



BeStMan and Users

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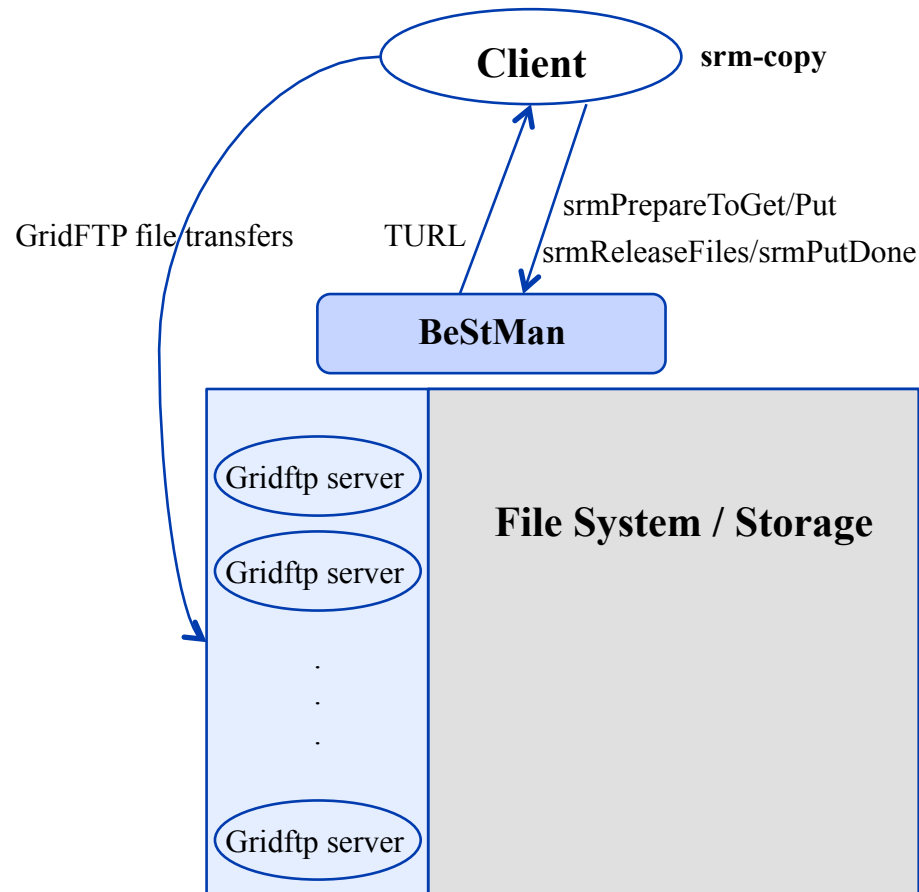
BeStMan for Users



- **Users have uniform access to Grid storages**
 - BeStMan is one of Grid storage services
 - Users can use the same storage clients to access BeStMan
 - There would be no difference in accessing BeStMan even if users have experiences with other types of storage services
- **Site with limited resources**
 - users can run their own BeStMan

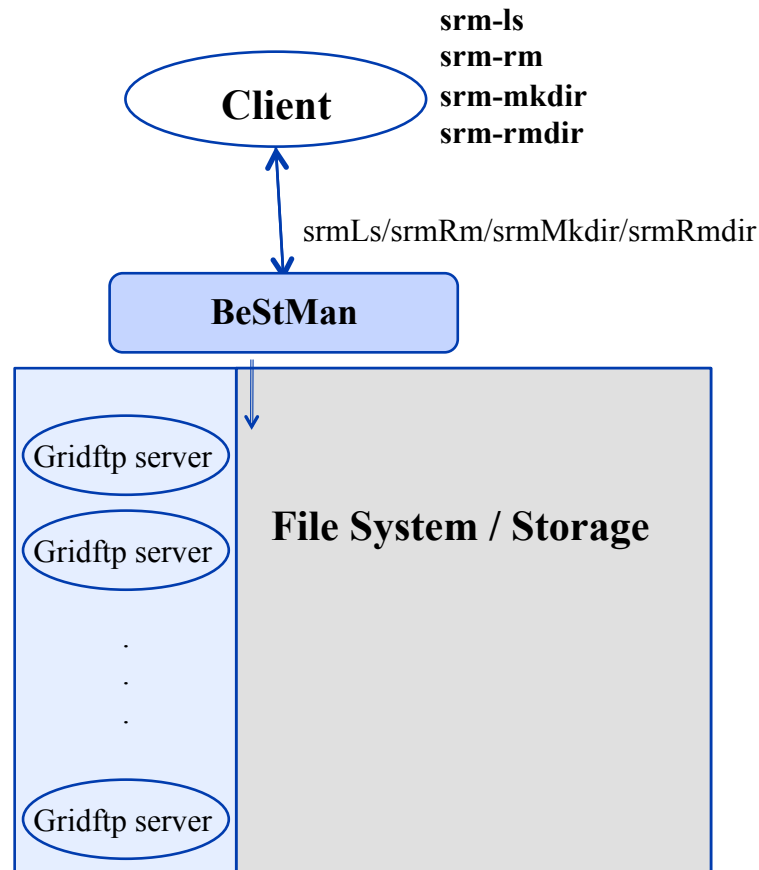
What do users do with BeStMan in file requests?

