globus

DataSet Services in GlobusOnline

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How Do We Use Data?

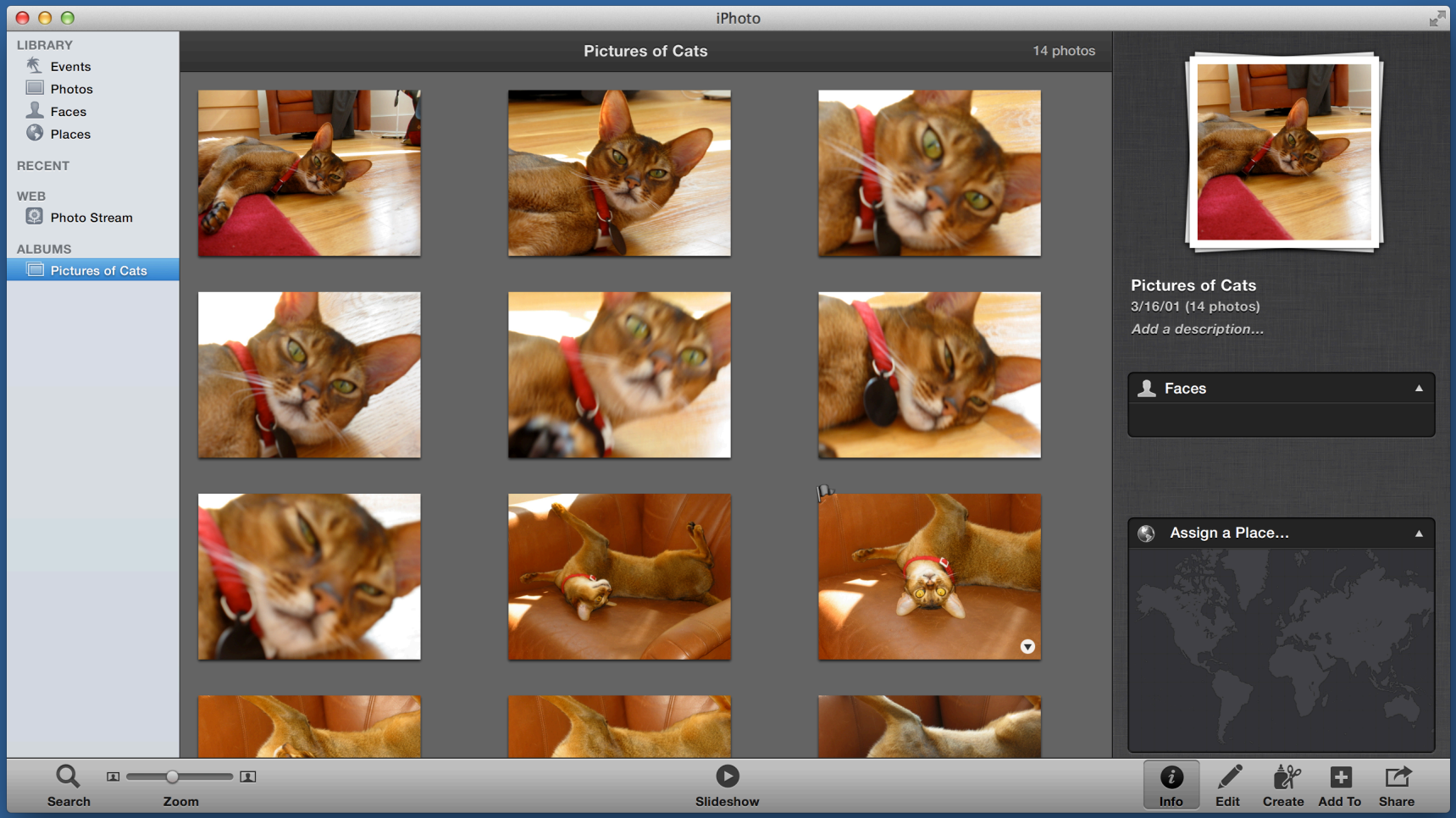
- **Researcher's questions often require many pieces of data to answer**
- **Data elements are spread across:**
  - Different locations, e.g. GO endpoints
  - Different file types (excel, txt, CDF, HDF, DICOM)
  - Ad hoc types and locations
- **Appropriate grouping of data can vary during investigation**
- **Data need to be operated on as a unit**
  - Shared, processed, copied, …

Organizing Data Is a Challenge

- **Structure into directories using file and directory naming conventions**
  - Hard to change once its done
  - Globus Transfer can help once we have done this
- **Capture data status in README files, …**

  Managing complex heterogeneous data using ad hoc methods is too time-consuming, complex and error prone
  - Why can't we manage our data like we manage our pictures and music?

