

Building the Research Applications and Services Ecosystem with the Globus Platform

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Cloud has transformed how software and platforms are delivered

Software as a service: **SaaS**

(web & mobile apps)



NETFLIX



Platform as a service: **PaaS**



Microsoft Azure



Infrastructure as a service: **IaaS**



EC2



S3



Microsoft Azure

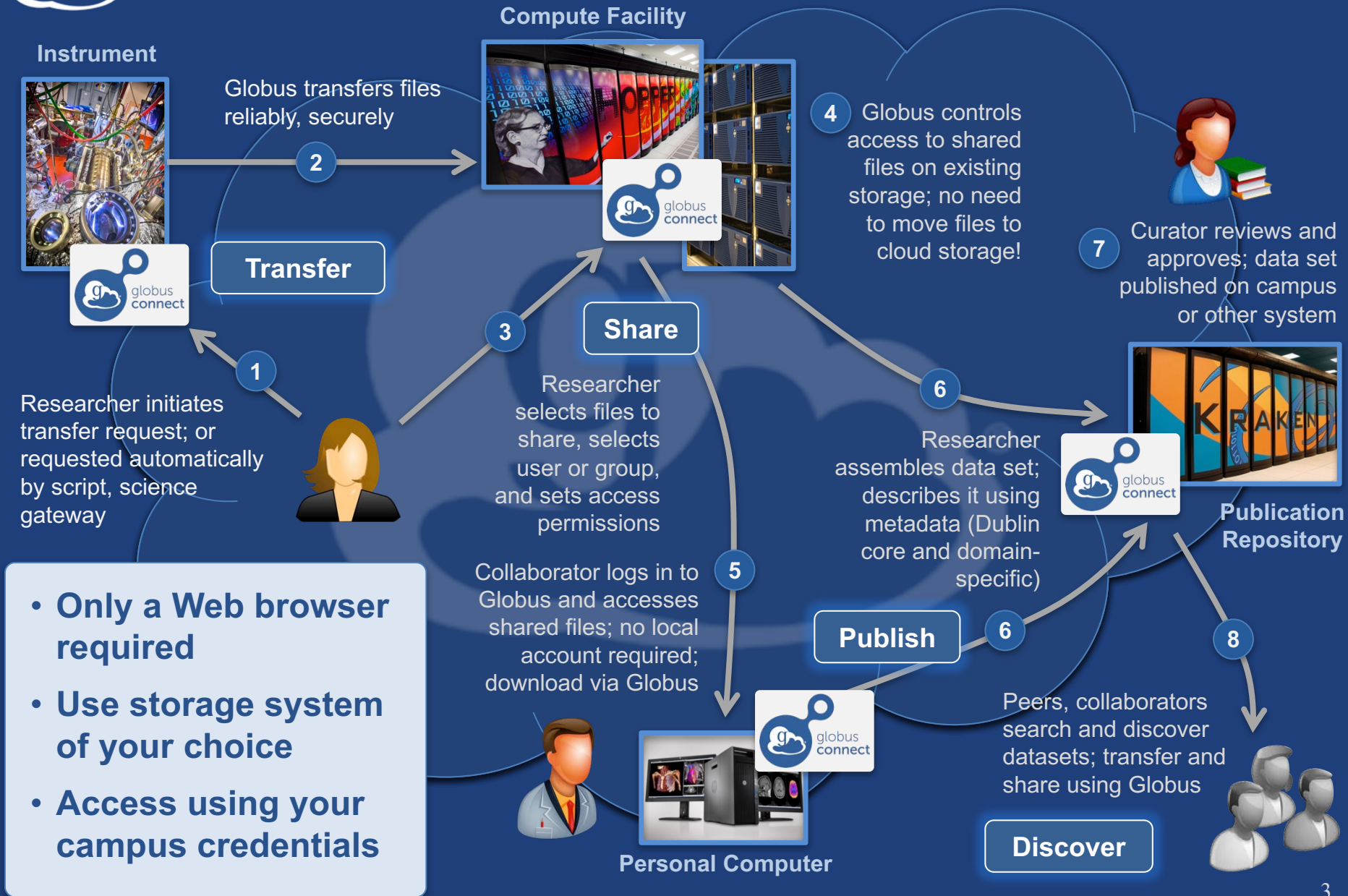


Google Compute Engine

PaaS enables more rapid, cheap, and scalable delivery of powerful (SaaS) apps



Globus SaaS: Research data lifecycle





**How do we empower the
research community to create
an integrated ecosystem of
services and applications?**



Example: NCAR RDA

UCAR NCAR

Closures/Emergencies

Locations/Directions

Find People

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