PUT/GET



What do users do with BeStMan in directory operations?

Ls/Rm/Mkdir/Rmdir



- **Space reservation**
 - Storage allocation for size, time, type of storage
 - Storage system ensures the reserved space is available
 - Pre-allocated space, dynamic space allocation
- **Pre-allocated space**
 - VOs or sites reserve certain portion of storage in advance
 - Users can access the space with the pre-defined space tokens
- **Dynamic space reservation – a.k.a. opportunistic storage**
 - Users can request space reservation for a certain amount of storage space for a certain amount of time (with srm-sp-reserve)
 - Upon successful space reservation, user can access the space by the space token
 - Dynamic space reservation on a shared resource is a big commitment
 - Supported by some storage systems and storage sites



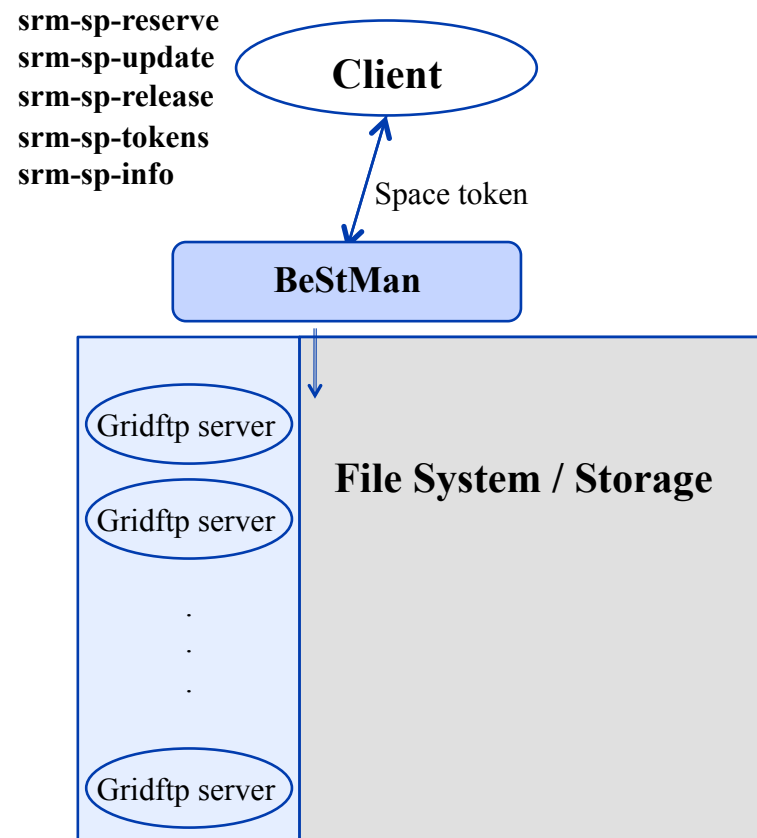
BeStMan and Space Reservation



- **BeStMan Full mode supports**
 - Dynamic space reservation
 - Pre-allocated spaces with pre-defined space tokens
- **BeStMan Gateway mode supports**
 - Pre-allocated spaces with pre-defined space tokens

