The lightweight Grid-enabled Disk Pool Manager (DPM)

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JRA1 All Hands Meeting

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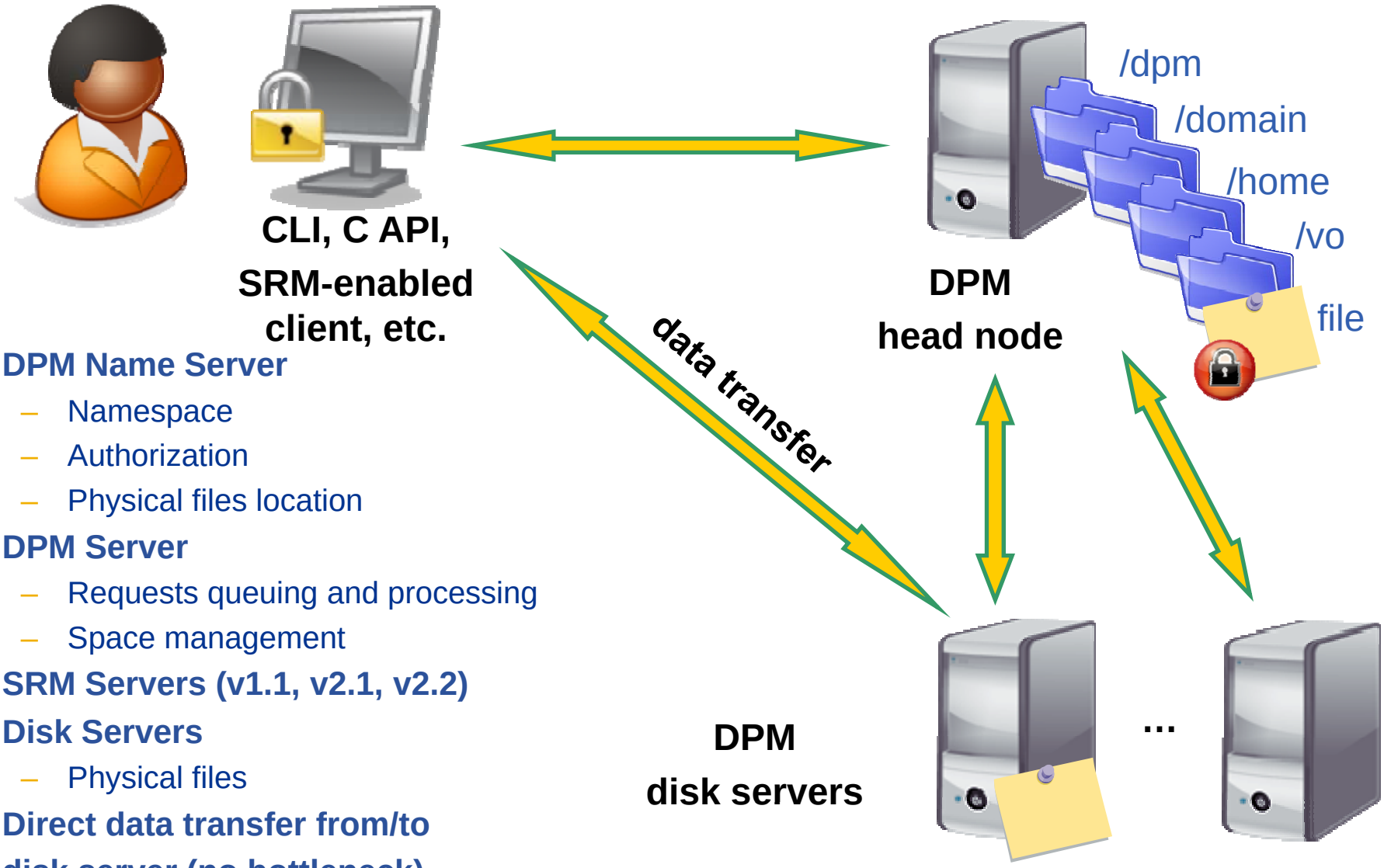
Status

