

Automation of Rucio Operations

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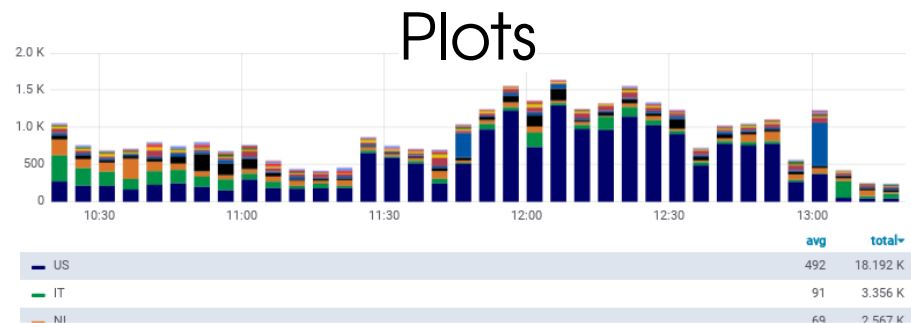
A Day In Operations

- Daily morning routine
 - Identify problems that occurred overnight
 - Assess whether Rucio is functioning as expected
 - Try to predict what could potentially fail until tomorrow
- Precious time taken from other activities
- Reliance on shifters with different time zone coverage
 - Training is necessary
- Most issues require a ticket
 - Identifying an issue and submitting a ticket is only half the work
 - Reporting and tracking it is the other half



Data Overload

- Way too many sources
- Data, not information
- No clear order
- No high-level overview



Logs

```
2020-03-05 14:34:30,098 25118 DEBUG Starting new HTTPS connection (1): fts.usatlas.bnl.gov:8446
2020-03-05 14:34:30,235 25118 DEBUG https://fts.usatlas.bnl.gov:8446 "/jobs/ca8efdc5-7793-5010-9ee7-260739687e17?files=file
_state_dest_surl,finish_time,start_time,staging_start,staging_finished,reason,source_surl,file_metadata HTTP/1.1" 200 1894
2020-03-05 14:34:30,237 25118 DEBUG Thread [15/41] : (u'c8eb4253-4745-57f6-bd68-ce7b9f2e15e0': {})
2020-03-05 14:34:30,237 25118 DEBUG Thread [15/41] : (u'c8eb4253-4745-57f6-bd68-ce7b9f2e15e0': {})
ov:8446
2020-03-05 14:34:30,239 25118 DEBUG Starting new HTTPS connection (1): fts.usatlas.bnl.gov:8446
2020-03-05 14:34:30,457 25118 DEBUG https://fts.usatlas.bnl.gov:8446 "/jobs/b19e5c2d-4393-52b0-bb78-ab5a8db25997?files=file
_state_dest_surl,finish_time,start_time,staging_start,staging_finished,reason,source_surl,file_metadata HTTP/1.1" 200 1909
2020-03-05 14:34:30,458 25118 DEBUG Thread [18/41] : (u'b19e5c2d-4393-52b0-bb78-ab5a8db25997': {})
2020-03-05 14:34:30,459 25118 DEBUG Thread [18/41] : Checking 791d04c4-959a-50ca-ba41-469ed50bec8 on https://fts.usatlas.bnl.g
ov:8446
2020-03-05 14:34:30,460 25118 DEBUG Starting new HTTPS connection (1): fts.usatlas.bnl.gov:8446
2020-03-05 14:34:30,601 25118 DEBUG https://fts.usatlas.bnl.gov:8446 "/jobs/c8eb4253-4745-57f6-bd68-ce7b9f2e15e0?files=file
_state_dest_surl,finish_time,start_time,staging_start,staging_finished,reason,source_surl,file_metadata HTTP/1.1" 200 2824
2020-03-05 14:34:30,603 25118 DEBUG Thread [15/41] : (u'c8eb4253-4745-57f6-bd68-ce7b9f2e15e0': {})
2020-03-05 14:34:30,603 25118 DEBUG Thread [15/41] : Checking f848c3ee-21ea-5582-8b0e-27f166265a52 on https://fts.usatlas.bnl.g
ov:8446
2020-03-05 14:34:30,605 25118 DEBUG Starting new HTTPS connection (1): fts.usatlas.bnl.gov:8446
2020-03-05 14:34:30,819 25118 DEBUG https://fts.usatlas.bnl.gov:8446 "/jobs/791d04c4-959a-50ca-ba41-469ed50bec8?files=file
_state_dest_surl,finish_time,start_time,staging_start,staging_finished,reason,source_surl,file_metadata HTTP/1.1" 200 1882
2020-03-05 14:34:30,821 25118 DEBUG Thread [18/41] : (u'791d04c4-959a-50ca-ba41-469ed50bec8': {})
```

Errors

TRANSFER [70] TRANSFER globus_ftp_client: the server responded with an error 500 Command failed. : Handle not in the proper state	5 K
TRANSFER [70] TRANSFER globus_ftp_client: the server responded with an error 500 500-Command failed. : globus_xio: System error in writv: Connection reset by peer 500-globus_xio: A system call failed: Connection reset by peer 500- 500 End.	4 K
TRANSFER [70] TRANSFER globus_ftp_client: the server responded with an error 500 500-Command failed. 500- : globus_xio_gsi: Token size exceeds limit. Usually happens when someone tries to establish a insecure connection with a secure endpoint, e.g. when	2 K

...and many more!



Planning Ahead

A reactive system (short-term)

Scope:

- Past
- Present
- Future



Effect:

- Identify issues
- Propose actions
- Take actions

A proactive system (long-term)



Anti-Patterns

- One more source
 - Should try to replace other sources as soon as possible
- No clear action
 - Uncertainty can lead to inaction
- High-maintenance or unreliable infrastructure
 - Avoid introducing new problems
- False positives
 - Annoyance can turn into neglect
- False negatives
 - Trust is difficult to build
- Change aversion



Transfers & Deletions

- The most common issue
 - Usually fixed by the site administrators shortly after being reported
- ATLAS has close to 120 sites
 - Not all sites are the same
- For transfers, identifying whether it's the source or the destination is not always obvious
- Grouping is useful, but not necessarily critical
 - Entire site
 - Service
 - Protocol
 - Area
 - Files



FTS & Networks

- A dependency for Rucio
- Some FTS instances are shared
- Recent incident: a node at an FTS instance was misbehaving
 - Two experiments identified and investigated the issue independently, then arrived at the same conclusion
- The network is a black box
 - We assume that it's stable and abundant
 - Investigating problems is difficult, if not impossible



Co-Operations

- Lots of common ground
 - Most issues are not specific to a particular experiment
 - Some aren't even specific to Rucio
- Shared experience
 - No benefit from solving the same problem twice
- A bigger picture
 - Common patterns
 - Insight into shared resources
- Synergy can potentially help and identify problems that each experiment on their own could not



Questions & Discussion