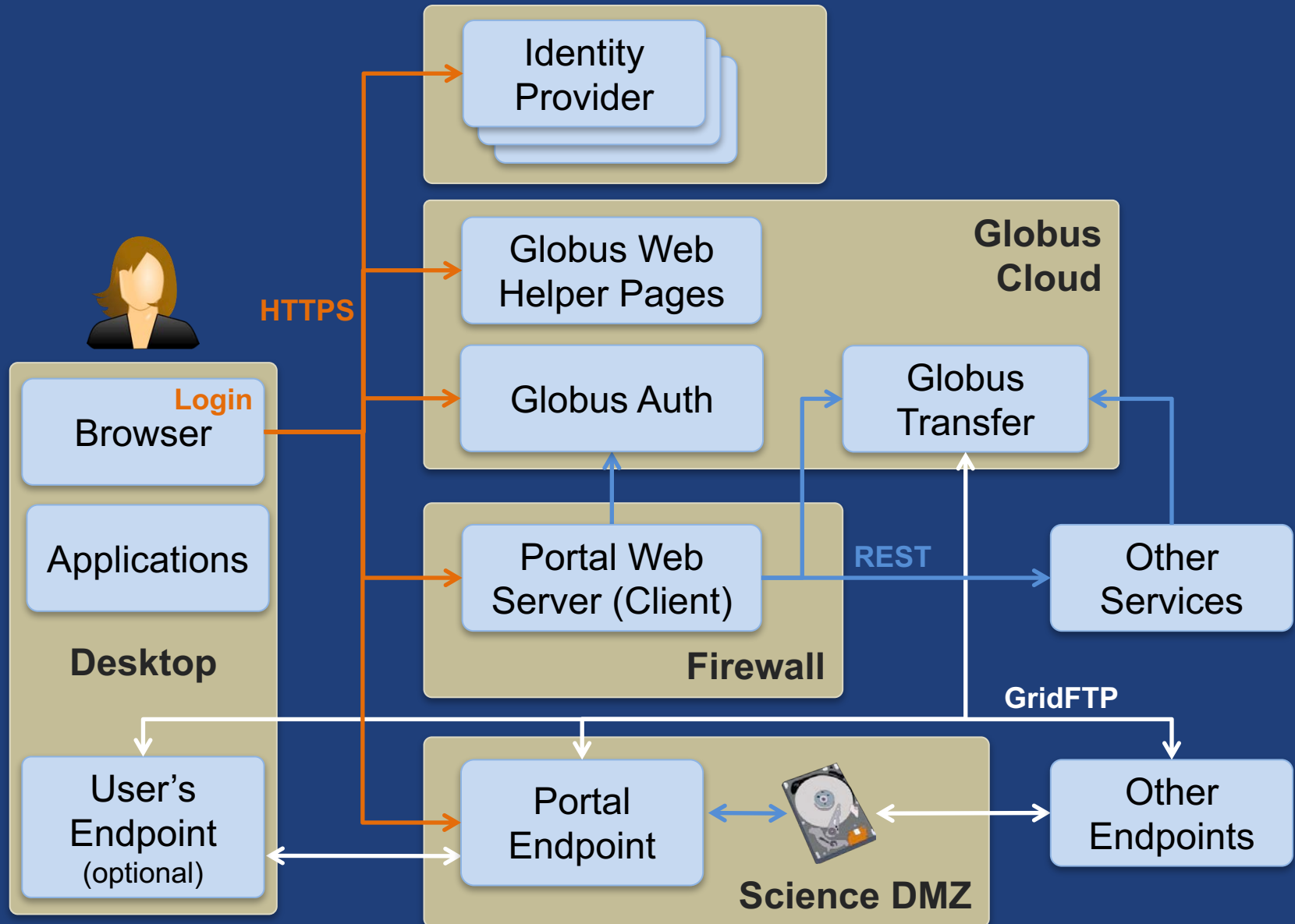
Data Access

Mouse over the table headings for detailed descriptions

Data Description		Data File Downloads		Customizable Data Requests	Other Access Methods	NCAR-Only Access	
		Web Server Holdings	Globus Transfer Service (GridFTP)	Subsetting	THREDDS Data Server	Central File System (GLADE) Holdings	Tape Archive (HPSS) Holdings
Union of Available Products		Web File Listing	Request Globus Invitation	Get a Subset	TDS Access	GLADE File Listing	HPSS File Listing
P R O D U C	Diurnal monthly means	Web File Listing		Get a Subset		GLADE File Listing	HPSS File Listing
	Regular monthly means	Web File Listing		Get a Subset		GLADE File Listing	HPSS File Listing
	Selected Parameter/Level Time Series	Web File Listing		Get a Subset	TDS Access	GLADE File Listing	HPSS File Listing

