AMI / Rucio

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Rucio (ATLAS 分散データ管理システム)

基本概念 - 1

- ATLAS の分散データ管理システム DQ2 の新しい実装
  - DQ2 のサポートは２０１６年 12 月で終了
- Grid ジョブ内部でのデータの移動にも使用
- CVMFS 上で Rucio CLI ツールから使用
  - Web インターフェースでも同じような機能を使用可能（後述）

基本概念 - 2

- アカウント（ account ）
  - 各 Rucio アカウントはユーザー やグループ等にマップ
  - Quota や属性はそれぞれのアカ ウントごとに設定
  - Rucio account は X509 証明書や ケルベロス認証をサポート
  - 一つの証明書は複数のアカウン トにマップ可

barisits

X509
barisits

tbeerman

X509
tbeerman

tzero

X509
vgaronne

phys-higgs
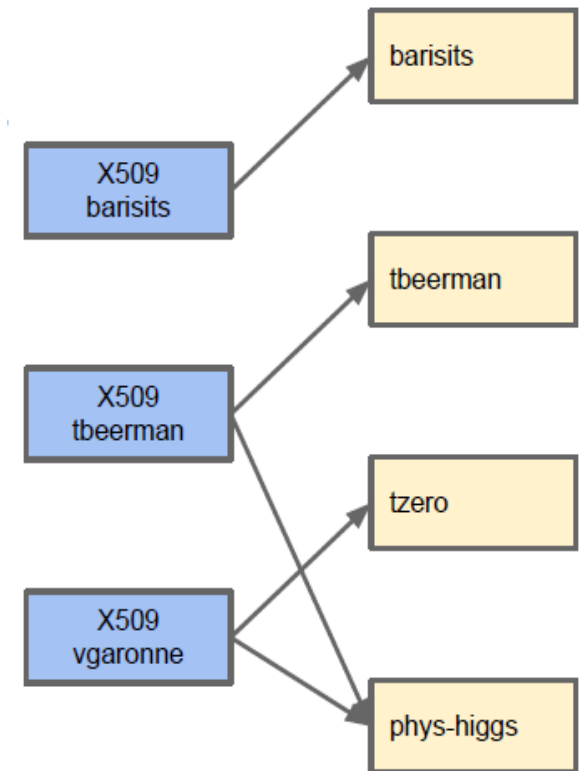
基本概念 - 3

- Rucio ネームスペース
  - 3種類の Data Identifiers (DIDs): ファイル，データセット，コンテナ
    - データセット：複数ファイルのセット
    - コンテナ：複数 Collection of Datasets or Containers
  - The namespace is divided using scopes. A name is unique within a scope but can be used in other scopes. A DID is identified by a scope a
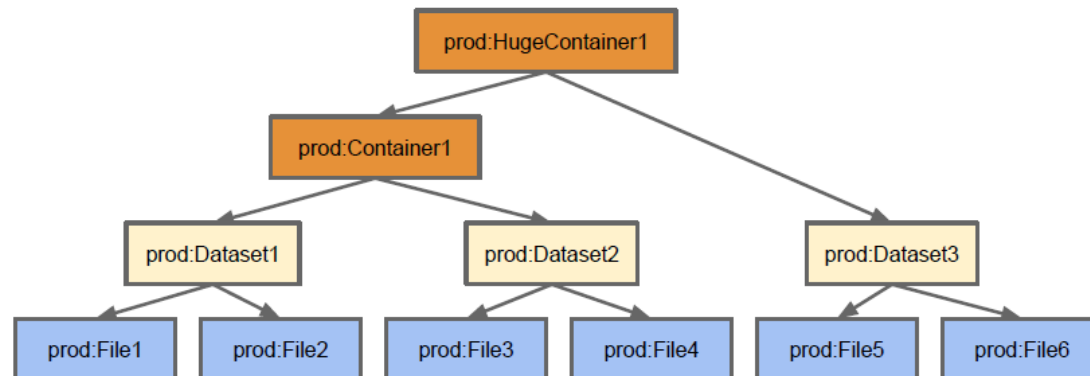
Basic concepts - 4

- Rucio ストレージエレメント (RSEs)
  - Rucio ストレージエンドポイント , 例 : GOEGRID_ LOCALGROUPDISK, CERN-PROD_DATADISK
  - 検索キーも使用可能（例 tier=2, cloud=DE)
- レプリケーション（複製）要求
  - Define how to replicate Data Identifiers to Rucio Storage Elements
  - E.g.: Make one replica of dataset user.gen:my.dataset on DESY-HH_ LOCALGROUPDISK
  - Using RSE expression: 2 replicas at cloud=DE&type=LOCALGROUPDISK (any German LOCALGROUPDISK)
  - Will create the minimum number of replicas to optimise storage space and minimise transfers

RSE 検索キー

- Rules can be created either with an exact RSE name or by using tags that are defined on an RSE, this is then called an RSE expression
  - Examples:
    - RSEs in German cloud: cloud=DE
    - LOCALGROUPDISKs in UK: country=UK&type=LOCALGROUPDISK
    - Any T2 in Italy but not INFN-NAPOLI: cloud=FR&tier=2\INFN-NAPOLI
  - More about this can be found in the Rucio documentation:
    - http://rucio.cern.ch/replication_rules_examples.html
- When using RSE expressions you can define a replication factor, so you can create multiple replicas for one datasets with on rule
- Also you can define the grouping of the data:
  - ALL: Rucio selects an RSE and all files will be copied to this RSE
  - DATASET: If there are multiple datasets Rucio will pick an RSE for each one and will copy all files in the same dataset to the same RSE
  - NONE: Rucio will pick a new RSE for every file, so that they spread over all available RSEs

RucioUI (WebUI)