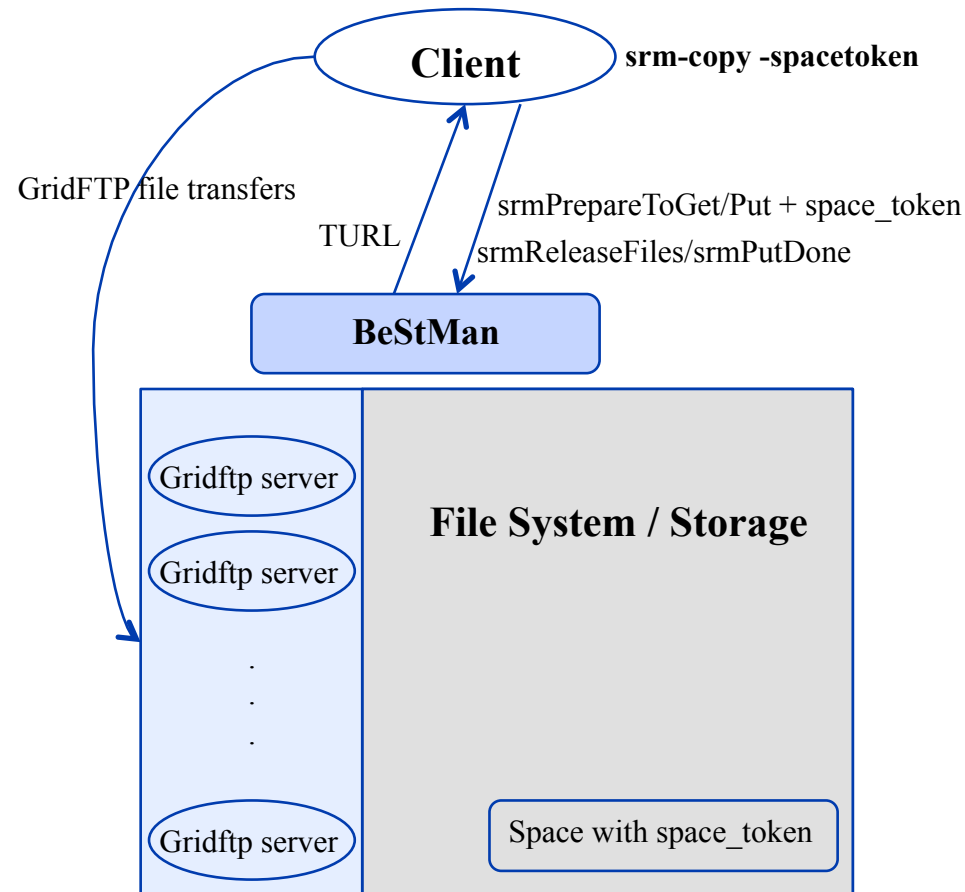
What do users do with BeStMan in space reservation?

Reserve/Update/Release



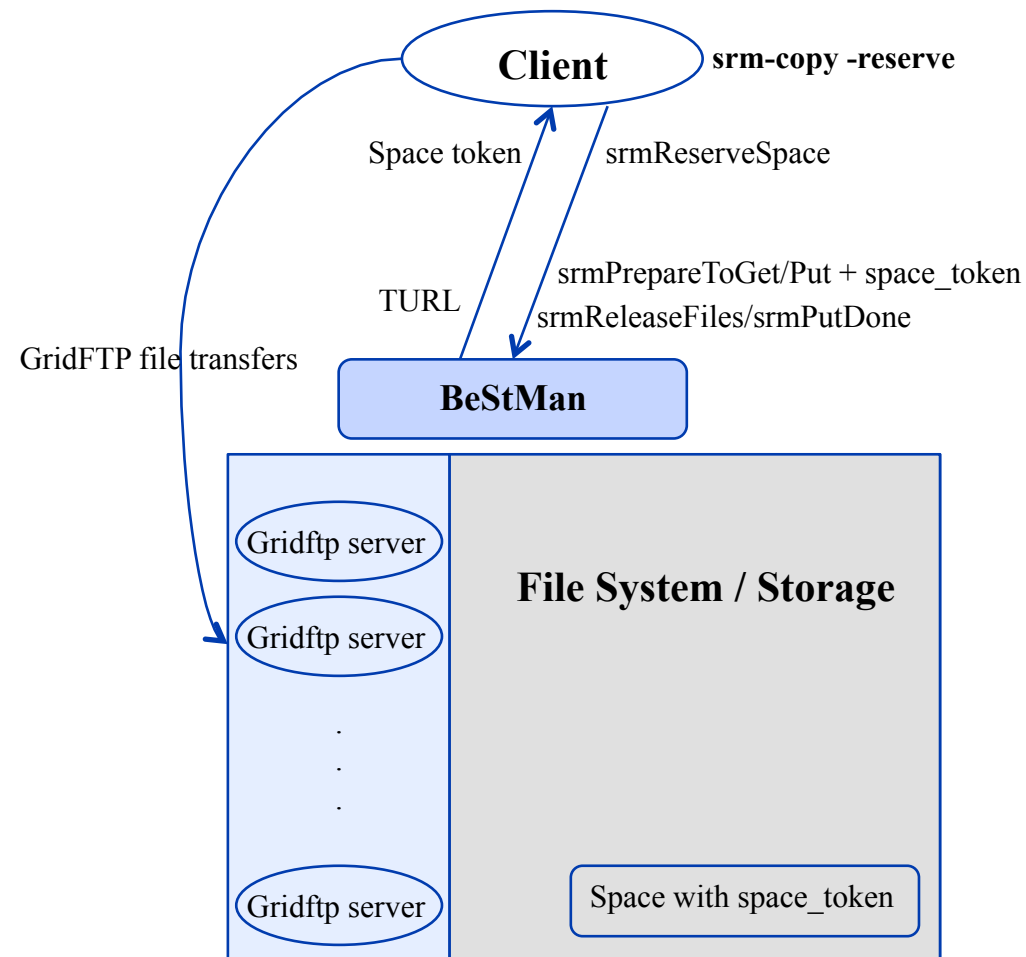
What do users do with BeStMan in file requests with space tokens?

