



Berkeley Storage Manager (BeStMan)



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- **Current version 2.2.1.1 (Nov. 3, 2008)**
 - Full implementation of SRM v2.2, except for ACL related permission functions
 - Support for WLCG SRM MoU
- **For disk-based storage and file systems**
 - NFS, GPFS, GFS, NGFS, PNFS, HFS+, PVFS, Lustre, XrootdFS
 - Support for multiple disk partitions
 - Dynamic space reservation and support for space token based operations
 - Support for accessibility to user managed disk space through SRM interface
- **Mass Storage support**
 - Currently, for HPSS and NCAR-MSS
 - Plug-in capability for easy customization for special underlying storage
 - E.g. SRM/L-Store, SRM/XrootD
- **Use of existing file transfer services**
 - GSIFTP, FTP, HTTP, HTTPS, BBFTP
 - Support for multiple transfer servers
- **Easy adaptability and integration to special project environments**
- **Simple installation and easy maintenance**



Who is BeStMan for?



- **Smaller sites with shared and limited resources**
- **Sites where minimal administrative effort is needed**
- **Main use is for disks with POSIX file systems**
- **Sites/users that need dynamic invocation of an SRM**
- **Can be customized for different file systems and MSS**
- **Sites that need great support**



BeStMan Gateway



- **Light-weight implementation of SRM v2.2 for POSIX file systems**
 - Designed to work with any posix file systems
 - NFS, GPFS, GFS, NGFS, PNFS, HFS+, PVFS, Lustre, XrootdFS, Hadoop
 - Generic SRM v2.2 load balancing front-end for GridFTP servers
 - Works with Grid-mapfile or GUMS server
 - Support for subset of SRM v2.2 interfaces
 - srmPing, srmLs, srmRm, srmMkdir, srmRmdir, srmPrepareToPut (Status, PutDone), srmPrepareToGet (Status, ReleaseFiles), srmGetSpaceMetaData, srmGetSpaceTokens, srmGetTransferProtocols
- **Use of existing gridftp servers**
 - Support for multiple file transfer servers
- **Can be used with any storage systems**
 - that have one or more file transfer servers and POSIX file system interface
- **Same packaging with BeStMan full management mode**
 - Mode selection at the configuration time (--enable-gateway-mode)
- **Simple installation and maintenance**



Who is BeStMan Gateway mode for?



- **Sites with POSIX file systems**
- **Sites without needs for request queuing or disk space management**
- **Sites that need great performance**
- **Sites that need SRM interface to their local resources**
- **Sites where minimal administrative effort is needed**
- **Sites that need great support**



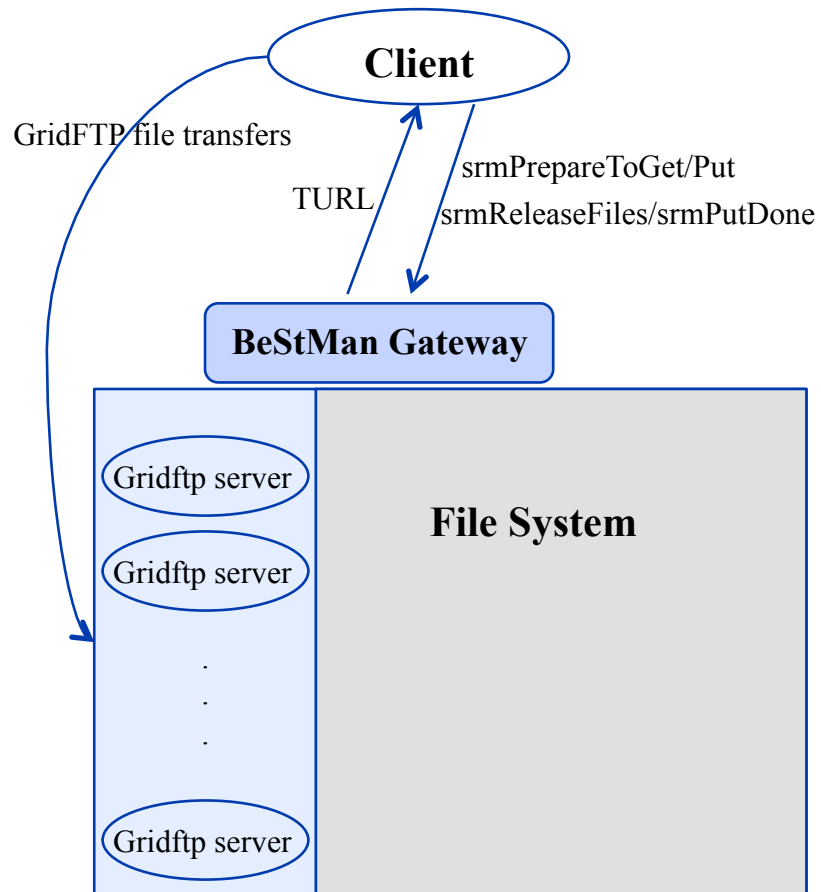
Difference between BeStMan Full mode and BeStMan Gateway mode

