

StoRM status and new release

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Pre-GDB Grid Storage Services

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- StoRM 1.3.20
- Status and open problem
- New release: StoRM 1.4

StoRM v 1.3.20

- Stable release: v**1.3.20**
- Released in March 2008
- 4 main updates for improvements/bug fixes
- Last stable update: v**1.3.20-04** released in July 2008

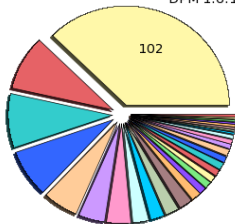
StoRM in WLCG

From GSSD SRM Deployment monitor:

Current status of deployed SRMv2.2 endpoints (Sum: 271 Count)

24 Hours from 2008-11-06 10:33 to 2008-11-07 10:33 UTC

DPM 1.6.11-3



DPM 1.6.11-3 (102)

DPM 1.6.10-4 (24)

(15)

dCache (10)

dCache production-1-8-0-15p12 (6)

dCache production-1-8-0-15p8 (6)

dCache production-1-9-0-3 (3)

dCache production-1-8-0-12p4 (3)

dCache production-1-8-0-15p5 (3)

dCache 0 0 0 (3)

StoRM (24)

DPM 1.6.7-2 (21)

dCache production-1-8-0-15p11 (11)

CASTOR 2.1.7-v2_7_8 (7)

CASTOR 2.1.7-v1_3_28 (6)

CASTOR 2-v1_3_27 (4)

dCache production-1-8-0-12p6 (3)

DPM 1.6.5-5 (3)

dCache production-1-8-0-15p6 (3)

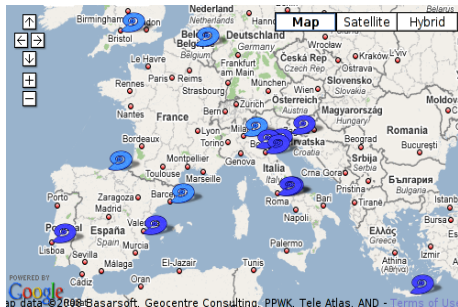
plus 11 more



StoRM in the world

Non exhaustive list of sites **using StoRM in production** on different file systems:

- **INFN CNAF Tier1 with GPFS**
- IFIC Valencia Tier2 with **Lustre**
- LIP Lisbon Atlas CMS T2 with **Lustre**
- ESA-ESRIN Roma2 with **GPFS 3.2**
- SISSA Trieste with **xfS**
- INFN Milano with **GPFS**
- INFN Roma3 with **ext3**



StoRM v 1.3.20

StoRM general status:

- Included in the INFN Grid release.
- Support for SL4, SLC3 has been dismissed.
- Installation and configuration available by **YAIM**. (**Quattor** profile made by INFN T1).
- File system driver currently available:
 - generic PosixFS (for **Lustre**, Ext3, etc.) ACL enforcing made through *setf/getfacl()* functionalities.
 - GPFS v3.x (Improved ACL management using the new GPFS API)
 - XFS

Front End v1.3.20

- Fix bug in the file size returned by *srmPrepareToGet* for file > 2GB.
- Ping version number and welcome messages that check both FE and BE services.

Back End v1.3.20

- Support for T1D1 Storage Class with GPFS 3.2 and TSM.
- Database self-cleaning operation.
- srmGetSpaceMetaData use GPFS fileset and quota.
- ROOT protocol support.
- Default ACL entries by Storage Area for the CMS use case.
- Groupmapfile and gridmapfile completely VOMS aware
- Improved LOG details.
- Heartbeat component.

SRM v2.2 command line client

Together with StoRM a fast command line client for SRM v 2.2 is available:

- Compatible with every SRM v 2.2 implementation.
- Written in C++ using the GSOAP toolkit.
- Provides the SRM syntax in a classic UNIX style.
- Example and tutorial available on the StoRM site.
- Usage example:

```
clientSRM ptp -e http://ibm139.cnaf.infn.it:8444 -s  
srm://ibm139.cnaf.infn.it:8444/dteam/test111 -p
```

StoRM support

For user support:

- Installation and configuration guides and FAQ on IG-release and StoRM site.
- Ticketing system (2 Level: StoRM support by experts, 3 Level: StoRM Developer)
- storm-user@cnafe.infn.it StoRM user community.
- storm-support@cnafe.infn.it Support from StoRM developer.

Open issues

Open StoRM Bugs:

- SrmLs result structure not hierarchical (**GGUS 39065**).
- Incorrect SOAP structure in case of SrmLs on non-existing stfnroot path (**GGUS 38730**).
- Wrong parser for service certificate.
- Wrong SRM Code for transfer protocol not supported.

Bug tracker on **StoRM forge site**

Open issues

Open bugs from other services:

- LCAS bug on voms plugin for sl4 **GGUS 43024 e 43027**.
Critical for GridFTP. Patch available on LCAS configuration.
- LCMAPS bug on log operation. Critical for StoRM BackEnd.

Open issues

- Information provider not really dynamic
- Lack of documentation for advanced configuration

StoRM 1.4

- New major release.
- One month late from the original plan (unplanned extra work, not related with the release)
- New features from sites feedback
- Compliant with MoU Addendum short term plan
- Release out for early December 2008.