PUT/GET with space tokens



What do users do more with BeStMan in file requests and space reservation?

PUT/GET with space reservation for the request



SRM client runs (1)

- **Ping: srm-ping**

- srm-ping checks the SRM server. In response to the call, SRM server returns the SRM version number as well as other backend information.
- srm-ping srm://hostname:port/service_handle

- **Put: srm-copy**

- srm-copy requests to copy files to and from SRM, between SRMs, between SRM and other storage repository, depending on the source and target URLs.
- srm-copy file:///local_file_path srm://hostname:port/sevice_handler\?SFN=/remotefilepath

- **Get: srm-copy**

- srm-copy srm://hostname:port/sevice_handler\?SFN=/remotefilepath file:///local_file_path

- **Ls: srm-ls**

- srm-ls srm://hostname:port/service_handle\?SFN=/file_path

- **Rm: srm-rm**

- srm-rm srm://hostname:port/service_handle\?SFN=/file_path

- **Mkdir: srm-mkdir**

- srm-mkdir srm://hostname:port/service_handle\?SFN=/dir_path

- **Rmdir: srm-rmdir**

- srm-rmdir srm://hostname:port/service_handle\?SFN=/dir_path



SRM client runs (2)



- **space reservation: srm-sp-reserve**
 - `srm-sp-reserve -serviceurl srm://hostname:port/service_handle \`
`-size desired_total_space_size -gsize desired_guaranteed_space_size -lifetime desired_space_lifetime`
- **space update: srm-sp-update**
 - `srm-sp-update -serviceurl srm://hostname:port/service_handle \`
`-size desired_total_space_size -gsize desired_guaranteed_space_size`
`-lifetime desired_space_lifetime -spacetoken space_token`
- **space release: srm-sp-release**
 - `srm-sp-release -serviceurl srm://hostname:port/service_handle \`
`-spacetoken space_token`
- **space tokens retrieval: srm-sp-tokens**
 - `srm-sp-tokens -serviceurl srm://hostname:port/service_handle`
- **space information retrieval : srm-sp-info**
 - `srm-sp-info -serviceurl srm://hostname:port/service_handle -spacetoken space_token`



SRM client runs (3)



- **put operation into the reserved space**
 - `srm-copy \`
`file:///local_file_path \`
`srm://hostname:port/service_handle\?SFN=/remote_file_path \`
`-spac token space_token`
- **purge a file from the reserved space**
 - `srm-sp-purge -serviceurl srm://hostname:port/service_handle \`
`-spac token space_token -s srm://hostname:port/service_handle\?SFN=/remote_file_path`



How many clients can user run?



- **How much can client machine handle?**
 - 6-8Hz on PUT/GET operations when one client node makes 5000 requests sequentially
 - ~23Hz on LS operations when 200 client nodes makes 5 requests sequentially
 - Peak memory usage ~60MB during 14000 operations



srm-ping



- **Ping:** `srm-ping srm://hostname:port/servicehandle`

- E.g. `srm-ping srm://dmx09.lbl.gov:6288/srm/v2/server`

```
% srm-ping srm://dmx09.lbl.gov:6288/srm/v2/server
srm-ping 2.2.1.2.i2 Mon Feb 9 10:25:04 PST 2009
SRM-Clients and BeStMan Copyright(c) 2007-2009,
Lawrence Berkeley National Laboratory. All rights reserved.
Support at SRM@LBL.GOV and documents at http://datagrid.lbl.gov/bestman
```

```
SRM-CLIENT: Connecting to serviceurl http://dmx09.lbl.gov:6288/srm/v2/server
```

```
SRM-PING: Mon Feb 09 13:01:32 PST 2009 Calling SrmPing Request...
versionInfo=v2.2
```

Extra information (Key=Value)

