MetaCat and Data Dispatcher

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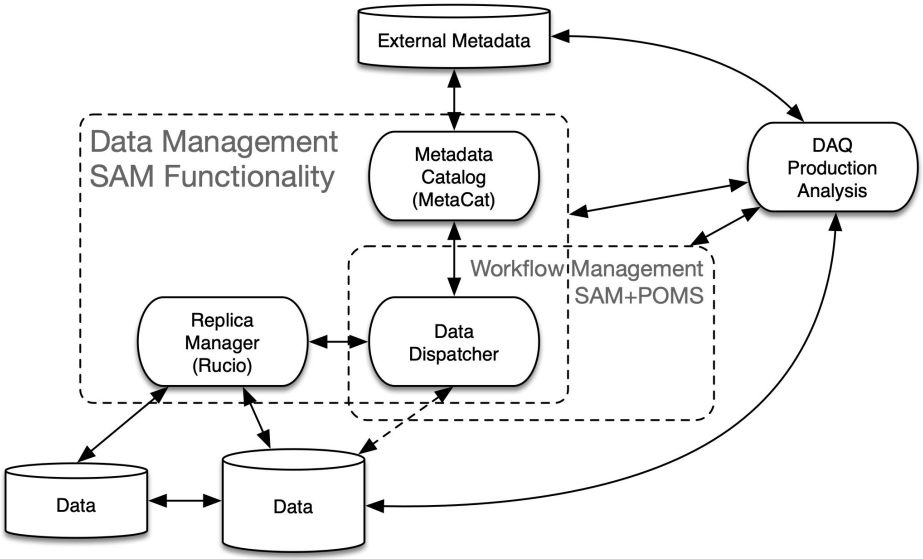
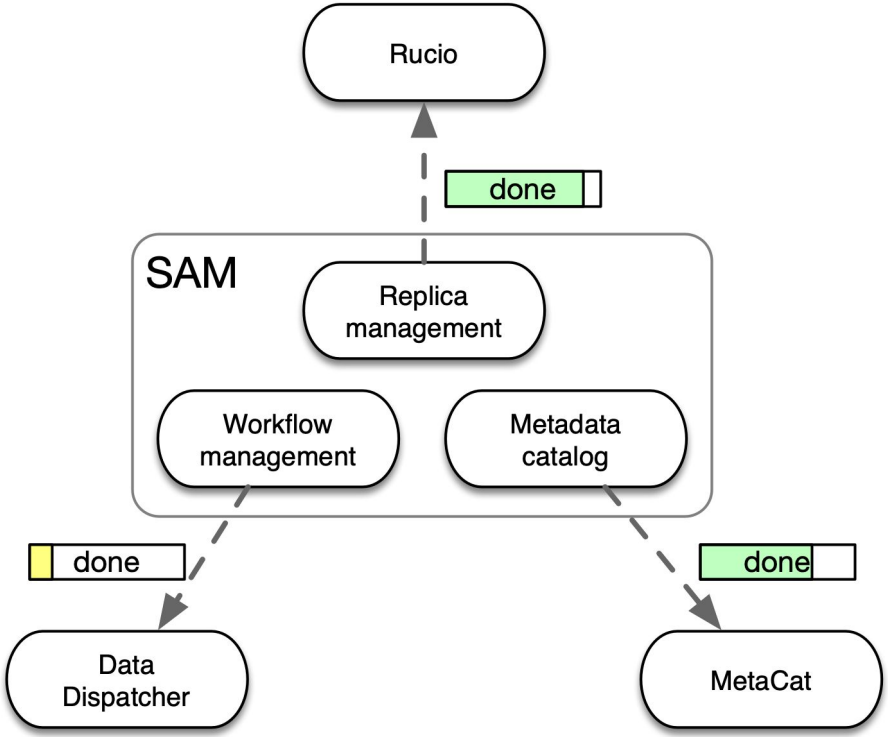
Data Management Big Picture



