

# Construction technologies and experience of **DISK POOL MANAGER** exploitation

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Disk Pool Manager Overview

How to install a DPM Server

DPM testing

# Disk Pool Manager Overview

The Disk Pool Manager (DPM) is a lightweight solution for disk storage management, which offers the SRM interfaces.

Storage Resource Manager (SRM) interface presents a combined view of a mass storage systems secondary and tertiary storage to grid clients. Permanent, durable and volatile file types allow for files to be safely stored while they are needed and removed when not. A pool is a group of file systems located on one or more disk servers.

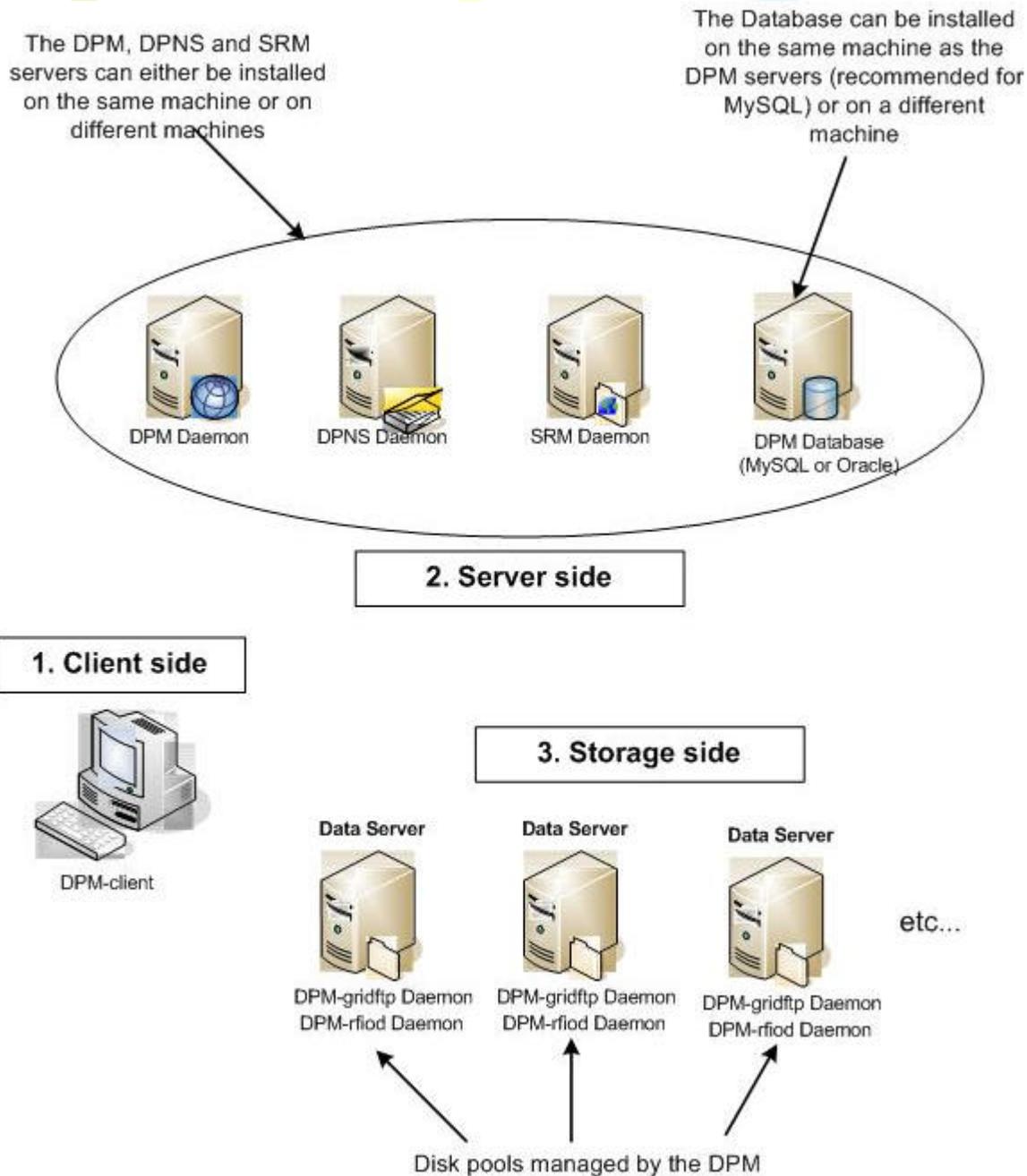
The DPM head node has to have one filesystem in this pool, and then an arbitrary number of disk servers can be added by YAIM. The DPM disk servers can have multiple filesystems in pool. The DPM head node also hosts DPM and DPNS databases, as well as SRM web service interfaces.