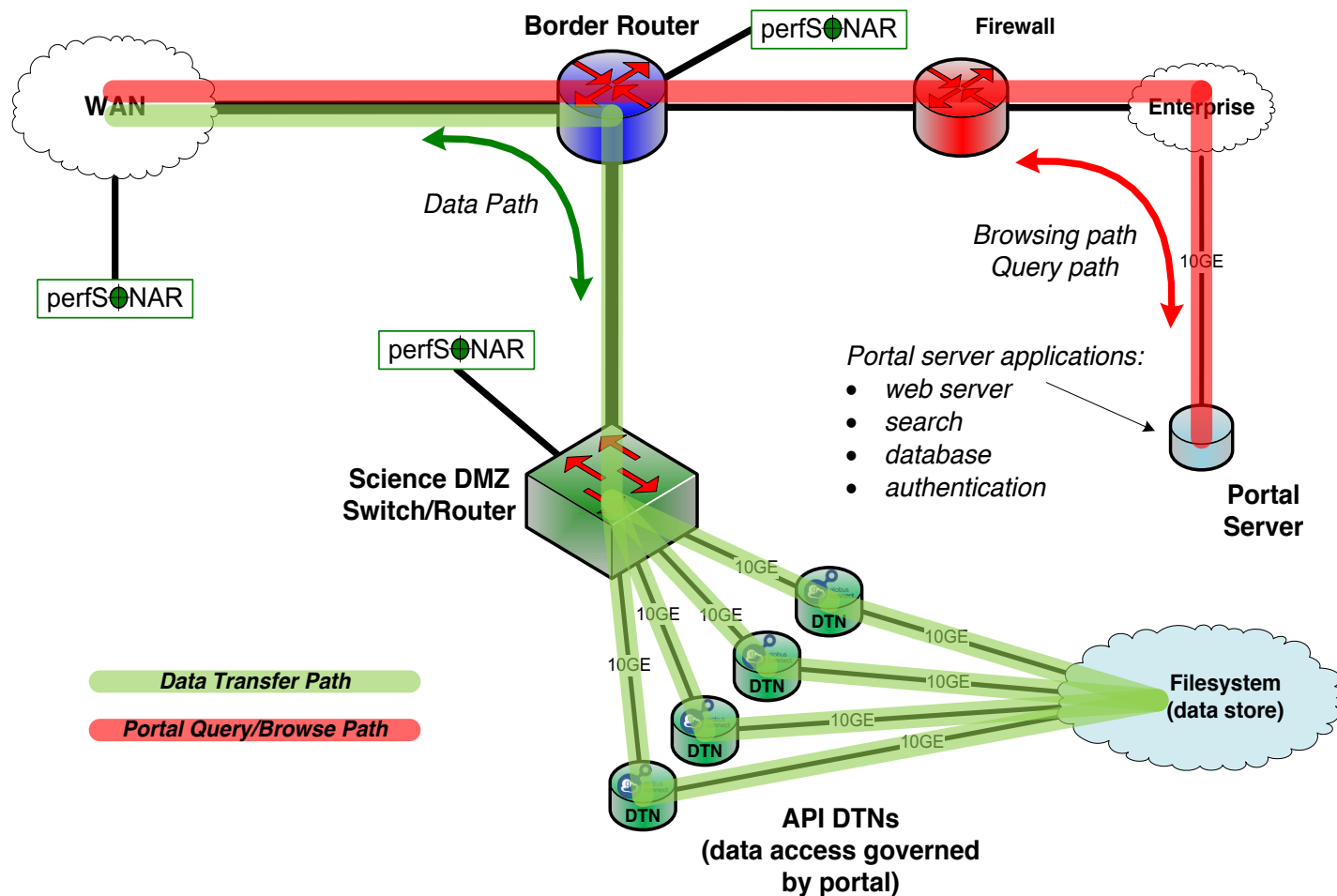


Prototypical research data portal





Next-Generation Portal Leverages Science DMZ



<https://fasterdata.es.net/>

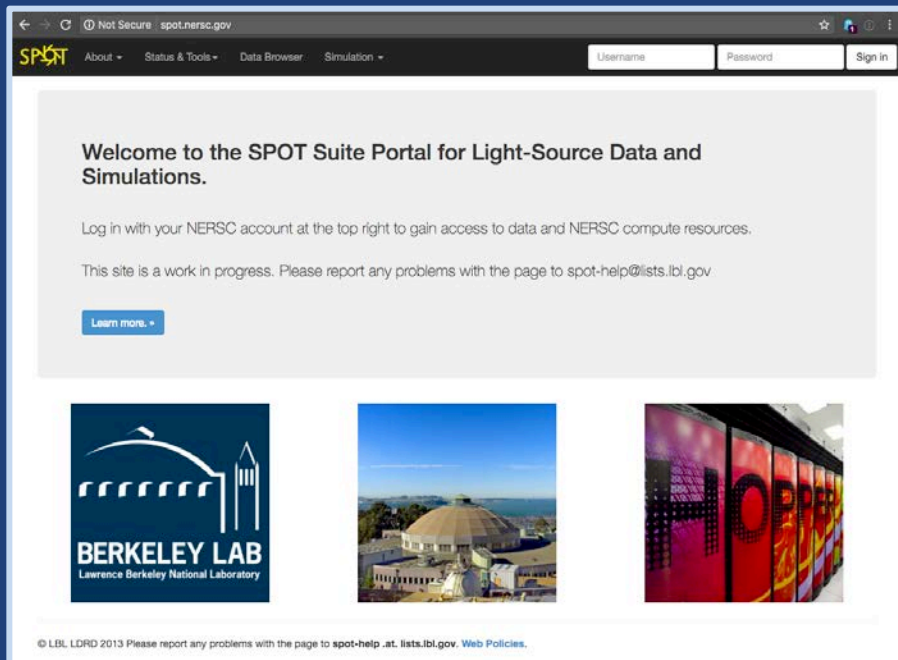