RucioUI

- Move data between RSEs, use Rucio replication rules

- Such request can be generated by CLI and UI

- The UI tool is *the Rucio Rule Definition Droid (R2D2)*
  https://rucio-ui.cern.ch/r2d2

- Basic need: X509 certificate in your browse

RucioUI: Select DIDs - 1

- Data transfers (R2D2) → Request new rule

RucioUI: Select DIDs - 2

- E.g. a wild card pattern

  – "data15_13TeV.*.physics_Main.merge.DAOD_SUSY1.*"

RucioUI: Select DIDs - 3

- Metadata

RucioUI: select a RSE - 1

- Find your destination space

RucioUI: select a RSE - 2

- SCRATCHDISKs in Germany

    - cloud=DE&type=SCRATCHDISK

2. Select Rucio Storage Elements (RSEs)

Please enter an RSE or an RSE expression.

RSE expression

| RSE (expression) | cloud=DE&type=SCRATCHDISK | Check Quota |

List of RSEs

Total size of selected DIDs: 237.94 MB

RSE	Remaining Quota	Total Quota
CSCS-LCG2_SCRATCHDISK	20 TB	20 TB
CYFRONET-LCG2_SCRATCHDISK	11 TB	11 TB
DESY-HH_SCRATCHDISK	30.68 TB	30.68 TB
DESY-ZN_SCRATCHDISK	25 TB	25 TB
FMPHI-UNIBA_SCRATCHDISK	11 TB	11 TB
FZK-LCG2_SCRATCHDISK	50 TB	50 TB
GOEGRID_SCRATCHDISK	25 TB	25 TB
HEPHY-UIBK_SCRATCHDISK	1.65 TB	1.65 TB
IEPSAS-KOSICE_SCRATCHDISK	14.29 TB	14.29 TB
LRZ-LMU_SCRATCHDISK	26.91 TB	26.91 TB
MPPMU_SCRATCHDISK	20 TB	20 TB
PRAGUELCG2_SCRATCHDISK	20.4 TB	20.4 TB
PSNC_SCRATCHDISK	2.2 TB	2.2 TB
TUDRESDEN-ZIH_SCRATCHDISK	4.26 TB	4.26 TB
UNI-FREIBURG_SCRATCHDISK	32.5 TB	32.5 TB
UNI-SIEGEN-HEP_SCRATCHDISK	50 GB	50 GB
WUPPERTALPROD_SCRATCHDISK	22.55 TB	22.55 TB
Name	**Remaining Quota**	**Total Quota**

Continue

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RucioUI: select options

3. Options

Please select/enter your wanted options and then submit your rule request.

Grouping
○ All ● Dataset ○ None

A grouping definition of how the replica will be distributed

Lifetime (in days). Leave empty for infinite lifetime.

15

Copies

1

Comment

For ATLAS-D

Create sample

Number of files

Use if you select files randomly

Asynchronous Mode

Continue

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Rucio UI: summary

- Before submission check rules

4. Summary

This request will create rules for the following DIDs:

DID	Copies	Files	Size	Requested Size
data15_13TeV:data15_13TeV.00266904.physics_Main.merge.DAOD_SUSY1.f594_m1435_p2361_tid05608871_00	1	7	237.94 MB	237.94 MB
data15_13TeV:data15_13TeV.00266904.physics_Main.merge.DAOD_SUSY1.r6944_p2410_p2425_tid06685122_00	1	14	2.96 GB	2.96 GB
data15_13TeV:data15_13TeV.00266904.physics_Main.merge.DAOD_SUSY1.r6944_p2410_p2540_tid07869001_00	1	5	3.4 GB	3.4 GB
data15_13TeV:data15_13TeV.00266904.physics_Main.merge.DAOD_SUSY1.r7600_p2521_p2614_tid08133087_00	1	10	2.62 GB	2.62 GB
Total	4	36	8.59 GB	8.59 GB

The rules will replicate to one of the following RSEs:

Check quota limit carefully!

RSE	Remaining Quota	Total Quota
CSCS-LCG2_SCRATCHDISK	20 TB	20 TB
CYFRONET-LCG2_SCRATCHDISK	11 TB	11 TB
DESY-HH_SCRATCHDISK	30.68 TB	30.68 TB
DESY-ZN_SCRATCHDISK	25 TB	25 TB
FMPHI-UNIBA_SCRATCHDISK	11 TB	11 TB
FZK-LCG2_SCRATCHDISK	50 TB	50 TB
GOEGRID_SCRATCHDISK	25 TB	25 TB
HEPHY-UIBK_SCRATCHDISK	1.65 TB	1.65 TB
IEPSAS-KOSICE_SCRATCHDISK	14.29 TB	14.29 TB
LRZ-LMU_SCRATCHDISK	26.91 TB	26.91 TB
MPPMU_SCRATCHDISK	20 TB	20 TB
PRAGUELCG2_SCRATCHDISK	20.4 TB	20.4 TB
PSNC_SCRATCHDISK	2.2 TB	2.2 TB
TUDRESDEN-ZIH_SCRATCHDISK	4.26 TB	4.26 TB

Rucio UI: Transfer status

- Go to top page and see your transfer activity

  - *https://rucio-ui.cern.ch/r2d2*

Links and references

- RucioUI
  - https://rucio-ui.cern.ch/
- Rucio Documentation
  - http://rucio.cern.ch/index.html
- ATLAS-D meeting 2015 Rucio Tutorial, Thomas Beermann
- ATLAS-D meeting 2016 Grid/Rucio Tutorial, Gen Kawamura
- Software tutorial using Grid
  - https://twiki.cern.ch/twiki/bin/viewauth/AtlasComputing/SoftwareTutorialUsingTheGrid