The DESY Cloud System

DESY IT VV
Patrick Fuhrmann
Aufgabenstellung:
DESY braucht einen CloudSpeicher

Für wann: Sommer 2014

Projektstart: Anfang 2014

Leute:
Tigran, Marvin, Quirin, Sven, Christian, (van der Reest und Birigit) and myself.
How do people see “The Cloud”?

• From the Amazon, Google, etc experience:
  – Unlimited storage space
  – Indestructible data store, never loosing data
  – Fast immediate access versus slow archive
  – Pay per use == detailed billing

• From the Web 2.0 experience:
  – Accessible from all kind of OS’s and mobile devices and from anywhere.
  – Synchronizing folders with “The Cloud”
  – Very easy to share data with groups and/or individuals.
The dCache cloud (cont)

What does that mean for DESY?

Big Data Part

– Unlimited storage space (scalability)
– Indestructible data store (resiliency)
– Fast immediate access versus slow archive
  – (Tape versus Disk and both)
– Pay per use, (detailed billing)

Web 2.0

– Accessible from all kind of OS’s and mobile devices and from anywhere.
– Synchronizing folders with “The Cloud”
– Very easy to share data with groups and/or individuals.
Web 2.0 Cloud interface

• For the web 2.0 interface we need some experts.
• Not much time for evaluation.
• Going for the most popular solution
  – Reduce likelihood for ‘product disappearing’
  – Possible build a user-community (Open Source)
• TU-Berlin
• TU-Dresden
• CERN
• Jülich
• United Nations (according to Tigran)
OC Features important for us..

- provides sync clients for all OS’s
- provides upload/download clients for mobile devices
- allows simple sharing of data
What provides dCache

• Unlimited space

• Managed space
  – Hot spot detection
  – Migration between media, decommissioning

• Multi protocol access
  – NFS, CDMI(Cloud), WebDAV, gridFTP(GlobusOnline)

• Multi Media Support
  – Tape
  – Spinning Disk
  – SSD’s
dCache – OwnCloud
Data Management

WEB 2.0

Unlimited hierarchical Storage Space
NFS 4.1
CDMI

SSDs

Spinning Disks
Tape, Blue Ray …
dCache OwnCloud integration

- Simply running OwnCloud on dCache was the easy bit and works nicely.
- dCache provides an NFS interface which lets it look like a regular file system.
- This is exactly what ownCloud needs.
- The fact the dCache doesn’t allow files to be modified doesn’t really bother ownCloud.
But how about ownerShip?

- **Owner ship**
  - Files owned by ‘patrick’ in OwnCloud are owned by apache/owncloud in dCache
  - That prevents us from using the same data with NFS4.1 or CDMI from dCache
  - Tigran solved that issue.

- **dCache ACL’s versus OwnCloud Sharing**
  - Files shared in OwnCloud needs to have similar ACL in dCache.
  - Not solved, won’t be solved in the context of this project
Ownership/mapping issue

- NFS, WebDAV, GridFTP, CDMI
- dCache owner: patrick
- OwnCloud owner: patrick

Diagram:
- Web 2.0, Sync
- Kerberos
- OC LDAP
- Registry Platform Adapter
- DESY LDAP

Additional Text:
- dCache owner: patrick
Ownership/mapping issue

Web 2.0
Sync
Share

NFS
WebDAV,
GridFTP,
CDMI

DESY
LDAP

Kerberos

dCache.org
Integration

• We need an registry platform adapter
• Adapter has to create the users home in dCache before first access by OwnCloud
• Adapter has to (somehow) fill in the OwnCloud LDAP from the DESY LDAP. (There are possibly other alternatives)
How would that look like for you?  

Your XXL Space  
/cloud/desy/home/PATRICK

NFS Mount  
gridFTP (GlobusOnline)  
WebDAV

Sync and Share
How would that look like for you?

**dCache homes**

- NFS Mount
- gridFTP (GlobusOnline)
- WebDAV
What’s done

• We already installed two systems.
  – One connected to the DESY LDAP
  – One with the dCache.org private cloud
• Most feature are already available
• Birgit already ordered hardware
  – Initially 200 TeraBytes
What’s still missing?

• The platform adapter needs to be written
• The DESY LDAP -> ownCloud filter needs to be done
• Customizing the ownCloud name space to support our schema.
• HTW Student (Leonie) is evaluating a ownCloud sync client working against dCache directly (under supervision of Tigran)
Testing and certification

• Sven is going to define a set of reproducible test, which we can run on about 20 machines to
  – Verify scalability
  – Guaranty for future dCache or OwnCloud updates
    • Functional
    • Performance
Further timeline

• We expect to have a pre-production system ready in about 6 - 8 weeks.

• You will be the guinea pics
dCache Big Data Cloud

LOFAR antenna
Huge amounts of data

X-FEL
(Free Electron Lasers)
Fast Ingest

Cloud User
WebDAV HTTP(S)
Globus Online

Cloud

Disks
Tape Storage

Mounted POSIX FS
(NFSv4.1, pNFS)

Computer farm

dCache.org

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The End

further reading

www.dCache.org