Sample Research Data Portal

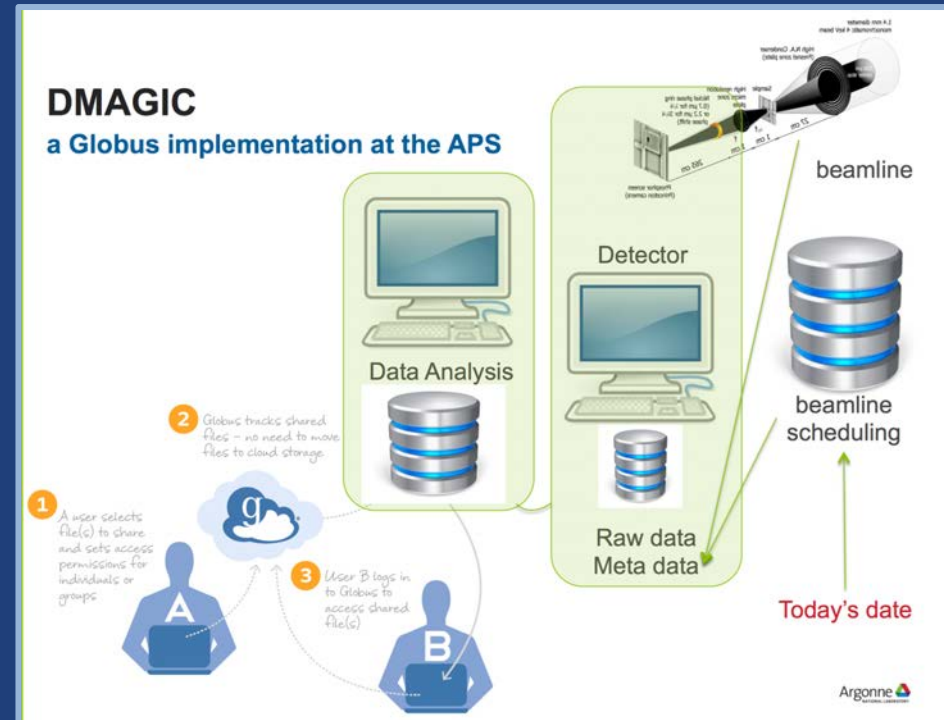
[**github.com/globus/
globus-sample-data-portal**](https://github.com/globus/globus-sample-data-portal)



