FNAL Dcache Project Status

Robert D. Kennedy

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2,3,4) WBS Talking Points

5,6) Architecture

7,8) Status

9,10) Some Action Items (GDM)

WBS Talking Points 1

- (1) Support
  - Contribute to the support, maintenance, and configuration of Dcache systems at Fermilab.
  - Aid US-CMS-T1 in the deployment Dcache at US-CMS-T2 sites.
  - Provide Dcache consulting and debugging help to local projects, experiments, and new T2 Dcache administrators.
- (2) Infrastructure
  - Contribute to creating a more rigorous development, integration, and production release process for the Dcache project.
  - This will help improve the overall quality of the Dcache product, and also help move towards a more predictable development and release schedule.
- (5) Administration
  - Support Fermilab and the Computing Division policies via sound administration and project management practices. (eg. Security)

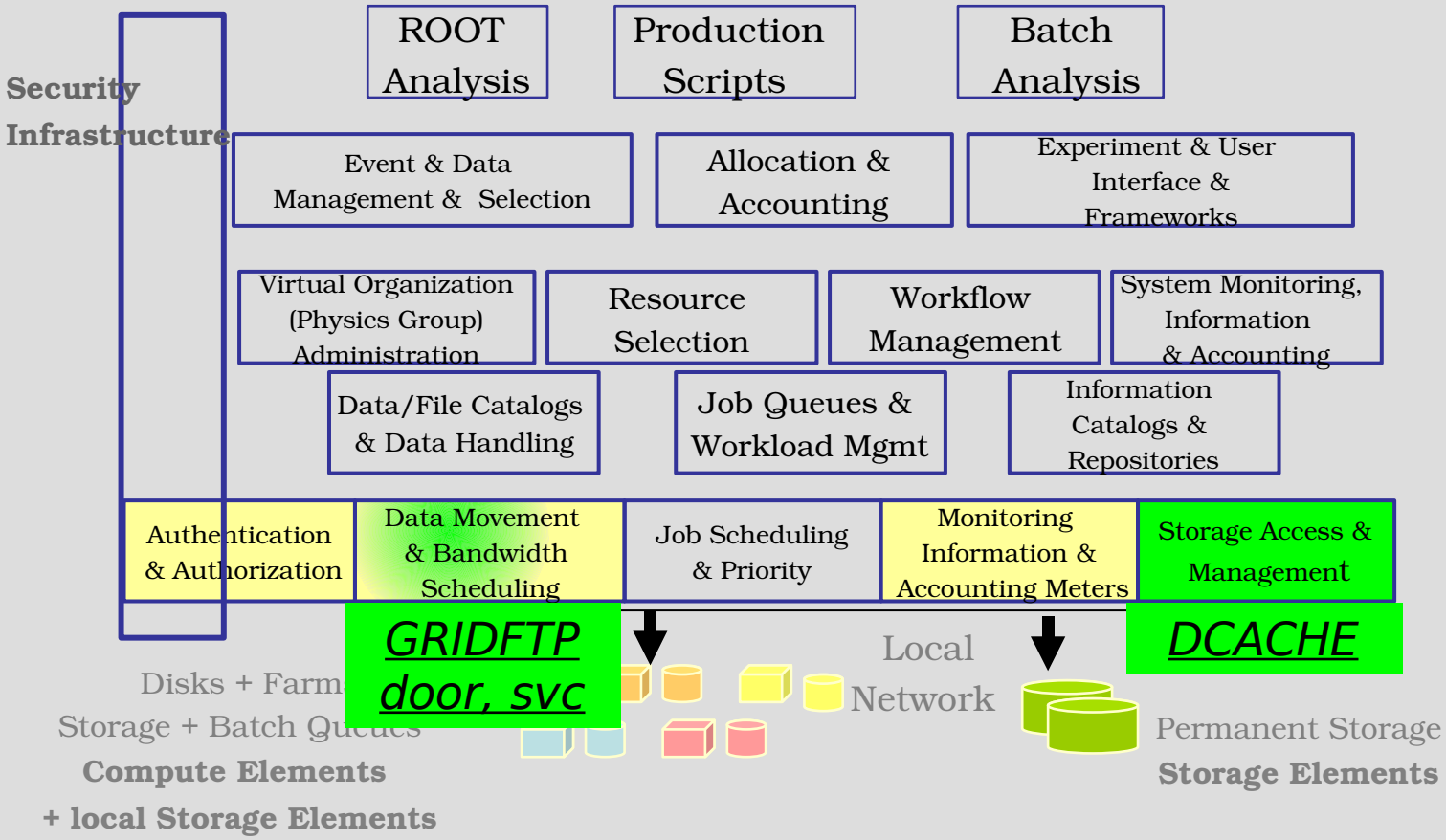
WBS Talking Points 2

- (3) Feature Development
  - Design and develop features and capabilities to support the scaling of Dcache to the larger data volumes, performance levels, and robustness requirements in the LHC era.
  - Support and extend Dcache features for which our group is responsible by de facto agreement with DESY and LCG, such as Resilient dCache and GridFTP interfaces.
  - We are committed to deliver the Dcache GridFTP features needed to maximally leverage both FNAL-CD SRM and Wide-Area Networking projects.
  - In addition, we are evaluating the scaling of the underlying namespace service, scaling the manageability of the Dcache, datafile size issues in the overall dCache+Enstore storage service, and the robustness of centralized and/or single-point-of-failure sub-services in dCache.

WBS Talking Points 3

- (4) Collaboration: Dcache, SRM, other Grid-related Projects
  - Participate in the Dcache collaboration with DESY as co-developers and co-maintainers of the dCache project for LCG, with emphasis on the requirements of US-CMS-T1. Collaborate with the FNAL
  - SRM Project to deliver an OSG Storage Element, SRM-Dcache, and with FermiGrid and the IA group to make FNDCA into a FNAL Grid Storage Element.
  - Collaborate with Grid-related projects to seek better long-term alignment of goals.
  - Collaboration in these areas not only consists of communications, but may also drive feature development to better leverage FNAL-CD investment in Dcache and other projects.

