

# dCache Storage Resource Manager Status update

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For the dCache Team



# People



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## Head of dCache.org project

Patrick Fuhrman

## Core Team (DESY and Fermilab)

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## Leader of Fermilab Development

Timur Perelmutov

## Leader of DESY Development

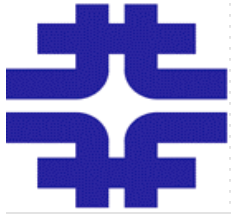
Tigran Mrktchyan

## External Development

Gerd Behrmann, NGDF  
Abhishek Sigh Rana, SDSC  
BNL in preparation

## Support and Help

Greig Cowan, gridPP (monAmi)  
Stijn De Weirdt (Quatfor)  
Maarten Lithmaath, CERN  
Flavia Donno, CERN  
N. N. CERN



# Progress



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



## Current Status

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- Almost All (WLCG) V2.2 functionality is implemented
  - Next 3 major tasks:
    - Functionality Tests
    - Compatibility Tests
    - Stress Test
  - Will be available in dCache 1.8 , April 2007



# Summary of S2 SRM v2.2 basic test - 22 January 2007 11:00pm CET WLCG MoU SRM v2.2 methods



## MOU Methods

## End of 2007 MOU Methods

Ping	StdOut Log
PrepareToPut	StdOut Log
StatusOfPutRequest	StdOut Log
PutDone	StdOut Log
PrepareToGet	StdOut Log
StatusOfGetRequest	StdOut Log
BringOnline	StdOut Log
StatusOfBringOnlineRequest	StdOut Log
AbortRequest	StdOut Log
AbortFiles	StdOut Log
ReleaseFiles	StdOut Log
GetRequestSummary	StdOut Log
GetRequestTokens	StdOut Log
GetTransferProtocols	StdOut Log
Ls	StdOut Log
Mkdir	StdOut Log
Rmdir	StdOut Log
Rm	StdOut Log
Mv	StdOut Log
ReserveSpace	StdOut Log
StatusOfReserveSpaceRequest	StdOut Log
ReleaseSpace	StdOut Log
GetSpaceTokens	StdOut Log
GetSpaceMetaData	StdOut Log
ExtendFileLifeTime	StdOut Log

Copy	StdOut Log
StatusOfCopyRequest	StdOut Log
ChangeSpaceForFiles	StdOut Log
StatusOfChangeSpaceForFilesRequest	StdOut Log

## Non-MOU Methods

UpdateSpace	StdOut Log
StatusOfUpdateSpaceRequest	StdOut Log
StatusOfLsRequest	StdOut Log
SuspendRequest	StdOut Log
ResumeRequest	StdOut Log
CheckPermission	StdOut Log
SetPermission	StdOut Log
GetPermission	StdOut Log
PurgeFromSpace	StdOut Log
ExtendFileLifeTimeInSpace	StdOut Log
LsRecursive	StdOut Log
RmdirRecursive	StdOut Log

Fixed Today

A bit more work

Latest Results of Flavia Donno's Tests are at:  
[http://grid-deployment.web.cern.ch/grid-deployment/flavia/basic/s2\\_logs/](http://grid-deployment.web.cern.ch/grid-deployment/flavia/basic/s2_logs/)

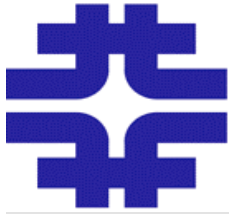
January 23, 2007



# Space Management



- ❑ SrmReserveSpace allows to reserve space with given Size, Lifetime, AccessLatency, RetentionPolicy, [description].
- ❑ User gets back SpaceToken
- ❑ SpaceToken can be specified as an argument to srmPrepareToPut or srmCopy.
- ❑ Dcache Manages diskSpace only.
- ❑ Space Reservation for writes only, no space management of read pools.
- ❑ SpaceTokens are discoverable by their description



# WLCG usage of Space Management *dCache*

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- Reservations are made by administrators for particular experiment, group , etc.
  - Need to better understand and test use cases
- Reservations are large and have long lifetime
  - Will it lead to abuses? Do we need quotas?
- Well known descriptions are assigned
  - What is the mechanism of distribution of descriptions, tokens?
- Space Tokens are discovered by users on basis of the description
  - Streaming model for tape backed systems



