

ESCAPE DAC21

LSST raw data replication exercise



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(CC-IN2P3)

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Cloud

EPO Data Center

Dedicated Long Haul Networks

Two redundant 100 Gb links from Santiago to Florida (existing fiber)
Additional 100 Gb link (spectrum on new fiber) from Santiago-Florida (Chile and US national links not shown)

UK Data Facility IRIS Network, UK

Data Release Production (25%)

US Data Facility SLAC, California, USA

Archive Center
Alert Production
Data Release Production (25%)
Calibration Products Production
Long-term storage
Data Access Center
Data Access and User Services

French Data Facility CC-IN2P3, Lyon, France

Data Release Production (50%)
Long-term storage

HQ Site AURA, Tucson, USA

Observatory Management
Data Production
System Performance
Education and Public Outreach

Summit and Base Sites

Observatory Operations Telescope and Camera
Data Acquisition
Long-term storage
Chilean Data Access Center



Purpose of this exercise

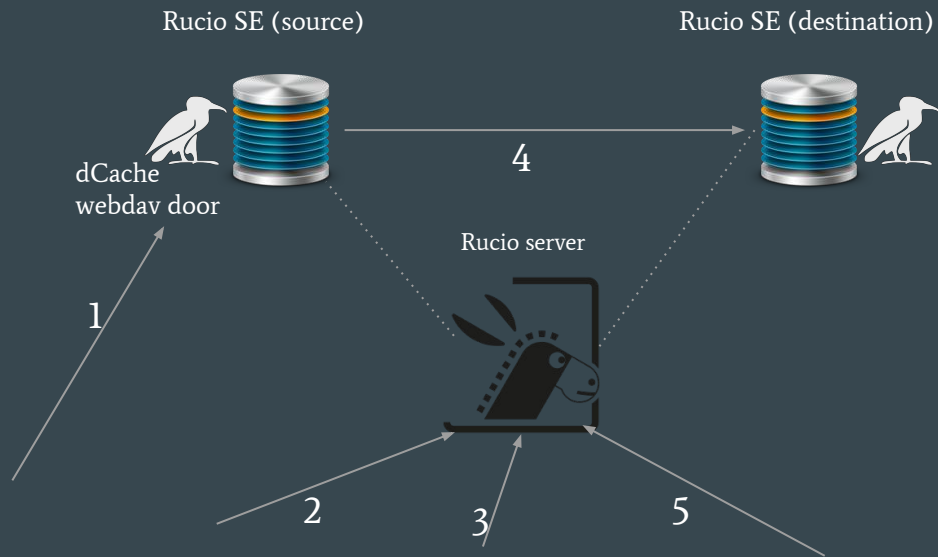
- Use Rucio to drive inter-site replication of one night's worth of LSST data
 - 4,000 exposures, ~800 k files, ~15 TB
 - Desirable time budget: 12 hours, equivalent to one night's data taking period
- Make sure Rucio preserves LSST namespace when replicating data between sites

Exercise conditions

- Inputs: dataset of realistic (simulated) images
 - Already present at CC-IN2P3 on a POSIX file system
- Destination site: CC-IN2P3 dCache
- Source site: ideally would be a US site, for the test to be realistic in terms of network latency
 - If not possible, using another ESCAPE site as the source would be helpful (ideally a site which can support HTTP-based third party copy)
 - If not possible, we will have both the source and destination sites at CC-IN2P3 (this is what we have been doing in development)

Principle of operation

1. Transfer each file of the dataset to the source site
HTTP PUT davs://...
2. Register each file of the dataset in Rucio via Python API
rucio.client.ReplicaClient.add_replica(...)
3. Declare a replication rule for the dataset
rucio add-rule ...
4. Let Rucio do the replication
5. Check that all files of the dataset have been replicated
rucio list-file-replicas ...



Technical details

- Rucio must be able to reconstruct LSST full path (Physical File Name=PFN) from the Rucio Logical File Name (LFN)
 - Custom LFN2PFN will be deployed on the Rucio server and used to access to both source and destination RSE data
 - The following convention will be used:
LFN:directory1__directory2__filename →
PFN:directory1/directory2/filename
 - Standard Rucio schema, used by ESCAPE's instance, does not allow '/' in LFN...
- Data will be removed from RSEs after the end of the exercise