FuncX in NIH's Common Fund Data Ecosystem (CFDE) Portal

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COMMON
FUND
DATA
ECOSYSTEM

NIH Common Fund Data Ecosystem (CFDE)

NIH National Institutes of Health
Turning Discovery Into Health

- The **Common Fund Data Ecosystem (CFDE)** is an attempt to standardize, simplify, and enhance researchers' experience with NIH's Common Fund data, much like…
  - NASA EOS portal (Earth observational data)
  - USGS ScienceBase (geological data)
  - ACCESS (NSF supercomputing centers)
- NIH's **Common Fund** sponsors several dozen big programs (each with dozens of individual awards) that produce valuable medical data.
  - Each program has one (or more) **Data Coordinating Centers (DCCs)** that collect and manage the data from the all the projects in the program.
  - Each DCC is essentially a data silo.

Gabriella Miller Kids First
PEDIATRIC RESEARCH PROGRAM
Data Resource Center

HMP

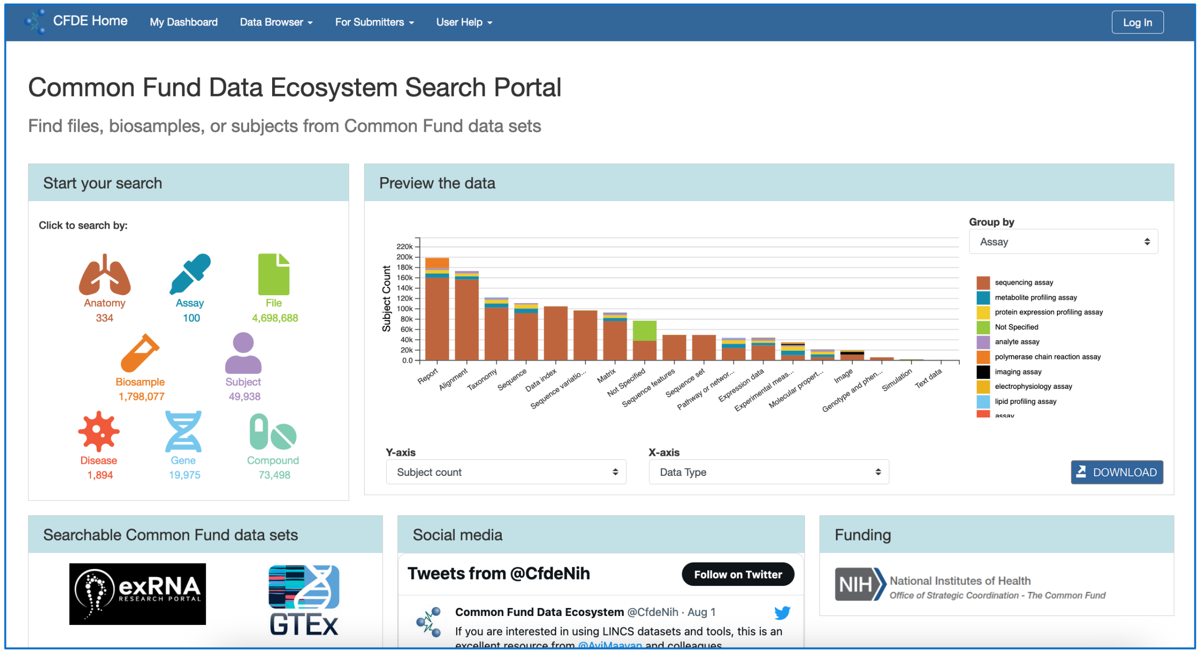
4D Nucleome

GTEx

SPARC

HuBMAP

CFDE Portal - Discover data from the NIH Common Fund



Common Fund Data Ecosystem Search Portal

Find files, biosamples, or subjects from Common Fund data sets

Start your search

Click to search by:

Anatomy	334
Assay	100
File	4,698,688
Biosample	1,798,077
Subject	49,938
Disease	1,894
Gene	19,975
Compound	73,498

Preview the data

Group by
Assay

Y-axis
Subject count

X-axis
Data Type

Searchable Common Fund data sets

Social media

Tweets from @CfdeNih

Common Fund Data Ecosystem @CfdeNih · Aug 1

If you are interested in using LINCS datasets and tools, this is an excellent resource from @AviMaayan and colleagues