# dCache SRM Space Reservations are Managing Disk

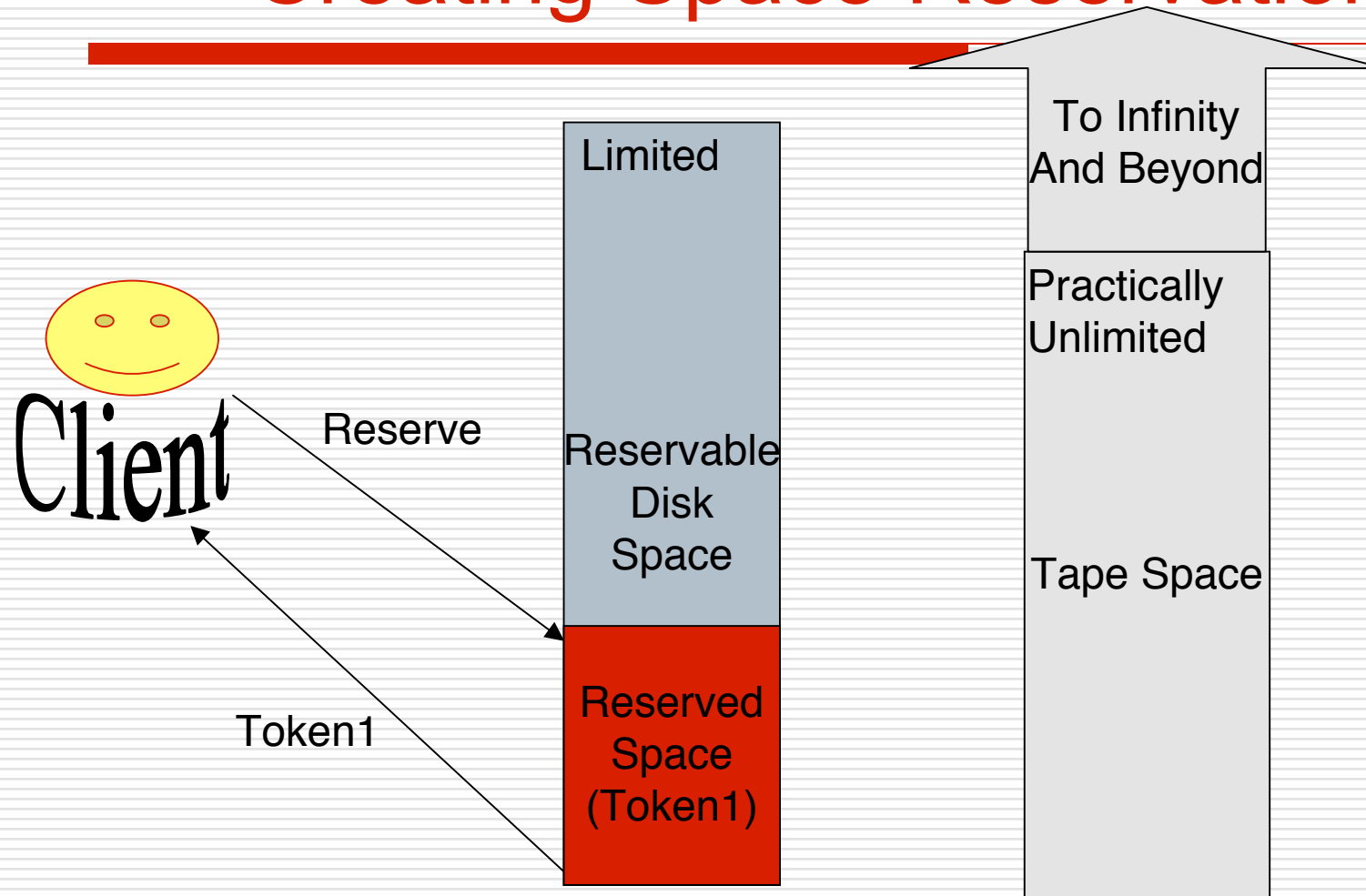


- ❑ Space Reservation is for managing write disk space (not Tape)
- ❑ Multiple subsequent space reservations might be needed for large ingests
- ❑ Using same Space Description String makes usage of Multiple Space Reservations (tokens) transparent to the users



