

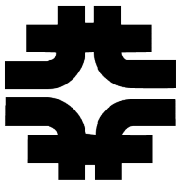
Data Movement & Storage - Upper Storage

(in 5 minutes or less)

Rob Kennedy

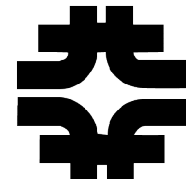
08 Feb 2005

GDM Meeting



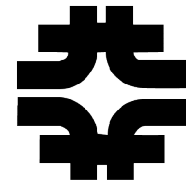
DMS-Upper Storage Drivers & Scope

- Driver 1: Maintain FNAL dCache Services
 - FNAL dCache support. Test/upgrade software. Coordinate w/exp'ts.
- Driver 2: Collaboration: dCache, GGF, OSG, ...
 - dCache Collaboration: represent FNAL, improve process, LCG support
 - GGF: SRM interface specification beyond v2.1.
 - Postgresql expertise: leverage for performance, reliability (PNFS,SRM)
- Driver 3: Develop SRM-dCache to meet the requirements of US-CMS
 - Develop and help support variants of Resilient and Classic dCache for use at US-CMS Tier-1 site (FNAL) and 7 US-CMS Tier-2 sites.
 - Develop/configure dCache to accommodate common Tier-2 networking
 - SRM-dCache: Provide interoperable interface to storage.
 - SRM/gridftp: Provide robust and performant data transfers (T0-T1-T2)
- Driver 4: Prepare/integrate SRM-dCache as a Storage Element on the OSG
 - Prove SRM-dCache in US-CMS T1/T2 context, first.
 - Issues: MIS schema, explicit space reservation, deployment model and procedures, proof of interoperability with all other SRMs on OSG, etc.



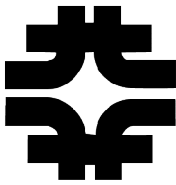
DMS-Upper Storage Drivers (Draft V0.12)

	Character in Cells: X = development, I = integration, L = low priority, H = high priority, ? = ?	Priority & Date of next Milestone	SRM (upper storage)	Resilient dcache (upper storage)	Remainder of Upper Storage [2]
	FTE months in FY05 Available/ Posted/ Needed/Outsourced:		>>	48/18/93/3	<<
COMMON	FermiGrid grid access to Fermilab resources		X		
COMMON	Fermilab resources accessible to Open Science Grid		X		I
COMMON	Common and/or interoperable Services with OSG and LCG		X		X
COMMON	Distributed, diversely located, persistent data store			I	I
COMMON	Distributed permanent data storage not only at FCC			X	X
COMMON	Computing Facility Expansion to meet Stakeholder needs.			X	X
COMMON	Minimize operational and deployment loads		I	I	I
COMMON	Cross VO access to event generation data (patriot)		X		
COMMON	Advanced Network Services for petabyte data movement		X	L	L
COMMON	Timely Deployments			I	I
COMMON	Common Data Management Services		X		X
CDF	Optimize use of tape resources				X
CDF	Support for ~x2 data taking rate	Almost done			X
CDF	Support for x3 data taking rate	need to write requirements			X
CDF	Load-balancing on Analysis Clusters				X
CDF	Accounting for Finance Committee				?
CDF	Use of OSG/LCG/FermiGrid resources	1/1/2006	I?		I
CMS	US CMS Tier-1/CERN Robust Data Movement	12/1/2004	X		X
CMS	CMS Data Management Prototype	6/1/2005	I	X	X
CMS	Tier-1 Grid resources access (policy) from OSG & LCG	1/1/2005	X?		
CMS	DC06 CMS 20% Data Challenge	3/1/2006	I?	?	?
CMS	DC07 CMS 50% Data Challenge	3/1/2007	I?	?	?
CMS	MCPS using Tier-2 and OSG resources	3/1/2005			X
Theory	Lattice Gauge Facility		I?		X
MINOS	Robust & Stable Operation	High Priority		X	X
MINOS	Use of OSG/FermiGrid resources	High Priority	I?		



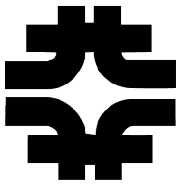
DMS-Upper Storage Drivers (remainder)

[2] Remainder of Upper Storage											
Support	Doc & Packaging	GridFTP	VO Authorization Module Integration	DCAP Library	PNFS Related Development	Features	Investigations for the Future	CMS Integration	dCache Collaboration	OSG	LCG
H	Base-H, Other-L	Base-H, Other-L	outsource	H		L	L	H	H	H	H
		L					L			I	
		X							X	X	X
I		I									
	X										
X											
I	I									I	
			X								
						L	L				
I	I		I							I	
										X	X
X					X	X					
X					X						
X				X	X	X	?				
X						X					
?						?					
						I					
X											
X		X				X		X	X	I	I?
?	?	?	?	?	?	?				?	?
?	?	?	?	?	?	?				?	?
?	?	X	?					X		I	
X											
X				X							
02/08/05					GDM Project Presentation						4



Drivers and Milestones

- Driver 1: Maintain FNAL dCache Services *on-going*
- Driver 2: Collaboration: dCache, GGF, OSG, ... *on-going*
- Driver 3: Develop SRM-dCache to meet the requirements of US-CMS
 - Develop Resilient dCache: *DONE.*
 - Develop Hybrid Resilient/Classic dCache: *Complete in next week.*
 - SRM-dCache robustness: CERN-FNAL data challenge. *DONE.*
 - SRM-dCache robustness: FNAL – Tier-2 challenges. *Feb-Mar 2005.*
 - SRM-dCache functionality: implicit space reservation. *March 2005.*
- Driver 4: Prepare/integrate SRM-dCache as SE on OSG
 - Prove SRM-dCache in US-CMS T1/T2 context. *Early Spring 2005.*
 - MIS schema – SRM to GRIS,GIIS works, but schema define/support?
 - Explicit space reservation – Difficult. Many error cases to treat.
 - Deployment issues – Seek Grid3-savvy collaborators for help (Vandy)
 - Interoperability with ALL participating SRMs – Not hard, takes effort.
 - Goal: deploy when “enough features” for real use: *Late Spring 2005.*



Effort Profile And Risks

- Budgeted Effort: Lower than WBS estimates we showed to experiments
 - Support: ~1.0 FTE dCache primary, exp't consult, upgrades
 - Collaboration: ~0.3 FTE dCache, OSG, LCG, GGF, ... (low)
 - Development: ~6.0 FTE SRM, gridftp, Resilient dCache & hybrids, ...
 - Management: ~0.1 FTE Budget, GDM, team leadership (low)
 - Investigations: ~0.5 FTE PNFS, compare file systems and caching, ...
- Actual Effort: now 4 FTEs, soon 6.5 FTEs ('090,'096), + modest outside effort.
 - Staff/Posted/Needed/Outsource = 48/18/93/3 (Dec 2004 driver matrix)
 - 2 FTE shortfall – outside effort, reduce/move support, and prioritize.
 - dCache admin interface complex. ISA is short-handed w.r.t. FY2004.
 - Streamline activities with defined, automated dev/build/test processes.
 - Seek common solutions (gridftp). (CANNOT cut investigations.)
- Risks: Evolving customer requirements, environment (OSG), technology.
 - Unknown effort to get streamlined dev/build/test/deploy process accepted.
 - SRM-dCache support explosion, esp. off-site.
 - SRM v3, WSRF, explicit space reservation – schedule risk, may defer