backend_type=BeStMan

backend_version=2.2.1.2.i2

backend_build_date=2009-02-09T18:24:42.000Z

GatewayMode=Enabled

gsiftpTxfServers=gsiftp://dmx09.lbl.gov

clientDN=/DC=org/DC=doegrids/OU=People/CN=Alexander Sim 546622

localIDMapped=asim

staticToken(0)=USATLASDATA1 desc=USATLASDATA1 size=12884901888



srm-copy for PUT



- **Put:** `srm-copy \`
`file:///local_file_path \`
`srm://hostname:port/servicehandle?SFN=/remote_file_path`
 - E.g. `srm-copy file:///tmp/test.data srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/mytest.file`

```
% srm-copy file:///tmp/test.data srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/mytest.file
```

```
...
```

```
SRM-CLIENT: Fri Aug 01 13:01:28 PDT 2008 Calling SrmPrepareToPutRequest now ...
```

```
request.token=asim:2(PUT)
```

```
status=SRM_REQUEST_INPROGRESS
```

```
explanation=null
```

```
...
```

```
SRM-CLIENT: Fri Aug 01 13:02:01 PDT 2008 Calling Status at Fri Aug 01 13:02:01 PDT 2008
```

```
SRM-CLIENT: Result Status from SRM (srmStatusOfPutRequest)=SRM_SUCCESS
```

```
TEMPCODE=SRM_SPACE_AVAILABLE
```

```
SRM-CLIENT: RemainingPinTime=868
```

```
SRM-CLIENT: received TURL=gsiftp://dmx09.lbl.gov//data/junmin/cache/asim/V.0.1-905933076/mytest.file
```

```
SRM-CLIENT: Fri Aug 01 13:02:02 PDT 2008 start file transfer.
```

```
SRM-CLIENT:Source=file:///tmp/test.data
```

```
SRM-CLIENT:Target=gsiftp://dmx09.lbl.gov//data/junmin/cache/asim/V.0.1-905933076/mytest.file
```

```
SRM-CLIENT: Fri Aug 01 13:02:05 PDT 2008 end file transfer.
```

```
SRM-CLIENT: Fri Aug 01 13:02:05 PDT 2008 Calling putDone for srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/mytest.file
```

```
Result.status=SRM_SUCCESS
```

```
Result.Explanation=null
```

```
SRM-CLIENT: Request completed with success
```



srm-copy for GET



- **Get:** `srm-copy \`
`srm://hostname:port/servicehandle\?SFN=/remote_file_path \`
`file:///local_file_path`
 - E.g. `srm-copy srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir5/mytest.file file:///tmp/my.tested.data`

```
% srm-copy srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir5/mytest.file file:///tmp/my.tested.data
```

```
...
```

```
SRM-CLIENT: Fri Aug 01 16:48:32 PDT 2008 Connecting to http://dmx09.lbl.gov:8444/srm/v2/server
```

```
SRM-CLIENT: Fri Aug 01 16:48:33 PDT 2008 Calling SrmPrepareToGet Request now ...
```

```
request.token=asim:54(GET)
```

```
status=SRM_REQUEST_INPROGRESS
```

```
explanation=null
```

```
StatusWaitTime=30000
```

```
SRM-CLIENT: Fri Aug 01 16:49:06 PDT 2008 Calling Status at Fri Aug 01 16:49:06 PDT 2008
```

```
Status=SRM_SUCCESS
```

```
SRM-CLIENT: RemainingPinTime=9185
```

```
SRM-CLIENT: FileStatus code from server=SRM_FILE_PINNED
```

```
...
```

```
SRM-CLIENT: received TURL=gsiftp://dmx09.lbl.gov//tmp/junmin/gt3/cache/asim/V.2-1870486411/mytest.file
```

```
SRM-CLIENT: Fri Aug 01 16:49:07 PDT 2008 start file transfer.
```

```
SRM-CLIENT:Source=gsiftp://dmx09.lbl.gov//tmp/junmin/gt3/cache/asim/V.2-1870486411/mytest.file
```

```
SRM-CLIENT:Target=file:///tmp/my.tested.data
```

```
SRM-CLIENT: Fri Aug 01 16:49:10 PDT 2008 end file transfer.
```

```
SRM-CLIENT: Request completed with success
```




srm-ls



- **LS: srm-ls srm://hostname:port/servicehandle\?SFN=/file_path**
 - E.g. srm-ls srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir/mytest.file

```
% srm-ls srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir/mytest.file
```

```
...
```

```
SRM-CLIENT: Connecting to serviceurl http://dmx09.lbl.gov:8444/srm/v2/server
```

```
SRM-DIR: Fri Aug 01 13:23:29 PDT 2008 Calling srmLsRequest
```

```
SRM-DIR: .....
```

```
Status : SRM_SUCCESS
Explanation : Ref:asim:9(LS)
Request token=null
SURL=/srmcache/asim/testdir/mytest.file
Bytes=15
FileType=FILE
StorageType=VOLATILE
Status=SRM_SUCCESS
Explanation=Read from disk
OwnerPermission=null
LifetimeLeft=null
LifetimeAssigned=null
ChecksumType=null
ChecksumValue=null
FileLocality=null
OwnerPermission=null
GroupPermission=null
OtherPermission=null
ArrayOfSpaceTokens=null
getRetentionPolicyInfo=null
getLastModificationTime=null
CreatedAtTime=Fri Aug 01 13:20:43 PDT 2008
```



srm-rm



- **Rm: srm-rm srm://hostname:port/servicehandle\?SFN=/file_path**
 - E.g. srm-rm srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir6/mytest2.file

```
% srm-rm srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir6/mytest2.file
```

srm-rm SRM-Clients and BeStMan Copyright(c) 2007-2008,
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SRM-CLIENT: Connecting to serviceurl <http://dmx09.lbl.gov:8444/srm/v2/server>