Dcache's Place in the Big Picture



Dcache Internal Architecture

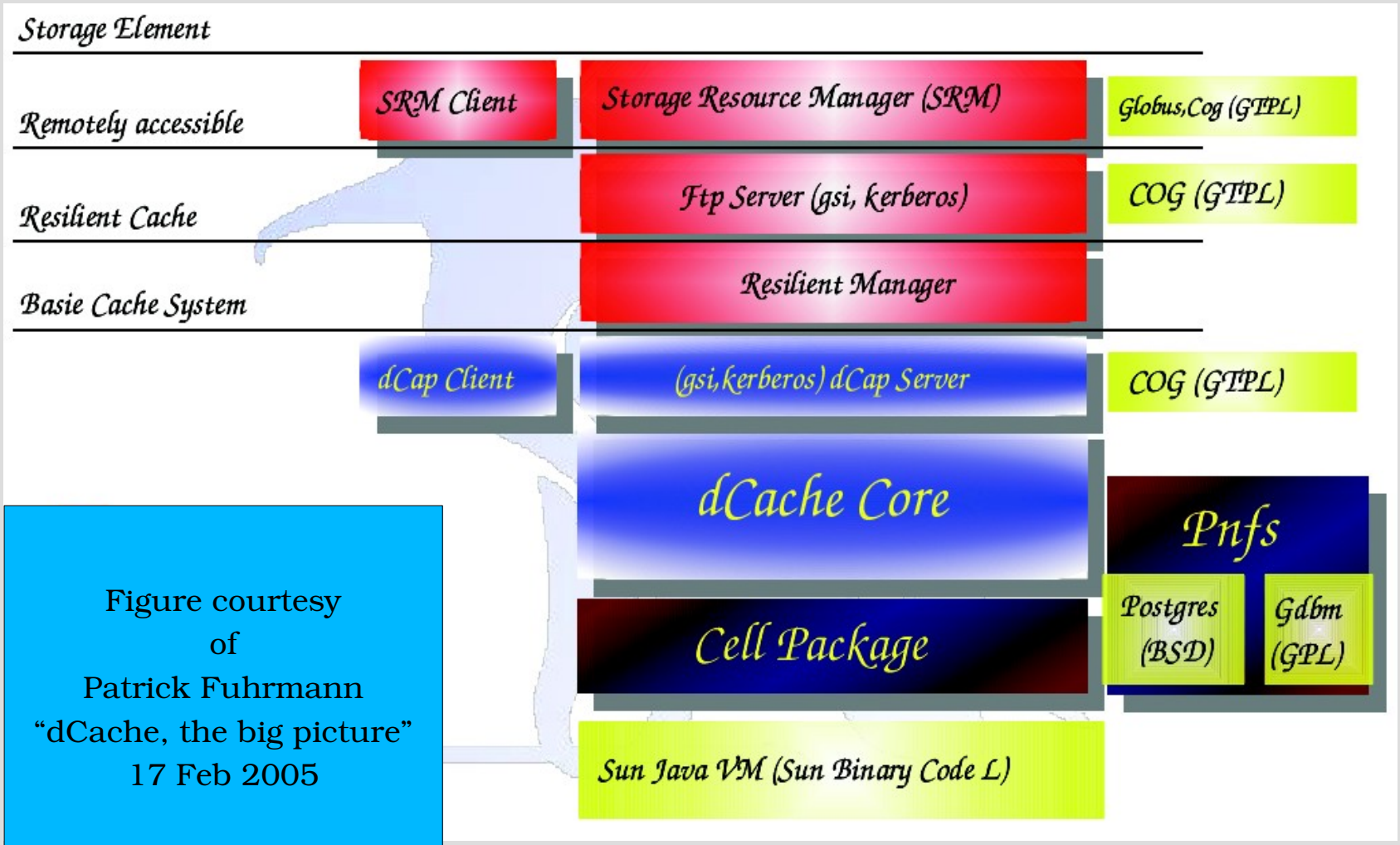


Figure courtesy of Patrick Fuhrmann "dCache, the big picture" 17 Feb 2005

FNAL portions: Postgres-Pnfs, Resilient Manager, FTP server, SRM and client, VO Auth Module Integration, "FNAL" plots, "FNAL" scripts, etc.

FNAL Dcache Project Status 1

- ***MOSTLY SHOWING ITEMS NOWHERE IN TALK***
- SC3 successful/succeeding, much learned from it
  - Scaling issues seen when at “next scale level” with namespace (PNFS), monitoring, and gridftp.
- Keeping up with requirements of US-CMS-T1
  - FTP performance markers, “distributed” gridFTP services
  - Resilient Manager robustness... a V2 design is planned
- GridFtp and Pnfs
  - May have found causal pattern to many errors. Work in progress.
  - More monitoring needed to identify undesirable use patterns.
- New Monitor Plot package
  - Releasing for “community” development. To package as add-on RPM.
- Formal Dcache production releases begun
  - Will restart continuous integration soon
  - Test harness planned to follow

FNAL Dcache Project Status 2

- Support load still high: 0.5+ FTE of developer group
  - Effort for admin group to transition dcache to their support?
  - More integrated support with customers to help scale support?
- Namespace Service performance concerns
  - Investigating DESY's Chimera, the new DB-based PNFS
  - Separate non-NFS-based namespace service with ACLs at FNAL?
- FNAL Dcache Service Software Upgrades
  - Next round (Q1 2006): production dCache 1.6.6-2, Pgsql v8.1, ...
  - Next round introduces much new hardware, new configurations.
  - Deferring RPM installations to round after next... too much on plate.
- FY06 WBS and Budget
  - Planned for 3 FTEs in budget
  - WBS contains an estimated 6+ FTEs of work, but shows only 3 FTEs... expresses priorities rather than actual work estimates.

