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, BBFTTP
  - 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), srmGetSpaceMetaMetadata, 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

Client

GridFTP file transfers

tURL

srmPrepareToGet/Put

srmReleaseFiles/srmPutDone

BeStMan Gateway

File System

Gridftp server

. .

Gridftp server

in Ls/Rm/Mkdir/Rmdir

Client

srmLs/srmRm/srmMkdir/srmRmdir

BeStMan Gateway

File System

Gridftp server

. .

Gridftp server
Interoperability with other SRM v2.2

Client
User/application

dCache
Fermilab
CASTOR

BeStMap
Berkeley
SRM

xrootd

SRB (iRODS)

DB

dCache

CASTOR

Client
User/application

Disk

BeStMap

xrootd

SRB

(iRODS)

SDSC

SINICA

LBNL

EGEE

A. Sim, CRD, LBNL

Nov. 13-14, 2008
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
• **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

- **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**