SRM-DIR: Fri Aug 01 14:11:24 PDT 2008 Calling SrmRmFile

SRM-DIR: Total files to remove: 1
status=SRM_SUCCESS
explanation=null
surl=srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/testdir6/mytest2.file
status=SRM_SUCCESS
explanation=null



srm-mkdir



- **Mkdir:** `srm-mkdir srm://hostname:port/servicehandle\?SFN=/dir_path`

- E.g. `srm-mkdir srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir`

```
% srm-mkdir srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir
```

srm-mkdir SRM-Clients and BeStMan Copyright(c) 2007-2008,
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SRM-CLIENT: Connecting to serviceurl <http://dmx09.lbl.gov:8444/srm/v2/server>

SRM-DIR: Fri Aug 01 13:20:00 PDT 2008 Calling SrmMkdir
status=SRM_SUCCESS
explanation=null



srm-rmdir



- **Rmdir:** `srm-rmdir srm://hostname:port/servicehandle\?SFN=/dir_path`

- E.g. `srm-rmdir srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir6`

```
% srm-rmdir srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/testdir6
```

srm-rmdir SRM-Clients and BeStMan Copyright(c) 2007-2008,
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SRM-CLIENT: Connecting to serviceurl <http://dmx09.lbl.gov:8444/srm/v2/server>

SRM-DIR: Fri Aug 01 14:12:57 PDT 2008 Calling SrmRmdir

SRM-DIR:
 status=SRM_SUCCESS
 explanation=null



srm-sp-reserve



- **space reservation: srm-sp-reserve**
 - **srm-sp-reserve -serviceurl srm://hostname:port/service_handle **
-size desired_total_space_size -gsize desired_guaranteed_space_size -lifetime desired_space_lifetime
 - **E.g. srm-sp-reserve srm://dmx09.lbl.gov:8444/srm/v2/server -size 50000 -gsize 40000 -lifetime 3600**

```
% srm-sp-reserve srm://dmx09.lbl.gov:8444/srm/v2/server -size 50000 -gsize 40000 -lifetime 3600
```

srm-sp-reserve SRM-Clients and BeStMan Copyright(c) 2007-2008,
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SRM-CLIENT: Connecting to serviceurl <http://dmx09.lbl.gov:8444/srm/v2/server>
SRM-CLIENT: Mon Aug 04 14:56:43 PDT 2008 Calling SrmReserveSpace

SRM-CLIENT:
Status Code=SRM_SUCCESS
SpaceToken=V.4
TotalReservedSpaceSize=50000
Guaranteed Space Size=50000
Lifetime=3600



srm-sp-update



- **space update: srm-sp-update**

- `$SRM_HOME/bin/srm-sp-update -serviceurl srm://hostname:port/service_handle \`
`-size desired_total_space_size -gsize desired_guaranteed_space_size`
`-lifetime desired_space_lifetime -spac token space_token`
- E.g. `srm-sp-update srm://dmx09.lbl.gov:8444/srm/v2/server -spac token V.8 -size 30000 -gsize 25000 -lifetime 6000`

```
% srm-sp-update srm://dmx09.lbl.gov:8444/srm/v2/server -spac token V.8 -size 30000 -gsize 25000 -lifetime 6000
```

srm-sp-update SRM-Clients and BeStMan Copyright(c) 2007-2008,
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SRM-CLIENT: Connecting to serviceurl <http://dmx09.lbl.gov:8444/srm/v2/server>

SRM-CLIENT: Fri Aug 01 18:10:33 PDT 2008 Calling updateSpace request
status=SRM_SUCCESS
Request token=null
lifetime=5999
Min=30000
Max=30000



srm-sp-release



- **space release: srm-sp-release**
 - **srm-sp-release -serviceurl srm://hostname:port/service_handle -spac token space_token**
 - **E.g. srm-sp-release srm://dmx09.lbl.gov:8444/srm/v2/server -spac token V.3**

```
% srm-sp-release srm://dmx09.lbl.gov:8444/srm/v2/server -spac token V.3
```

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```
SRM-CLIENT: Connecting to serviceurl http://dmx09.lbl.gov:8444/srm/v2/server
SRM-CLIENT: Fri Aug 01 17:57:58 PDT 2008Calling ReleaseSpace request ....
SRM-CLIENT: Releasing space for token=V.3
              status=SRM_SUCCESS
```

- **space tokens retrieval: srm-sp-tokens**
 - **srm-sp-tokens -serviceurl srm://hostname:port/service_handle**
 - **E.g. srm-sp-tokens srm://dmx09.lbl.gov:8444/srm/v2/server -userdesc my_space_test_1**