Functionality offered

- **Management of disk space on geographically distributed disk servers**
- **Management of name space (including ACLs)**
- **Control interfaces**
  - socket, SRM v1.0, SRM v2.1, SRM v2.2 (no srmCopy)
- **Data access protocols**
  - secure RFIO, gsiFTP, HTTPS, HTTP and XROOTD

DPM architecture

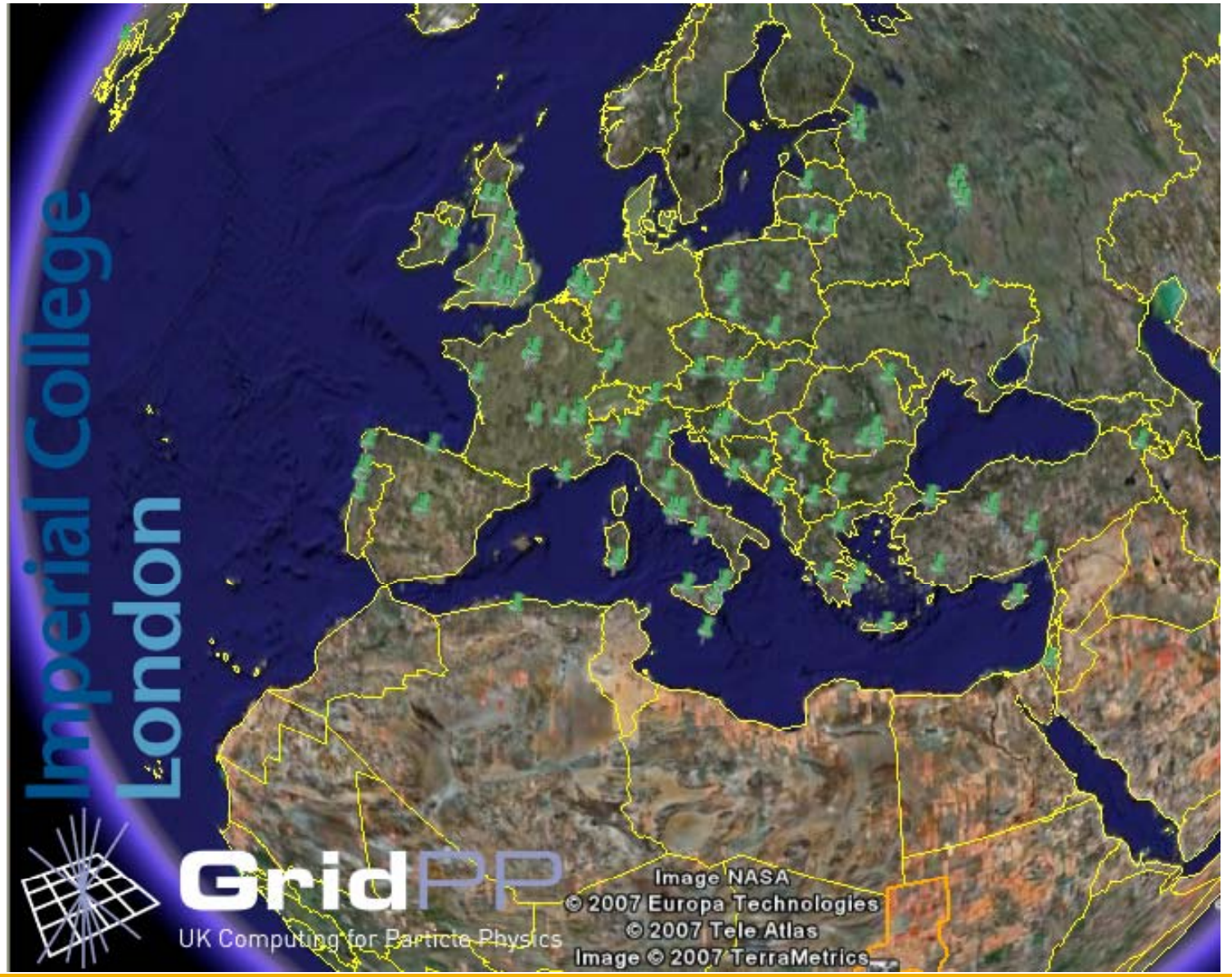


- **DPM Name Server**
  - Namespace
  - Authorization
  - Physical files location
- **DPM Server**
  - Requests queuing and processing
  - Space management
- **SRM Servers (v1.1, v2.1, v2.2)**
- **Disk Servers**
  - Physical files
- **Direct data transfer from/to disk server (no bottleneck)**

DPM administration

- **Intuitive commands**
  - As similar to UNIX commands as possible
  - Ex: dpns-ls, dpns-mkdir, dpns-getacl, etc.
- **DPM architecture is database centric**
  - No configuration file
  - Support for MySQL and Oracle
- **Scalability**
  - All servers (except the DPM one) can be replicated if needed (DNS load balancing)

131 DPMs in LCG/EGEE



SRMv2.2

What's new ?

- **Retention policies**
  - Given quality of disks, admin defines quality of service
  - Replica, Output, Custodial
- **Access latency**
  - Online, Nearline
  - Nearline will be used for BIOMED DICOM integration
- **File storage type**
  - Volatile, Permanent
- **File pinning**
  - Set TURL lifetime (srmPrepareToGet, srmPrepareToPut)
  - Set file lifetime in space (srmBringOnline)

