

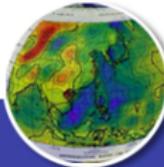
SE installation

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Outline

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- ② DPM
- ③ Installation
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- ⑤ Testing
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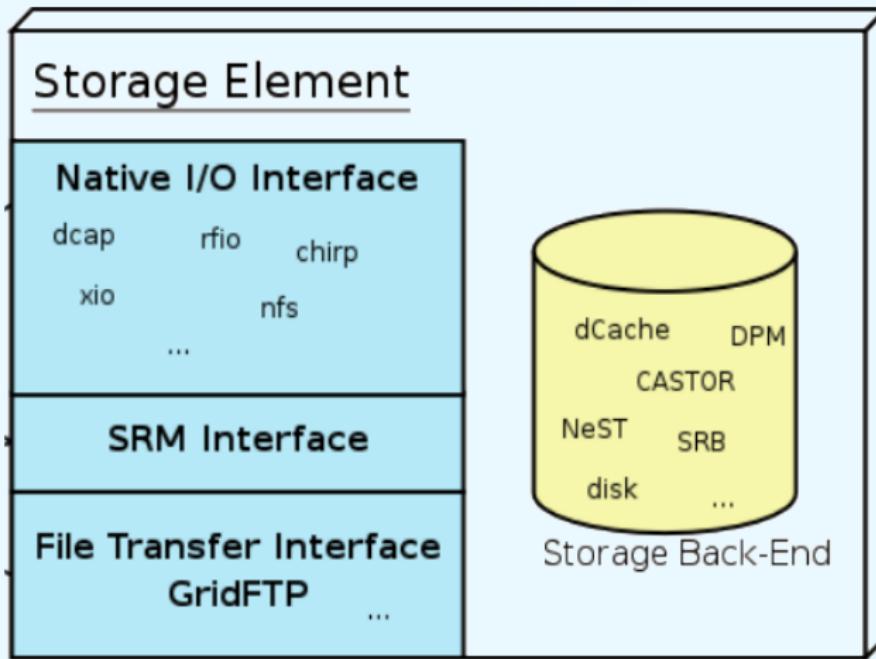
Storage Overview

gLite SE



- The gLite Storage Element handles files on the Grid
- Different implementations available
 - **DPM**
 - dCache
 - CASTOR
- Storage user interface and **commands do not depend on the implementation**
 - The SRM (Storage Resource Manager) takes care of providing an uniform access