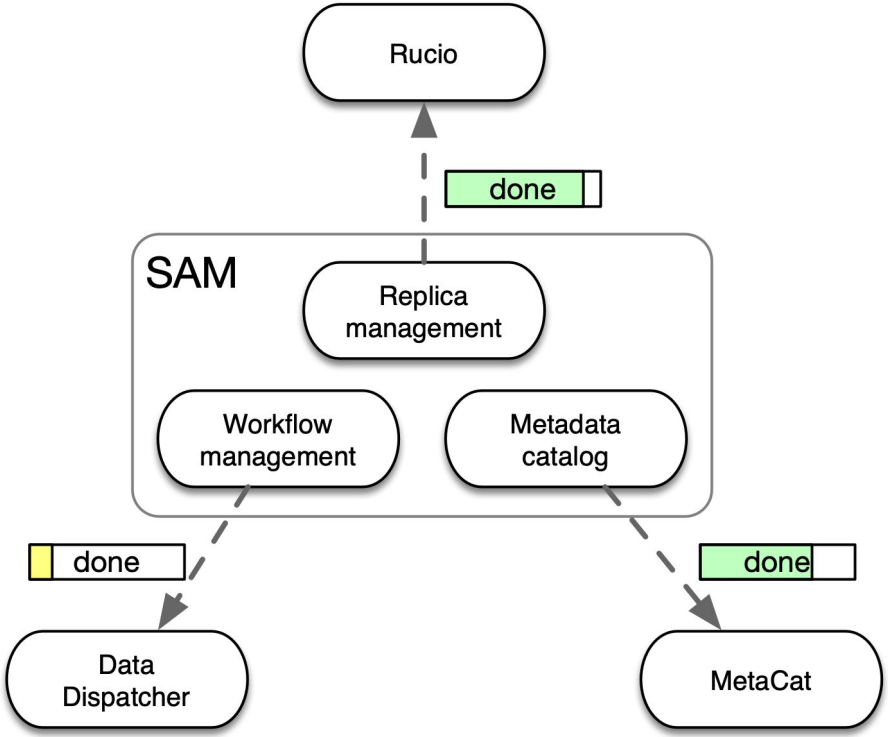
- Metadata catalog
  - What kind of information stored in the file ?
  - What files should be processed (analyzed) ?
- Replica Management
  - Where are copies of the files ?
- Workflow Management
  - File processing coordination
- Currently, SAM+POMS does all
- Goals:
  - Use Rucio as replica manager
  - Decompose SAM
  - Global WMS

Migration from SAM



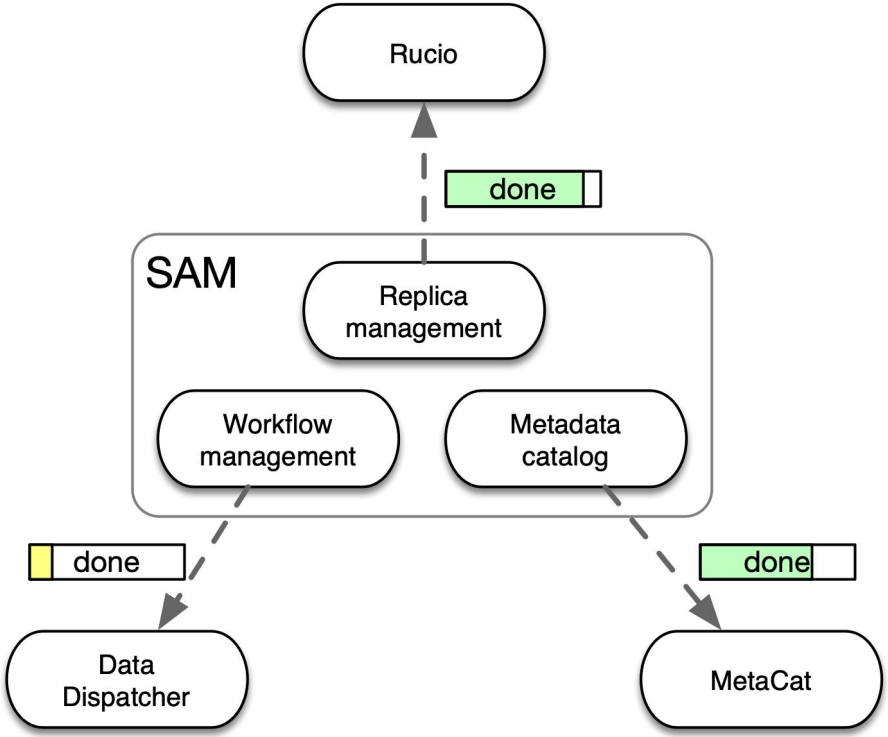
- Replica management
  - Almost done
  - Still uses SAM
  - Replica management delegated to Rucio
    - Virtual location