Space reservation

- **Static space reservation (admin)**

  $ dpm-reservespace --gspace 20G --lifetime Inf --group atlas --token_desc Atlas_ESD

  $ dpm-reservespace --gspace 100M --lifetime 1h --group dteam/Role=lcgadmin --token_desc LcgAd

  $ dpm-updatespace --token_desc myspace --gspace 5G

  $ dpm-releasespace --token_desc myspace

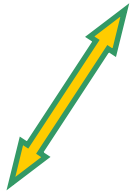
- **Dynamic space reservation (user)**
  - **Defined by user on request**
    - dpm-reservespace
    - srmReserveSpace
  - **Limitation on duration and size of space reserved**

Secondary groups

DPM secondary groups

DPM
Name Server

(uid1, gid1)
Ex: (102, 103, 101)



Virtual uids mapping (example)

/C=CH/O=CERN/OU=GRID/CN=Sophie Lemaitre 2268	101
/C=CH/O=CERN/OU=GRID/CN=Simone Campana 7461	102

Virtual gids mapping (example)

atlas	101
atlas/Role=lcgadmin	102
atlas/Role=production	103

$ voms-proxy-init –voms atlas:/atlas/Role=production

⇒Simone will be mapped to
(uid, gid, …) = (102, 103, 101)
⇒Simone still belongs to “atlas”

What's next ?

What's next ?

- **Short term (end 2007)**
  - srmCopy daemon
  - Medical data management
    - Encryption
    - DICOM backend
  - Quotas
- **Medium term (2008)**
  - NFSv4.1

Local LFC

- **DPM Name Server**
  - Can act as a local LFC (LCG File Catalog)
- **Advantages**
  - Only one service to run instead of two (LFC + DPM)
  - Transparent to the users

