Contribution of dCache.org to the Storage Area session of the WLCG Workshop 2016 in San Francisco.

Topic :

"Reducing the cost of storage"

Patrick Fuhrmann

On behave of the project team

dCache contribution to 'reducing the cost of storage'

dCache.org

- Improved support of 'dark data centers' and LOM, through full "High Availability" functionality and consistent remote management API.
- Building upon well established low level "low maintenance", "Open Source" storage backend technologies. (e.g. CEPH)
- Extending dCache cross-site federation features, a la, NDGF and Uni Michigan, to consolidate national human resources.
- Supporting standards in data transfer, data access and authentication mechanisms to simplify sharing of resources among different scientist communities.
- Agile integration of new soft and hardware technologies into installed system.

Supporting 'Dark Data Centers' and LOM

dCache.org

- Full support of "High Availability", allowing to cover any 'one' subsystem outage without the necessity of immediate manual intervention, resulting in
  - the reduction of operations team sizes
  - reducing 'full operation' hours.
- HA available with dCache 3.1
- See CHEP poster on dCache HA by Paul and Gerd.
  - "Towards redundant services in dCache", Poster Thursday afternoon
- Ongoing process : Support of "Lights-Out Management" by migrating towards a consistent (REST) interface for system administration and data management, simplifying the integration of dCache operations into existing monitoring and administration frameworks.

Leaving the 'low level storage expertise' to the experts.

- Building upon well established low level storage technologies.
  - "low maintenance",
  - "horizontally scaling",
  - "Open Source" is preferred (option for payed support.)
- Example : CEPH
  - Step wise integration of CEPH into dCache
  - CEPH only prototype for other shared object or block storage systems.
  - By the way: Not everyone agrees that CEPH is actually of any advantage.
- Other, similar technologies, e.g. GPFS will benefit from this new dCache-to-storage interface.
- See Tigrans CHEP talk
  - "dCache on steroids - delegated storage solutions", Monday 14:00

"Federation Functionality" in dCache.

dCache.org

- Benefits:
  - Human Resource synergy effect between sites.
  - Single Storage Endpoint seen from experiments point of view, while storage highly distributed across sites or countries.
  - Small sites can benefit from their storage as cache only.
- Improving the 'federation feature' of dCache, already in place for a decade at NDGF and Uni Michigan.
- Demonstrator with Russian Labs,
  - Kurchatov, Dubna and St. Petersburg.
- Development work :
  - Improved authorization of components against each other.
  - Improved local caching setups (if necessary)
- Mostly integration and verification of features already in place for a decade.

"Federation Functionality" in dCache.

dCache.org

- Supporting standards in data transfer, data access and authentication mechanisms.
- Benefit:
  - Simplify sharing of resources among different scientist communities.
- Established :
  - NFS
  - WebDAV
  - GridFTP
  - Sync and Share via ownCloud
- In progress
  - Open ID Connect

Agile evaluation and integration of new software and hardware technologies.

dCache.org

- dCache.org does the evaluation and integration of new soft and hardware technologies for you. You just install the latest version.

- This gar

- Examples:
  - First implementation of parallel NFS.
  - Sync and share with ownCloud
  - Multi-Tier with Tape and SSD
  - Integration of new underlying

The END

further reading
www.dCache.org