

# dCache and SRM Projects Status update

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CD Project Status Meeting  
Feb 13, 2007

# Outline

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- Executive Summary
- dCache Status and Plans
- SRM Status and Plans
- Conclusion
- People of Fermilab dCache

# Executive Summary

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- dCache GridFTP door, Resilient Manager and SRM are main contributions to dCache
  - Already a great success
  - High expectation for the new features
  - More development is needed to make these products successful in the long term
- dCache increasing support load and reduced staffing lead to reduction in development activity
  - Number and size of deployments is ever increasing
  - Diverse users bring diverse new requirements
  - Need to shift more responsibilities to SSA and concentrate on development, But
    - SSA staff turn over + new responsibilities = risk

# Past and new dCache project goals

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- ❑ Maintain and Expand Fermilab dCache Systems
  - We can't sustain both development and support at the current level of staffing. Instead:
- ❑ Shift support load to SSA
  - Documentation of administrative procedures
  - Administrator education
  - Uniformity of dCache installations
- ❑ Concentrate on development to
  - Meet storage requirements of Fermilab experiments, US-CMS T1 and LHC in General
  - dCache as OSG Storage Element

# dCache Project year Summary

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- ❑ Maintenance, support and upgrades of Fermilab dCache installations
- ❑ Development of Replica Manager, gPlazma, GridFTP, Monitoring Plots, etc.
- ❑ Evaluation and continuous Testing
- ❑ Collaborations

# Maintenance, support and upgrades of Fermilab dCache installations

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- Different levels of support for FNDCA, CDFDCA, CMSDCA, LQCD and CDF Analysis dCache system
- reorganizations and upgrades
- Documentation of common procedures
- Primary developer duties
- Public dCache FNDCA
  - Upgraded to dCache 1.7
  - New Hardware is being deployed
  - Pools reconfigured to support higher throughput
  - New role and FermiGrid storage element
  - More changes on February 15
- CDF dCache CDFDCA
  - New hardware, No major software changes in the last year
  - Upgrade to 1.7 on March 15

# US-CMS Tier1 dCache CMSDCA

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- ❑ Mostly administered and maintained by US-CMS without direct dCache team involvement
- ❑ Largest dCache installation in the World
- ❑ 11 Nodes for Head Node functionality
- ❑ >100 Node, 700TB Read/Write Area
- ❑ 2 Resilient Manager areas
  - 650 Worker node, 100 TB, 3 copies
  - 55 TB of non-tape-backed PRECIOUS and RESILIENT pools for unmerged output
- ❑ 11 Node 10 TB staging area

# dCache Development

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- Resilient manager
  - Successfully used by US-CMS
  - Now disallows same host replication
- System robustness and self defense
  - Per node resource measurement and management
- gPlazma Storage Authorization service
  - Can be a cell or plugin
  - Support for VO based authorization
  - Works with GUMS/VOMS
  - Need
    - multi VO support and true plugability
    - Dynamic uid/gid assignment

# dCache Development cont.

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## □ Gridftp

- Several bug fixed and features developed
- Still suffers weak socket error handling
- Did not have resources to implement X-Block mode, multi directional adapter, NIO movers, on demand GridFTP server startup, etc.
- NorduGrid (Gerd Behrmann) has picked up the dev
- More Fermi contribution possible with ANL as a part of CEDPS

## □ Monitoring Plots

- Great statistics visualization tool, more than 50 plots
- Need dynamic configuration and query functions

# Transfer Rate for US-CMS T1 dCache



# dCache testing

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- Chimera (pnfs replacement)
  - We committed to 6 month long testing (2 more remains)
  - Will possibly develop PNFS-Chimera-PNFS migration tools
- CruiseControl based dCache test
  - Continuous Automatic Builds
  - Started Work on Automatic Integration, Deployment and Testing

# dCache Collaborations

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- dCache collaboration with DESY
- OSG
- ANL - CEDS and GridFTP
- BNL - Quota Manager

# dCache@FNAL Plans

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- ❑ Document most of tasks performed by primaries
- ❑ Shift more administration to SSA
- ❑ Contribute more to active development
- ❑ Move all dCache installations to rpm based uniform deployment
- ❑ Generalize and turn into products monitoring, scans and alarm scripts developed by Jon Bakken

# SRM Project Goals

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- ❑ Complete development, testing and production deployment of SRM V2.2
- ❑ Provide support, bug fixes and improvements to deployed SRM V1.1 and SRM V2.2
- ❑ Reduce operational loads through better monitoring and admin interface
- ❑ Improve protocol and implementation through collaborations

# SRM Project year Summary

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- ❑ SRM V2.2 Development
- ❑ Srmcp client suite
- ❑ dCache SRM support
- ❑ SRM Collaboration

# What is new in SRM

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- ❑ SRM BOF at WLCG Workshop in Mumbai, February 06
  - SRM V2.1 does not express quality of retention and access latency, needs changes
- ❑ WLCG SRM Workshop in Batavia, May 06
  - SRM V2.2 is accepted and WLCG requirements are defined, among new features:
    - ❑ AccessLatency := NEARLINE|ONLINE
    - ❑ RetentionPolicy := REPLICATA|OUTPUT|CUSTODIAL
    - ❑ SpaceReservation is a vehicle for the above attributes
  - dCache commits to PNFS Path independent support
- ❑ SRMCP V1.25

# Progress

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- Work on V2.2 implementation since May 06
- Fall 06 - intermediate dCache 1.7 release
  - Greater stability and performance of SRM V1.1
  - Some v2.2 functionality
  - Monitoring

