dCache, list of topics

EGI Meeting on H2020

Patrick Fuhrmann
Content

• The project structure
• Project funding, customers and contacts
• Current work areas and plans
The dCache partners and team

Primary Funding
- DESY
- LSDMA
- FERMILab
- NDGF
Primary Communities

- WLCG (Worldwide, 60 Labs)
- Photon Science (DESY)
- LSDMA (Germany)
- Intensity Frontier (FERMILab)
- CSSB (DESY, Center of Structural System Biology)
Data Lifecycle Labs (Customers)

- Energy
  - smart grids, battery research, fusion research
- Earth and Environment
- Heath
- Key Technologies
  - synchrotron radiation, nanoscopy, high throughput microscopes, electron-microscope imaging techniques
- Structure of Matter

Data Service Integration Team

- Federated Identity
- Federated Data Access
- Metadata Management
- Archiving
Possible topics for common projects in LSDMA:

- Federated Identities
- Federated Storage systems, which could be storage clouds
- Already collaborating in storage:
  - dCache
  - UNICORE
dCache development areas
Generic development

• Extending the hierarchical storage management from Tape/Disk to Tape/Disk/Fast Media(SSD)
  – Based on rules or manual intervention

• Pushing further for standards beyond nfs and WebDAV towards cloud standards
Development for WLCG

• Contributing to the different xrootd federations (FAX and AAA)

• Collaborating with CERN DM on the WLCG http "Eco System"
  – DavIX
  – WebDAV and NFS (for local access)
  – Dynamic Http Federation

• Improving fast analysis by adding fast access layers (SSD)

• CMS Tape Disk separation effort
Development for Photon Communities

- Small file support for Tertiary Storage and possibly for long term archiving.
- Support of HDF5 and other container formats -> means read/modify/write for dCache.
- NFS 4.1 / pNFS for fast local analysis
Development for LSDMA

• Federated Identity
  – Building an IdP infrastructure (initially in Germany)
  – Supporting SAML in dCache.
  – Goal is to allow dCache access from Social Network accounts.
• Implementing CDMI (from HTW)
  – Collaboration with UNICORE
• Implementing Object stores.
Scientific Storage Cloud

LOFAR antenna
Huge amounts of data

X-FEL (Free Electron Lasers)
Fast Ingest

dCache.org

Cloud User

WebDAV HTTP(S)

Globus Online

Cloud

Disks

Tape Storage

Mounted POSIX FS (NFSv4.1, pNFS)

Computer farm
Scientific Storage Cloud
Requirements

• Data can be accessed by a variety of protocols
  – Globus-online transfers via gridFTP
  – FTS Transfers for WLCG via gridFTP or WebDAV
  – Private upload and download via WebDAV
  – Public anonymous access via plain http(s)
  – Direct fast access from worker-nodes via NFS4.1/pNFS (just a mount like GPFS or Lustre but with standards)

• Individuals are authenticated by different mechanisms
  – X509 certificates or proxies
  – Username/password
  – SAML assertions (from IdP)
  – Kerberos tokens
Deployment of the scientific storage cloud

• Next week we will open the cloud for DESY and HTW students.

• Steps
  – Multi Protocol (support of Mobile Clients and e.g. Globus Online data transfers.
  – Multi authentication (e.g. Google account)
  – Investigation in more Web 2.0 sharing mechanisms. (Authorization)
  – Integrating in Local Infrastructure systems (DESY, FERMILab etc)