Some Action Items 1

- CDF Analysis dCache Storage Extension
  - A1ex Kulyavtsev is project liaison to CDF dCache
  - Monthly Focus meetings, discussion just begun
  - Discussed: volatile, not-tape-backed storage (no replication)
  - Need much more discussion on data flows, service agreements, operations procedures, IA versus Run2-sys responsibilities, etc.
  - Propose: Evaluation back to GDM in Feb 2006?
- Fermigrid Volatile Storage Extension
  - Will become part of FNDCA and treated as such.
  - Rob Kennedy is project liaison to public dCache
  - Developers do not install the hardware though… 8^) IA to do.
  - Dan Yocum pursuing use of KteV pool (thanks BobT) to emulate this feature in the meantime, to allow avoid bottlenecking FermiGrid dev
  - Mostly likely will deliver equivalent space across more hardware.
  - Installation with FNDCA hardware upgrade (see next)… Jan 2006

Some Action Items 2

- Public dCache Upgrade and Expansion
  - Upgrade to CMSDCA/CDFDCA-level core configuration
  - Expand disk space considerably (IA has #s)
  - Reconfigure to help with Raw Data and other High Priority data flows to tape (or restore to disk for RMAN backups).
  - Plan to burn in equipment, then test in a FNDCAT system weeks before actual upgrade (which meansby mid-Dec 2005)
  - Actually upgrade in January 2006, more like a cut-over really.
- US-CMS-T1 Storage Expansion
  - SC4 is coming. March 2006 readiness, July 2006 begin.
  - Will go to new scale in disk space, client use, data movement.
  - Namespace, GridFtp, Monitoring shown to be stressed at next scale.
  - Will require both proactive and reactive development to succeed.
  - FNAL dCache project needs to have other dCache system activities completed before this time, to focus entirely on this.