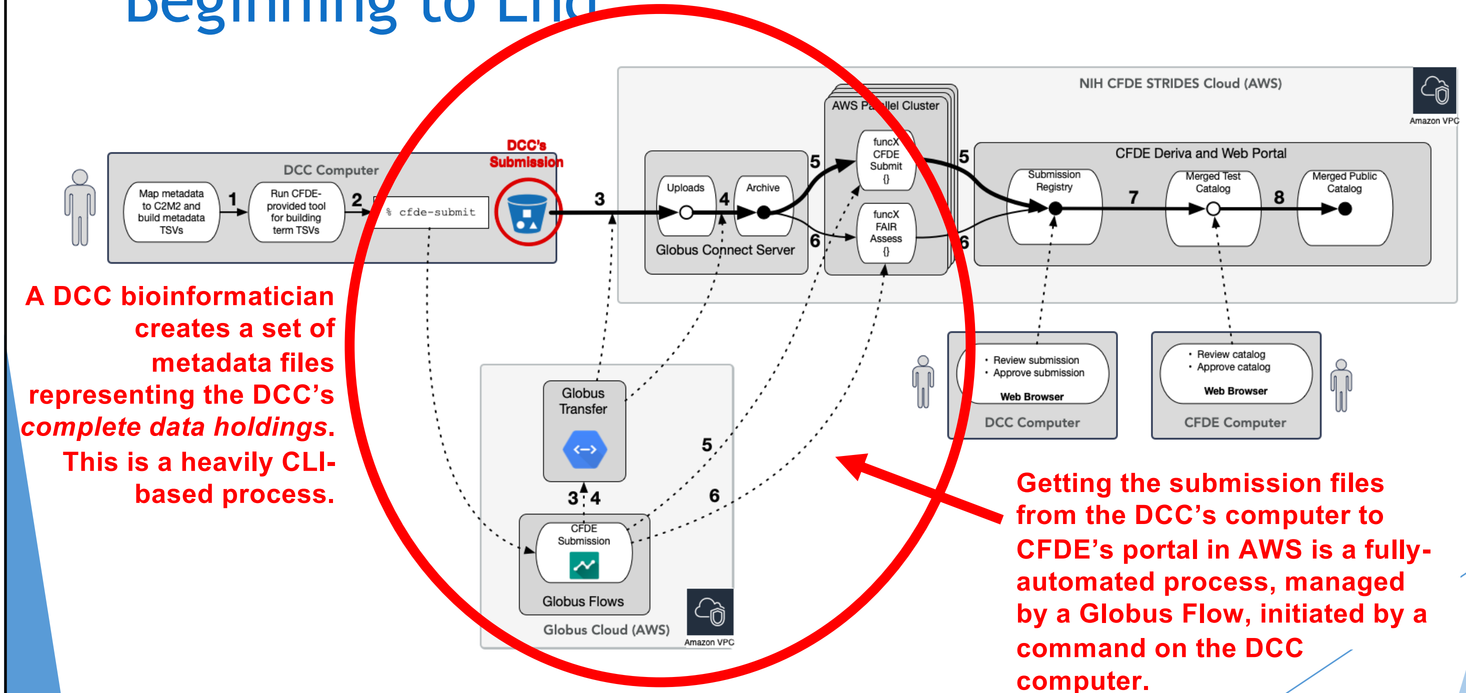
Funding

National Institutes of Health
Office of Strategic Coordination - The Common Fund

https://app.nih-cfde.org/

…but how does CFDE know what each DCC has?