Migration from SAM



- Metadata catalog
  - MetaCat
  - Development mostly done
  - Volume tests:
    - ProtoDUNE SAM ~10M files
    - NOvA SAM ~200M files, 5.5B name/value pairs
  - External data access test - ProtoDUNE Runs DB
  - Need more feedback !

Migration from SAM



- Data Dispatcher *as piece of SAM*:
  - Requirements and functionality understood
  - Prototype exists
- Interaction with global WMS
  - *Unclear*

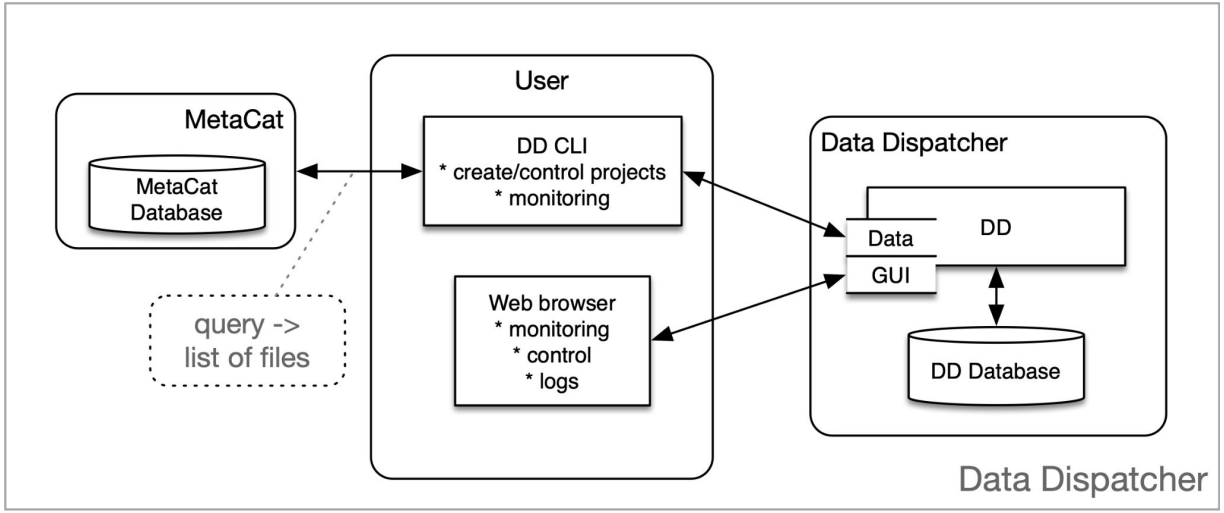
Data Dispatcher Functionality (SAM Station)

- Coordinate workflow as a stream of *projects*
- Project is a list of *files* to process with given executable
- Dispatch file *replicas*, as they become available, to *workers*
  - I am a working on this Project, give me next file
  - File processed successfully
  - File processing failed
- Optimization - replica to CPU proximity, etc.
- Monitoring, logging, control, report generation

Data Dispatcher and MetaCat

- Select “interesting” files
  - MetaCat query
- Create project with Data Dispatcher
- Wait for project completion
  - Monitor project status/progress
- Project final status
  - Logs
  - Reprocess some files ?

