

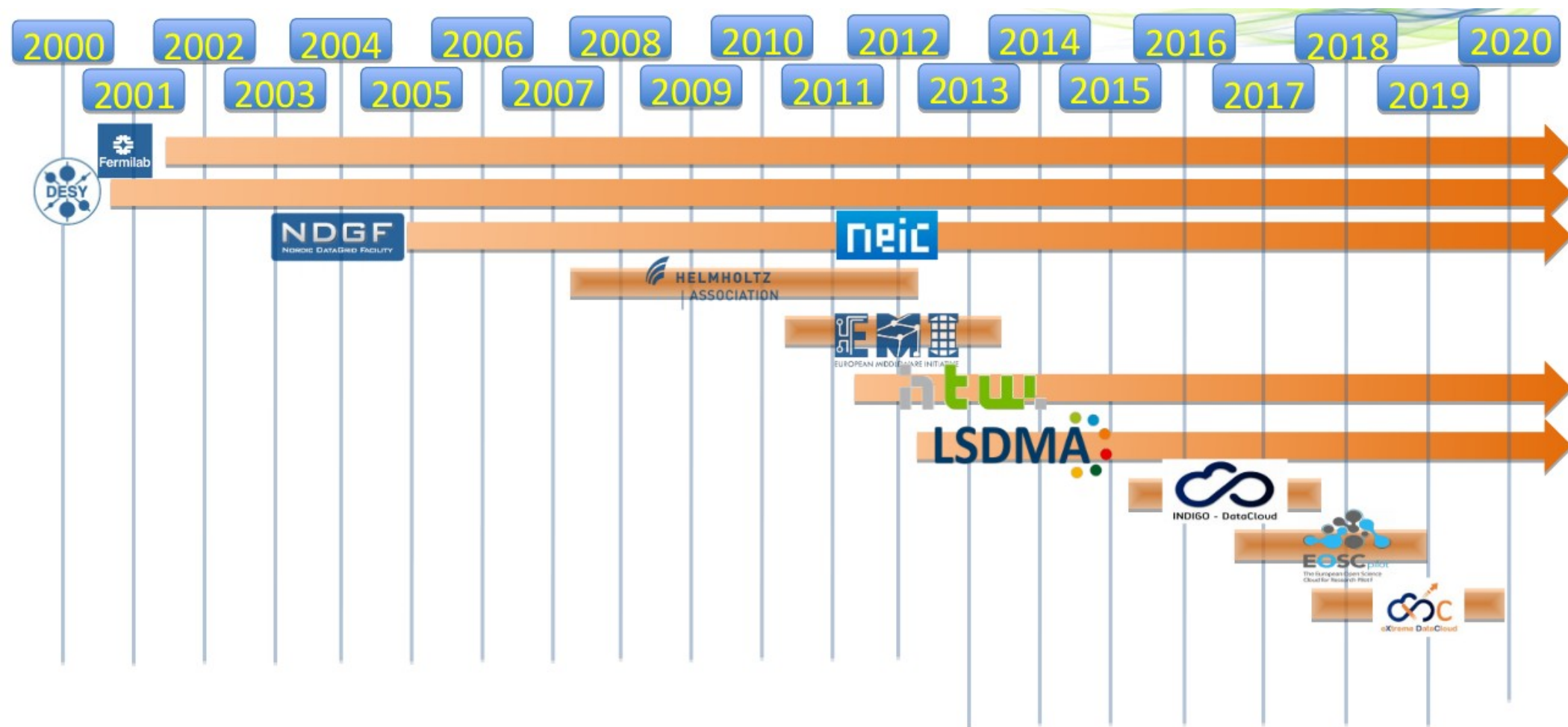


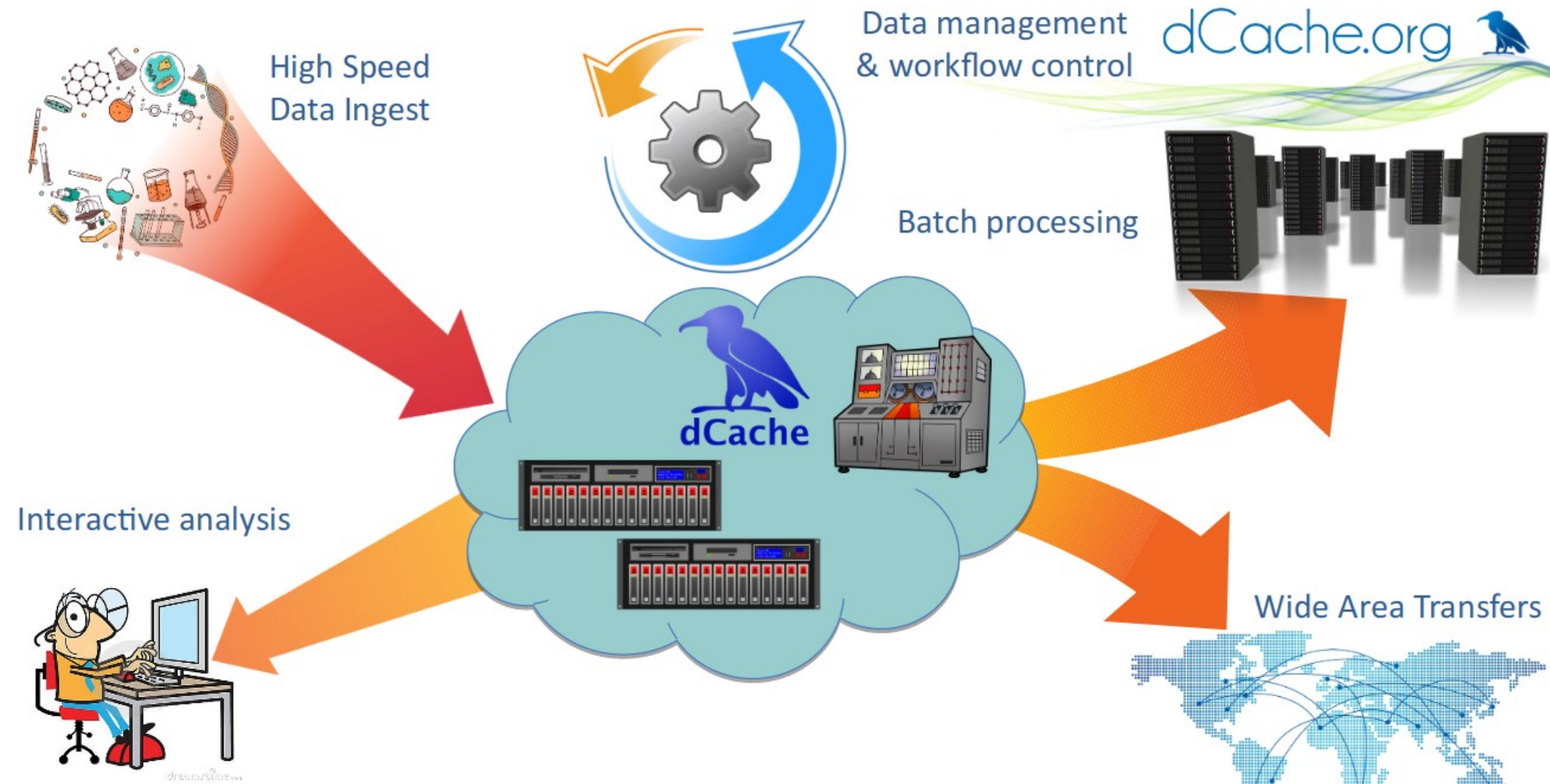
dCache @CCIN2P3

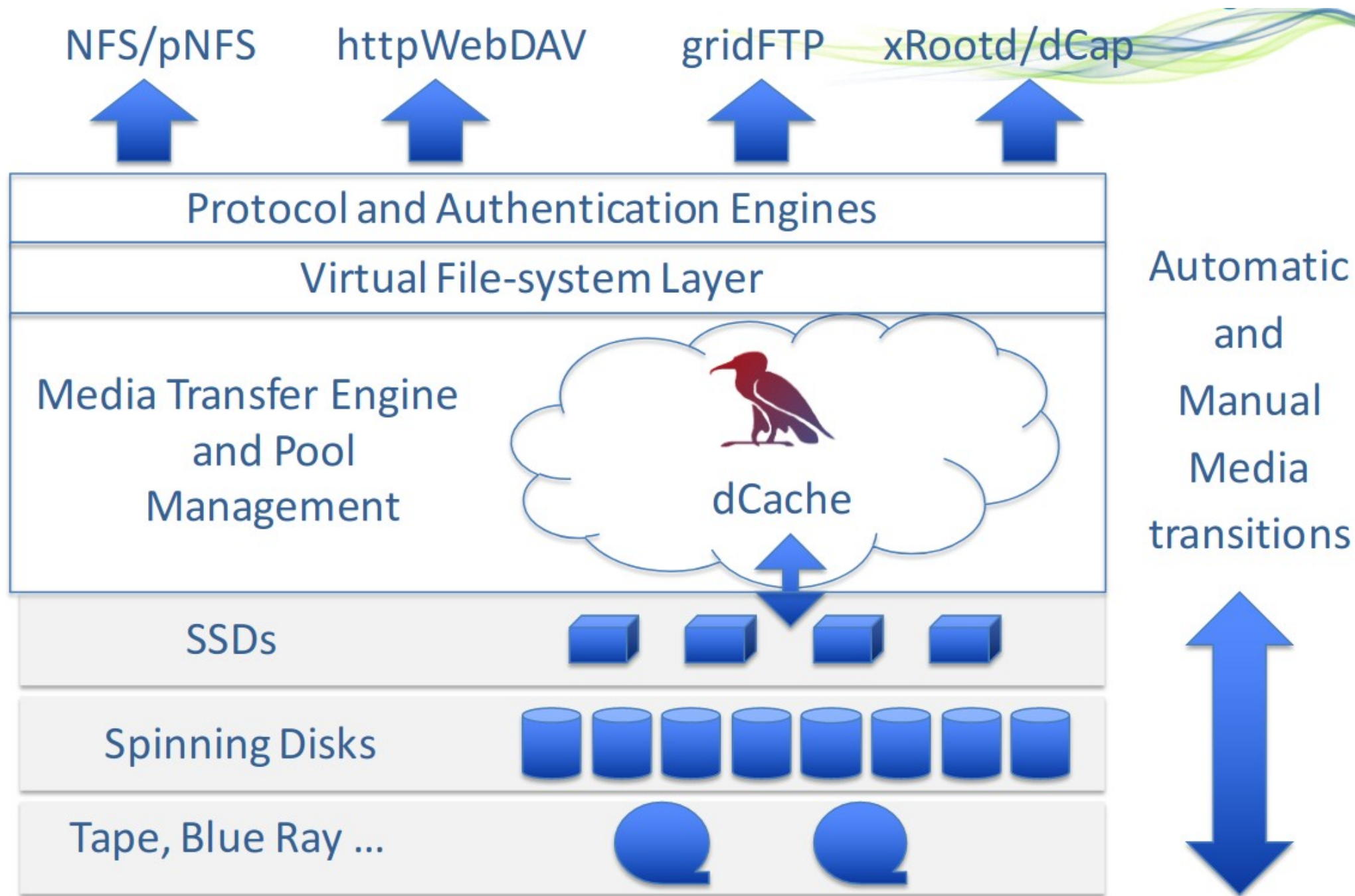
Adrien Georget

- Système de stockage distribué majoritairement utilisé pour l'hébergement des données scientifiques (~50 % des données WLCG)
- 76 sites WLCG, +140PB au total
- Support des protocoles standards et HEP
- Interface HSM
- QoS, gestion de l'espace
- réplication
- IPv4/IPv6
- Open source

