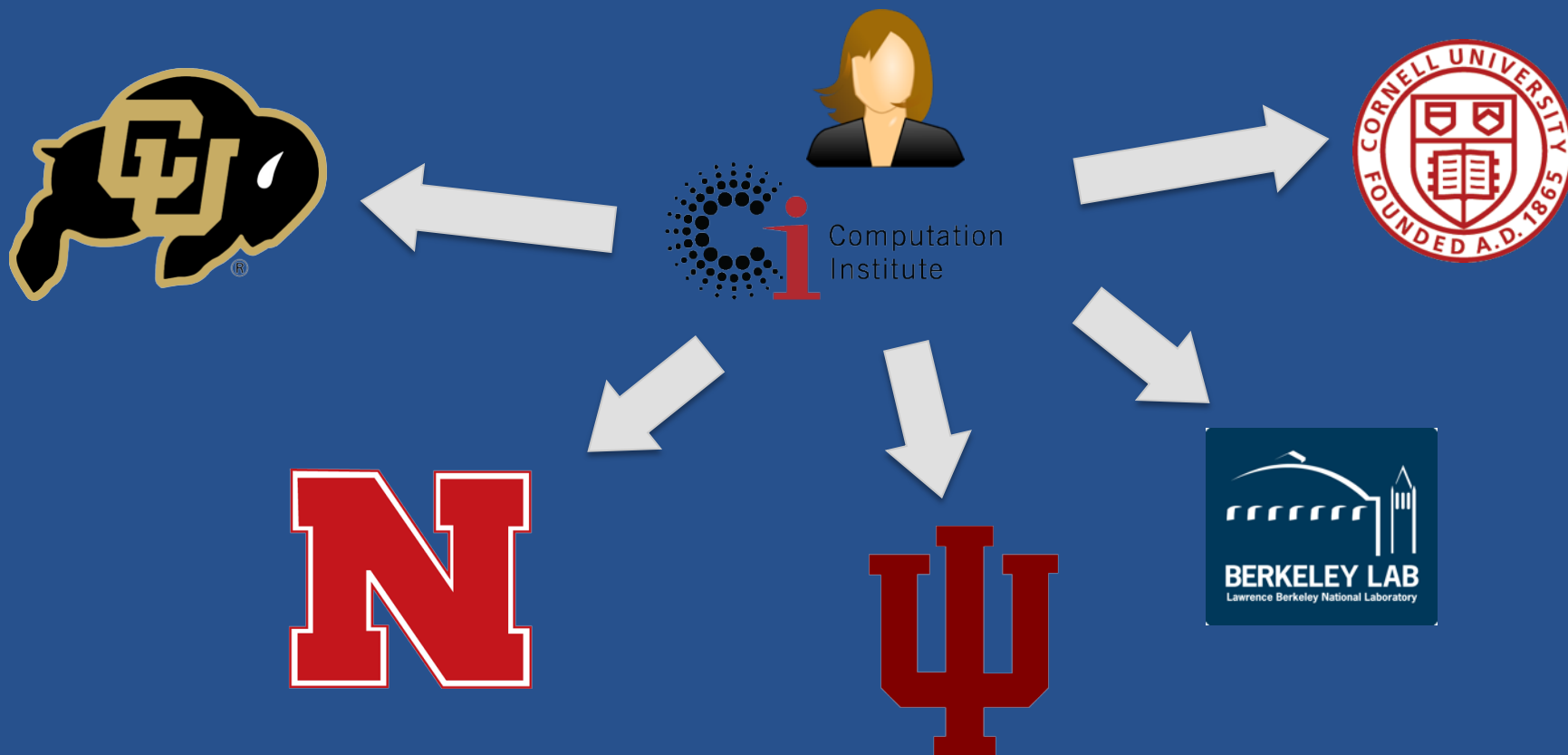
Next Gen
Sequencer



Light Sheet Microscope



“I need to easily and securely share my data with my colleagues at other institutions.”