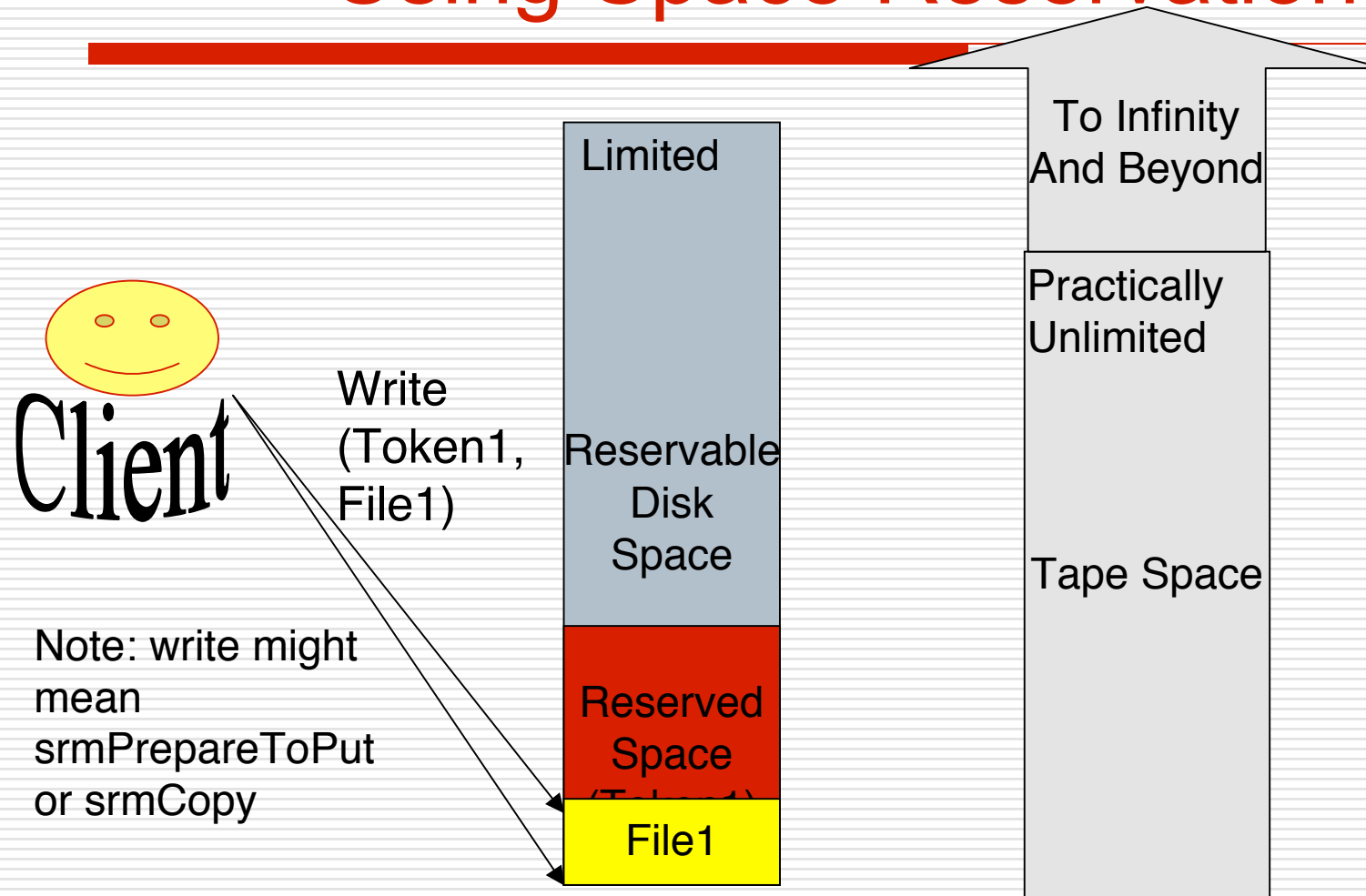


# Creating Space Reservations *dCache*





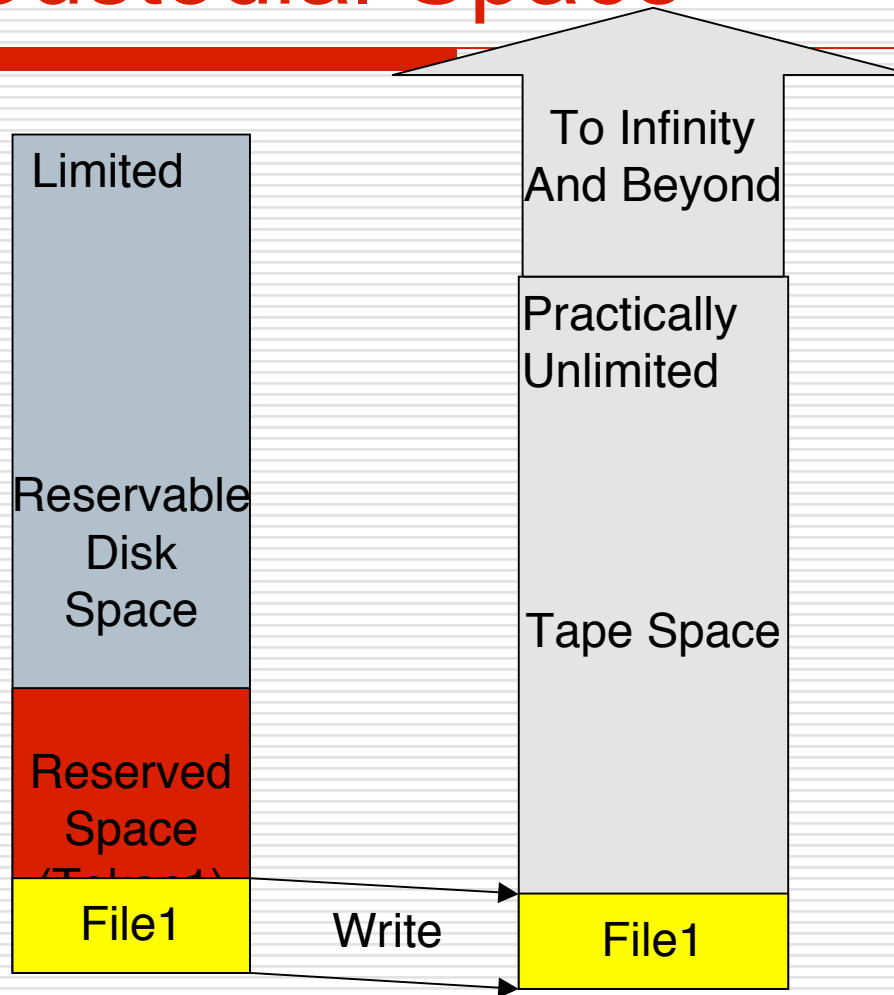
# Using Space Reservation *dCache*



Note: write might mean  
srmPrepareToPut  
or srmCopy



# Writing Data to Tape using Custodial Space

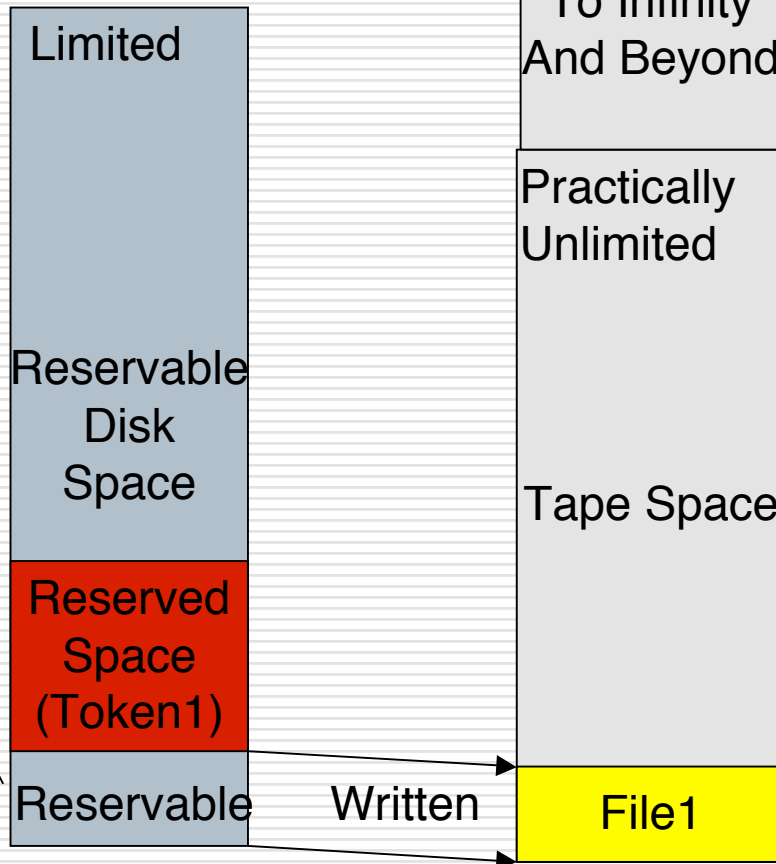




