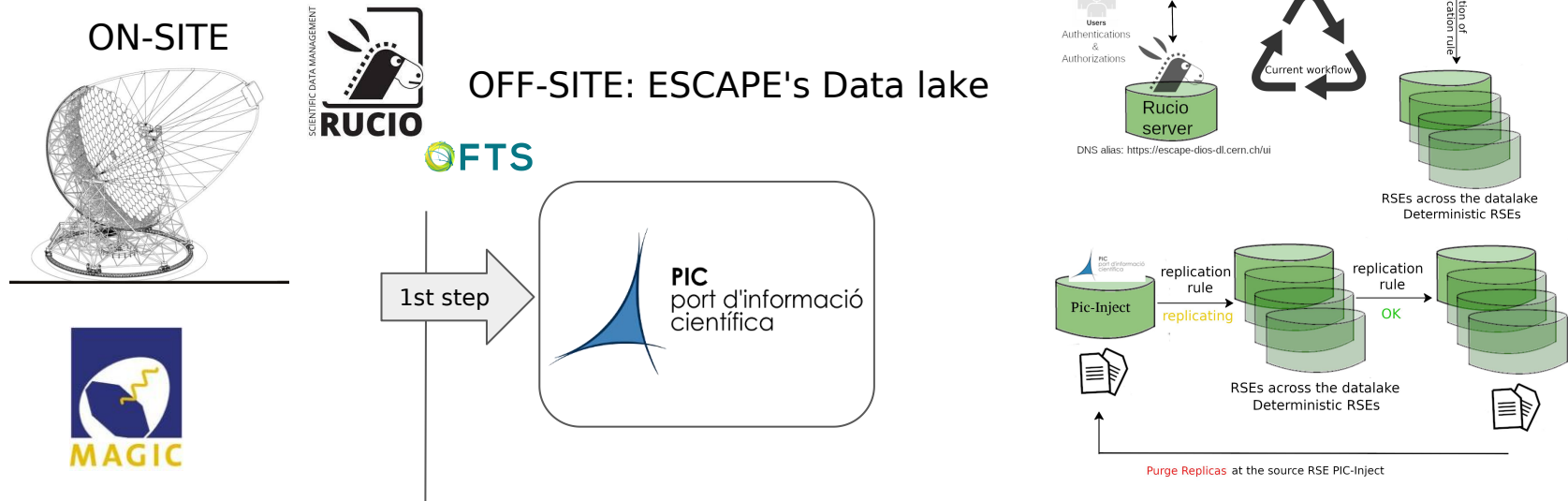

Rucio deployment: Managing MAGIC data

A. Bruzzese (bruzzese@pic.es) on behalf of ESCAPE-PIC working group

WP2 Use case: Long haul ingestion and replication

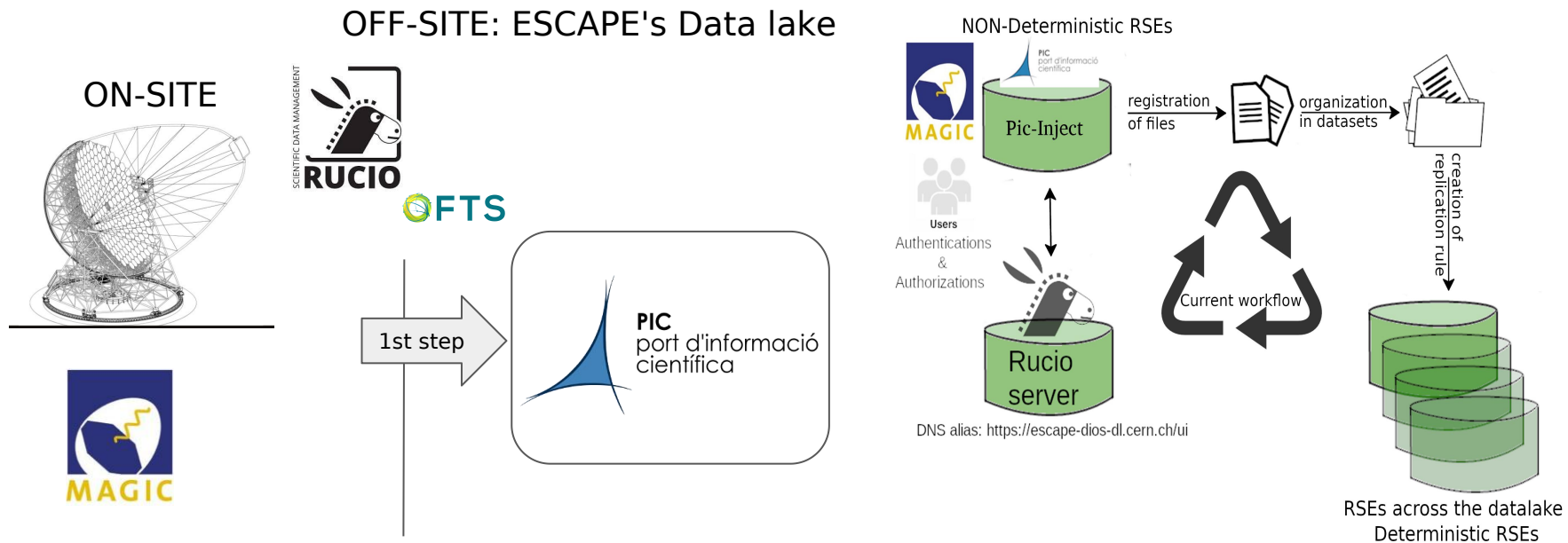
Description/Goal: Ingestion of MAGIC data from a remote site to the ESCAPE's data lake. Data Transfer and replication in off-site and after replication deletion of data at the origin.