“I need to publish my data so others can find/use/validate/reproduce it.”



Scholarly
Publication

Reference
Dataset

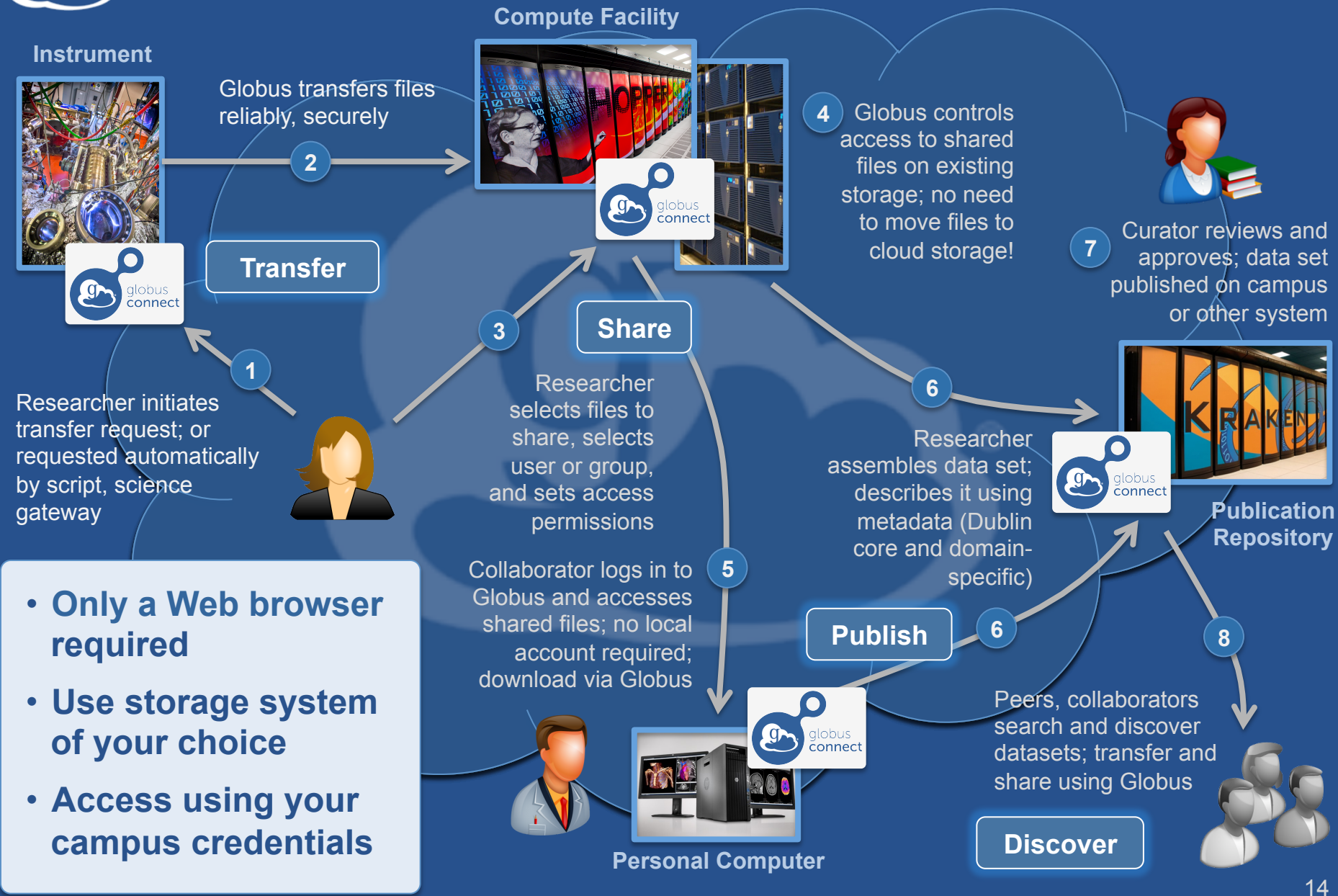


Research
Community
Collaboration





Globus and the research data lifecycle





Globus delivers...