- **Full implementation of SRM v2.2**
- **Support for dynamic space reservation**
- **Support for request queue management and space management**
- **Plug-in support for mass storage systems**
- **Support for essential subset of SRM v2.2**
- **Support for pre-defined static space tokens**
- **Faster performance without queue and space management**

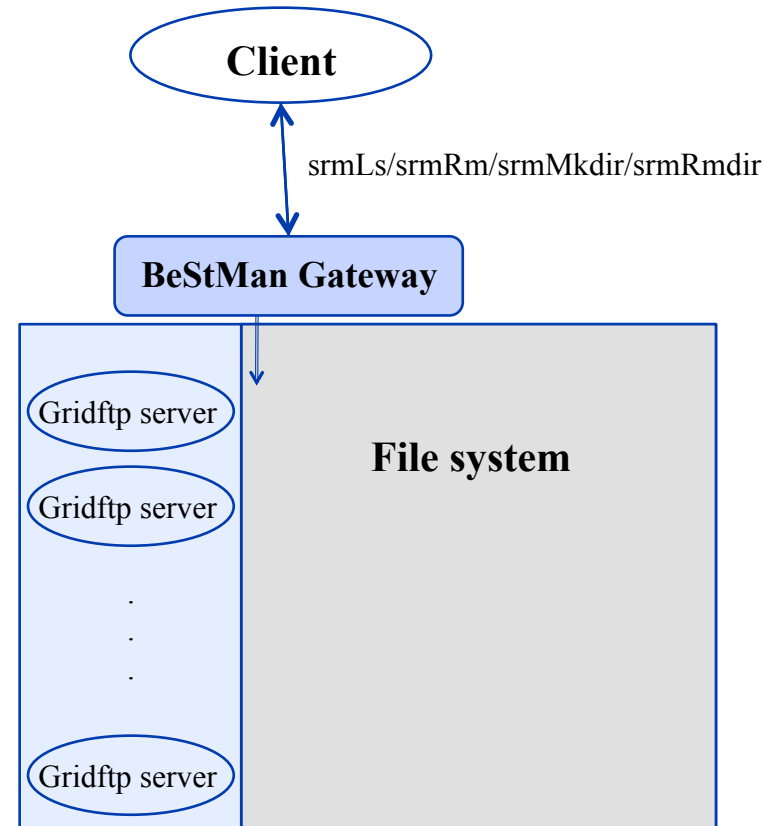


How it works all together

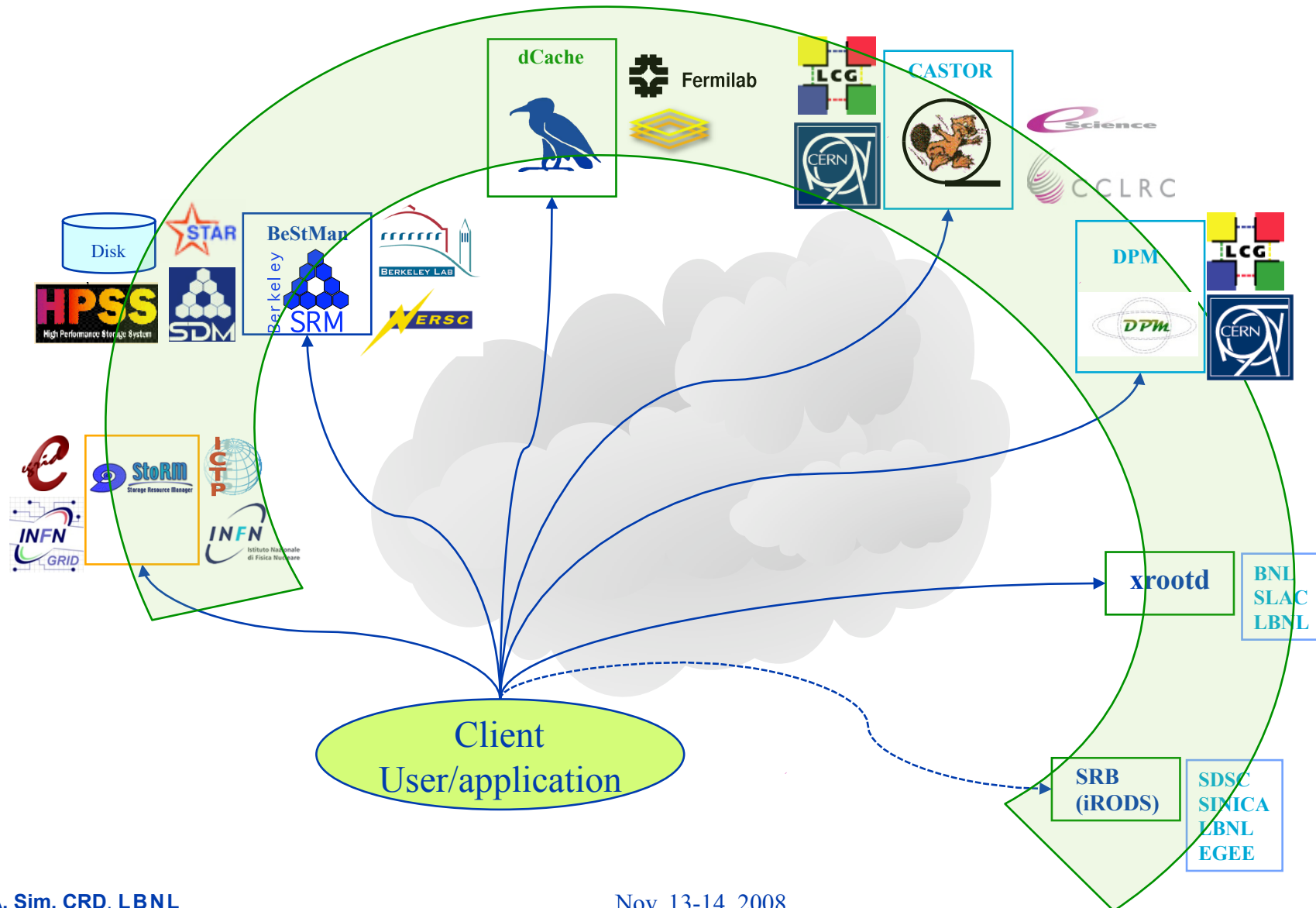
in PUT/GET



in Ls/Rm/Mkdir/Rmdir



Interoperability with other SRM v2.2





Some Use Cases



- **CMS**
 - BeStMan Gateway as a SRM frontend for Hadoop via FUSE
 - Passed all the automated CMS tests through EGEE SAM
 - Load-balancing 10 GridFTP servers with ~110TB raw disk space
- **STAR**
 - Data replication between BNL and LBNL
 - HPSS access at BNL and NERSC
 - SRMs (version 1.1) in production for over 4 years
 - Part of analysis scenario to move job-generated data files from PDSF /NERSC to remote BNL storage
- **Earth System Grid**
 - Serving about 6000 users
 - Over a million files and 170TB of climate data
 - from 5 storage sites with SRMs (LANL, LLNL, NCAR, NERSC, ORNL)
 - Uses an adapted BeStMan for NCAR's own MSS



Testing and Monitoring