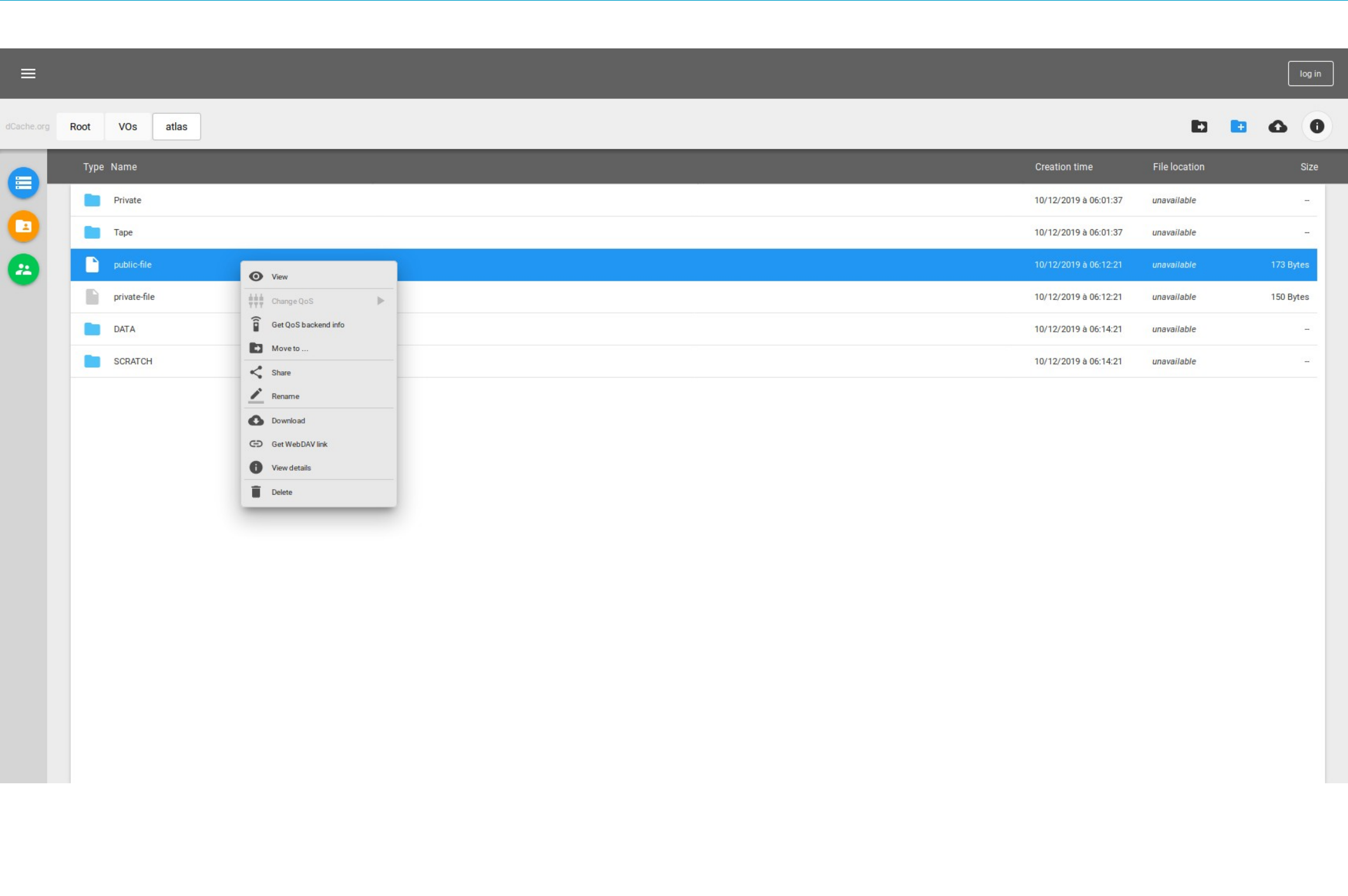






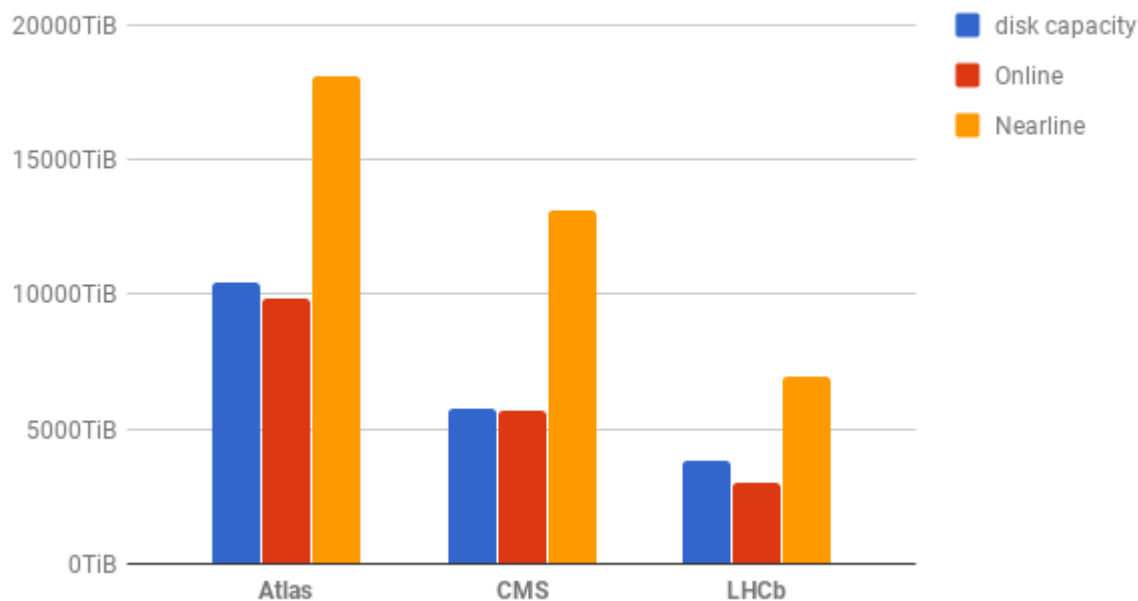


dCache-view via webdav

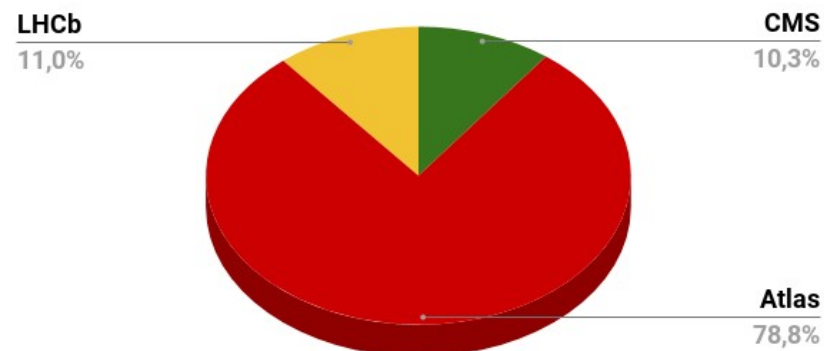


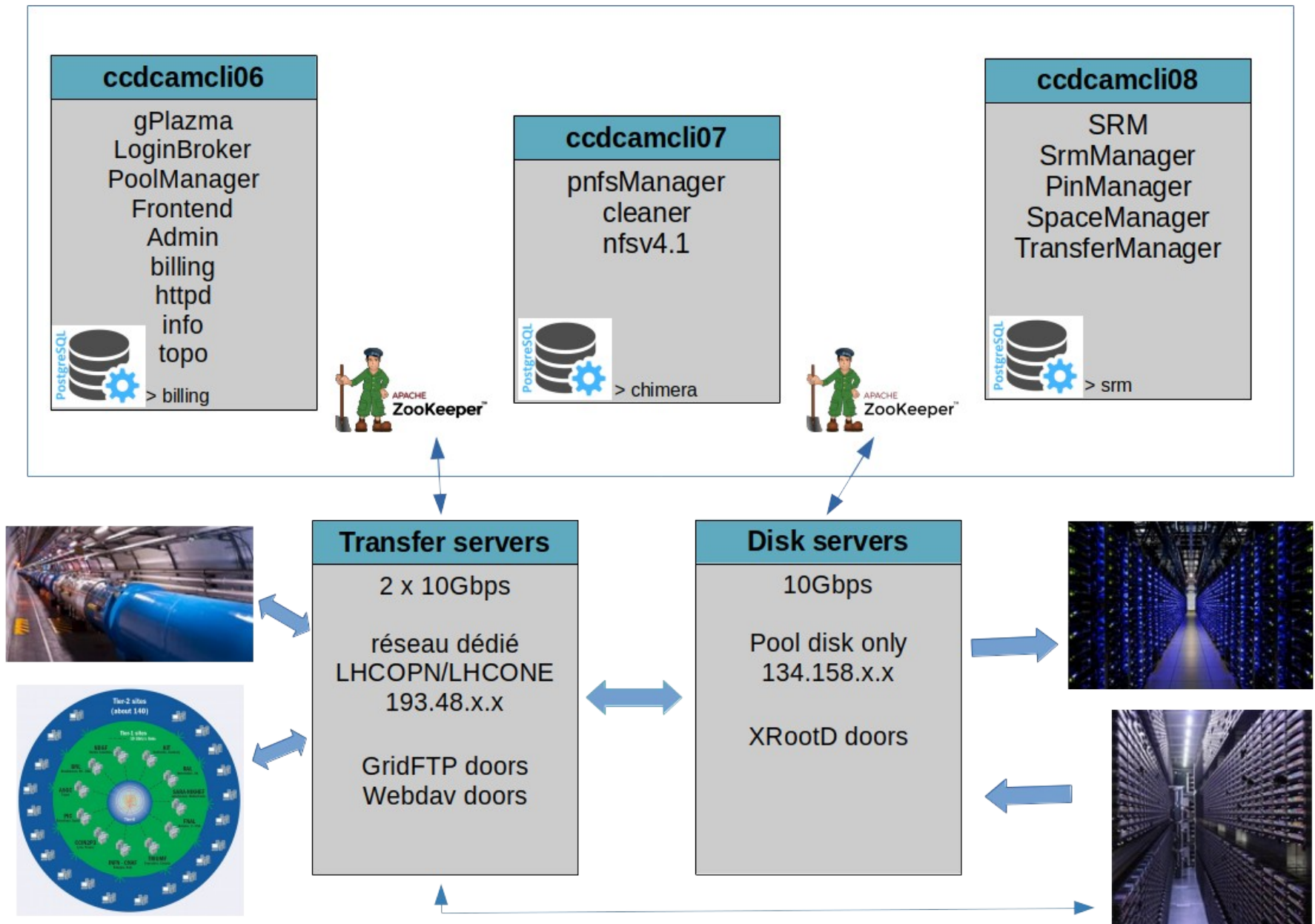
- dCache version 5.2.9, CentOS7
- 106 Dell disk servers (10Gpbs)
 - 76 R730xd, 29 R740xd, 1 R740xd2
- 30 Dell transfer servers (2x 10Gpbs)
 - 19 R730xd, 11 R740xd
- Total capacity : 20.5PiB (used 18.5PiB)

Storage by VO



Nb of files





- Déploiement du soft par playbook Ansible
- Écosystème géré par Puppet
- Rolling upgrade possible
- Tendance haute disponibilité des services
- Dualstack IPv4/IPv6
- Monitoring syslog/collectd -> Kibana/Grafana

dCache Billing

pool: transfer

186710

door: request

174573

872

door: remove

49120

SRM Billing

get

21449

put

20748

Suspended Req

0

Disk Cleaner

945

Current Activity

	pgroup	active	queued
+	xrootd	4495	0
+	gridftp	1351	255
+	p2p-clientqueue	29	0
+	p2p-queue	25	0
+	regular	4	0
+	restore	1	0