SE Components

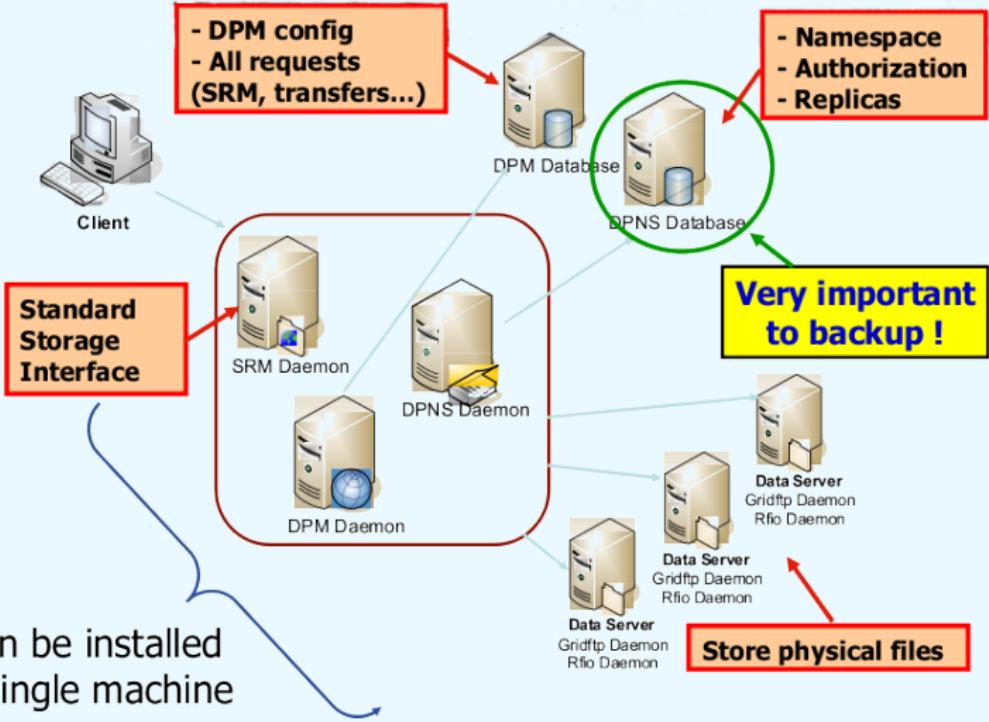


DPM

What is DPM?

- The Disk Pool Manager (DPM) is a lightweight solution for disk storage management
 - **Manages storage on multiple disk servers**
 - Supports: SRM 2.2, GridFTP, RFIO
- Features:
 - Easy to install/configure
 - Advanced storage management
 - Logical Namespace
 - Easy to add/remove file systems

Architecture



Daemons

- DPM Server
- DPM Name Server
- SRM servers
- RFIO server
- DPM-enabled GridFTP server
 - Normal GridFTP server slightly modified for the DPM
 - Can be used in place of the normal GridFTP server but note vice-versa

Installation

Initial Setup

- Create a machine with Scientific Linux
 - A virtual machine is provided for this tutorial
- Configure the repo files for all the needed CA and Java packages
 - GILDA services will be included in this tutorial

Get the Repo files

```
# cd /etc/yum.repos.d  
# wget ftp://mirror.biruni.upm.my/repos/3.1/jpackage.repo  
# wget ftp://mirror.biruni.upm.my/repos/3.1/lcg-CA.repo  
# wget http://grid018.ct.infn.it/mrepo/repos/gilda.repo
```

Installation

- DPM with MySQL back-end requires the installation of `glite-SE_dpm_mysql` meta package
 - This includes RPM for both DPM head and disk node

Add DPM repository

```
# cd /etc/yum.repos.d/  
# wget ftp://mirror.biruni.upm.my/repos/3.1/glite-SE_dpm_mysql.repo
```

Run DPM Install

```
# yum install glite-SE_dpm_mysql lcg-CA gilda_utils
```



Host Certificates



- Certificates for the VMs already created by GILDA CA
 - Available at: <ftp://mirror.biruni.upm.my/klacgrid/hostcert/>
 - Copy host certificates in /etc/grid-security

Host certificates

```
# ll /etc/grid-security/host*
-rw-r--r--  1 root root    1062 Nov  9 11:25 hostcert.pem
-r-----  1 root root     891 Nov  9 11:25 hostkey.pem
#
```



Configuration

Setup the DPM Disk

- Create the data directory that will hold DPM disk data
 - This should normally be on a separate partition
 - This **partition cannot be called dpm** which will cause confusion with the DPMs logical namespace
- DPM server can include additional disks from external machines at run time
 - The machines have to be configured as DPM disks

Yaim files

- Yaim is in charge of all the configurations
- Copy the configuration template files in a new directory

Copy config template

```
# cp -r /opt/glite/yaim/examples/siteinfo myConfig
```

- Protect your configuration file

Fix permissions

```
# chmod 600 myConfig/site-info.def
```

Customise the configuration

- The file `site-info.def` has to be modified to include the parameter for the SE
 - Some parameters are generic for any components
 - Site name, domain, etc.
 - Location of the BDII
 - Supported VOs information
 - Other variables are specific
 - For this installation the DPM variables
 - Configuration required only for the components to install

General Configuration

SITE_EMAIL reference e-mail for the site

SITE_NAME must be the same of site BDII

MY_DOMAIN the site domain name

- Use the command `hostname -d`

BDII_HOST location of top BDII

USERS_CONF

GROUPS_CONF file containing the list of local users and groups to use for each VO

- A customised version including users for gilda is available at
<ftp://mirror.biruni.upm.my/klacgrid/>

General Configuration

MYSQL_PASSWORD an admin pass-phrase for the DB back-end

SE_LIST the list of SE (at least the one installed)

