



Enabling Grids for E-scienceE

gLite Data Management Services - Overview

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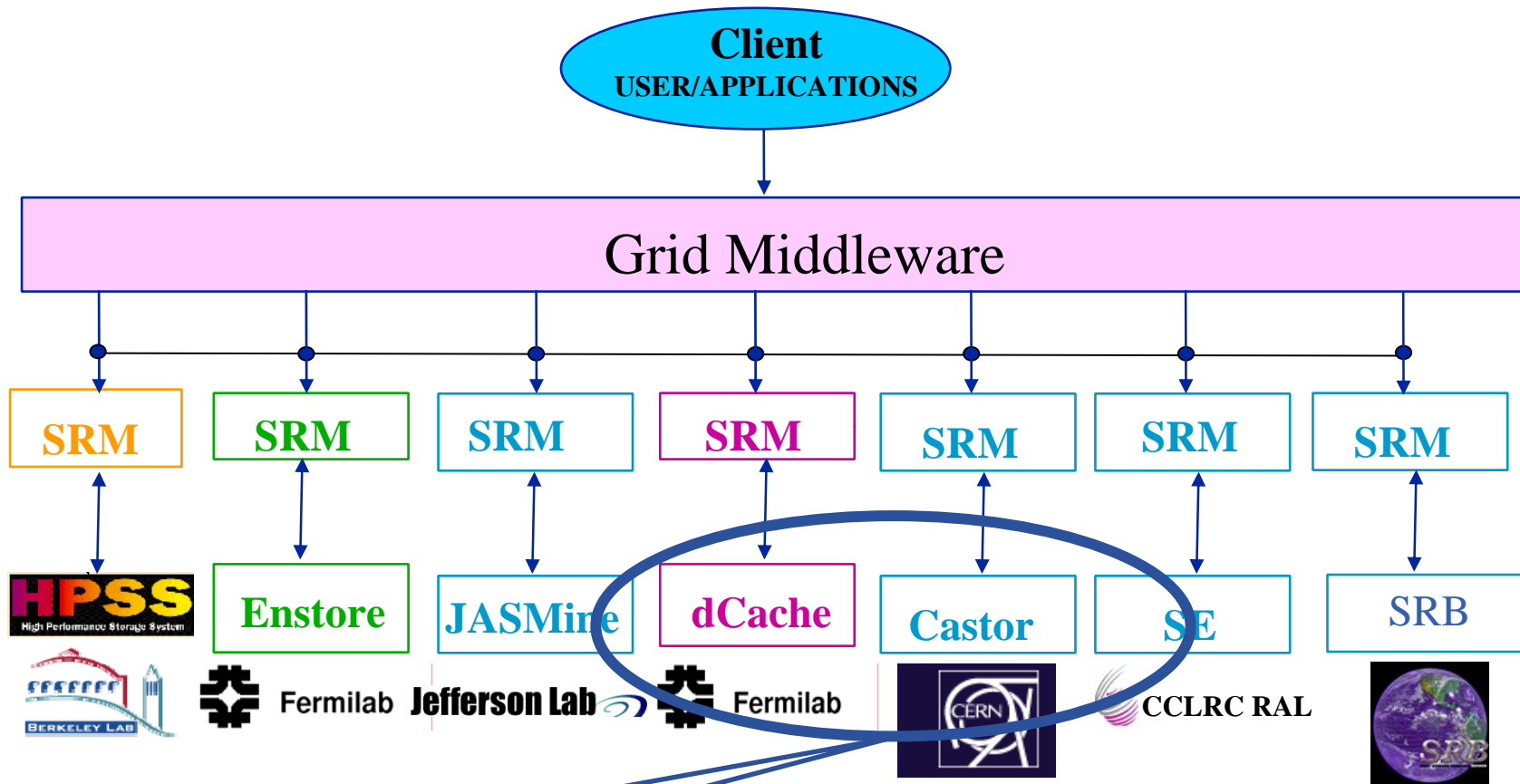
Information Society



- **EGEE Middleware Architecture and Planning**
<https://edms.cern.ch/document/594698/>
- **SRM slides derived from presentation by Andrew Smith (NeSC)**
- **Roberto Barbera, ISSGC05, Vico Equense, July2005**
<http://www.dma.unina.it/~murli/GridSummerSchool2005/index.htm>

- **Storage Element**
- **Data services in gLite**
- **Catalogs**
- **File Transfer**