Big data transfer, sharing,
publication, and discovery...

...directly from your own
storage systems...

...via software-as-a-service



Globus is SaaS

- **Easy to access via Web browser**
 - Command line, REST interfaces for flexible automation and integration
- **New features automatically available**
- **Reduced IT operational costs**
 - Small local footprint (Globus Connect)
 - Consolidated support and troubleshooting



Lowering collaboration overhead

- **Grant collaborators access to data on systems without requiring local accounts**
- **No need to replicate or move data to separate system/cloud just for sharing**
- **Researchers manage “virtual” ACLs...**
- **Respect local system access controls**



Group Management

- User-managed group creation and management
- Flexible control over roles, policies, workflows, and visibility
- Groups can be used in authorization decisions

Example: kBase

- Every kBase user added to kbase_users
- Subgroups also created
- Groups used for access control

The screenshot displays the kBase user interface. At the top is a navigation bar with links for 'Dashboard', 'Groups', 'ian's account', and 'Log Out'. The main content area is divided into two columns. The left column, titled 'My Groups', shows a list of groups: 'kbase_users', 'kbase_staff', 'kbase_microbes', and 'ENIGMA'. Below this list are three tabs: 'Home', 'Members', and 'SubGroups'. The right column contains three sections: 'Browse Groups' with a description 'Browse and join groups', 'My Account' with a description 'View and change your account settings, including contact information and security credentials', and 'KBase Site' with a description 'Return to the main KBase website'. Each section is accompanied by a circular icon representing its function.



Globus today...

4

major services

137 PB

transferred

20 billion

files processed

31,000

registered users

13

national labs
use Globus

10,000

active endpoints

~400

active daily users

99.95%

uptime

35+

institutional
subscribers

1 PB

largest single
transfer to date

3 months

longest
continuously
managed transfer

130

federated
campus identities



New Features: Globus Auth and HTTP



New features: Globus Auth



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Request for Approval

Do you approve of granting the following clients access?

Globus Web Client needs to use your **chard@uchicago.edu** identity in order to:

- ✓ Manage identities in Globus Auth ⓘ
- ✓ Manage your Globus Groups ⓘ
- ✓ Transfer files using Globus Transfer ⓘ

Globus Transfer needs to use your **chard@uchicago.edu** identity in order to:

- ✓ Manage your Globus Groups ⓘ
- ✓ View your identities on Globus Auth ⓘ



By clicking "Approve", you allow clients to use your information in the ways described above.

Approve

Deny



New features: HTTP

 globus 

[Manage Data](#) [Publish](#) [Groups](#) [Support](#) [Account](#)



[Transfer Files](#) [Activity](#) [Endpoints](#) [Bookmarks](#) [Console](#)

Transfer Files

Endpoint:

Path:

select none up one folder


 hello.txt
 ianfoster.jpg

Label This Transfer

This will be displayed in your transfer list

Transfer Settings

☐ sync - only transfer files that have changed
☐ delete files on destination
☐ preserve source file timestamps
☒ verify file integrity
☐ encrypt transfer





Leveraging the Globus Platform



Globus Platform-as-a-Service



Globus APIs



Data Publication & Discovery

File Sharing

File Transfer & Replication

Identity, Group, and
Profile Management

Globus Connect



Globus Toolkit



APIs and Clients

- **Globus Nexus (identity, profile, groups)**
 - API: <http://globusonline.github.io/nexus-docs/api.html>
 - Clients:
 - <https://github.com/globusonline/python-nexus-client>
 - <https://github.com/globusonline/java-nexus-client>
- **Globus transfer**
 - API: <https://docs.globus.org/api/transfer/>
 - Clients:
 - <https://github.com/globusonline/transfer-api-client-python>
 - <https://github.com/globusonline/transfer-api-client-java>
- **Globus publication (coming soon)**