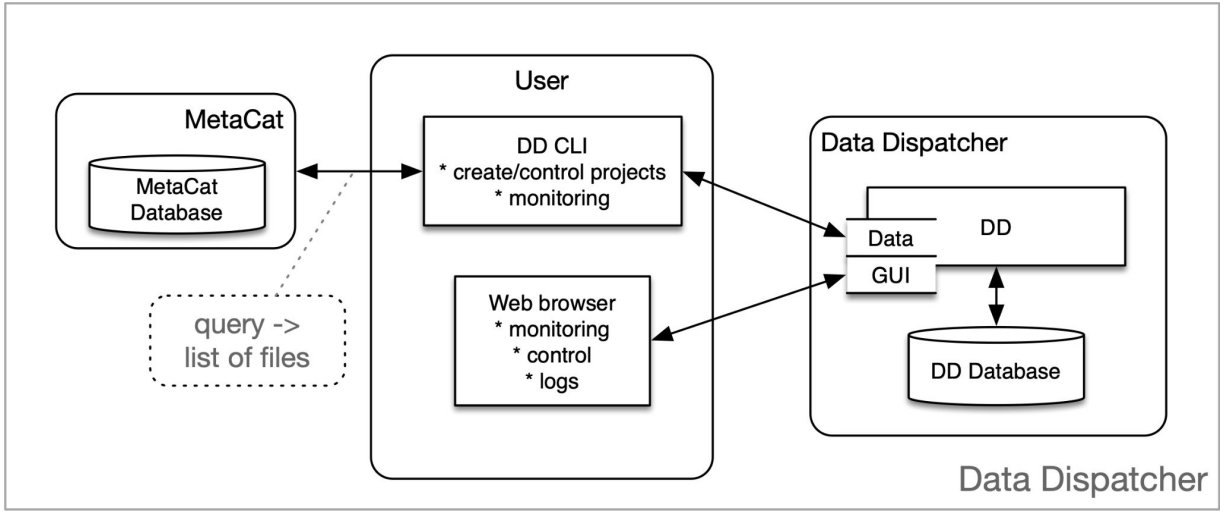
Data Dispatcher and MetaCat



- Query MetaCat for files based on the user's criteria
- Create project with given set of files to process
- DD will run the project

DD = Data Dispatcher

Data Dispatcher and MetaCat



- Query MetaCat for files based on the user's criteria
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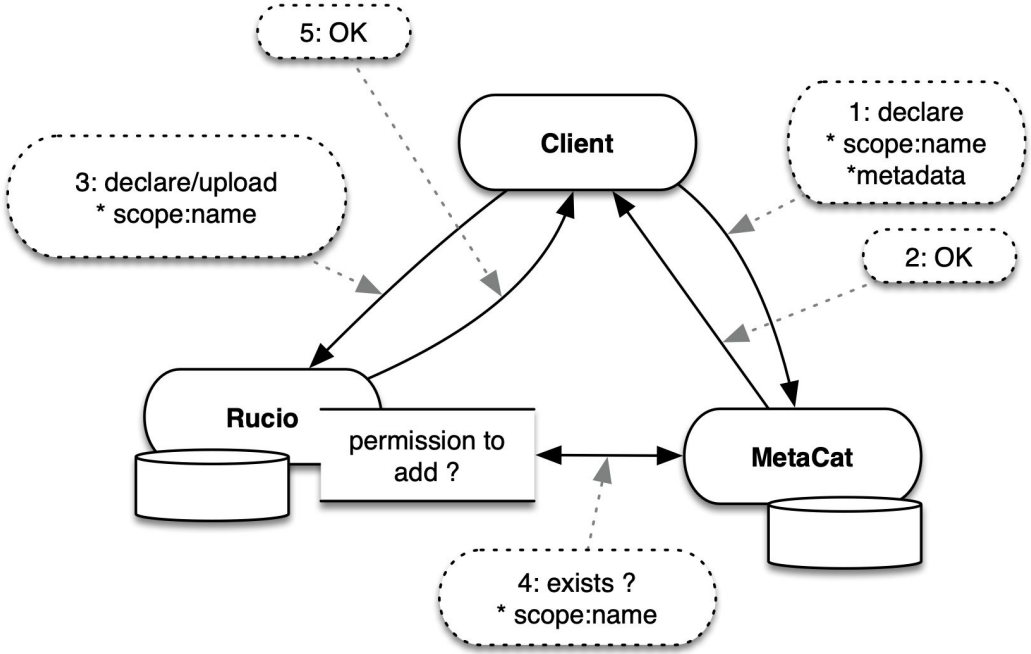
Options:

More SAM-like

Rucio/MetaCat Synchronization

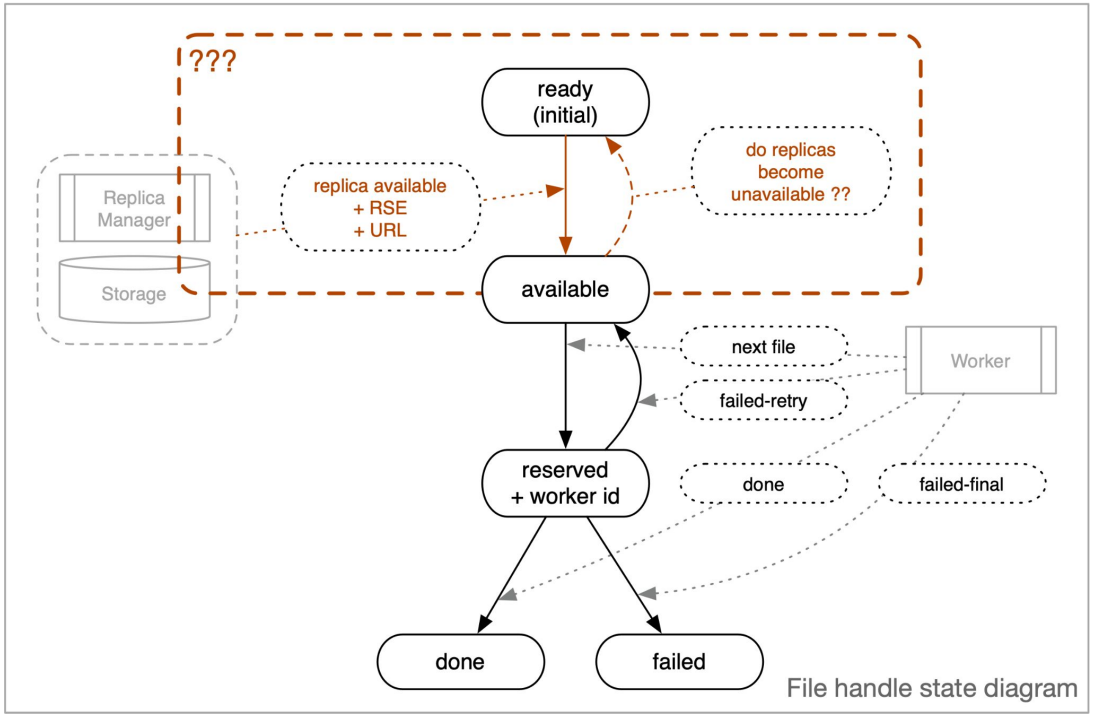


Implementation:

- Customizable permission-to-add-file Rucio module
- Permission is granted only if the file is already known to MetaCat
- Rucio/metadata catalog interface mechanism
  - Rather trivial
  - Written, to be tested