Tests SAM

name	state
atlas	OK
cms	OK
lhcb	Missing

Showing 1 to 3 of 3 entries

Add a filter +

Import size

26.34TB

Export size

36.24TB

Tape migration

58.736GB

Tape staging

1.114TB

Import/Export traffic

Transfer volume

LCG transfer traffic xferout

Pgroup Spaces

precious

pined

removable

free

pgroup-atlas-export-tape

98%

pgroup-atlas-import-disk

96%

pgroup-atlas-import-tape

11%

89%

pgroup-atlas-localexport-tape

99%

pgroup-atlas-permanent-disk

94%

6%

pgroup-cms-analysis

85%

15%

pgroup-cms-hpssdata

100%

pgroup-cms-import-disk

98%

pgroup-cms-prod

81%

19%

pgroup-cms-xferout

99%

pgroup-disk-sc3

62%

38%

pgroup-lhcb-dst

79%

21%

pgroup-lhcb-read

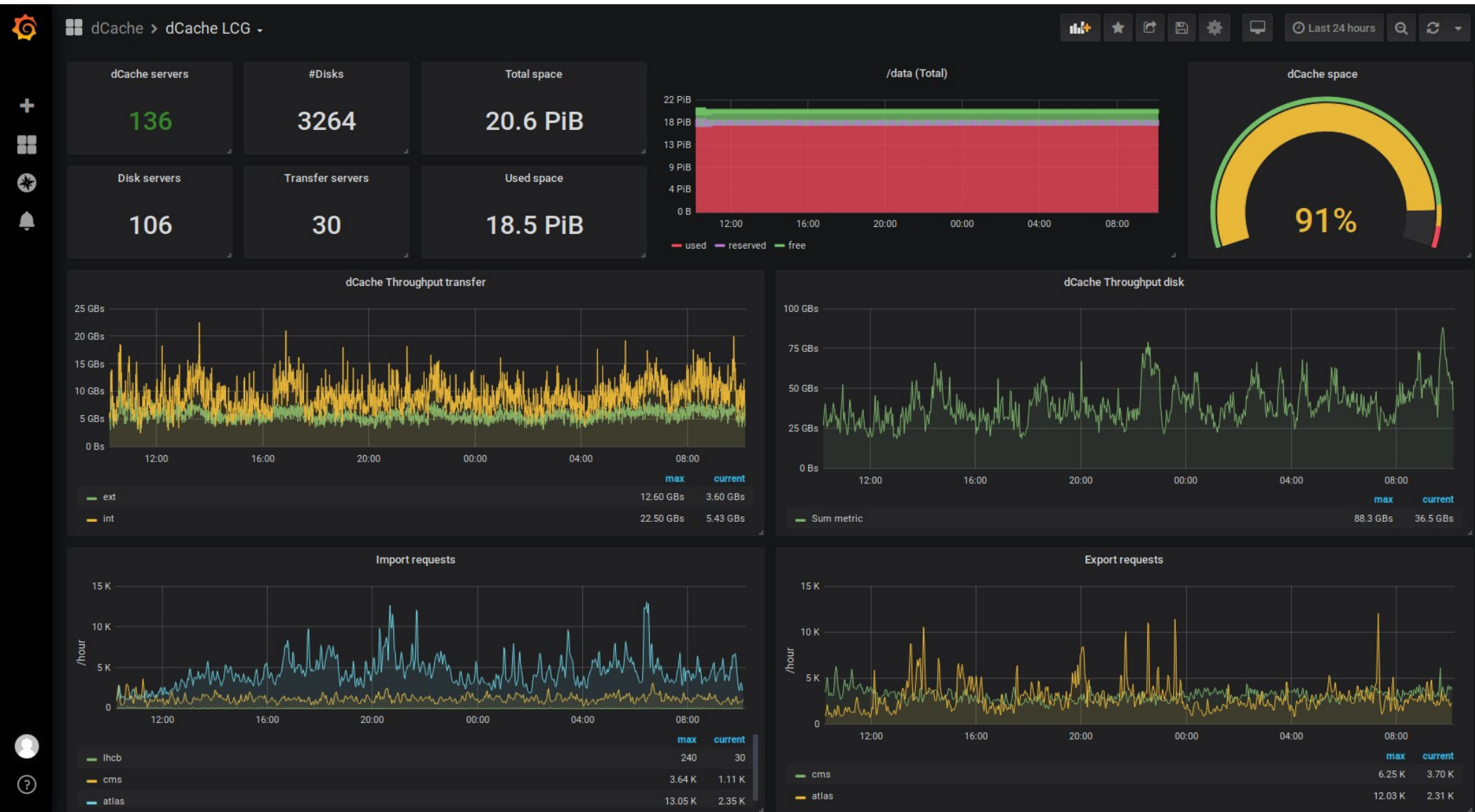
100%

pgroup-lhcb-tapebuffer

100%

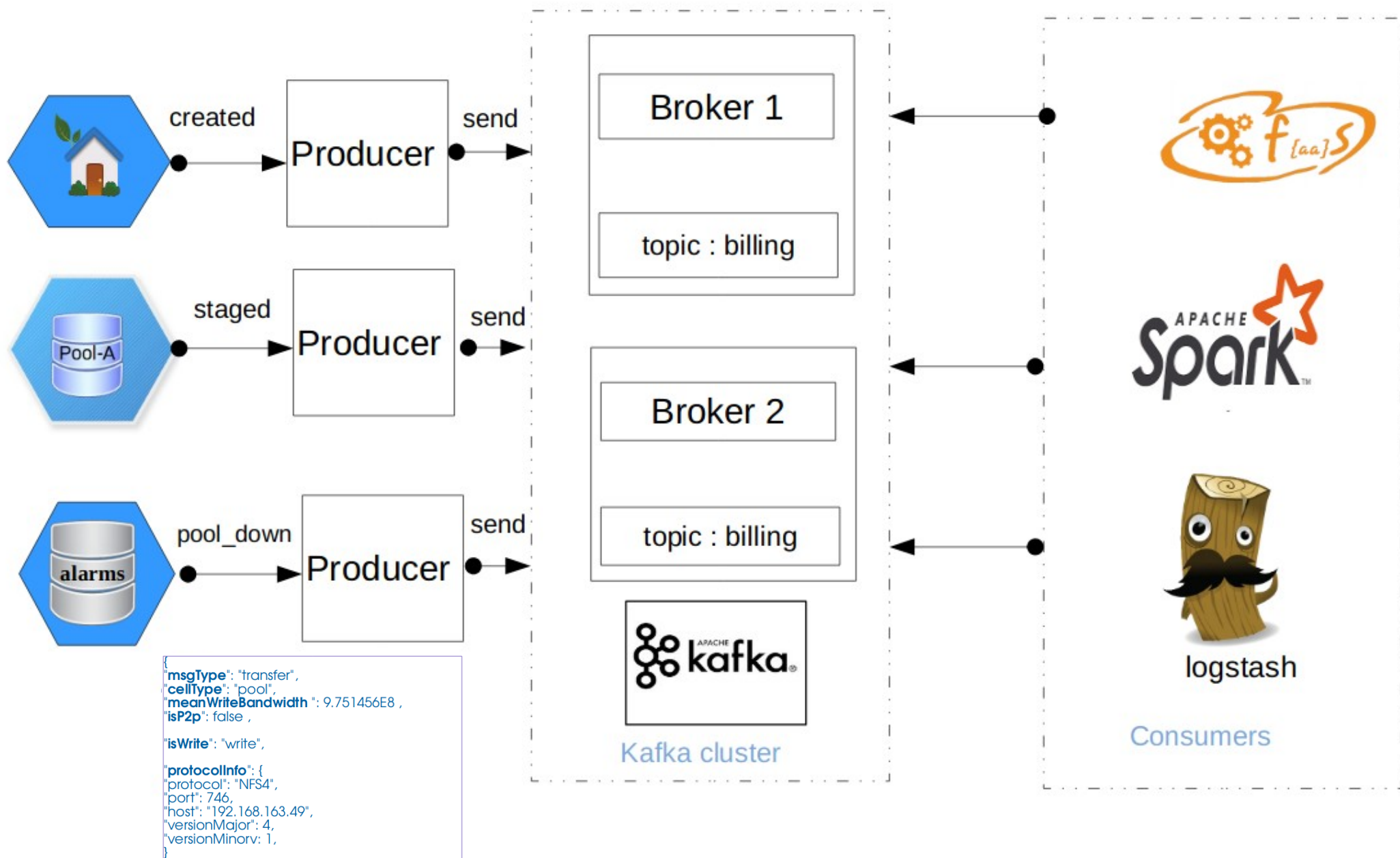
pgroup-lhcb-xferout

100%



- Gestion des évènements
- Third party copy
- Fédération d'identité, tokens

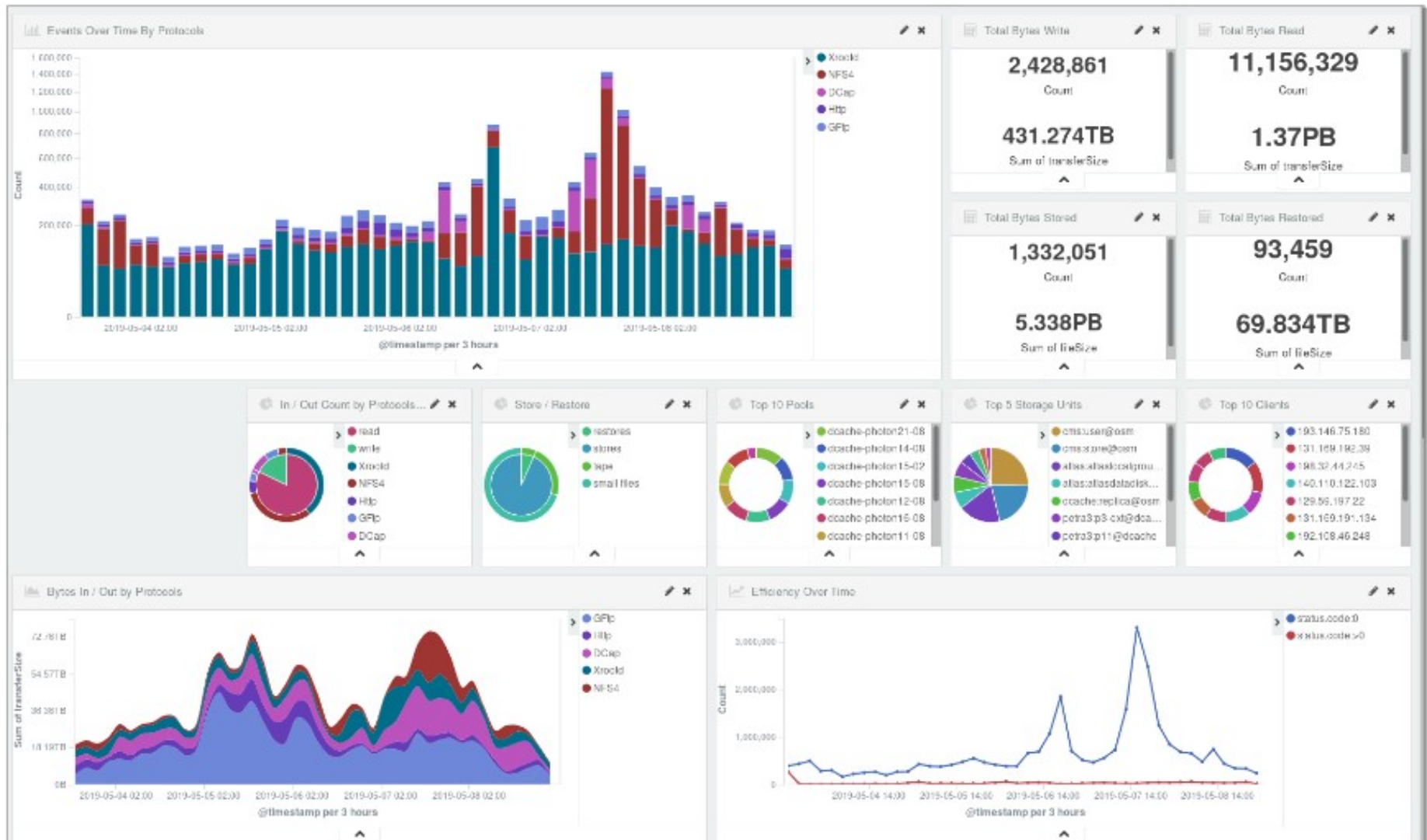