# DPM architecture

**Server side:** DPM, DPNS, SRM daemons and DPM Database (MySQL or Oracle)

**Storage side:** DPM-gridftp Daemon, DPM-rfiod Daemon

**Client side:** DPM-client



**Graph1.1 The DPM Architecture**

# DPM configuration variables

\$ MY DOMAIN - your domain

\$ SE HOST - the DPM hostname

\$ DPMDATA - the file system on the separate partition (ex: /storage)

\$ DPMUSER PWD - the password for the Mysql DPM user account

\$ DPMPOOL - name of the pool that the DPMDATA filesystem shall be in (ex: Permanent)

\$ DPMFSIZE - the space to be reserved by default for a file stored in the DPM (ex: 200M)

# Install DPM

Operating System - Scientific Linux 4 (CERN);

Install and configure head node:

```
yum install glite-SE_dpm_mysql
```

```
/opt/glite/yaim/bin/yaim -c -s /etc/yaim/site-infodef.def -n glite-SE_dpm_mysql
```

Install and configure pool node:

```
yum install glite-SE_dpm_disk
```

```
/opt/glite/yaim/bin/yaim -c -s /etc/yaim/site-infodef.def -n glite-SE_dpm_disk
```

# First steps

Setup environment:

```
$ export DPNS HOST=lxb1921.cern.ch
```

```
$ export DPM HOST=lxb1921.cern.ch
```

GRID environment:

```
$ source /opt/glite/etc/profile.d/grid-env.sh
```

For generating proxy:

```
$ voms-proxy-init --voms dteam
```

Enter GRID pass phrase:

```
Your identity: /C=RU/O=RDIG/OU=users/OU=ihep.su/CN=Sofia
```

```
Sayzhenkova
```

```
Creating temporary proxy ..... Done
```

# DPM Command Line Interface

COMMAND	DESCRIPTION
dpm-addfs	add a filesystem to a disk pool
dpm-addpool	define a new disk pool
dpm-modifyfs	modify the parameters of a disk
dpm-modifypool	modify a disk pool definition
dpm-qryconf	display the Disk Pool Manager configuration
dpm-rmfs	remove a filesystem from a disk
dpm-rmpool	remove a disk pool definition

# DPM Name Server Command Line Interface

COMMAND	DESCRIPTION
dpns-chmod	change access mode of a DPM directory/file in the name server
dpns-chown	change owner and group of a DPM directory/file in the name server
dpns-entergrpmap	define a new group entry in Virtual Id table
dpns-enterusrmap	define a new user entry in Virtual Id table
dpns-getacl	get DPM directory/file access control lists
dpns-ln	make a symbolic link to a file or a directory in the DPM Name Server
dpns-ls	list DPM name server directory/file entries
dpns-mkdir	make DPM directory in the name server
dpns-modifygrpmap	modify group entry corresponding to a given virtual gid
dpns-modifyusrmap	modify user entry corresponding to a given virtual uid
dpns-rename	rename a DPM file or directory in the name server
dpns-rm	remove DPM files or directories in the name server
dpns-rmgrpmap	suppress group entry corresponding to a given virtual gid or group name
dpns-rmusrmap	suppress user entry corresponding to a given virtual uid or user name
dpns-setacl	set DPM directory/file access control lists

# Testing DPM

Various tests have been written for testing a DPM machine:

- ? dpns-commands - DPM Name Server Command Line Interface (Commands run on abstraction of dpms' pools/filesystems);
- ? dpm-commands - DPM Command Line Interface (commands run on dpms' actual pools/filesystems);
- ? rf-commands - commands run on dpm from a ui/wn;
- ? stress test - checking of DPM work with many processes.