# Nearline Space Reservations *dCache*



Nearline File  
Can be removed  
from Disk

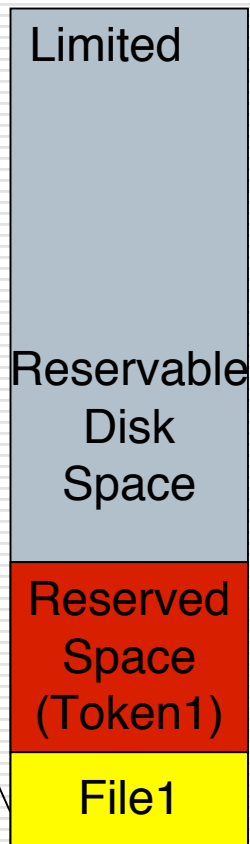




# Online Space Reservations *dCache*



Online File  
Stays on Disk



To Infinity  
And Beyond

Practically  
Unlimited

Tape Space

File1

Data  
resides  
on Disk  
and Tape  
In case of  
Online  
Custodial  
space



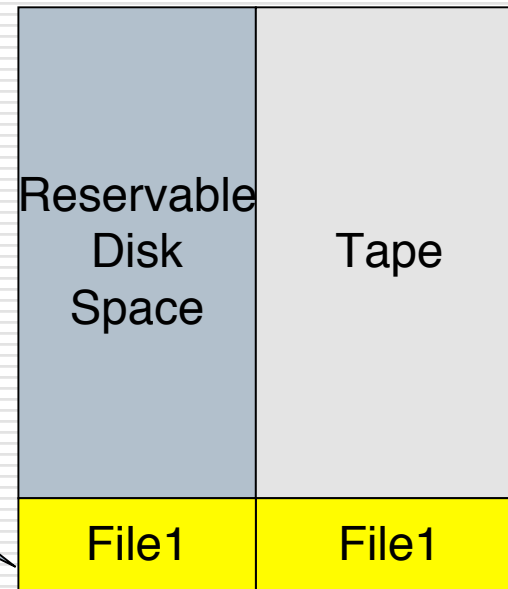
# ChangeSpaceForFiles

*dCache*

- ❑ Custodial, Online (Tape1Disk1) to Custodial, Nearline (Tape1Disk0) without internal copying