WP2 Use case: Long haul ingestion and replication

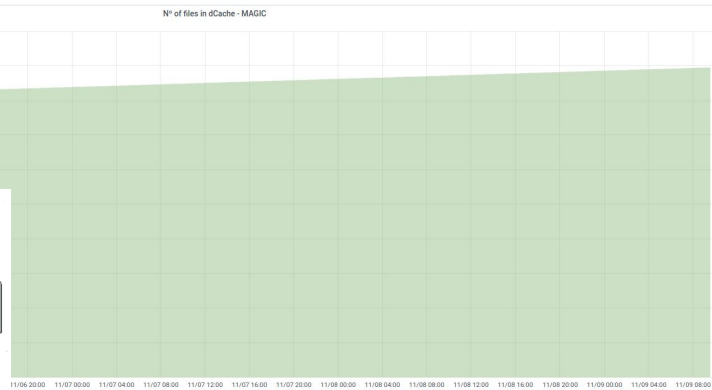
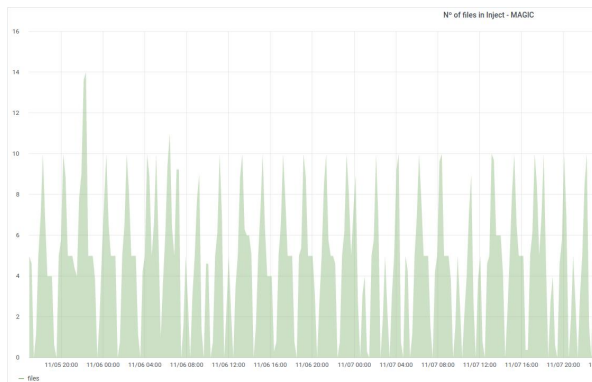
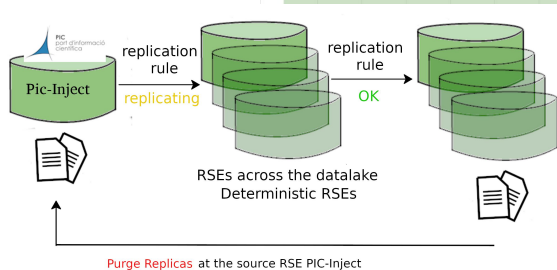
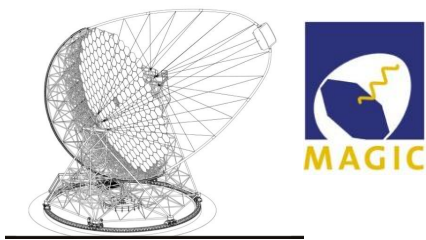
Description/Goal: Ingestion of MAGIC data from a remote site to the ESCAPE's data lake. Data Transfer and replication in off-site and after replication deletion of the data at the origin.

ESCAPE's Rucio results



WP2 Use case: Long haul ingestion and replication

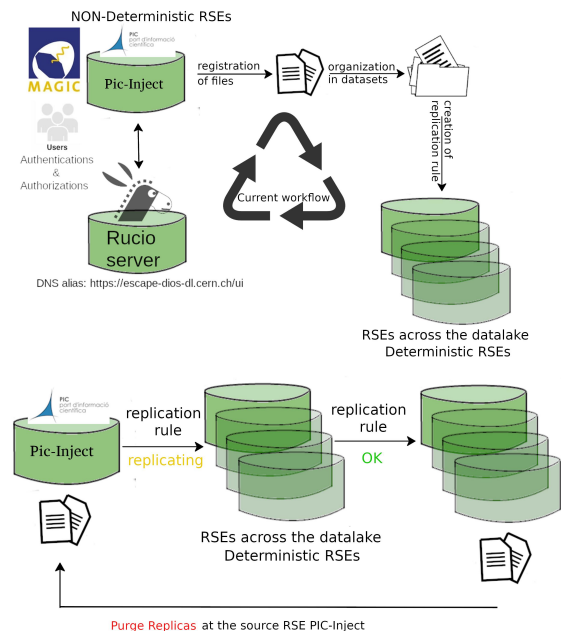
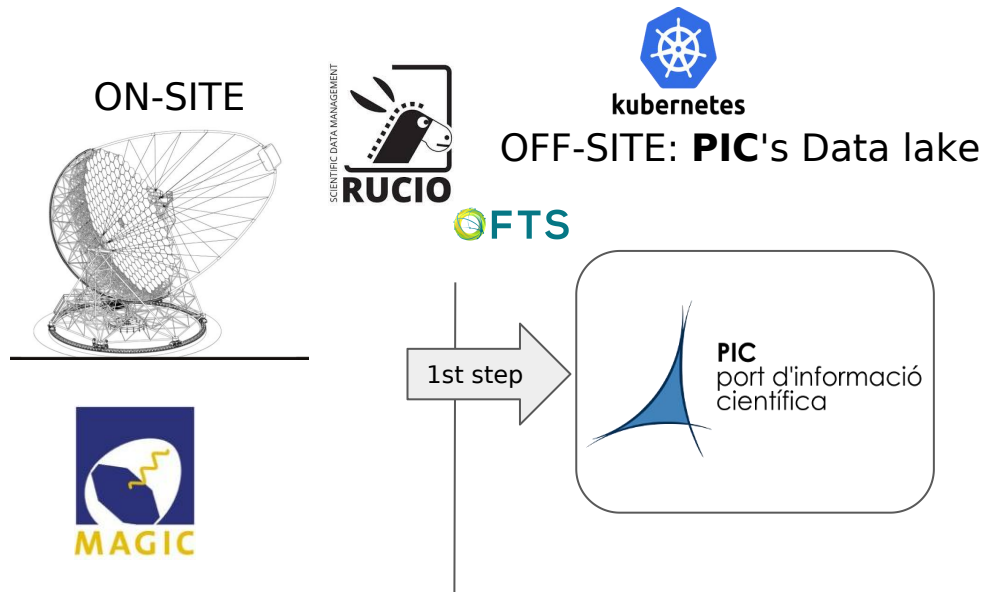
Description/Goal: Ingestion of MAGIC data from a remote site to the ESCAPE's data lake. Data Transfer and replication in off-site and after replication deletion of the data at the origin.