# Testing DPM

## To run the test:

```
./start <machine name> <vo>
```

## Notes:

To run the test you need a valid credential, and the DPM/DPNS client libraries has to be installed on the usual location. You can use a UI for this purpose.

The `dpnsdaemon` command starts the name server. This command is usually executed at system startup time. This will read the name server configuration file, create the `/` entry in the database if it does not exist yet, create a pool of threads and look for requests.

# Testing DPM

Stress test have to check system's fault tolerance. There were started 25 processes synchronous. After that they were finished new process was started. Total quantity of processes were 40. They were started directly one after another. System passed this check.

```
dpm-qryconf test [|||||] 100% (1/14) [OK]
dpm-reservespace test [|||||] 100% (2/14) [OK]
dpm-updatespace test [|||||] 100% (3/14) [OK]
dpm-releasespace test [|||||] 100% (4/14) [OK]
dpm-register test [|||||] 100% (5/14) [OK]
dpm-addpool test [-----] 0% (6/14) [FAILED]
dpm-adddfs test [-----] 0% (7/14) [FAILED]
dpm-replicate test [|||||] 100% (8/14) [OK]
dpm-drain test [-----] 0% (9/14) [FAILED]
dpm-modifypool test [-----] 0% (10/14) [FAILED]
dpm-modifydfs test [-----] 0% (11/14) [FAILED]
dpm-rmfs test [-----] 0% (12/14) [FAILED]
dpm-rmpool test [-----] 0% (13/14) [FAILED]
dpm-ping test [|||||] 100% (14/14) [OK]
```

# DPM bugs

## 1) dpm and dpnsdaemon

```
[root@lxb1921 ~]# cat config  
gdgfdhbfgl
```

```
[root@lxb1921 ~]# dpnsdaemon -c config ; echo $?  
0
```

```
[root@lxb1921 ~]# tail -n 5 /var/log/dpns/log
```

```
04/22 12:28:29 17200,0 Cns_srv_readdir: returns 0
```

```
04/22 12:28:37 22122 Cns_serv: started (DPNS 1.6.7-1)
```

```
04/22 12:28:37 22122 Cns_serv: NS009 - fatal configuration error:  
config incorrect
```

```
04/22 12:31:58 22265 Cns_serv: started (DPNS 1.6.7-1)
```

```
04/22 12:31:58 22265 Cns_serv: NS009 - fatal configuration error:  
config incorrect
```

So dpnsdaemon correctly logs the error, however the exit code is still 0

# DPM bugs

2) `dpm-modifypool` - modify a disk pool definition

Pool space type for add or modify pool must be V, D, P.

Retention policy specifies supported by the disk pool. (R, O, C).

```
dpm-modifypool --poolname Testpool --s_type Y ; echo $?  
0
```

```
[root@ctb-generic-60 2008-04-09]# dpm-qryconf  
POOL Testpool DEFSIZE 200.00M GC_START_THRESH 0  
GC_STOP_THRESH 0 DEF_LIFETIME 7.0d DEFPINTIME 2.0h  
MAX_LIFETIME 1.0m MAXPINTIME 12.0h FSS_POLICY  
maxfreespace GC_POLICY lru RS_POLICY fifo GIDS 0 S_TYPE  
Y MIG_POLICY none RET_POLICY R  
CAPACITY 0 FREE 0 ( 0.0%)
```

It have been changed in DPM  $\geq$  1.6.11

# Summary

There weren't discovered seriously damages.

Work above DPM tests proceeds.

I took part in this work in CERN in Grid Deployment Group.

It was teamwork.

I wish to thank all with whom I worked in the same group.

**Thanks for attention**