Enabling Research Collaboration and Data Management Through Globus

Troy Axthelm
Advanced Research Computing Center
University of Wyoming

Presented April 14, 2015

ARCC Overview

Advanced Research
Computing Center Overview

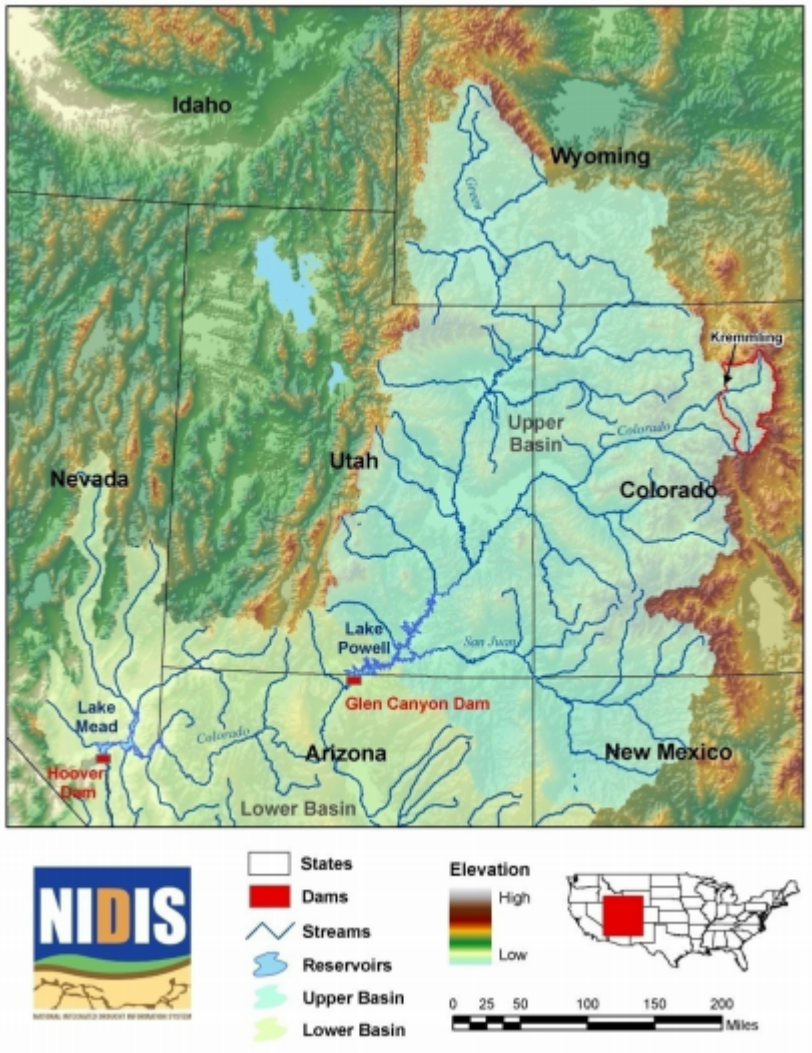
- Computational research support to all areas of study on campus
- Multiple compute clusters, Mount Moran is the primary cluster for research: 284 node/4,544 core
- Provide storage services, with plans of adding a Peta-scale storage system
- Partnerships with NCAR-Wyoming Supercomputing Center (NWSC), XSEDE, University of Utah
- Member of Internet 2, Front Range GigaPop

Enabling Collaboration

CI-Water Project : A Utah-Wyoming Cyberinfrastructure Water Modeling Collaboration

"Massive amounts of data on interrelated natural and built systems affecting water resources require robust networks and data centers through CI-Water, the University of Wyoming and University of Utah, which serve as data hubs for researchers throughout the region, have upgraded equipment and systems to better address the needs of researchers, water resource managers and general public"

Enabling Collaboration



- Modeling watershed for the entire Upper Colorado River Basin
- 288,000 km^2 area to model
- Variable resolution model, based on elevation
- Petabytes of data generated on compute clusters in Wyoming:
  - Mount Moran (UWYO)
  - Yellowstone (NWSC)
- Data stored on Peta-scale storage system in Utah

Enabling Collaboration

- In less than a year, the CI-Water project has transferred over 150 TB of data between the University of Wyoming and Utah
- Additional data has been transferred between NWSC and Utah using Globus
- Ease of use of Globus allows CI-Water researchers to focus on their research and not be burdened by the nuances of data transfer
- Tools like Globus make collaborative projects like this more practical

Controlled Data Access

Secure, Controlled Data Access Through Globus

ARCC was approached by a researcher, who works with sensitive terra-scale data, with a request to be able to share data with external collaborators with ease. This data needed to be available at fast transfer rates.