- **Storage back-end with all the associated hardware and drivers**
- **SRM service implementation on the given storage**
- **Transfer service for a (set of) transfer protocol(s)**
- **gLite POSIX-like File I/O service**
- **Auxiliary Security and Logging services**
 - If SE supports ACL (extensions to POSIX-like access control – e.g. multiple groups), SE accesses the user, group data in VOMS proxy
 - Optional logging and accounting services
- **Currently, Mass Storage Systems:**
 - Castor, dCache

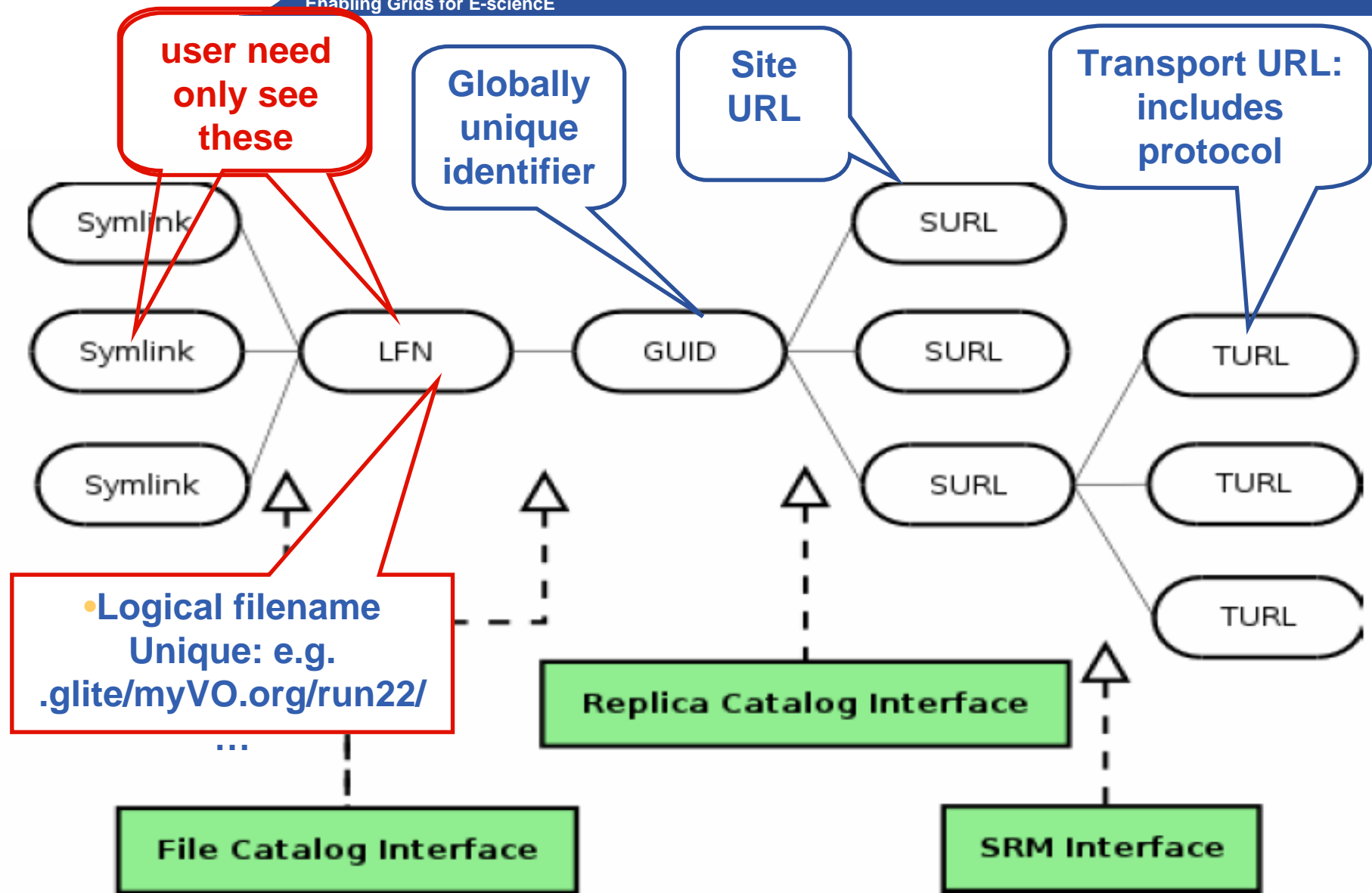


Currently supported,
via SRM, by gLite

- **Becoming standard for data management in grids – GGF working group - <http://sdm.lbl.gov/gsm/>**
- **Will also allow gLite to provide data scheduling**
 - Before jobs run
 - For file transfer
- **<http://sdm.lbl.gov/srm-wg/doc/ggf10.DataWorkshop.Arie.SRM.interface.pdf>**

