EMI Data, the Introduction

Patrick Fuhrmann (DESY)
EMI Data Area lead
People

- Alejandro Alvarez
- Alex Sim
- Claudio Cacciari
- Christian Loeschen
- Dirk Duellmann
- Elisabetta Ronchieri
- Fabrizio Furano
- Giuseppe Fiameni
- Giacinto Donvito
- Giuseppe Lo Presti
- Jon Kerr Nilsen
- Jan Schaefer
- Jean-Philippe Baud
- Michele Carpene
- Michele Dibenedetto
- Michail Salichos
- Mischa Salle
- Oscar Koeroo
- Oliver Keeble
- Paul Millar
- Ralph Mueller-Pfefferkorn
- Ricardo Rocha
- Riccardo Zappi
- Tigran Mkrtchyan
- Zsolt Molnar
- Zsombor Nagy

Our wiki: https://twiki.cern.ch/twiki/bin/view/EMI/EmiJra1T3Data
Outline

- EMI in the European FP7 context.
- What is EMI doing?
- Why are we doing this?
  - **EMI Data** in the EMI context.
- When are we doing what?
- What is EMI Data doing in particular?
- Some selected topics.
- Conclusions
EMI Factsheet

- **Budget**: about 24 Million Euros
- **Funding**: about 50% by EU-FP7, rest by partners
- **Covers**: JRA, SA and NA
- **Partners**: 22
- **Middlewares**: Arc, gLite, UNICORE and dCache

16/09/2010

EMI Overview - EGI Tf, Amsterdam

Oct 19, 2010

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Why

According to our Project Director, Alberto Di Meglio:

The European Middleware Initiative (EMI) project represents a close collaboration of the major European middleware providers - ARC, gLite, UNICORE and dCache - to establish a sustainable model to support, harmonise and evolve distributed computing middleware for deployment in EGI, PRACE and other distributed e-Infrastructures.
EMI in context

Stolen from Alberto Di Meglio

EGI, PRACE, WLCG, OSG

Requirements
SLAs & Support
Releases

EMI

Collaborations

ESFRI, VRCs

Standards Industry

DCI collaborations

StratusLab
VENUS-C
SIENA
EDGI
IGE

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What is EMI doing

EMI Middleware Evolution

Before EMI

3 years

After EMI

Applications
Integrators, System Administrators

Specialized services, professional support and customization

EMI Reference Services

Standards, New technologies (clouds) Users and Infrastructure Requirements

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**Why again?**

*Why are WE doing this?*

Because with EMI we got the money and the organizational infrastructure to achieve goals, which we were planning to do anyway but didn’t find time nor money yet, e.g.:

- Moving towards standards
  - https / webDav
  - NFS 4.1
  - SRM
- Fixing flaws
  - Catalogue synchronization
- Improving usability
  - Storage Accounting
  - Monitoring Interface
  - Individual efforts of product teams of components
When will it happen?

Release Plan

Start | EMI 0 | EMI 1 | EMI 2 | EMI 3

01/05/2010 | 31/10/2010 | 30/04/2011 | 30/04/2012 | 28/02/2013

Major releases

Support & Maintenance

Support & Maintenance

Support & Maintenance

Stolen from Alberto Di Meglio

See Alberto Aimar’s presentation for details (yesterday)

01/05/2010
31/10/2010
30/04/2011
30/04/2012
28/02/2013

01/05/2010
31/10/2010
30/04/2011
30/04/2012
28/02/2013
EMI Data in context

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How does EMI Data contribute.
EMI workplan (activities)

- WLCG ARC
  - Catalogue Synchronization
  - DATA client Library consolidation
- ARGUS Integration
- SECURITY
  - SRM Security
- EMI DATA
  - UNICORE Integration
  - GLUE 2.0
  - Storage Accounting
  - SRM Spec Simplification
- Standards
  - NFS 4.1
  - http(s) WebDav
- Standardization
  - OGF IETF
Standardization efforts
The EMI SE bundle

Access
- Data
- Name Space
- Control

Storage Control
- dCache
- StoRM (Storage Resource Manager)
- DPM

Storage Layer
- Storage Control
- Storage Access
- Storage Monitoring

Custodial Layer
- Monitoring
- Accounting
- API

Control
- SRM
- NFS 4.1
- Posix
- WebDav
- http(s)
- gsi
- FTP
- Namespace API

Name Space
- Monitoring
- Accounting
- API

Access
- Data
- Name Space
- Control
WebDav

- Very useful for new (non-LHC) communities.
- Already available in dCache.
- Will be added to StoRM and DPM after EMI-1.
- Allows “File system like” access with
  - Mac OS
  - Linux
  - Windows
Standardization: NFS 4.1 (pNFS)

- NFS 4.1 (pNFS): industry standard (defined by IETF)
- Genuine POSIX access through mounted file system.
- pNFS supports highly distributed data sources.
- Clients provided and maintained by OS.
- Will be used by industry heavyweights: IBM, EMC, Panasas...
- Production dCache 1.9.10; beta in DPM; considered for StoRM
Standardization : NFS 4.1 (pNFS)

Ongoing NFS evaluation with dCache

Stability (Hammercloud)

Overall Efficiency

7360

46

Simple I/O ‘cat … >/dev/null

Draft, please see Yves

Presentation tomorrow

NFS 4.1

dCap
SRM is a remote *storage management* protocol.

The SRM does:
- Transfer protocol negotiation
- Name space operations
- Space management
- Storage Management: access latency, retention policy (tape, disk,...)
- Allows bulk operations.

- Specification not easy to understand by customers.
- Spec might need a cleanup based on our experience.
- Better documentation from user perspective.
- The SRM is an extremely useful and btw the only tool to remotely manage data in a standardized way across SE’s.
Standardization : SRM, security

- Right now : GLOBUS : library and protocol (non standard)
- Goal : replacing GSI by SSL/TLS-X509
- Step I :
  - No delegation (srmcp)
  - GLOBUS library in SSL compatibility mode.
  - Prove of concept done : dCache SRM server and client.
- Step II
  - No delegation.
  - Server and client can use standard java/openssl libraries.
- Step III
  - Agreement on delegation service : done GDS
  - Agreements in progress 😊
    - Who tells to create delegated proxy : client or server
    - How does the server tell the client w/o changing the WSDL
    - Where do we store the delegation ID (w/o WSDL change)
    - How close should the delegation service be to the SRM service
Standardization: Storage Resource Mgr

SE
- Monitoring API
- SRM
- NFS 4.1
- WebDav
- http(s)
- gsi
- FTP
- Namespace API

gLite FTS
The gLite File Transfer Service

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More efforts

Fixing a design flaw
• Catalogues storage file locations (Storage URLs)
• Catalogues and SE’s get out of sync over time.
• Current (full dump) synchronization approach is painful and doesn’t scale.
• Message Passing is envisioned to fix this flaw.
Even more efforts

Harmonization / Integration
• UNICORE SRM-Client to do remote Storage Management.
• Interaction with gLite file catalogue to get Storage URL
• Already available:
  – http(s) client.
  – Posix I/O via mounted filesystem.
Conclusions

- **EMI Data** is a good opportunity to get our storage management middleware into a maintainable shape.
- Standardization is the way to get broader acceptance by other communities.
- Everybody can join or may provide suggestions through WLCG or EGI.eu.
Further reading

https://twiki.cern.ch/twiki/bin/view/EMI/EmiJra1T3Data

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