Example: Automation



Spot.nsl.gov



Courtesy of Francesco De Carlo, Argonne National Laboratory (2016)

dmagic.readthedocs.io



Example: Command Line Interfaces

```
$ 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



Security Challenge

- **How to provide:**
 - Login to apps
 - Web, mobile, desktop, command line
 - Protect all REST API communications
- **While:**
 - Not introducing even more identities
 - Providing least privileges security model
 - Being agnostic to programming language and framework
 - Being web friendly
 - Making it easy for users and developers



Globus Auth

- **Foundational identity and access management (IAM) platform service**
- **Simplify creation and integration of advanced apps and services**
- **Brokers authentication and authorization interactions between:**
 - end-users
 - identity providers: InCommon, XSEDE, Google, portals
 - services: resource servers with REST APIs
 - apps: web, mobile, desktop, command line clients
 - services acting as clients to other services



Globus Auth

- Identity and access management PaaS

docs.globus.org/api/auth

- Introduction
- Developer Guide
- Reference



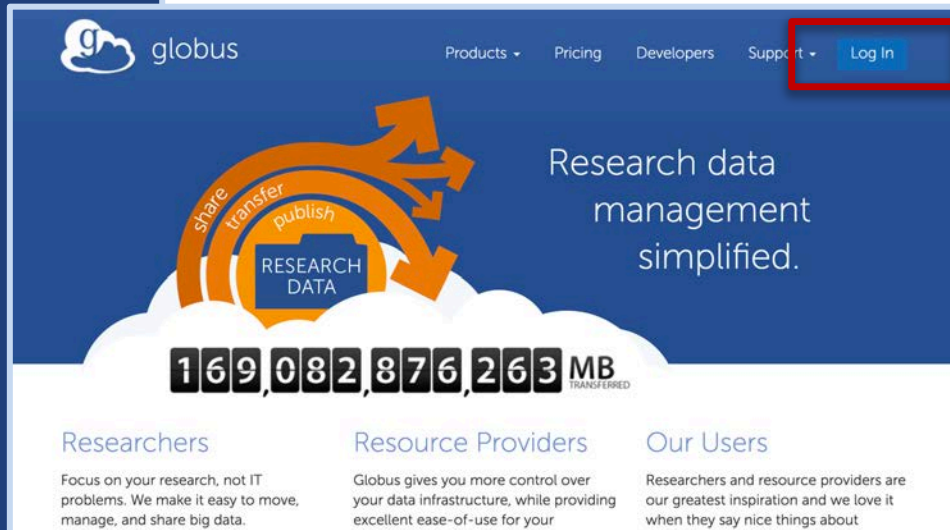
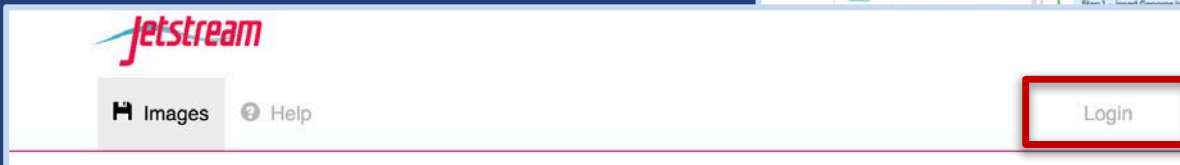
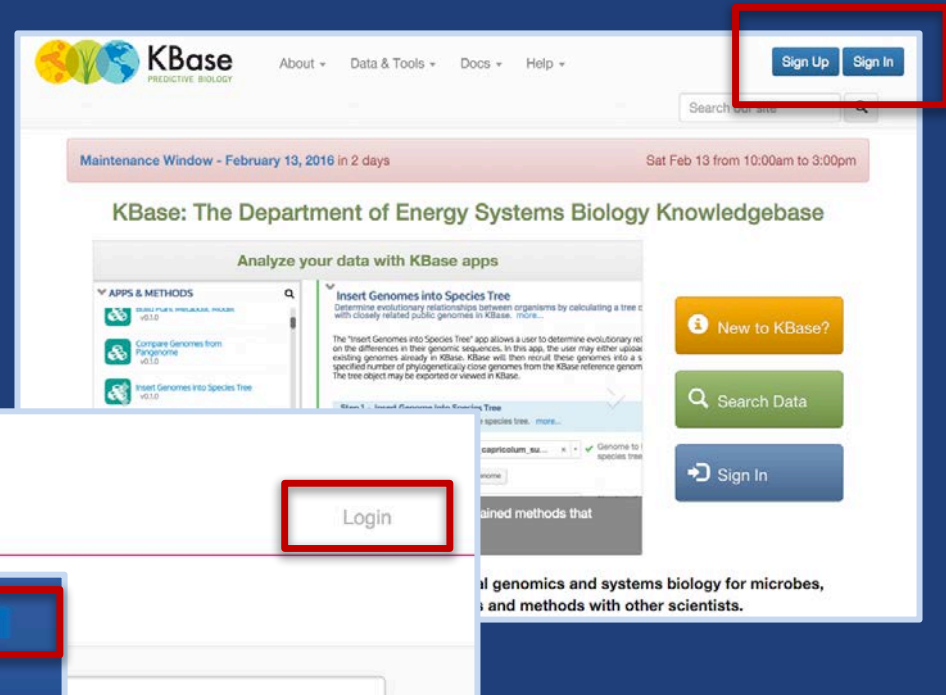
Based on widely used web standards

- **OAuth 2.0 Authorization Framework**
 - aka OAuth2
- **OpenID Connect Core 1.0**
 - aka OIDC



Log in with Globus

- Similar to:
“Log in with Google”
“Log in with Facebook”
- Using existing identities
- Providing access to community services





Protect all REST API communications

- **App → Globus services**
- **App → non-Globus services**
- **Service → Service**



Globus Transfer API

- **Nearly all Globus Web App functionality implemented via public Transfer API**