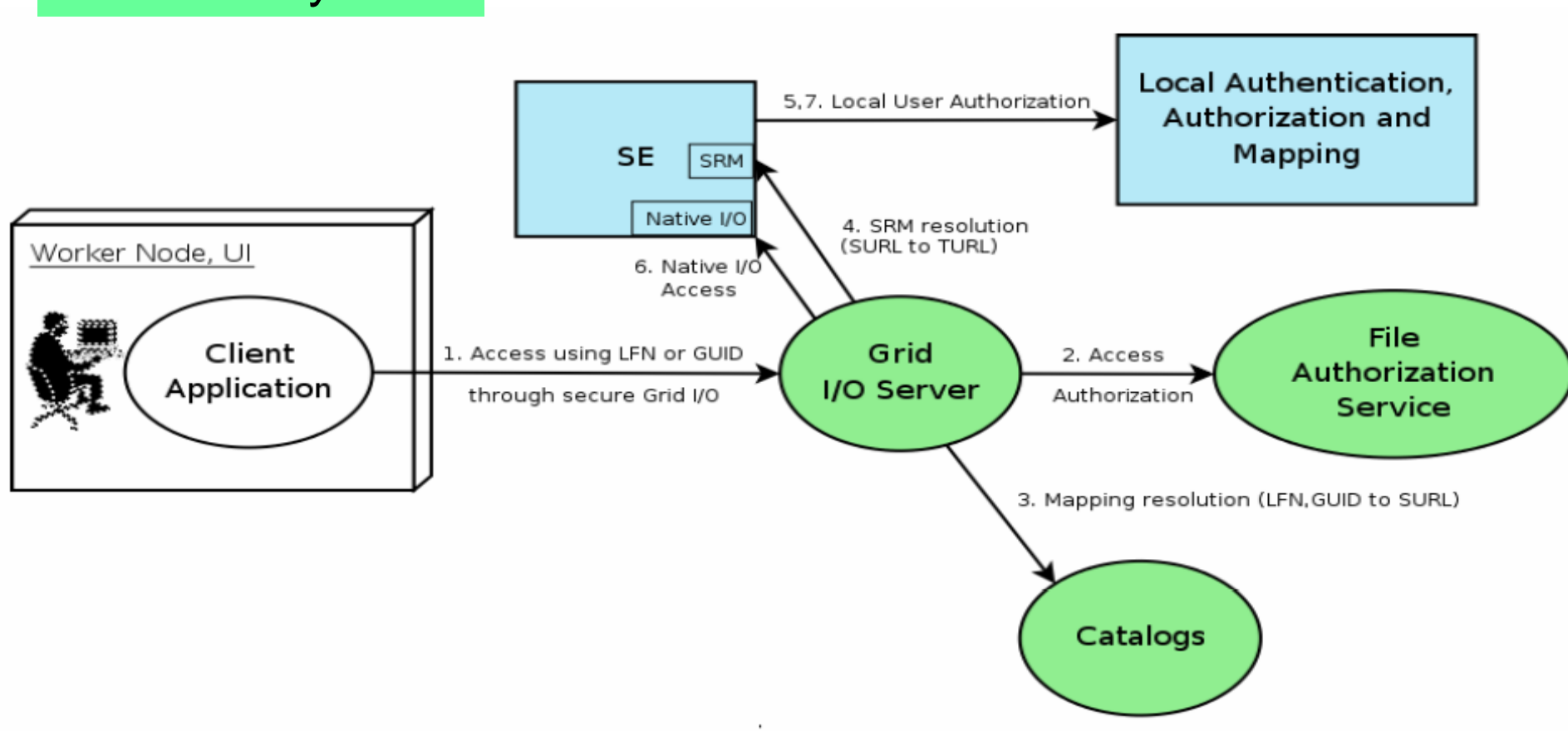
- **File Access Patterns:**
 - Write once, read-many
 - Rare append-only with one owner
 - Frequent updated at one source - replicas check/pull new version
 - (NOT frequent updates, many users, many sites)

