dCache: status and plans

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dCache server releases

... along with the series support durations.

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<th>2.13 series</th>
<th>2.12 series</th>
<th>2.11 series</th>
<th>2.10 series</th>
<th>2.9 series</th>
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**2.13: Next Golden Release**

**RUN 2**
8th International dCache workshop
dCache German Support

• Group of volunteer dCache admins

  Answer questions on mailing list.
  Share and publish knowledge on site operations.
  Organise and help run dCache tutorials:
    GridKa school (KIT, Karlsruhe);
    ISGC (ASGC, Taipei);
    dCache workshops (various locations).

• Would like to see role of this group grow

  see German dCache sites to be exemplary
Communication

- **EGI:**
  Patrick in TCB; Paul leads FedCloud AAI; Christian part of “UMD Release Team”

- **WLCG:** Member of various storage-related groups

- **CERN Data Management:** direct communication
  dCache organised data-management session at EGI Amsterdam meeting.

- **SLAC:** xrootd collaboration with direct f2f meetings and conferences.

- **Standards:** OGF, SNIA

- **Industry:** direct communication with NFS client developers
Sustainability: funding

- **dCache.org partners:**
  Commitment from DESY, Fermilab and NEIC

- **LSDMA:**
  project continues until end of 2016

- **Horizon 2020:**
  dCache.org participating in two proposals: 
  Zephyr and IndigoDataCloud
Sustainability: other communities

- **DESY**: “dCache storage cloud”
  providing sync-and-share capabilities
- **Fermilab**: Intensity Frontier (NFS)
- **JADE**: Jülich-Aachen Data Exchange
  Storage for Supercomputing and Modelling for the Human Brain (SMHB), candidate for the Human Brain Project (HBP)
- **Commercial**: DESY directorate signed contracts with an industry partner in Switzerland for dCache support.

... only a selection
dCache the scientific cloud

- **HPC & Grid Clusters**: Low latency access
- **Cloud storage**: Standard back-end for clusters and portals
- **Fast data ingest**: Standard devices at high data rates
- **DropBox-like storage**: Devices synchronise with storage
- **Bulk WAN transfer**: Moving huge datasets
- **Remote access**: Rich access via web-browser

- **NFS**
- **CDMI**
- **FTP**
- **HTTP**
- **WebDAV**
Activities

- **HTTP ecosystem**:  
  - Collaboration with CERN; HTTP federation – harmonising xrootd and WebDAV federations.  
  - With 2.10, dCache supports WebDAV 3rd-party transfers.
- **NFS**:  
  - Belle I & II support completely based on NFS  
  - Photon science: in production for many years  
  - CMS (@DESY): start 2nd phase, intent is that all reading is via NFS on a “CHEP time-scale”.  
  - ATLAS (@DESY): mid-term roll out similar reading via NFS support.
Activities: HTTP Federation

- Project in collaboration with CERN
- All SEs in federation provide WebDAV access.
- Central server provides an **aggregate view**
  - Assume that if files exists in multiple server, they are identical replicas
  - Client sees all available files
- When reading data, the client is **redirected** to “best” replica.
Activities: HTTP Federation

- ATLAS has two prototypes:
  
  - **federation.desy.de**: small number of endpoints
  
  - **Canadian-Australian fed**: sites in CA and one in Melbourne

- Federates path as exported by storage system; e.g.,

  http://federation.desy.de/fed/atlasdisks/atlasdatadisk/rucio/mc12_8TeV/00/00/AOD.01226672._003195.pool.root.1

- Next step: investigate providing a FAX-like view; e.g.,

  http://federation.desy.de/fed/atlasdisks/rucio/mc12_8TeV/AOD.01226672._003195.pool.root.1
Activities

• AAI
  • Mid-term activity at CERN to get rid of X.509 for end-users
  • dCache.org already started investigations (ahead of demand) → work supported by LSDMA
    As CERN joins SWITCH, so DESY is joining DFN-AAI

• xrootd 3rd-party copy:
  We're evaluating the protocol docs and demand
**dCache with ownCloud**

- Use ownCloud on top of dCache, via NFS
  
  Files in dCache **owned by the user** *(not ownCloud process)*

- Users can write data into dCache
  
  *Immediately* visible through ownCloud.

- Users can write data into ownCloud (sync client)
  
  *Immediately* visible through dCache

- Limitations:
  
  - If user shares data with you, you can only read that through ownCloud.
  - If you set ACL in dCache, not reflected in ownCloud

- Service is **live**: currently limited to DESY-IT (as a beta test).
How to store small files on tape
CDMI: managing cloud storage

- **Network protocol** for Cloud storage
  - initially by SNIA, now an ISO standard
  - with many, many features
- Limited vendor uptake:
  - Catch-22: demand and availability
- Some **IAAS** systems use CDMI internally,
  - the EGI FedCloud has CDMI as a common requirement
- **Preliminary support for dCache** from student project,
  - Not available now, but plan to integrate (after code review)
- What is the demand?
Software Defined Storage & QoS

- dCache can already provide **differentiated QoS** (Quality of Service):
  - Different files can have different replication factors, multi-tier (SSD, HDD, tape) usage, utilise different hardware
- Currently these QoS attributes are most configured by the **dCache admin**.
- We are investigating SDS to allow:
  - Modification of QoS after data is written,
  - Allow users finer grain control of QoS choices.
Summary

• Future of dCache is secure
• Sites should plan their upgrade to 2.10
• Continue expanding dCache admin community
• Continue to provide innovative features, based on what will best help dCache users
Thanks for listening … any questions?