The researcher requested control of the following:

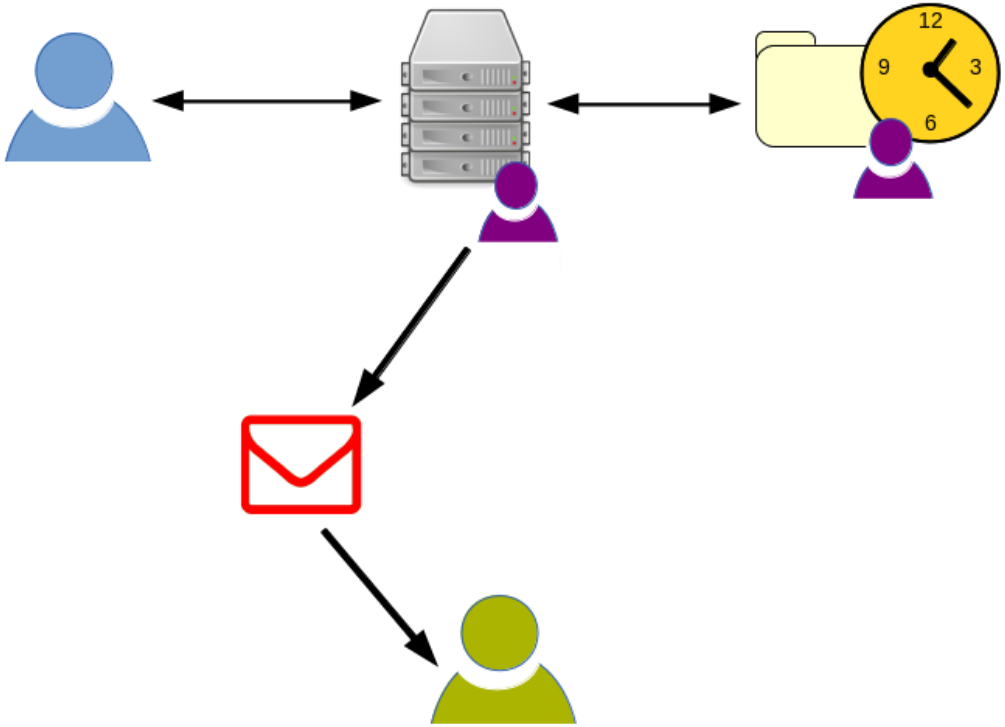
- Time duration that the collaborator would have access to the files
- Location of the storage system that the data would be stored on, could not be an external server
- Permissions granted to the collaborator

Controlled Data Access

A request is made by the file owner to share a file:

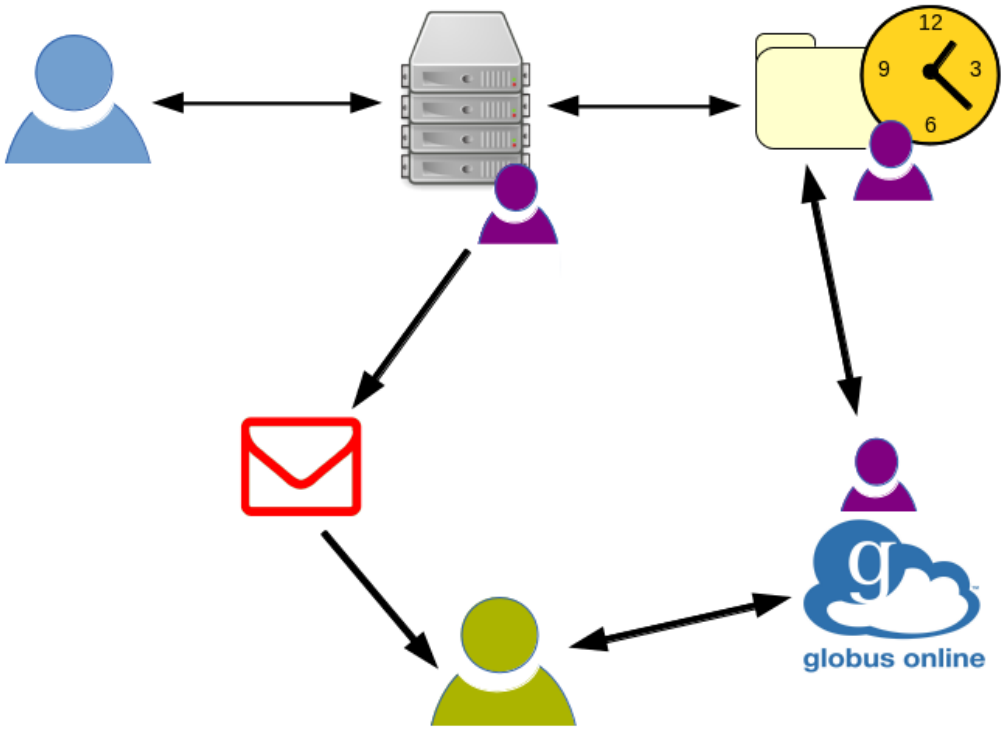
quickShare someone@mail.com -h 6 ./afile ♪