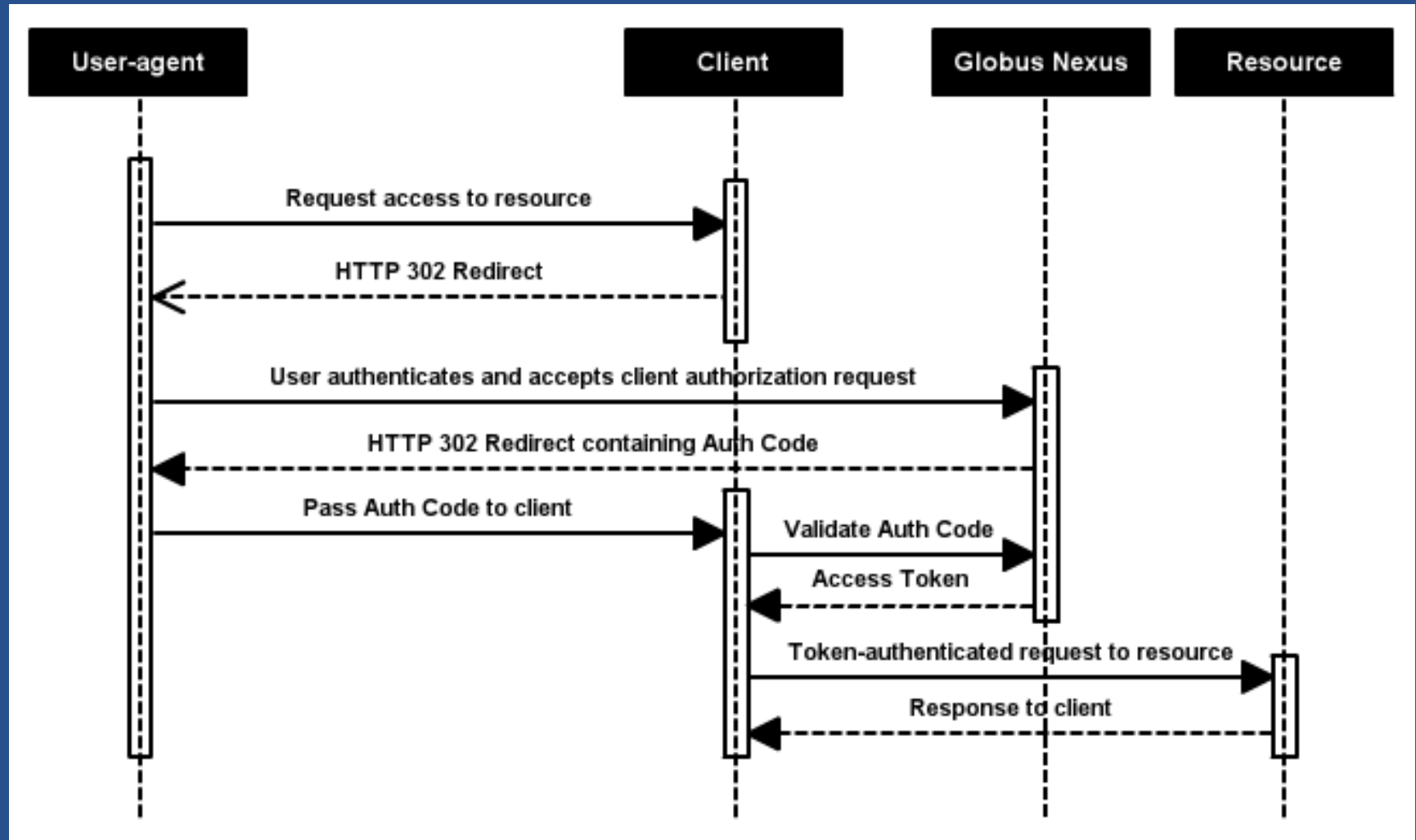


Developing a 3rd party application

- **Register client (URL and client username/password)**
- **Implement an OAuth client (or reuse an existing one)**
- **Store the resulting access token and make calls to Globus APIs on behalf of the authenticated user**



Globus OAuth workflow





Developing a 3rd party application

The image displays three overlapping browser windows illustrating the Globus Data Publication interface for developing a 3rd party application.

