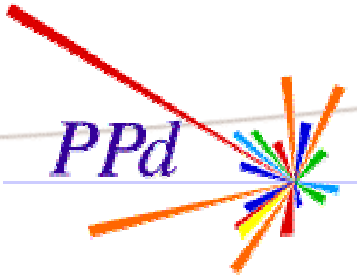
Overview of applications view of the data management middleware

Stephen Burke



Software areas discussed

- BrokerInfo et al
- Replica Manager
- Storage Element

Based on testing on the EDG dev TB and LCG C&T TB, plus preliminary testing on the EDG app TB

Brokerinfo etc

- Issues of file matching and use of BrokerInfo fall between WPs, not always obvious who is responsible
  - WP1: matching in JDL, .BrokerInfo file
  - WP2: general file management, edg-brokerinfo (???)
  - WP3 + GLUE: information schema
  - WP4: CESEBind info provider
  - WP5: TURLs and SE info provider
  - WP6: testbed configuration
- ***This area is very important to users!***

File matching

- Basic matching works OK
- Problems with more than one close SE per CE
- Matching algorithm has some quirks
  - With multiple files will match on 1 even if the others are not available
- Automatic uploading of output files was broken
  - Supposed to be fixed but not deployed
- Gang-matching (matching on SE attributes) apparently does not work
- Optimisation (access cost ranking) not yet tested
- Can only match/use files from one VO

File access in jobs

- Functionality of BrokerInfo getSelectedFile in TB 1 is missing
  - Should return a usable TURL given an LFN and protocol
- Configuration of NFS mount point is less flexible than TB 1
  - Schema does not properly describe mount points, interim solution relies on having a close CE for every SE with identical mount points
- No file locking, job may have to call getBestFile again to recover a deleted file
- Still no local disk space management on the WN
- Slashgrid?

Replica Manager - General

- Extensively tested on EDG dev TB
- Some testing on LCG
  - No ROS, no WP5 SE, MDS instead of R-GMA
- 134 bugs in bugzilla, 33 still open
- Biggest problem is speed: various reasons, but much too slow
- LFN/GUID/SURL/SFN/StFN/TURL system is very complex!
  - Hidden inside POOL?

RM - Outstanding bugs

- RM does not make full use of Service/ServiceStatus tables
- getBestFile does not deal properly with multiple close SEs
- Some bugs are marked as fixed but not yet deployed

RM - Command line

- edg-rm is a general interface to all DM functions
  - Metadata and wildcard operations excepted
  - Interface is fairly intuitive
- Some errors generate a java backtrace or misleading error messages, but problems are being fixed as they are found
- Exception recovery is not perfect
  - e.g. failed write to catalogue may leave file on disk
  - Different operations deal with failures in different ways
- No equivalent of GDMP (everything is done by the client)
  - No bulk file transfers, no subscriptions, no server-based actions

RM - Catalogues

- Currently have a single LRC and RMC for each VO
  - ROS is distributed
- Distributed system desirable for fault tolerance, but may be complex to configure?
- Nothing to keep catalogues and SEs consistent
  - Are the catalogue data backed up?
- Still needs testing with large numbers of files
- Not clear if experiments need metadata in RMC – or even LFNS? (POOL)

RM - Security

- Not clear what experiments want, or what they will get!
  - Namespace control on LFNs?
  - ACLs on files?
  - ACLs on SEs?
- Will we get the secure web service?
  - Denial of service etc.

WP8 view of replica management

- Summary:
  - New replica manager works well in general
  - File registration is ***very*** slow (> 20 secs for 1 12-byte file!)
- Issues:
  - Moving to the distributed RLI/LRC system is a big change, can we get it working in time?
  - BrokerInfo interaction / getSelectedFile functionality
  - VOMS integration – what do we want and can we get it?
  - Schema changes – lots of interested parties

Summary of Priorities for WP2

Existing system:

- Registration time
- getSelectedFile
- Exception handling
- Metadata
- Optimisation

New features:

- Secure web service
- Distributed RLI/LRC
- VOMS integration

Vital

Desirable

Low priority

SE - General

- Tested on dev TB only, not installed by LCG
  - Basic functionality works
  - Castor and ADS interfaces seem to be (mostly) working
- Configuration seems fragile, not much guidance for sysadmins (e.g. use of partitions)
  - Validation tests?
- 220 bugs in bugzilla, 51 still open
- Delete still does not work
- Very limited user documentation
  - But largely hidden behind the RM

SE - Command line

- ele* commands removed due to ssh problems, but were more intuitive than edg-se-webservice
- edg-se-webservice command is clumsy (especially in insecure mode), but users will normally only use edg-rm
- Error reporting is poor, most errors give an XML dump, error messages are often meaningless

SE - Architecture

- Separation between permanent storage and cache area makes sense, but only if the cache gets cleaned, otherwise all files are stored twice
- Create/write/commit and cache/getTURL/read cycles are reasonably intuitive
- No space reservation yet
- Storage under hashed names – what is the hash algorithm? Is the mapping from SFNs stored securely?
- Should it be possible to overwrite an existing file? (General model is that files are read-only)
- Each VO has a separate name space, no way to identify a file uniquely

SE - Usage

- create, getTURL, commit, cache, ls, mkdir, getMetaData all OK
  - Easy to forget to call getTURL!
- Can also register an existing file
- No way to get back the TURL for a file which has been created but not committed
- Metadata is limited (creator CN, size, and create, modify and access timestamps) and is only available when the file is cached
- getSECost returns 1 if the file is on disk and –1 if not

SE - Security

- Secure web service badly needed
- No way to specify VO or user with insecure interface, hence everyone is John Gordon
- ACLs?

SE - Information providers

- Schema is part of GLUE, supposed to be generic for all storage systems
  - SE providers come from WP5
- Free disk space reporting is problematic
  - Does it report the space in the permanent file area or the cache?
  - Still doesn't deal properly with partitions (but may not be such a problem)
  - Can cope with different areas per VO
- Technical problem in the way the DN for the SA (Storage Area) object is constructed
  - First test of GLUE change procedure?
- Policy values are published (`MaxFileSize`, `MinFileSize`, `MaxData`, `MaxNumFiles`, `MaxPinDuration`) but they are not enforced, hence they are meaningless

WP8 view of SE

- Situation:
  - Functionality is mostly there
  - Lots of minor bugs and problems
  - Configuration seems delicate, SEs often fail to work for no obvious reason, diagnosing problems is hard
  - Error reporting is poor
- Issues:
  - Space management
  - ACLs
  - GLUE schema

Summary of Priorities for WP5

Existing system:

- Stability/reliability
- Delete
- Secure web service
- Interaction with WP2
- Error reporting
- ele* command line

New features:

- Space management
- VOMS integration (ACLs)