

Storage Interfaces

Introduction

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Based on previous discussions with Working Group:
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Short reminder of motivation and mandate

- For more details see [previous GDB](#) and [TEG report](#).
- Little of current management interface (SRM) is used:
 - Performance overheads for experiments.
 - Work on developers to maintain.
 - Restricts sites technology choices.
- WG proposed by TEG; presented to MB on 19 / 6
 - 1st meeting was 21 Sep.
- This meeting is a “working” one.

Slightly Refined Mandate

- Building on Storage/Data TEG, clarify for disk-only systems the minimal functionality for WLCG Storage Management Interface.
- Evaluate alternative interfaces as they emerge, call for the need of tests whenever interesting, and recommend those shown to be interoperable, scalable and supportable.
- Help ensure that these alternatives can be supported by FTS and lcg_utils to allow interoperability.
- Meetings to coincide with GDBs plus extras on demand:
 - Presentations from developers / sites / experiments covering activity
 - **Not** designing a replacement interface to SRM but there **are** already activities so bringing together and coordinating these.

Brief functionality table:

(see also LHCb talk and backup slides)

Function	Used by ATLAS	CMS	LHCb	Is there an existing Alternative or Issue (to SRM)
Transfer: 3 rd Party (FTS)	YES	YES	YES	Using just gridFTP in EOS (ATLAS) and Nebraska (CMS) What about on other SEs?
Transfer: Job in/out (LAN)	YES	YES	YES	ATLAS and CMS using LAN protocols directly
Negotiate a transport protocol	NO	NO	YES	LHCb use lcg-geturls;
Transfer: Direct Download	YES	NO	NO	ATLAS use SRM via lcg-cp, Alternative plugins in rucio
Namespace: Manipulation / Deletion	YES	YES	YES	ATLAS: Deletion would need plugin for an alternative
Space Query	YES	NO	YES?	Development Required
Space Upload	YES	NO	YES?	Minor Development Required

Areas requiring possible development

Needed by?	Development for?	Issue
ATLAS	Middleware	Reporting of space used in space tokens: WebDav quotas?
ATLAS	Middleware	Targeting upload to space token: Could just use namespace but certain SEs would need to change the way they report space to reflect
ATLAS	ATLAS?	Deletion
LHCb	Middleware	Surl->Turl (see Philippe's talk / discussion)
Any?	Middleware	Checksum check – confirm not needed?
All?	Middleware	Transfers using pure gridFTP on different storage types

Summary and goals for this session

- Experiments: current and future data models.
 - CMS: no “blockers” for non-SRM usage
 - ATLAS: some that may be resolved in next gen of data management: **rucio**
 - **LHCb** have some more
- Sites: Those looking moving to possible technology without SRM: e.g. **CERN**; RAL
- Middleware and tool development : e.g. **DPM** and **FTS**
- Finalize **functionality map**; identify **blocking issues** and needed **development**.

Links to other activity:

- Accounting (StAR) and publishing (glue/bdii)
 - Later is only minimally used (and former doesn't exist yet). Is this within scope of WG?
- Federation WG:
 - Medium term there will still be another interface
 - Longer term use of federation is not yet clear.

Extra Slides

Table of used functions from TEG

	<i>Is this feature used by ...</i>				Tier	SRM function ²
	<i>Atlas</i>	<i>CMS</i>	<i>LHCb</i>	<i>FTS only</i>		
<i>Transfer Management</i>						
Upload / download a complete file	Yes	Yes	Yes	No	All	srmPrepareToPut/Get//Put/GetDone
Manage transfers.	Yes	Yes	Yes	Yes	T1/2	srmAbort/Suspend/ResumeRequest
Balance over multiple transfer servers.	Yes	Yes	Yes	Yes	T1/2	srmPrepareToGet ³
Manage third-party copy	Yes	Yes	Yes	Yes ⁵	T1/2	
Negotiating a transport protocol	No	No	No			srmGetTransferProtocols
<i>Namespace Interaction</i>						
Querying information about a file (stat)	No	No	Yes ¹	Yes ⁶	T1/2	srmLs
Upload data integrity information (chksums)	No	No	No	No	T1/2	
Check integrity information	Yes	Yes	Yes	Yes		srmLs
Creating/Deleting data and directories	Yes	Yes	Yes ¹	Yes ⁷	All	srmMkdir srmRmdir srmRm srmMv
Changing ownership, perms and ACLs	No	No	No	No	-	srmSet/Check/GetPermission
<i>Storage Capacity Management</i>						
Query used capacity (like df)	Yes	No	Yes	No	T1/2	srmGetSpaceMetaData/Tokens
Create/remove reservations; assign characteristics	No	No	No	No	-	srmReserve/Update/ReleaseSpace
Targeting uploads to specific reservation	Yes	Yes	Yes	No	T1/2	srmPrepareToPut
Moving files between reservations	No	No	Yes	No	T1/2	srmChangeSpaceForFiles
<i>Server Identification</i>						
Test service availability and information	Yes	Yes	No	No		srmPing

- Somewhat simplified and removed those only relevant for Archive/T1
- Still probably can't read it (!) but a couple of observations:
 - Not that much is needed – e.g. space management is only querying and not even that for CMS

“getturls” issue (my short summary)

- LHCb use SRM to get a tURL
 - For WAN: load balancing of gridftp servers.
 - For WAN: sites don't want to expose name of “doors”.
 - For LAN: tells which protocol to use
- CMS use “rule-based” lookups method and are happy with it
- ATLAS have a zoo of site-specific regexps etc.
 - But see an advantage in simplification
- Ways forward:
 - WAN: gridFTP redirection or DNS-balancing
 - LAN: Force single protocol (e.g. xroot or http) and/or path