Storage events

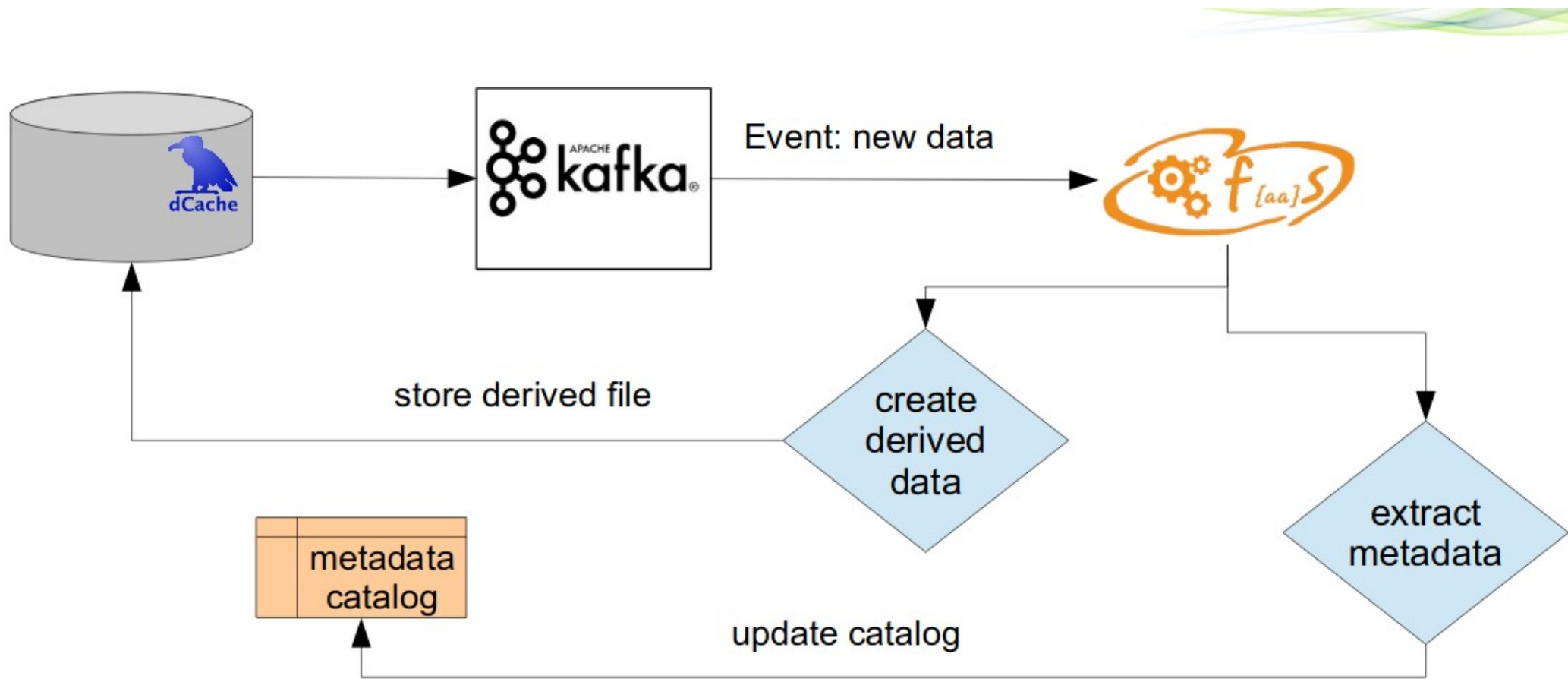


Storage events

```
{
  "date":"2019-07-09T10:47:41.319+02:00",
  "owner":"/O=GRID-FR/C=FR/O=CNRS/OU=CC-IN2P3/CN=Adrien Georget",
  "msgType":"request",
  "clientChain":"134.158.240.106",
  "mappedGID":239,
  "cellName":"gridftp-ccdcalitest11-AAWNO5o7B6A",
  "session":"door:gridftp-ccdcalitest11-AAWNO5o7B6A@gridftp-ccdcalitest11Domain:1562662015579000",
  "subject":[
    "UserNamePrincipal[ageorget]",
    "UidPrincipal[3915]",
    "LoAPrincipal[IGTF-AP:Classic]",
    "EntityDefinitionPrincipal[Person]",
    "FQANPrincipal[/dteam/NGI_FRANCE/sites/IN2P3-CC]",
    "GidPrincipal[239,primary]",
    "/O=GRID-FR/C=FR/O=CNRS/OU=CC-IN2P3/CN=Adrien Georget",
    "GroupNamePrincipal[lcgdteam,primary]",
    "Origin[134.158.240.106]",
    "FQANPrincipal[/dteam/NGI_FRANCE]",
    "FQANPrincipal[/dteam/NGI_FRANCE/sites]",
    "EmailAddressPrincipal[adrien.georget@cc.in2p3.fr]",
