Data Movement & Storage - Upper Storage

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12 April 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 (+LCG), GGF, OSG, Vanderbilt, ...
  - 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 T1
  - 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: Interoperable storage interface. API V2.1 Implementation
  - SRM/gridftp v2: Robust and performant data transfers (T0-T1-T1-T2)
- Driver 4: Prepare/integrate SRM-dCache as a Storage Element on the OSG
  - US-CMS T1/T2 context to test (done). Release client tools, then service.
  - Issues: MIS schema, explicit space reservation, deployment model and procedures, proof of interoperability with all other SRMs on OSG, etc.
- Driver 5: (NEW) Expand FNAL dCache Service: Minos, CDF Raw & iCAF

DMS-Upper Storage Drivers (Draft V0.13)

	12/14/04		Top Level		
	Character in Cells: X = development, I = integration, L = low priority, H = high priority, ? = ?	Priority& Date of next Milestone	SRM (upper storag e)	t dcache (upper storage)	der of Upper Storage [2]
	FTE months in FY05 Available/ Posted/ Needed/Outsourced:		>>	48/18/93/	<<
COMMON	Inter-VO grid access to Fermilab resources		X		
COMMON	Fermilab Computing and Strategic Storage 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 & custodial data storage not only at FCC			X	X
COMMON	Computing Facility capacity expansion that meets Stakeholder needs			X	X
COMMON	Minimize operational and deployment loads		I	I	I
COMMON	Cross VO access to event generation data (patriot)		X		
COMMON	Good Internetworking with Present and Potential Partners		X	L	L
COMMON	Timely Deployments			I	I
COMMON	Common Data Management Services		X		X
CDF	Support for ~x2 data taking rate	Almost done			X
CDF	Support for x3 data taking rate	need to write requirements			X
CDF	Tape migration support				
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-1Grid resources access (subject to 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	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					
?						?					
						I					
X											
X		X				X		X	X	I	I?
?	?	?	?	?	?	?				?	?
?	?	?	?	?	?	?				?	?
?	?	X	?					X		I	
X											
X				X							

Drivers and Milestones 1

- Driver 1: Maintain FNAL dCache Services ***on-going***
  - Improve processes, admin tools, monitoring, ... ***June-July 2005.***
- Driver 2: dCache (+LCG), GGF, OSG, Vanderbilt, ... ***on-going***
  - SRM v3 API, prove FNAL SRM on other storage, ... ***(no timescale set)***
- Driver 3: Develop SRM-dCache to meet the requirements of US-CMS T1
  - Develop Resilient dCache: ***Initial version DONE.***
  - Develop Hybrid Resilient/Classic dCache: ***V1 DONE. V2 Planning.***
  - SRM-dCache robustness: CERN-FNAL Service Challenge 1. ***DONE.***
  - SRM-dCache robustness: CERN-FNAL Service Challenge 2. ***DONE.***
  - SRM-dCache robustness: CERN-FNAL Service Challenge 3. ***July 2005.***
  - US-CMS integration: – Tier-2 setup help and consult. ***3/7 DONE.***
  - US-CMS integration: – Tier-2 setup help and consult. ***2/7 Almost done.***
  - SRM-dCache: Implicit space reservation. Proto released. ***Almost done.***
  - SRM-dCache: Most V2.1 API implementation. ***May 2005.***
  - SRM-dCache: Explicit space reservation. ***June 2005.***

Drivers and Milestones 2

- Driver 4: Prepare/integrate SRM-dCache as SE on OSG
  - Prove SRM-dCache in US-CMS T1/T2 context. ***DONE.***
  - Deploy SRM client V1.1 tools to ITB (not to production) ***Late April 2005.***
  - Deploy SRM client V2.1 tools to ITB and to OSG production ***May 2005.***
  - Demo SRM-dCache service to SRM client tool testers ***April 2005.***
  - Deploy SRM-dCache service to ITB ***May 2005.***
  - Deploy SRM-dCache service to ITB/OSG Prd ***May-June 2005.***
  - Issues:
    - MIS schema – To GRIS,GIIS works, but schema define/support?
    - Explicit space reservation – Difficult. Many error cases to treat.
    - Deployment issues – Initially straight to OSG cache, need pacman packaging of tools/service, may get help from Vanderbilt on this.
    - Interoperability with ALL participating SRMs – on-going.
- Driver 5: (NEW) Expand FNAL dCache Service: Minos, CDF Raw & iCAF
  - Plan expansion of FNDCA for Minos, early FermiGrid ***April 2005.***
  - Consult, support CDF: Raw data dCache, iCAF dCache. ***(timescale?)***

Effort Profile And Risks

- Budgeted Effort: Lower than WBS estimates we showed to experiments
  - See last talk for the details.
- 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. Work on admin doc for ISA.
  - Streamline activities with defined, automated dev/build/test processes.
  - Seek common solutions (gridftp).
  - *Cannot cut investigations*. Diverse toolset needed for 3-5 year time-frame.
- Risks: Expanding customer requirements; Evolving environment, technology.
  - SRM-dCache support explosion, especially off-site.
  - dCache system expansions and support on-site.
  - US-CMS T1 mission creep – additional consult/support outside WBS
  - CMS Data Handling – may need to divert effort to explore competitors.
  - Explicit space reservation – schedule risk (hard to do)
  - SRM V3 API – schedule risk (outside parties driving this)