Updating the CFDE Portal’s copy of a Data Coordinating Center’s holdings: Beginning to End

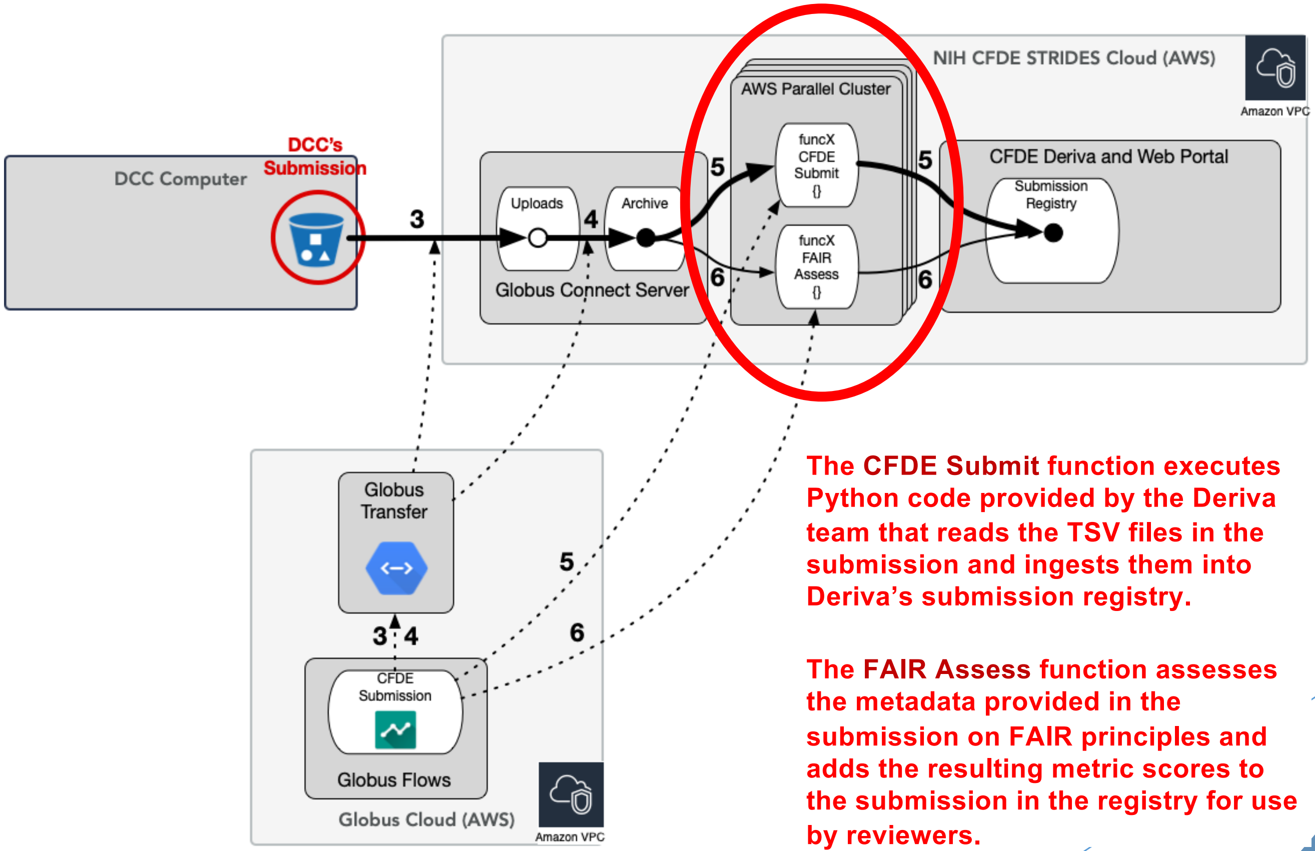


A DCC bioinformatician creates a set of metadata files representing the DCC’s *complete data holdings*. This is a heavily CLI-based process.

Getting the submission files from the DCC’s computer to CFDE’s portal in AWS is a fully-automated process, managed by a Globus Flow, initiated by a command on the DCC computer.

After the submission is present in the CFDE Portal, curation by authorized DCC and CFDE personnel is performed using the portal’s web interface.

FuncX in the CFDE submission flow



The CFDE Submit function executes Python code provided by the Deriva team that reads the TSV files in the submission and ingests them into Deriva's submission registry.

The FAIR Assess function assesses the metadata provided in the submission on FAIR principles and adds the resulting metric scores to the submission in the registry for use by reviewers.

Both funcX functions are memory-intensive, and submission traffic is bursty around submission deadlines, so we use an AWS ParallelCluster to handle multiple submissions in parallel if needed and avoid paying for idle resources.