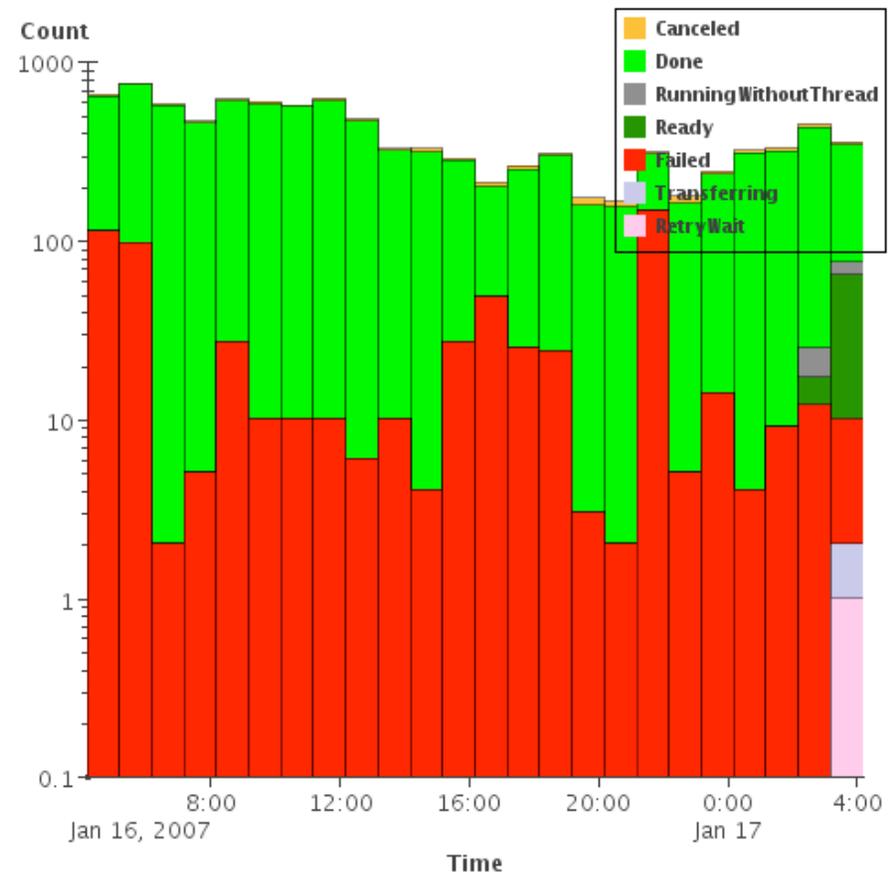
# Current Status

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- Implemented
  - Directory Functions
  - Space Management
  - AccessLatency and RetentionPolicy support
  - Better Error reporting
  - Permission Management
- Almost All (WLCG MoU) V2.2 functionality is implemented
  - Next 3 major tasks:
    - Functionality Tests
    - Compatibility Tests
    - Stress Test
  - Will be available in dCache 1.8, April 2007

# Monitoring interface “SRMWatch”

- List of active request
- History of the Request and File state transitions
- Plots of usage and errors
- Query requests by DN, source or destination SURLs, creation time etc.



# dCache SRM support

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- US-CMS Tier 1 - Main customer
- US-CMS Tiers 2
- Fermilab Experiments
- OSG
- WLCG deployments and everyone else
- New documentation

# SRM Collaboration

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- WLCG
  - SRM 2.2 modifications to satisfy LHC Experiments
  - Experiment use cases
  - Interoperability
- SRM Collaboration (PI: Arie Shoshani)
  - Version 3.0
- OSG

# Summary

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- Project is decreasing in size
  - Role of Fermilab as dCache contributor might diminish due to lack of resources, and concentration on operations
  - Completion of shifting day to day operations support from development to SSA will free resources up for the development
- SRM V2.2 is almost ready, but
  - Took more than a year to stabilize SRM V1.1
  - SRM V2.2 is more complex and not tested in battle
- Need to expand collaborations

# Fermilab dCache team members and some of their roles

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- ❑ Ted Hesselroth -Authorization, T1/T2 support, reports to OSG
- ❑ Robert Kennedy -former Leader, architect of deployments, gridFtp, primary, will leave the team in mid-year
- ❑ Alex Kulyavtsev - Resilient Manager, dCache code development and testing, primary
- ❑ Dmitry Litvintsev-SRM and dCache code development and testing
- ❑ Timur Perelmutov - Leader, SRM and dCache code development and testing, primary
- ❑ Vladimir Podstavkov- Monitoring plots, dCache and Chimera testing, dCache code development and testing, primary
- ❑ Forrest Christian - dCache and SRM documentation for OSG

# Resources

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- ❑ dCache <http://www.dcache.org>
- ❑ dCache SRM <http://srm.fnal.gov>
- ❑ Fermilab dCache project <http://dcache.fnal.gov>
- ❑ SRM WG <http://sdm.lbl.gov/srm-wg/>
- ❑ SRM V2.2 spec <http://sdm.lbl.gov/srm-wg/doc/SRM.v2.2.html>
- ❑ WLCG SRM V2.2 MoU  
<https://srm.fnal.gov/twiki/pub/WorkshopsAndConferences/GridStorageInterfacesWSAgenda/SRMLCG-MoU-day2.doc>
- ❑ S2 SRM V2.2 tests [http://grid-deployment.web.cern.ch/grid-deployment/flavia/basic/s2\\_logs/](http://grid-deployment.web.cern.ch/grid-deployment/flavia/basic/s2_logs/)
- ❑ LBNL SRM V2.2 tester <http://sdm.lbl.gov/srm-tester/v22daily.html>