File1 Is "Online"  
Can't be removed

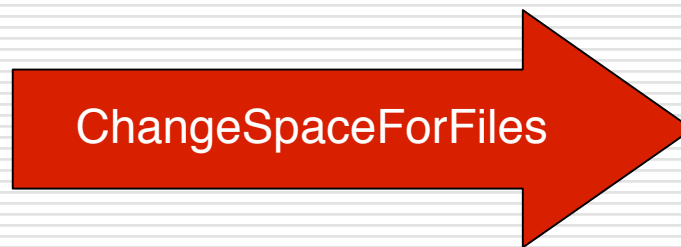




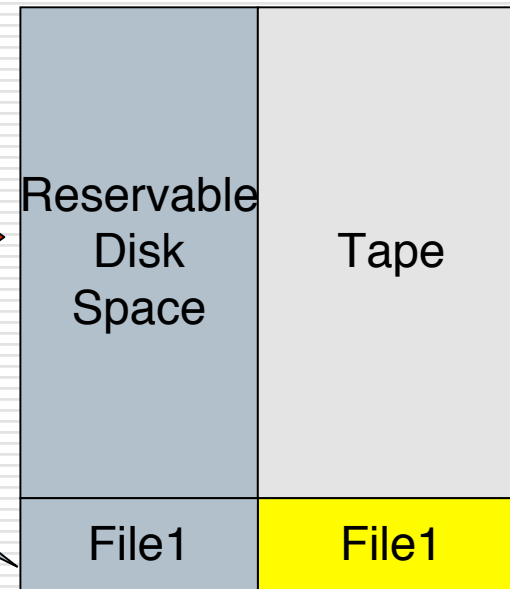
# ChangeSpaceForFiles

*dCache*

- ❑ Custodial, Online (Tape1Disk1) to Custodial, Nearline (Tape1Disk0) without internal copying



File1 space is reservable

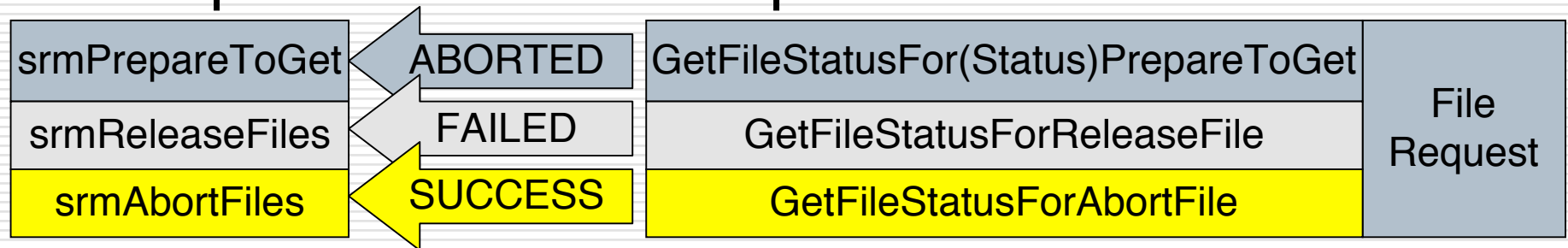




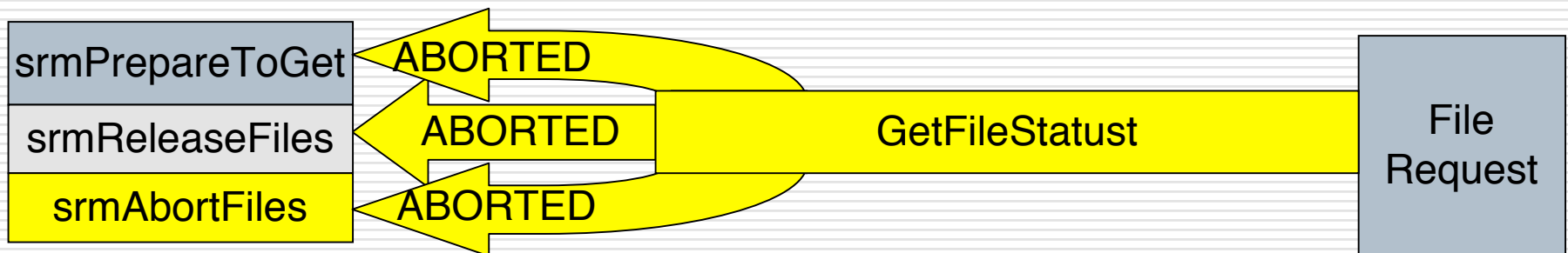
# FileStatus in different functions



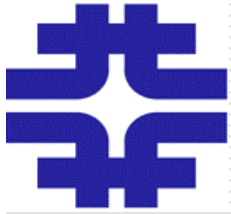
## □ Spec and current implementation:



## □ Could be simplified and made more logical







# Implementation Plans

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- All Of MoU functions except of ChangeSpaceForFiles in dCache 1.8
- ChangeSpaceForFiles and permission management in dCache 1.9
  - Need dCache Chimera with ACLs
- No Plans to implement remaining non-MoU functions unless users ask for them



# Implementation Issues

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- ChangeSpaceForFiles
  - Replica <-> Custodial
  - Space accounting
- Authorization for multi-VO users
- We pass functional tests
- But will it work in production?



# 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>
- Flavia Donno's 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>