Standardization in EMI-Data

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EMI Data Standardization Efforts

According to the EMI Data Description of Work

EMI Storage Elements (dCache, StoRM, DPM)

- Implementing NFS 4.1 / pNFS
- Implementing WebDAV

EMI Components and beyond : CASTOR (cern), OSG Storage

- Defining and standardizing a Storage Accounting Record
- Replacing the SRM GSI security layer by plain SSL/X509 plus delegation.
- Migrating from GLUE 1.3 to GLUE 2.0
- Cleaning up SRM 2.2 spec

Agreement on common Authorization (Blackmailing) : ARGUS

BTW : we are of course doing many more cool things in EMI-Data
GLUE 1.3 to GLUE 2.0 Migration

GLUE 2.0

See Paul’s presentation ….
SRM over SSL/X509

Or

Providing Standard and Secure transport.

See Paul’s presentation ....
Storage Accounting

The Storage Accounting Record

See Jon’s presentation

....

If there would be a Nobel Price, Jon would deserve it.

“Geez, I had no idea there was a Nobel Prize for accounting “
NFS 4.1 / pNFS
The NFS 4.1 effort is going beyond EMI:

- EMI
- gLite
- Labs
  - DESY,
  - FNAL
  - NDGF
- German Government:
  - German d-grid
  - HGF “Physics at the Terascale”
Why should you be interested in pNFS

Benefits of Parallel I/O

- Delivers Very High Application Performance
- Allows for Massive Scalability without diminished performance

Benefits of NFS (or most any standard)

- Ensures Interoperability among vendor solutions
- Allows Choice of best-of-breed products
- Eliminates Risks of deploying proprietary technology

Stolen from: http://www.pnfs.com/
Two aspect from our perspective

Simplicity

✓ Regular mount-point and real POSIX I/O
✓ Can be used by unmodified applications (e.g. Mathematica..)
✓ Data client provided by the OS vendor
✓ Smart caching (block caching) development done by OS vendors

Performance

✓ pNFS: parallel NFS (first version of NFS which support multiple data servers)
✓ Clever protocols, e.g. Compound Requests
Availability for production use

2010

Q4

Industry

NetApp

Blue Arc

dCache

DPM

StoRM

2011

Q1

NetAppTest DESY

Q2

Production (OnTap 8.1)

Q3

Next Golden Release (1.9.12)

Q4

GPFS native

GPFS pNFS

pNFS in official 2.6.38 kernel

Linux distributions (RH6.2…)

DESY Linux pNFS kernel for SL5

pNFS Enabled Kernel

1.9.8 - 1.9.11

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Standardization in EMI Data, Vilnius EGI UF
pNFS support in SL5/6

- Full NFS 4.1/pNFS client available in 2.6.38
- Back port into RH6 expected with RH6.2, shortly after it will be in SL6.2.
WebDAV

WebDAV
- Web-based Distributed Authoring and Versioning
- A major extension to HTTP(s)
- Provides some kind of web-based network file system
- Allows browsing, uploading, downloading, renaming... of files
- Standard: defined by IETF
- Supported by all major Operating Systems
- From browser plug-in to file system simulation (fuse).

EMI DoW requires that all EMI Storage Elements support http(s) and WebDAV before end of the project.

Availability
- Done for dCache in the EMI – 1 release.
- DPM and StoRM following with EMI-2 (one year from now)
Standards provide …

Standards but especially NFS4.1/pNFS and WebDAV

• opens new communities to EMI-Data.
  • E.g. Photon science (XFEL, CFEL @ DESY)
  • SNIC, Swedish National Infrastructure for Computing
• Makes EMI-Data systems a realistic competitor to expensive industry solutions. (IBM, NetApp ..)
Some references
References

Center for Technology Integration
http://www.citi.umich.edu/

NFS
http://www.nfsv4.org/nfsv4techinfo.html

PNFS
http://www.pnfs.com/

RFC 5661

NFS 4.1 in first dCache Golden Release (1.9.5)
http://www.dcache.org/downloads/1.9/release-notes-1.9.5-1.html

EMI, The European Middleware Initiative

EMI, The European Grid Infrastructure
http://www.egi.eu

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Grid Deployment Board, Oct 13, 2010, Patrick Fuhrmann

11 Reasons you should care, June 16, 2010, Gerd Behrmann
References

CHEP 2010, Oct 20, 2010, Yves Kemp:

Hepix Fall 2010, Nov 2, 2010, Patrick Fuhrmann

Linux Kernel: www.kernel.org

NetApp: www.netapp.com

BlueArch: www.bluearc.com

Scientific Linux
http://www.scientificlinux.org

FERMILab
http://www.fnal.gov

pNFS enabled SL5 Kernel
http://www.dcache.org/chimera/x86_64; dcache-www01.desy.de/yum/nfs4.1/el5/nfsv41.repo
Thank you

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