Controlled Data Access



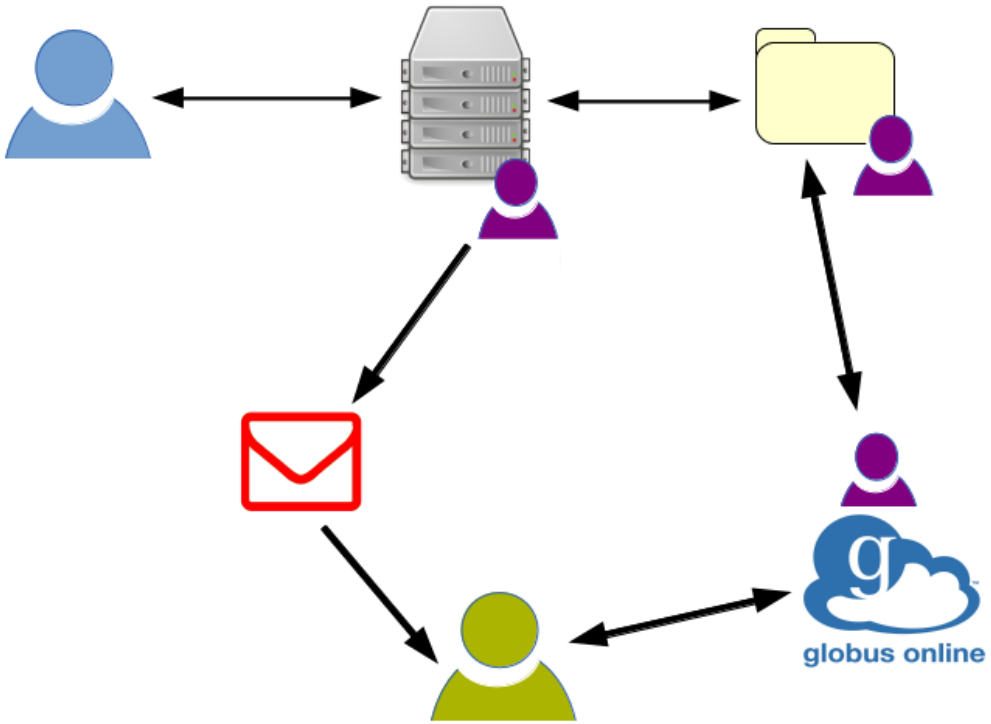
Temporary user created and given permissions to file
Email notification of file shared and access procedure

Controlled Data Access

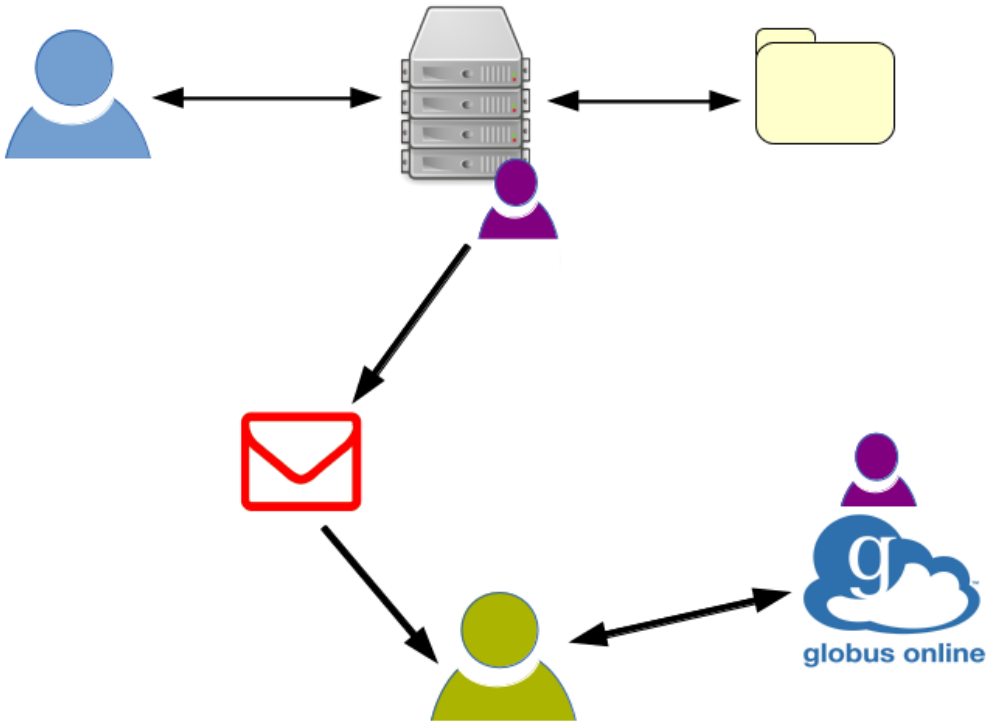


Collaborator can now login to Globus, authenticate endpoint with temporary account, and access file

Controlled Data Access



Controlled Data Access



After timeout of file access, temporary user permissions are revoked

Controlled Data Access

Temporary user is then deleted from the host, eliminating access to the system.

Enabling Research Collaboration and Data Management Through Globus

Troy Axthelm
Advanced Research Computing Center
University of Wyoming

Please email questions/comments to:
troy.axthelm@uwyo.edu