Photos as DataSets

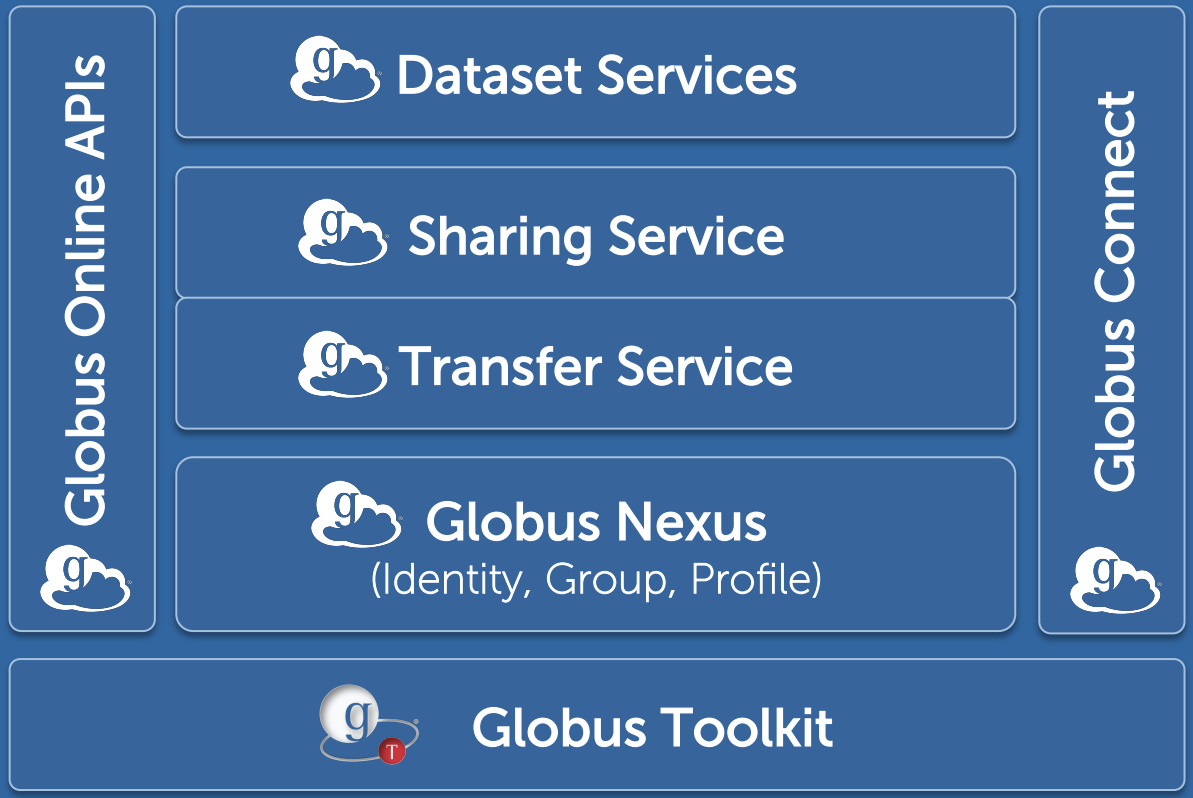


Introducing the DataSet

- **Provide a simple method for grouping together files based on use**
  - Logical grouping to organize, reorganize, search and describe closer to how the data is used
- **Tag the data with characteristics that reflect its content**
  - Capture as much existing information as we can
- **Tag data to reflect current status in investigation**
  - Stage of processing, provenance, validation, ..
- **Share data sets for collaboration**
- **Provide methods that operate on data sets**
  - Copy, export, analyze, ...

Globus DataSet Services

- **Builds on current GO services and new hosted services**
  - tagging service (tagfiler)
  - Extensible metadata extraction service (InBox)
- **Accessible via UI or REST interface**



Demonstration in Genomics

- **Exome analysis pipelines used by the Onel lab at U. Chicago**
  - Compare gene sequence data from leukemia patients against the human genome project sequence data to investigate rare variants
  - More detailed description of science in next talk
- **Data from human and animal subjects**
- **Phenotypic, genotypic and imaging data**
  - DICOM, FASTQ, and VCF formatted files
- **Create datasets around patients and analyze**
  - Create, annotate, share, and export

Demonstration

DataSet Services Wrapup

- **Paradigm shift in how researchers work with their data**
  - Allow researcher to organize data in ways that make sense for what they are trying to do
- **Enhances sharing and collaboration**
- **Data management for the small labs**
- **Thanks to: Karl Czajkowski, Rob Schuler, Bryce Allen, Rachana Ananthakrishnan, Steve Tuecke**

Questions and Open Discussion