ESCAPE's Rucio instance results

WP2 Use case: Long haul ingestion and replication

Description/Goal: Ingestion of MAGIC data from a remote site to the PIC's data lake. Data Transfer and replication in off-site and after replication deletion of the data at the origin.



Rucio: Kubernetes Cluster

● Deployed with:

- The Rucio server and daemon services are fully packaged with Helm
- Available in : <https://rucio.github.io/helm-charts/>



● Monitoring:

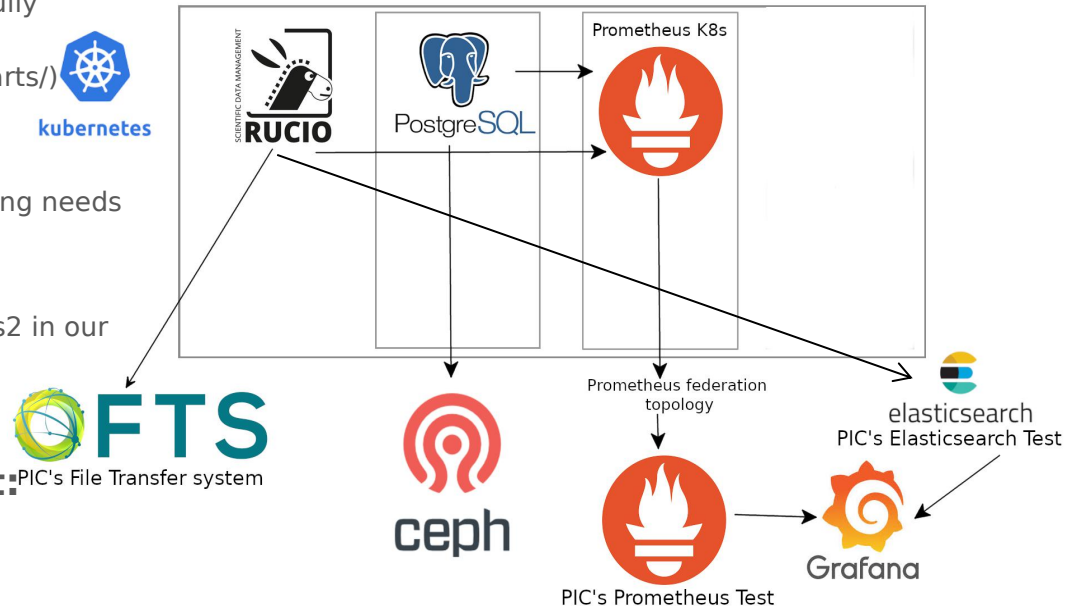
- Will be using Prometheus for all our monitoring needs

● Logging:

- Were currently writing the logs using hermes2 in our own
- Elasticsearch centralized instance

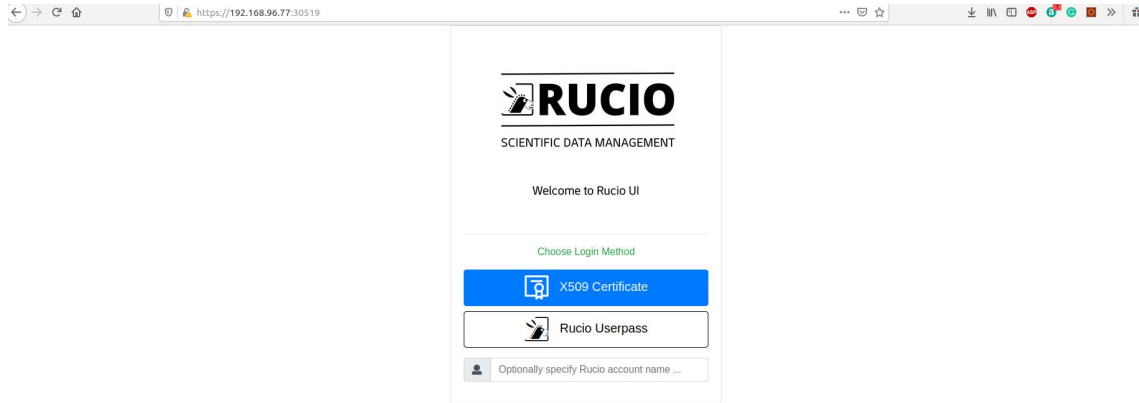
● Limitation of current deployment:


- Test instance



Kubernetes Cluster

Rucio web-ui:

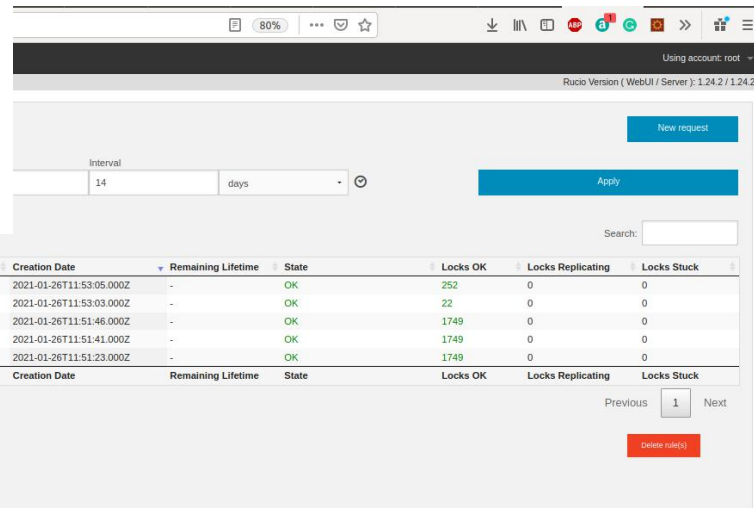




 SCIENTIFIC DATA MANAGEMENT

Welcome to Rucio UI

Choose Login Method



Using account: root

Rucio Version (WebUI / Server): 1.24.2 / 1.24.2

Interval: 14 days

Apply

Search:

Name	Account	RSE Expression	Creation Date	Remaining Lifetime	State	Locks OK	Locks Replicating	Locks Stuck
test-root-RAW_M2	root	PIC-DET	2021-01-26T11:53:05.000Z	-	OK	252	0	0
test-root-RAW_M1	root	PIC-DET	2021-01-26T11:53:03.000Z	-	OK	22	0	0
test-root-LST_DL2	root	PIC-DET	2021-01-26T11:51:46.000Z	-	OK	1749	0	0
test-root-LST_DL1	root	PIC-DET	2021-01-26T11:51:41.000Z	-	OK	1749	0	0
test-root-LST_RAW	root	PIC-DET	2021-01-26T11:51:23.000Z	-	OK	1749	0	0

Showing 1 to 5 of 5 entries

[download as JSON](#)

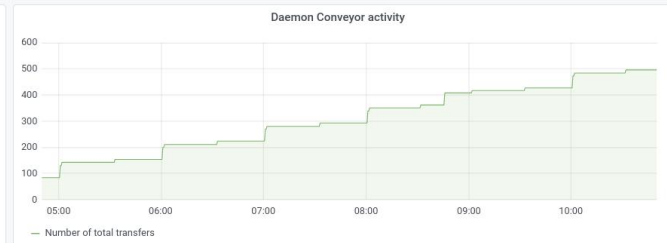
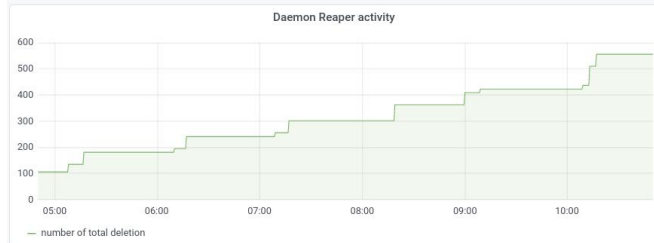
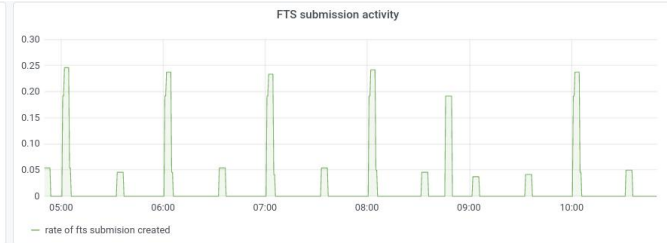
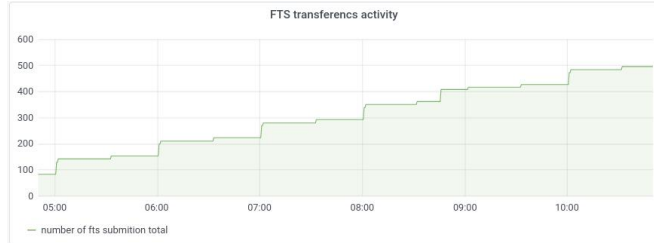
Previous Next



Rucio: Kubernetes Cluster



cherenkov telescope array



Daemon Name

- Judge
- Automatrix
- Conveyor
- Undertaker
- Hermes2
- Kronos
- Reaper
- Necromancer
- Transmogriker
- Abacus

Daemon activity

- replication rule engine
- generates fake data and upload it on a RSE
- handles requests for data transfers
- obsoleting data identifiers with expired lifetime
- delivers messages to an asynchronous broker
- consumes tracer messages and updates replica last access time accordingly
- deletion of the expired data replicas
- tries to repair erroneous rules, by selecting different replica destinations
- is responsible to apply subscriptions and to generate replication rules

Rucio: Kubernetes Cluster

● Deployed with:

- The Rucio server and daemon services are fully packaged with Helm
- Available in : <https://rucio.github.io/helm-charts/>



kubernetes

● Monitoring:

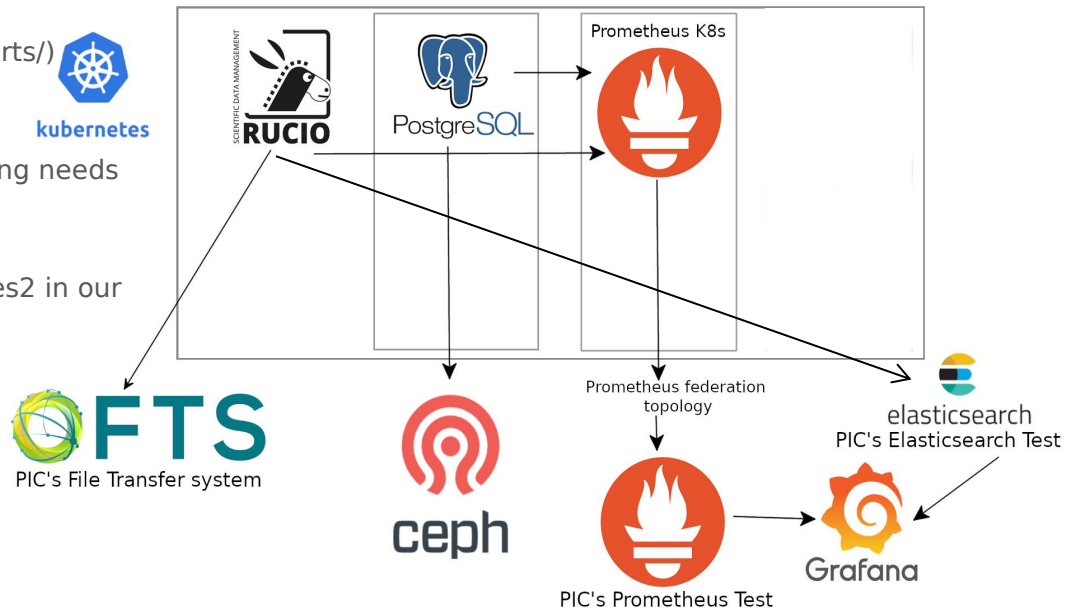
- Will be using Prometheus for all our monitoring needs

● Logging:

- We are currently writing the logs using hermes2 in our own
- Elasticsearch centralized instance

● Limitation of current deployment:

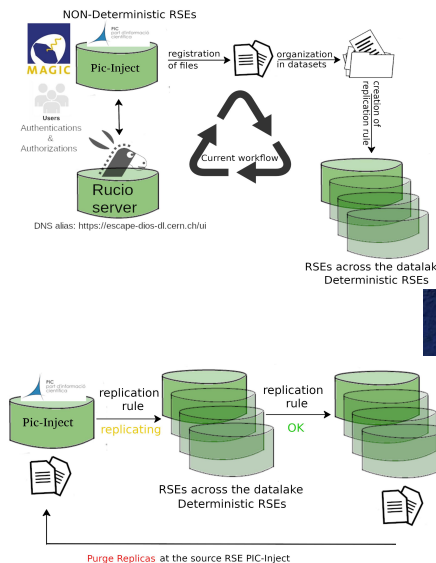
- Test instance



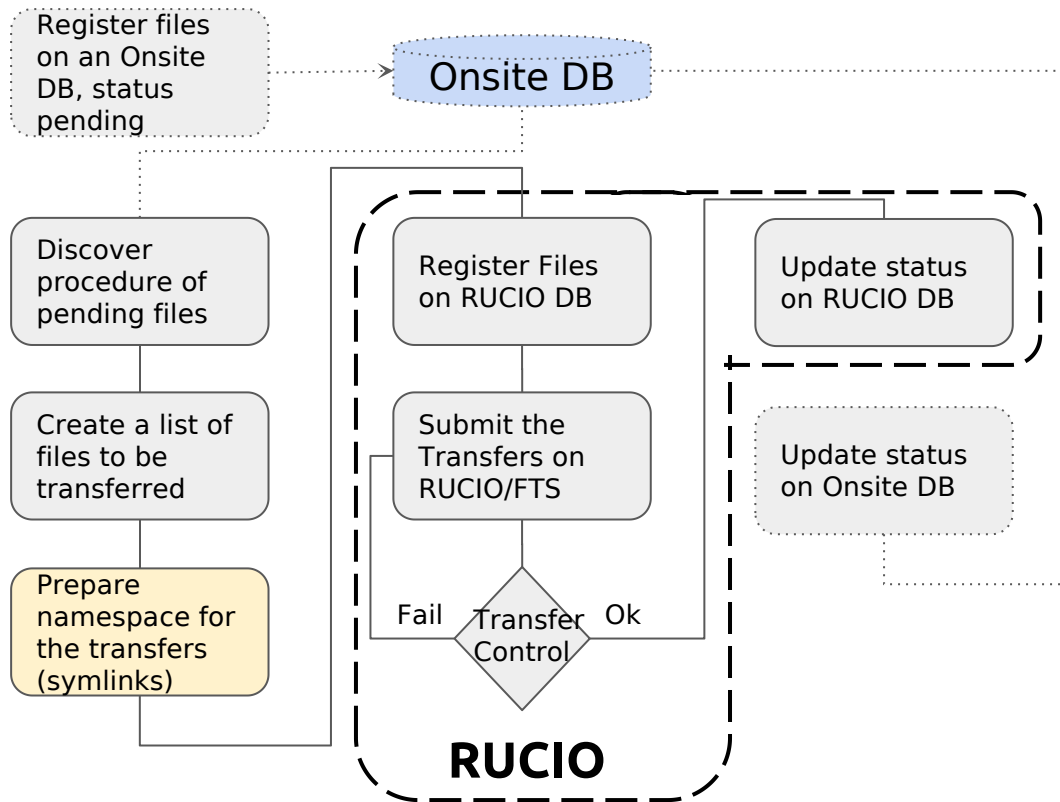
PIC-CTA Rucio instance: Orchestration of rule creation and automatic removal

PROGRESS :

- 1) Data is injected from the storage system located at the source (ORM La Palma) :
 - a) Currently testing a non-deterministic RSE configuration at la Palma that allows to register files with their original path in the detector.
- 2) By means of the RUCIO API, we automate the orchestration of the data: using replication rules :
 - a) Files are replicated through different research facilities among the Data Lake.
 - b) Once replicated, source files are removed.