- **OSG provides daily SRM v2.2 testing and monitoring for registered SRM endpoints**
 - Results on <http://datagrid.lbl.gov/osg>
 - Site registration on <http://datagrid.lbl.gov/sitereg>
- **Site testing**
 - Available through srm-tester-2
 - Instructions can be found on
 - <https://twiki.grid.iu.edu/twiki/bin/view/Storage/BeStMan>

Summary

- **BeStMan is an implementation of SRM v2.2.**
 - Great for smaller disk-based storage and file systems
- **BeStMan Gateway mode gives an SRM v2.2 access to POSIX compliant file systems**
- **Install/maintain through VDT**
- **Works with other SRM v2.2 implementations**
 - Servers: CASTOR, dCache, DPM, StoRM, SRM/SRB, ...
 - Clients: FTS, PhEDEx, glite-url-copy, lcg-cp, srm-copy, srmcp, ...
 - In OSG, WLCG/EGEE, ESG



Documents and Support



- **BeStMan**
 - <http://datagrid.lbl.gov/bestman>
 - <https://twiki.grid.iu.edu/twiki/bin/view/Storage/BeStMan>
 - <http://hep-t3.physics.umd.edu/HowToForAdmins.html#osgBestman>
- **BeStMan Gateway**
 - <http://datagrid.lbl.gov/bestman>
 - <http://wt2.slac.stanford.edu/xrootdfs/bestman-gateway.html>
- **SRM testing and monitoring**
 - <http://datagrid.lbl.gov/>
- **SRM Collaboration and SRM Specifications**
 - <http://sdm.lbl.gov/srm-wg>
- **Contact and support : srm@lbl.gov**