    "FQANPrincipal[/dteam,primary]"
  ],
  "transferPath":"/pnfs/in2p3.fr/data/lsst/testBig2",
  "sessionDuration":45740,
  "storageInfo":"disk:lsst@osm",
  "cellType":"door",
  "fileSize":13942346752,
  "mappedUID":3915,
  "VERSION":"1.0",
  "queuingTime":0,
  "cellDomain":"gridftp-ccdcalitest11Domain",
  "client":"134.158.240.106",
  "pnfsid":"0000736CB75410C949F998CC838E2F0CF126",
  "billingPath":"/pnfs/in2p3.fr/data/lsst/testBig2",
  "status":{
    "msg": "",
    "code":0
  }
}
```

Storage events : use case



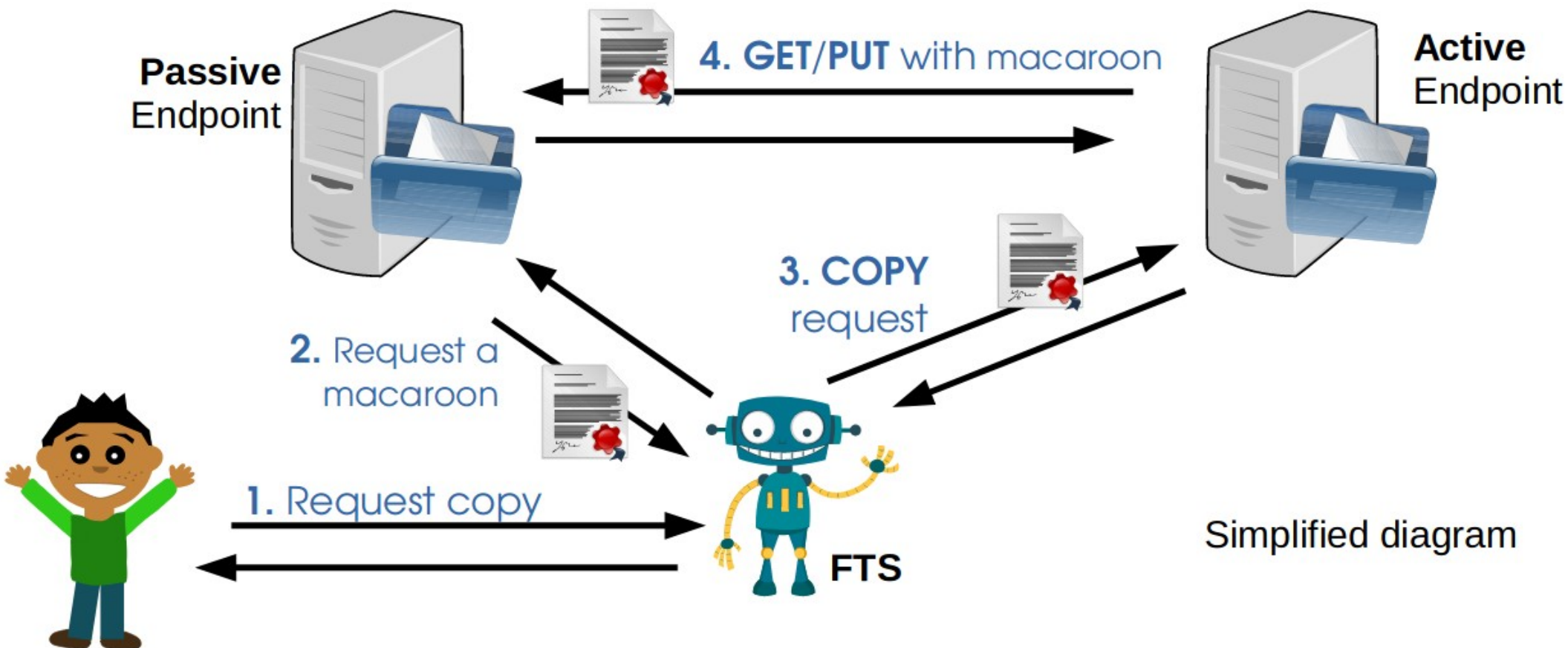


by Michael Schuh

- Besoin de trouver une alternative à GSI/GridFTP (Globus Toolkit)
- WG créée pour évaluer XRootD et HTTP
<https://twiki.cern.ch/twiki/bin/view/LCG/ThirdPartyCopy>
- 3 phases :
 - Prototype / Implémentation 
 - Test de déploiement sur sites > 3PB 
 - Déploiement sur tous les T1 WLCG 
<https://twiki.cern.ch/twiki/bin/view/LCG/T1StorageVersionsTable>