VOS the list of supported VOS

VO_<VO NAME>_<VO PARAM> a set of attribute for each supported VO

- An example configuration file with *gilda* and *euasia* VO parameters available at
<ftp://mirror.biruni.upm.my/klacgrid/>

DPM Configuration

DPM variables in file services/glite-se_dpm_mysql

DPMPOOL the name for the new DPM pool

DPM_HOST the host of DPM head node

DPM_FILESYSTEMS path to DPM directory

DPM_DB_HOST DPM DB server

DPM_DB_USER

DPM_DB_PASSWORD DB account of the user
managing DPM info

DPM_INFO_USER

DPM_INFO_PASS DB read only account

Run the Configuration

Check the syntax

```
# source <your-site-info>
```

Verify the parameters

```
# /opt/glite/yaim/bin/yaim -v -s <your-site-info> -n glite-SE_dpm_myse
```

Start the Configuration

```
# /opt/glite/yaim/bin/yaim -c -s <your-site-info> -n glite-SE_dpm_myse
```



Testing

Check Network Services

- Several servers should be running after the configuration
 - Use the command `netstat -tnlp` to check
 - Running daemons include:

Service	Port
mysqld	3306
dpbsdaemon	5010
dpm	5015
rfiod	5001
bdii-fwd	2170
slapd	2171, 2172
GridFTP	2811



DPM Certificate



- DPM copies the original host certificates. Check the status of the copied host certificates

DPM certificates

```
# ll /etc/grid-security/dpmmgr/
-rw-r--r-- 1 root root 1062 Nov  9 11:25 dpmcert.pem
-r----- 1 root root 891 Nov  9 11:25 dpmkey.pem
#
```

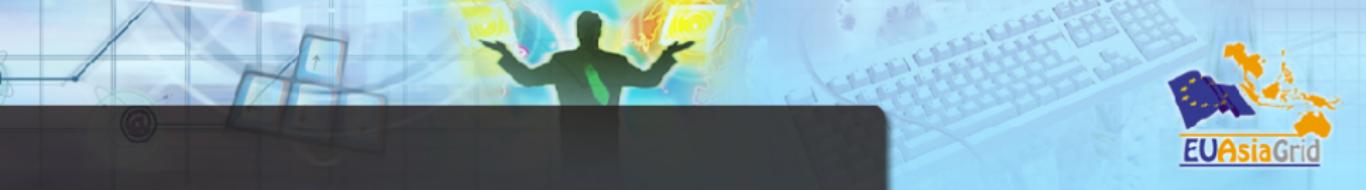
- When you update your host certificate, remember to update these copies as well

Query the DPM server

- UI commands to access the DPNS (i.e. dpm-*)
 - Configure the environment variable DPM_HOST
 - DPM_HOST=<your storage>
 - Command dpm-qryconf shows the server status
- Some commands allow to access the DPNS
 - Configure the environment variable DPNS_HOST
 - DPNS_HOST=<your storage>
- Command dpns-ls show the file hierarchy
 - Similar to ls

gLite final tests

- Check if your DPM is correctly published in the Information System
 - Use `lcg-infosites` commands or query the BDII ldap server
- Try to copy a file on the storage
 - If a LFC catalog is available use the `lcg-cr` command with destination flag the new server
 - If the LFC catalog is not available use the `lcg-cp` command



Conclusion

Conclusion



- Each site should have Storage Elements
- Many implementations available
- DPM provides all the needed protocols and is easy to install and maintain

References

- DPM
 - http://www.gridpp.ac.uk/wiki/Disk_Pool_Manager
 - <https://twiki.cern.ch/twiki/bin/view/LCG/DpmAdminGuide>
- gLite general installation
 - <https://twiki.cern.ch/twiki/bin/view/LCG/GenericInstallGuide310>
- Yaim
 - <https://twiki.cern.ch/twiki/bin/view/EGEE/YAIM>
- Site Info
 - https://twiki.cern.ch/twiki/bin/view/LCG/Site-info_configuration_variables

Questions!!!



Based on

- *Mohd Bazli Ab Karim* (MIMOS) presentation at EAGSS09 for EUAsiaGrid
- *Federico Bitelli* (INFN) presentation at INFN Grid Training 2008