Top Window: Data Publication | Globus
URL: <https://publish.globus.org>
The page features the Globus logo and a search bar. Below the search bar, it states: "Globus simplifies the preserve data at design and other interested". A link is provided: "Click here to learn how here." Below this, it says "Try a free trial of Globus". The "Communities" section is visible, with a prompt "Choose a community to" and a list of communities: "Materials Data Facility", "Community for the Materials Collaboration", "MICCoM Community", and "University of Chicago".

Middle Window: OAuth Sign In | Globus
URL: https://www.globus.org/OAuth#response_type=code&client_id=globuspublish&redirect_uri=https%3A%2F%2Fpublish.globus.org%2Fjsui%2Fgoauth-login
This window shows the OAuth authentication process.

Bottom Window: Data Publication Dashboard
URL: <https://publish.globus.org/jsui/PublishDashboard>
The dashboard includes the Globus logo and navigation links: "Manage Data", "Publish", "Groups", "Support", and "chard". Below these are links for "Browse & Discover", "Data Publication Dashboard", and "Communities & Collections". A search bar is present. The main content area is titled "Data Publication Dashboard" and contains two buttons: "Submit a New Dataset" and "View My Published Datasets". At the bottom, it states: "© 2010-2015 Computation Institute, University of Chicago, Argonne National Laboratory [legal](#)".



Globus PaaS at NCAR

- Research Data Archive at NCAR
- Integrate Globus for data downloads
- Shared endpoint with subfolder per request
- Single sign on via streamlined account provisioning

CISL Research Data Archive

Managed by NCAR's Data Support Section
Data for Atmospheric and Geosciences Research

Find Data

Ancillary Services

About/Contact

All Datasets | Recently Added/Updated | Browse the RDA

- GCMD Topic:

Agriculture • Atmosphere • Biosphere • Climate
Oceans • Paleoclimate • Solid Earth • Spectral/En

- Atmospheric Reanalysis Data:

All Reanalysis Datasets • BPRC Arctic System Reanal
ECMWF ERA15 Reanalysis (ERA15) • ECMWF ERA40
ECMWF Interim Reanalysis (ERA-I) • JMA Japanese 2
JMA Japanese 55-year Reanalysis (JRA55) • NCEP CL
NCEP North American Regional Reanalysis (NARR) •
NCEP/NCAR Reanalysis Project (NNRP) • NOAA-CIRE

- Station Observations:

Land Surface Air Temperature: Hourly, Monthly

Find Platform Observations datasets

RDA



Branded sites

BLUE WATERS
FAST-TRACKED PERSONAL COMPUTING

Reliable, high-performance, secure file transfer by Globus Online.

Blue Waters has partnered with the Globus Online file transfer service.

You may access this service by entering your Blue Waters username and password.

Sign In

Use Your NCSA Blue Waters login [alternate login](#)

You will now be redirected to NCSA Blue Waters's authentication page.

[Proceed](#)

NOTE: If you are accessing this file transfer service for the first time, you will be redirected to your Blue Waters account to a Globus Online account if you have a Globus Online account (it will be able to create one).

Access | Support | About | Sign Up

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Efficiently connect your science to cycles and data

osg connect

OSG Connect offers users simple access to distributed high throughput computing resources, and reliable, high-performance file transfer services.

Sign In [Sign Up with Globus Online](#)

Using your InCommon / OGL login [alternate login](#)

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Systems Biology Knowledgebase

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BIRN ACCESS Group Management

Manage Data Groups Log In Sign Up

ACCESS is a user and group management system used by the BIRN community to allow editing access to the BIRN Vols.

Sign in with your Globus Online ID.

Are you working with a BIRN Working Group or user community and need editing access to the BIRN Vols? Sign up now.

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BIRN Modules >
BIRN Support >

Username:

Password:

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Thank you!