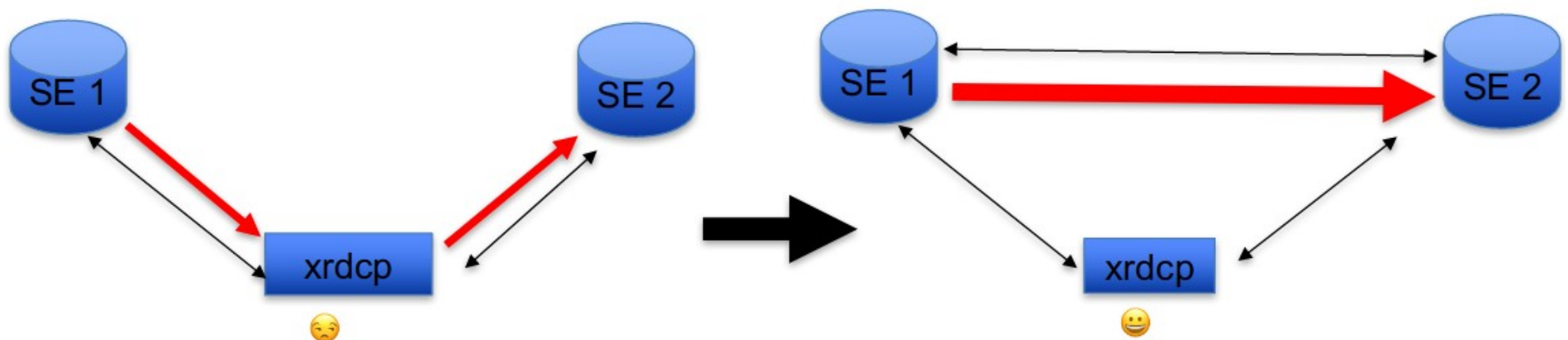
- HTTP-TPC

- Source/destination supporté à partir de dCache 4.2
- Flexibilité des mécanismes d'authentification : support X509, Macaroon et SciToken
- Fonctionne avec des SE hors grille (endpoint S3, ...)



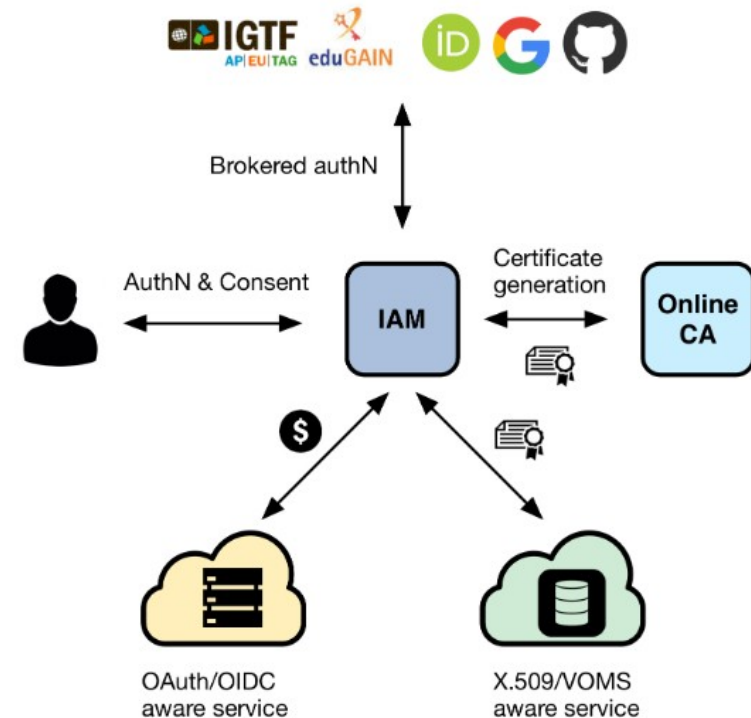
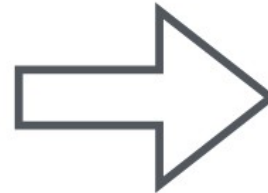
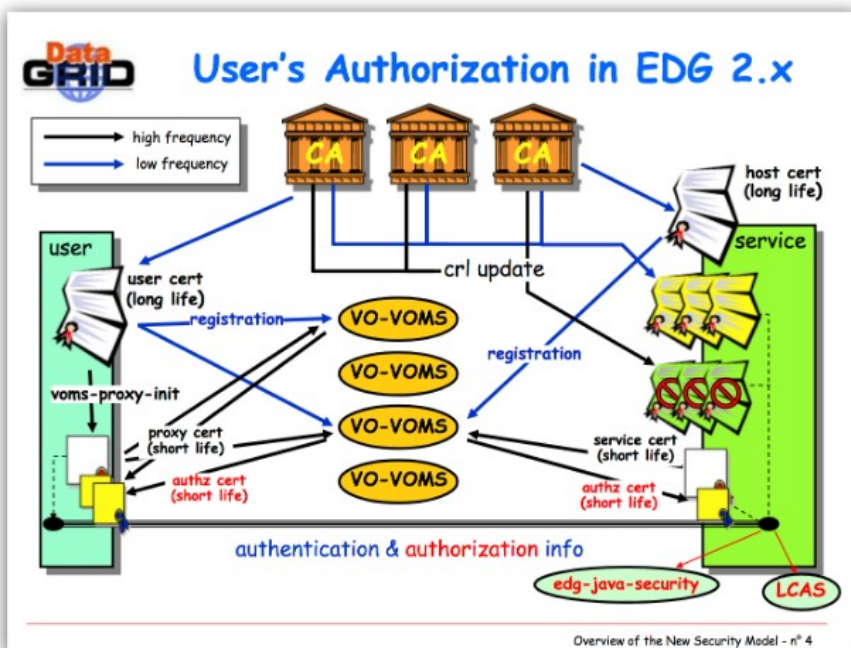
- XrootD

- Source/destination supporté (dCache 4.2+)
- Sécurité, vérification des signatures de hash (dCache 5.0+)
- GSI auth et délégation (dCache 5.2+)
- TLS/token à venir



- dCache 5.2 est la dernière version LTS, compatible TPC et recommandée par DOMA-TPC WG

- certificat utilisateur X.509 -> fédération d'identités (SAML & OpenIDConnect)



- Intégration IAM déjà effective sur :
 - dCache, StoRM, XRootD, FTS, RUCIO, HTCondor, Openstack, Kubernetes, Grafana, ...



- <https://www.dcache.org>
- dCache mailing-list user-forum@dcache.org
- Token-based AuthN/Z for RUCIO
- WLCG Authorization; from X.509 to Tokens
- Beyond X.509: token-based authentication and authorization in practice
- Third-party transfers in WLCG using HTTP
- Xrootd Third Party Copy for the WLCG and HL-LHC