DPM quotas

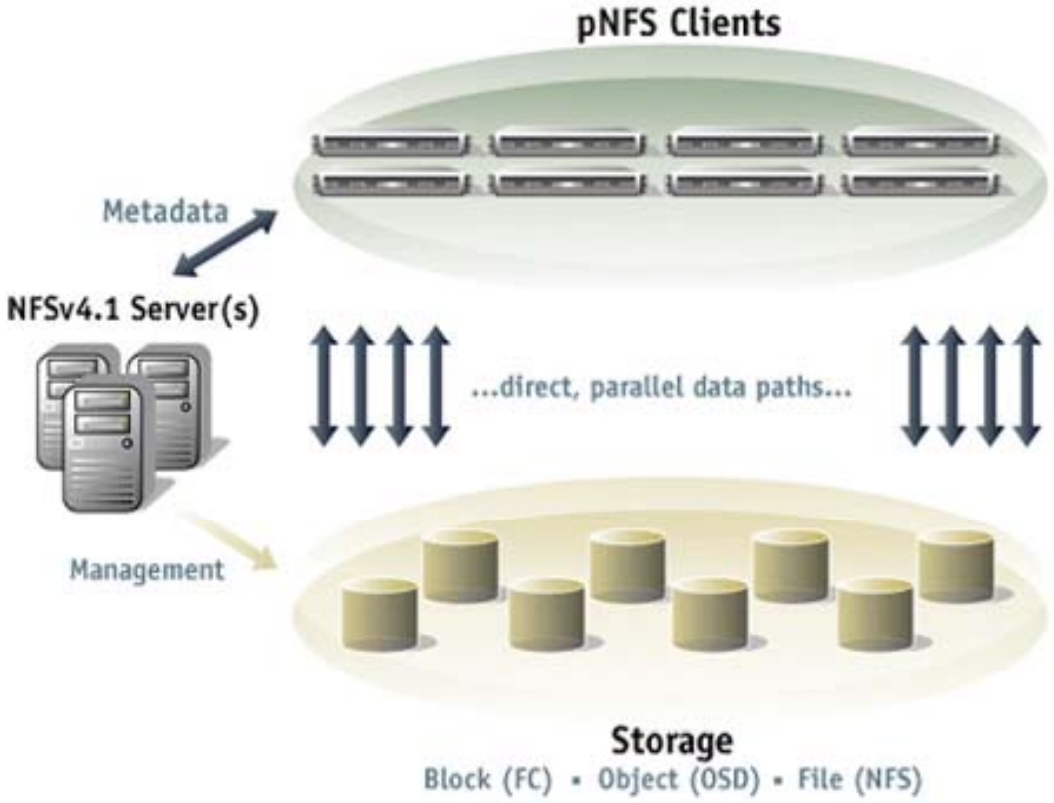
- **DPM terminology**
  - A DPM pool is a set of filesystems on DPM disk servers
- **Unix-like quotas**
  - Quotas are defined per disk pool
  - Usage in a given pool is per DN and per VOMS FQAN
  - Primary group gets charged for usage
  - Quotas in a given pool can be defined/enabled per DN and/or per VOMS FQAN
  - Quotas can be assigned by admin
  - Default quotas can be assigned by admin and applied to new users/groups contacting the DPM

DPM quota interfaces

- **Unix-like quota interfaces**
  - User interface
    - dpm-quota gives quota and usage information for a given user/group (restricted to the own user information)
  - Administrator interface
    - dpm-quotacheck to compute the current usage on an existing system
    - dpm-repquota to list the usage and quota information for all users/groups
    - dpm-setquota to set or change quotas for a given user/group

DPM with NFSv4

- **NFSv4 and DPM have similar architectures**
  - Separate metadata server
  - Direct access to physical files
  - Easy NFSv4 integration



Summary

- **DPM**
  - Manages space on distributed disks
  - Transparently to the users
- **DPM service**
  - Easy to configure and administer
  - Stable and reliable Grid service
  - Widely deployed
    - 131 instances
- **Future**
  - srmCopy daemon
  - Quotas
  - NFSv4 support

Help ?

- **DPM online documentation**

  https://twiki.cern.ch/twiki/bin/view/LCG/DataManagementDocumentation

- **Support**
  - helpdesk@ggus.org

- **General questions**
  - hep-service-dpm@cern.ch