What is new

Front End:

- Use of GSOAP 2.7
- Installation directory refactoring.
- Multiple thread pool separated for Synchronic and Asynchronous srm call
- User-friendly configuration

What is new

Back End:

- New Authorization source for Storage Area
- Internal GridFTP Load balancer for multiple server
- Improved Storage Area management for file systems different than GPFS.
- Refactoring of Synch, Async, Configuration, Space component

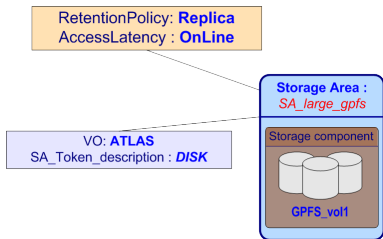
Storage Area in StoRM Namespace (NS) Component

The Storage Area (SA) is a logical portion of space statically assigned to a VO.

In StoRM the SA is defined as a "NS-File System" within the Namespace Component.

The NS-File System contains:

- **SA attributes:** SSToken Description, Online Size, Retention Policy, ...
- **NS-File System specific attributes:** Driver class, FS-Type, **Authz-source**, ...



Protecting Storage Areas

The SAs are twice protected.

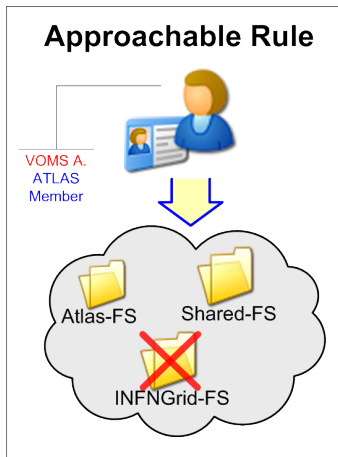
① Which SA an user can approach?

- *Approachable rule* allows to define which VOs can approach the SA.

② Which actions an user can perform on a approachable SA?

- *StoRM 1.4: SA-AuthZ-source* allows to define which actions users can perform in that SA.

Approachable rules



- Defines, in terms of user credential, which file systems can be approached.
- Access rules are expressed as regular expression by user DN and FQAN.

Approachable rules sample

- **All users:**

$\langle dn \rangle * \langle /dn \rangle$

- **All user with VOMS credentials:**

$\langle dn \rangle * \langle /dn \rangle$

$\langle vo - name \rangle * \langle vo - name \rangle$

- **DN rules** (all user named John):

$\langle dn \rangle CN = John \langle /dn \rangle$

- **VO rules** (all users belonging to *infngrid*):

$\langle dn \rangle * \langle /dn \rangle$

$\langle vo - name \rangle infngrid \langle /vo - name \rangle$

AuthZ-source per Storage Area

- StoRM prevents misuse of spaces through the ACL (ordered list of ACE)
- The ACL model is derived from NFS v4.1-draft-21 [[Link](#)]
- The ACL is related to Storage Area, then to NS-File System
- The ACL is stored in a external AuthZ-source, a flat text file.
 - To bound the AuthZ-source to a SA:
 - < *authz – source* > **AuthZ-DB-FileName**
 - < /*authz – source* >
 - if not defined, a default AuthZ-source will be used. If not specified, the default is DENY ALL.

The AuthZ-DB-File (1/2)

- Every line in AuthZ-DB file correspond to an ACE
- The ACE is composed by 4 fields:
SubjectType:subject:actions:permission
 - **SubjectType** : DN/FQAN
 - **Subject** : Regular Expression as defined in "FQAN wildcard" document [[Link](#)]
 - **Actions** : As defined in "MoU addendum" document [[Link](#)]
 - **Permissions** : DENY/ALLOW

The AuthZ-DB-File (2/2)

- There are two "hidden" ACEs (Implicit ACE) to implement a "default DENY".
 - *fqn : EVERYONE : DURWSCPQM : DENY*
 - *dn : EVERYONE : DURWSCPQM : DENY*
- In StoRM does not exist the concept of "Owner of Space" (when Space is intended as a Storage Area).
- StoRM ignores the action "MODIFY-SPACE-ACL".
 - The unique way to modify the ACL is to modify the AuthZ-DB file (if you can).

Internal GridFTP load Balancer

- **Each storage area** can be configured to use a set of different GridFTP servers.
- Transfer load can be distributed on the different server using a **GridFTP load balancer**.
- The balancer can be configured to use different Policy to distribute load:
- **Basic Policy:**
 - RandomPolicy: Transfer assigned with Random algorithm
 - RoundRobinPolicy: Transfer assigned with Round Robin policy
 - WeightPolicy: Transfer distributed following weights assigned to each server.

Internal GridFTP load Balancer

- A **GridFTP sensor** is also provided to monitor real-time availability/status of each server.
- **Advanced Policy:**
 - **NumberOfFTPPProcess:** transfer assigned to the server with minor number of FTP processes.
 - **NumberOfFTPPProcess with weight:** Together with number of FTP processes also a weight is evaluated.

Storage Area size enforcement

Storage Area size can be enforced at SRM level without rely on fs quota

- Size defined in namespace configuration as usual
- Used and Available size updated at each SRM operation
- Overuse not allowed at SRM level (SRM_NO_FREE_SPACE)
- Continue to support file system quota for SA

What is new

- New YAIM installation profile
- Improved Information provider
 - Compliant with discussion on Glue 1.3 and storage
 - Use dynamic GIP functions to update dynamic info
- ETICS integration on going
- Documentation improvement
 - Focus on advanced configuration for site admin
 - namespace.xml documentation
 - storm.properties documentation
 - Review and update of the documentation section on StoRM site

Questions

- Questions ?