 - File and folder management, transfer, sharing, and sync

docs.globus.org/api/transfer



Globus Python SDK

- Python client library for the Globus Auth and Transfer REST APIs

globus.github.io/globus-sdk-python

- Open source



Python SDK Jupyter notebook

- Jupyter (iPython) notebook demonstrating use of Python SDK

github.com/globus/globus-jupyter-notebooks

- Open source



HTTPS to Endpoints

- **Each endpoint HTTPS server is a Globus Auth protected service**
- **Web pages can link to files on server**
- **Apps and services can request access token to access endpoint via HTTPS**



Globus Search PaaS (coming soon)

- **All data, irrespective of location**
- **Access controlled metadata and data**
- **Schema agnostic**
- **Flexible, deep metadata indexing**
- **Rich query API**
- **Ingestion API**



Why Globus Auth for your service?

- **Outsource all identity management and authentication**
 - Federated identity with InCommon, Google, etc.
- **Outsource your REST API security**
 - Consent, token issuance, validation, revocation
 - You provide service-specific authorization
- **Apps use your service like all others**
 - Its standard OAuth2 and OIDC
- **Your service can seamlessly leverage other services**
- **Other services can leverage your service**
- **Implement your service using any language and framework**

Add your service to the science cyberinfrastructure platform



Join the Globus developer community

- Join `developer-discuss@globus.org` mailing lists: globus.org/mailing-lists
- Documentation: docs.globus.org
- Python SDK and CLI
- Examples: Jupyter notebook, sample data portal, native app examples

Together we can build an integrated ecosystem of services and applications



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