MAGIC Workflow - Roadmap

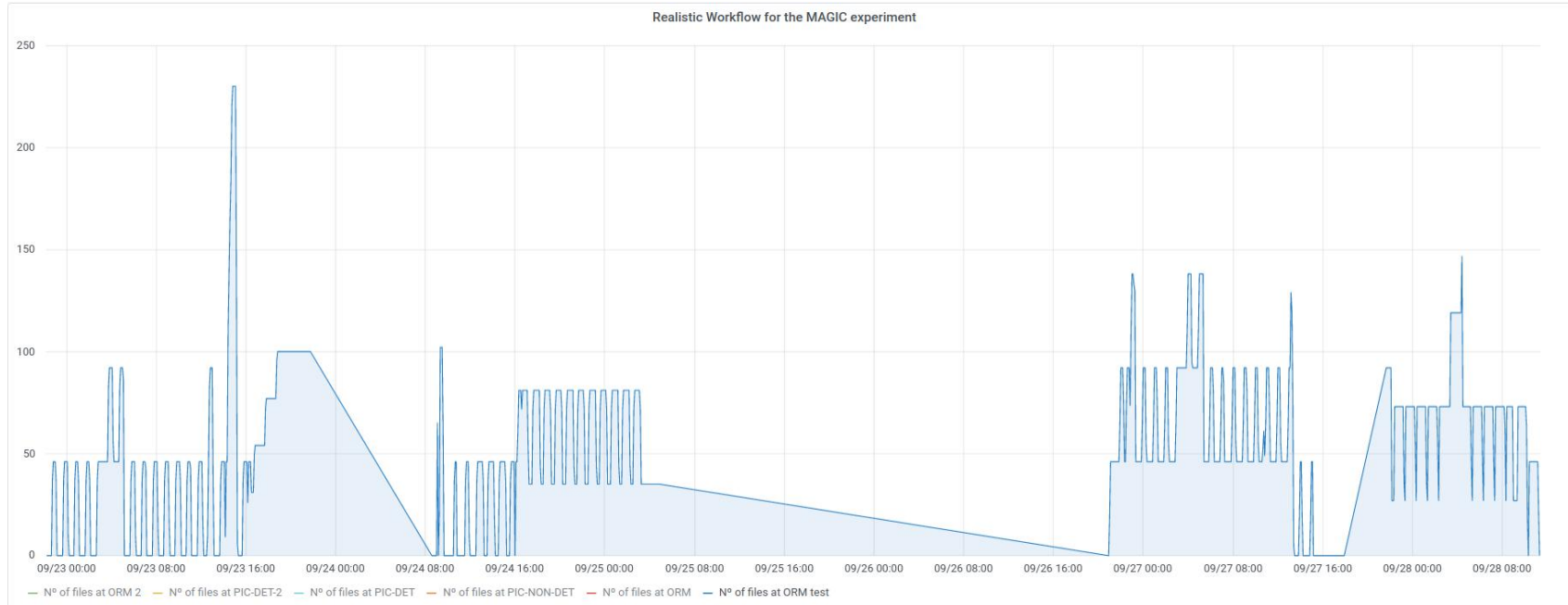


Configuration:

- Storage Element 1: IT Container Endpoint
- Storage Element 2: PIC Endpoint

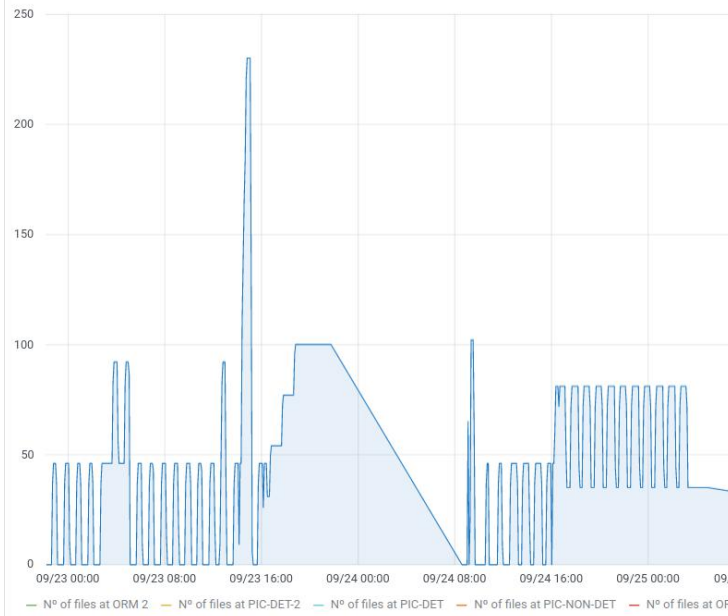
RUCIO and auxiliary code will run on PIC side **except the Onsite DB and Onsite DB registration procedure.**