```
% srm-sp-tokens srm://dmx09.lbl.gov:8444/srm/v2/server -userdesc my_space_test_1
```

```
...
```

```
SRM-CLIENT: Connecting to serviceurl http://dmx09.lbl.gov:8444/srm/v2/server
```

```
SRM-CLIENT: Fri Aug 01 17:49:49 PDT 2008 Calling srmGetSpaceTokens ...
```

```
SRM-CLIENT: .....
```

```
    Status=SRM_SUCCESS
```

```
    Explanation=null
```

```
SRM-CLIENT (0)SpaceToken=V.5
```

```
% srm-sp-tokens srm://dmx09.lbl.gov:8444/srm/v2/server
```

```
...
```

```
SRM-CLIENT: Connecting to serviceurl http://dmx09.lbl.gov:8444/srm/v2/server
```

```
SRM-CLIENT: Fri Aug 01 17:49:49 PDT 2008 Calling srmGetSpaceTokens ...
```

```
SRM-CLIENT: .....
```

```
    Status=SRM_SUCCESS
```

```
    Explanation=null
```

```
SRM-CLIENT (0)SpaceToken=V.2
```

```
SRM-CLIENT (1)SpaceToken=V.3
```

```
SRM-CLIENT (2)SpaceToken=V.4
```

```
SRM-CLIENT (3)SpaceToken=V.5
```

```
SRM-CLIENT (4)SpaceToken=V.6
```


- **space information retrieval : srm-sp-info**
 - **srm-sp-info -serviceurl srm://hostname:port/service_handle -spacetoken space_token**
 - **E.g. srm-sp-info srm://dmx09.lbl.gov:8444/srm/v2/server -spacetoken V.8**

```
% srm-sp-info srm://dmx09.lbl.gov:8444/srm/v2/server -spacetoken V.8
```

```
...
```

```
SRM-CLIENT: Connecting to serviceurl http://dmx09.lbl.gov:8444/srm/v2/server
```

```
SRM-CLIENT: Fri Aug 01 17:54:26 PDT 2008 Calling SrmGetSpaceMetaDataRequest ...
```

```
SRM-CLIENT: .....space token details .....
```

```
status=SRM_SUCCESS
```

```
SpaceToken=V.8
```

```
TotalSize=50000
```

```
Owner=asim
```

```
LifetimeAssigned=3600
```

```
LifetimeLeft=3528
```

```
UnusedSize=50000
```

```
GuaranteedSize=50000
```

```
RetentionPolicy=REPLICA
```

```
AccessLatency=ONLINE
```

```
status=SRM_SUCCESS
```

```
explanation=my_test-space_1
```



srm-copy with space token



- put operation into the reserved space
 - **srm-copy **
**file:///local_file_path **
**srm://hostname:port/service_handle\?SFN=/remote_file_path **
-spac token space_token
 - **E.g. srm-copy file:///tmp/test.data srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/mytest.file -spac token V.2**

```
% srm-copy file:///tmp/test.data srm://dmx09.lbl.gov:8444/srm/v2/server\?SFN=/srmcache/asim/mytest.file -spac token V.2
```

```
...
```

```
SRM-CLIENT: Mon Aug 04 12:25:38 PDT 2008 Connecting to httpg://dmx09.lbl.gov:8444/srm/v2/server
```

```
SRM-CLIENT: Mon Aug 04 12:25:39 PDT 2008 Calling SrmPrepareToPutRequest now ...
```

```
request.token=asim:1(PUT)
```

```
status=SRM_REQUEST_INPROGRESS
```

```
explanation=null
```

```
SRM-CLIENT: Next status call in 30 seconds.
```

```
SRM-CLIENT: Mon Aug 04 12:26:12 PDT 2008 Calling Status at Mon Aug 04 12:26:12 PDT 2008
```

```
SRM-CLIENT: Result Status from SRM (srmStatusOfPutRequest)=SRM_SUCCESS
```

```
STATUSCODE=SRM_SPACE_AVAILABLE
```

```
SRM-CLIENT: RemainingPinTime=868
```

```
SRM-CLIENT: received TURL=gsiftp://dmx09.lbl.gov//tmp/junmin/gt3/cache/asim/V.2-57524824/mytest.file
```

```
SRM-CLIENT: Mon Aug 04 12:26:13 PDT 2008 start file transfer.
```

```
SRM-CLIENT:Source=file:///tmp/test.data
```

```
SRM-CLIENT:Target=gsiftp://dmx09.lbl.gov//tmp/junmin/gt3/cache/asim/V.2-57524824/mytest.file
```