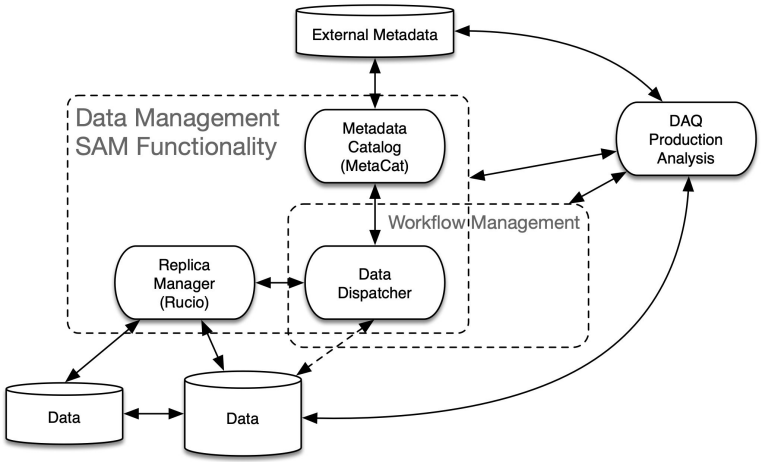
Goal: Make sure all files known to Rucio have metadata in MetaCat

Data Dispatcher and Replica Manager



- Dispatch *replicas* to workers as replicas become available
- Availability notification mechanism options:
  - Poll Rucio ?
  - Subscription/notification mechanism ?
- Data Dispatcher prototype has interface to update replica availability information
  - RSE, URL

Data Dispatcher and Global WMS

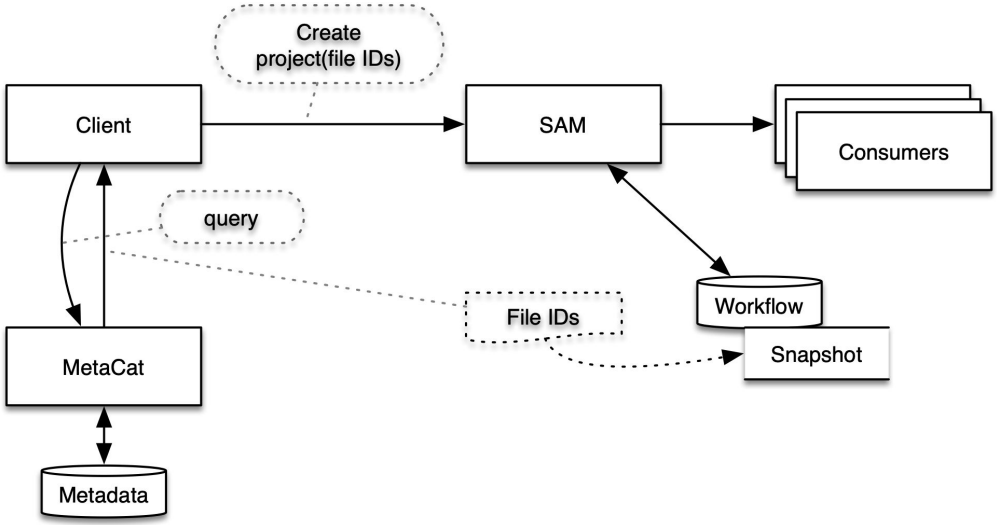


Beyond SAM decomposition - unclear:

- DD/WMS scope separation
- Functionality separation
- Architecture
  - DD is a separate component
  - Or part of WMS
- Communication
  - If separate, how does it communicate with WMS - has to be defined

Further Data Dispatcher development needs these to be cleared

Option: keep using SAM Station as is



1. Client sends query to MetaCat
   - -> List of file IDs
2. Client contacts SAMWeb to create a new snapshot with the list of file IDs
3. SAM creates snapshot
4. SAM creates project for the new snapshot

Minor changes in SAM: add function to create a project from a list of files (file ids)