File creation, discovery, replication and deletion cycle



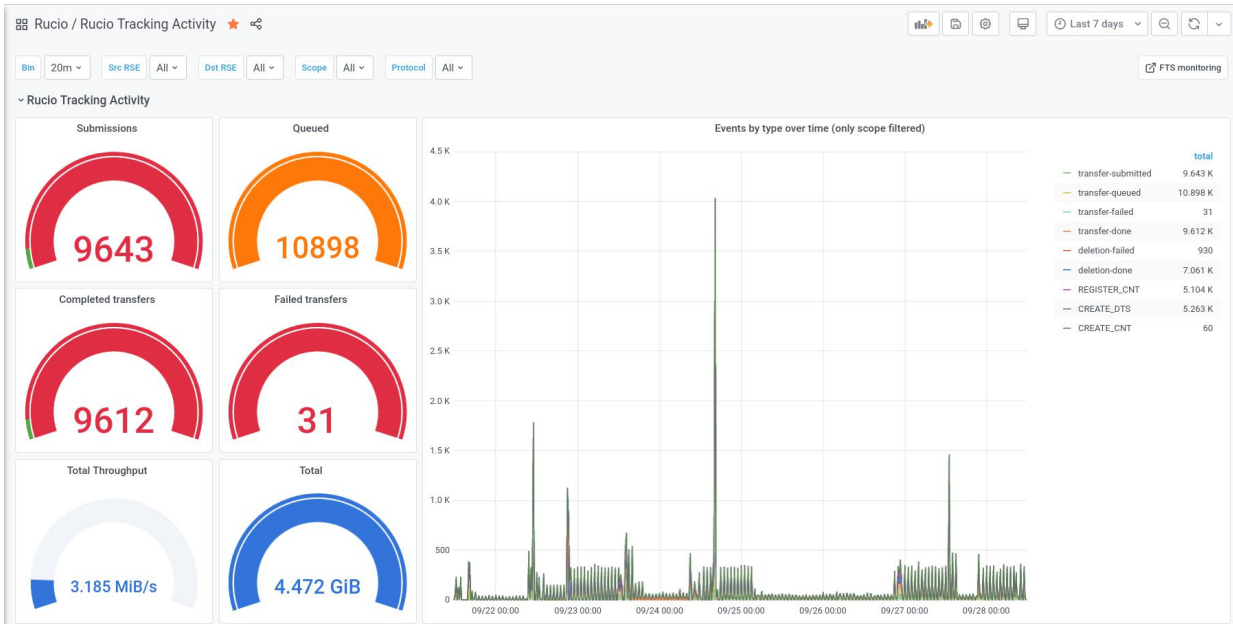
File creation, discovery, replication and deletion cycle