```
SRM-CLIENT: Mon Aug 04 12:26:16 PDT 2008 end file transfer.
```

```
SRM-CLIENT: Mon Aug 04 12:26:16 PDT 2008 Calling putDone for srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/mytest.file
```

```
Result.status=SRM_SUCCESS
```

```
Result.Explanation=null
```

```
SRM-CLIENT: Request completed with success
```



srm-sp-purge



- **purge a file from the reserved space**
 - **srm-sp-purge -serviceurl srm://hostname:port/service_handle **
-spac token space_token -s srm://hostname:port/service_handle?SFN=/remote_file_path
 - **E.g. srm-sp-purge srm://dmx09.lbl.gov:8444/srm/v2/server -spac token V.4 **
-s srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/testdir6/mytest.file

```
% srm-sp-purge srm://dmx09.lbl.gov:8444/srm/v2/server -spac token V.4 \  
-s srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/testdir6/mytest.file
```

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SRM-CLIENT: Connecting to serviceurl <http://dmx09.lbl.gov:8444/srm/v2/server>

SRM-CLIENT: Fri Aug 01 18:03:33 PDT 2008 Calling purgeFromSpace

```
status=SRM_SUCCESS  
explanation=null
```

```
SURL=srm://dmx09.lbl.gov:8444/srm/v2/server?SFN=/srmcache/asim/testdir6/mytest.file  
status=SRM_SUCCESS  
explanation=null
```



Summary



- **BeStMan is one of SRMs and supported by OSG**
 - Users have uniform access to BeStMan and other Grid storages
 - There would be no difference in accessing BeStMan and other Grid Storages even if there are different types of storage services
- **OSG supports users!**
 - osg-storage@opensciencegrid.org



Extra

BeStMan Server Installation Samples



Documents



- **OSG documents describe step-by-step instructions**
 - <https://twiki.grid.iu.edu/bin/view/Documentation/BestmanGateway>
 - <https://twiki.grid.iu.edu/bin/view/Documentation/BestmanGateway-Xrootd>



Preparation



- **Grid service certificate**
- **GridFTP server hostname, port number**
 - Default: `$hostname:2811`
- **GLOBUS_TCP_PORT_RANGE**
 - If `$hostname` has a firewall
- **Two open port numbers to be assigned to BeStMan**
 - Default: 8080, 8443
- **Local disk path and size information to be managed by BeStMan**
- **Log file path information**
 - Default: `/var/log`
- **Java 1.6.0_x installation path**
 - Default from `$PATH`
- **BeStMan installation directory**
 - Default: current directory
- **BeStMan downloads from <http://datagrid.lbl.gov/bestman>**
 - Or VDT pacman installation



Preparation : example



- **Grid service certificate**
 - `/DC=org/DC=doegrids/OU=Services/CN=srmdemo/dmx09.lbl.gov`
 - `$HOME/osgdemo/srmdemocert.pem` and `$HOME/osgdemo/srmdemokey.pem`
- **GridFTP server hostname, port number**
 - `dmx09.lbl.gov`
- **GLOBUS_TCP_PORT_RANGE**
 - `6201,6299`
- **Two open port numbers to be assigned to BeStMan**
 - `6249, 6250`
- **Local disk path and size information to be managed**
 - `/data/osg/demo/data : 20000MB`
- **Log file path information**
 - `/data/osg/demo/log`
- **Java 1.6.0_x installation path**
 - `/software/jdk1.6.0_12`
- **BeStMan installation directory**
 - `/data/osg/bestman`



Configuration



- **./configure **
 - `--with-globus-tcp-port-range=6201,6299 \`
 - `--with-http-port=6249 \`
 - `--with-https-port=6250 \`
 - `--with-eventlog-path=/data/osg/demo/log \`
 - `--with-cachelog-path=/data/osg/demo/log \`
 - `--with-replica-storage-path=/data/osg/demo/data \`
 - `--with-replica-storage-size=20000 \`
 - `--with-certfile-path=/home/users/asim/osgdemo/srmcert.pem \`
 - `--with-keyfile-path=/home/users/asim/osgdemo/srmkey.pem`



BeStMan server start/stop



- **As a user/service login**
 - **\$SRM_HOME/sbin/SXXbestman.personal start**
 - `$SRM_HOME/sbin/bestman.server >& /tmp/bestman-.log 2>&1 &`
 - `$SRM_HOME/sbin/bestman.server`
 - **\$SRM_HOME/sbin/SXXbestman.personal stop**
- **As a root login**
 - **\$SRM_HOME/sbin/SXXbestman start**
 - `su $SRMOWNER -c "$SRM_HOME/sbin/bestman.server &"`
 - **\$SRM_HOME/sbin/SXXbestman stop**