Realistic Workflow for the MAGIC experiment



```
bruzzese@rucl03 ~$ rucio list-dids-extended --filter 'telescope=M1' test-orm:*
-----
SCOPE:NAME
-----
test-orm:RAW_M1/DarkPatch3/2021_09_21/39552105/20210921_M1_39552105_001_C_DarkPatch3.raw      Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/20855490/20210921_M1_20855490_002_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/10218291/20210921_M1_10218291_010_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/45206848/20210921_M1_45206848_005_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/12021388/20210921_M1_12021388_001_J_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/DarkPatch15/2021_09_21/21021382/20210921_M1_21021382_001_C_DarkPatch15.raw     Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/12160148/20210921_M1_12160148_001_J_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/39796477/20210921_M1_39796477_003_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/13643053/20210921_M1_13643053_005_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/24038076/20210921_M1_24038076_010_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/14878011/20210921_M1_14878011_001_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/PulseInjector/2021_09_21/43790426/20210921_M1_43790426_001_J_PulseInjector_Att28.raw Info not available in JSON Plugin
test-orm:RAW_M1/DarkPatch3/2021_09_21/15334236/20210921_M1_15334236_001_C_DarkPatch3.raw     Info not available in JSON Plugin
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test-orm:RAW_M1/Dummy/2021_09_21/17297099/20210921_M1_17297099_001_J_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/40993631/20210921_M1_40993631_003_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/17897739/20210921_M1_17897739_006_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/DarkPatch15/2021_09_21/28926103/20210921_M1_28926103_001_C_DarkPatch15.raw     Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/18095605/20210921_M1_18095605_004_B_Dummy.raw              Info not available in JSON Plugin
test-orm:RAW_M1/Dummy/2021_09_21/19711111/20210921_M1_19711111_001_J_Dummy.raw              Info not available in JSON Plugin
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test-orm:RAW_M1/Dummy/2021_09_21/55251822/20210921_M1_55251822_004_B_Dummy.raw              Info not available in JSON Plugin
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test-orm:RAW_M1/FlatFieldIngStep00/2021_09_21/68946119/20210921_M1_68946119_001_C_FlatFieldIngStep00.raw Info not available in JSON Plugin
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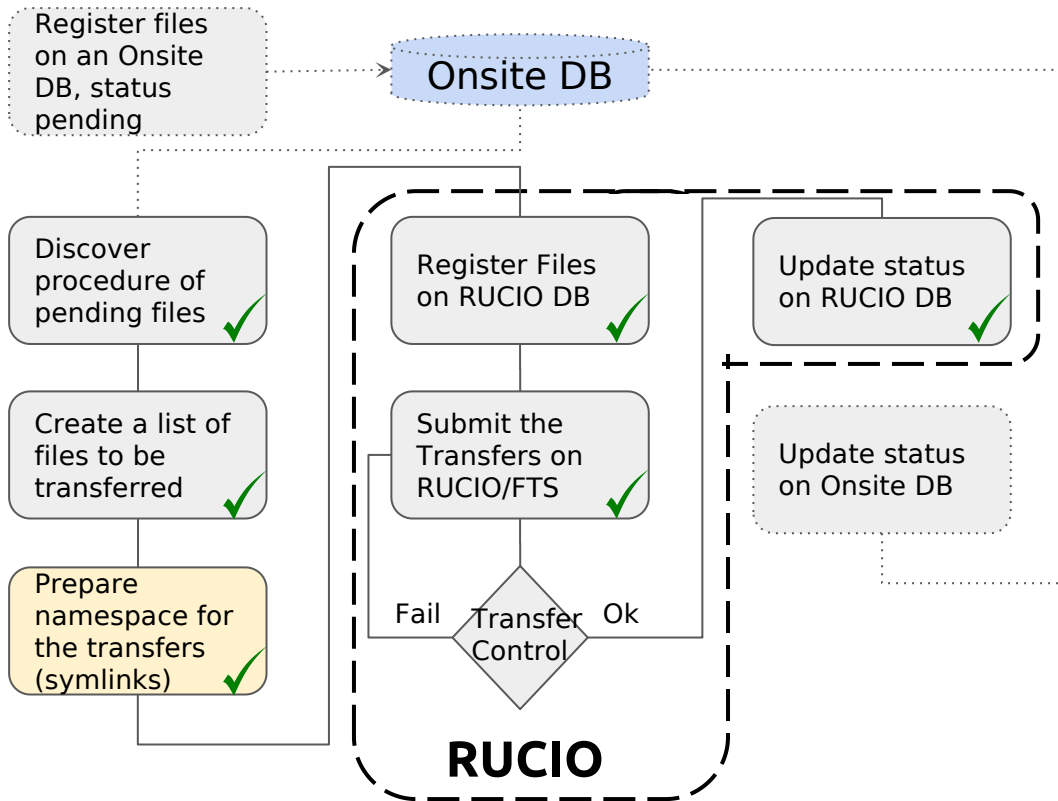
PIC's Rucio internal monitoring dashboard



Results

- The results obtained in the PIC's rucio instance and activity files transfer dashboards show similar patterns to those obtained with the ESCAPE rucio instance

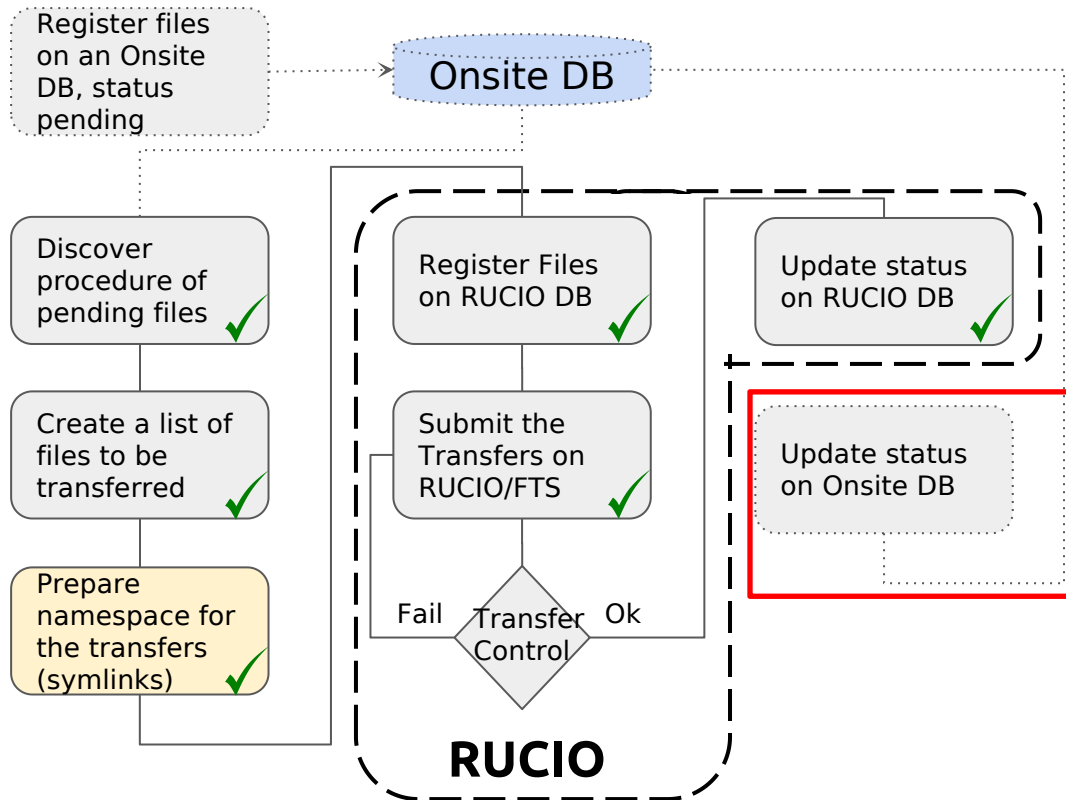
MAGIC Workflow - Accomplished goals



Conclusions

- Using the rucio instance of the PIC, we have been able to transfer data from the Palma to the PIC from symbolic links to the gamma ray telescope observations via PIC's FTS.

MAGIC Workflow - Further steps



Next steps:

- We still need to feed the onsite database to change the replication states.
- Migrate the current test Rucio instance to a production environment.