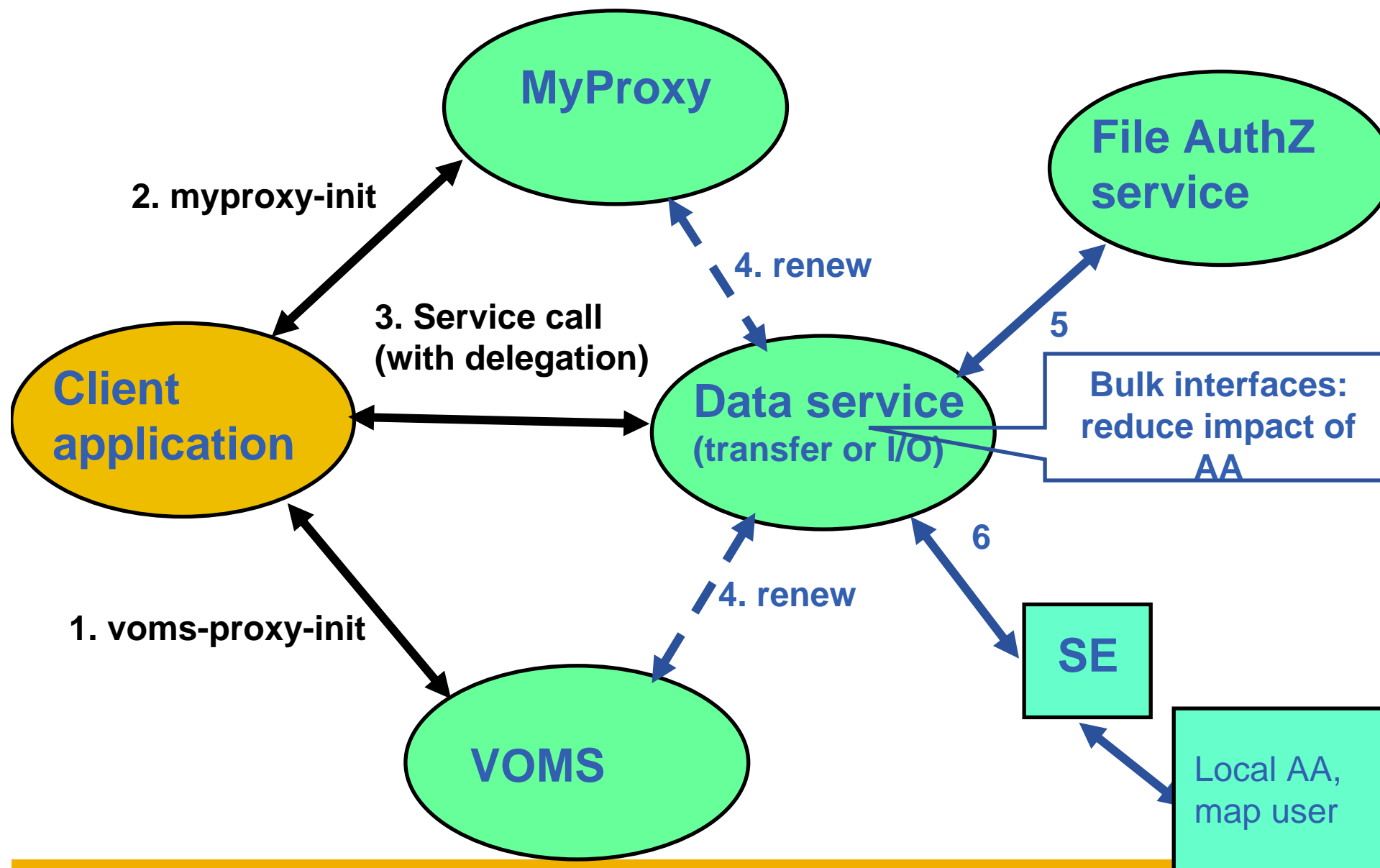
- **3 service types for data**
 - Storage
 - Catalogs
 - Movement



Provided by site

Provided by VO





- **Catalogs built based on requirements from HEP experiments and the Biomedical EGEE community**
- **Started design from AliEn File Catalog**
 - Logical namespace management
 - Virtual Filesystem view (DataSets via directory hierarchy)
 - Support Metadata attached to files
 - Bulk Operations
 - Strong security: basic unix permissions and fine-grained ACLs (i.e. not just directory but file-granularity)
 - Support flexible deployment models
 - Single central catalog model
 - Site local catalogs connected to a single central catalog model
 - Site local catalogs without single central catalog model
 - Scalable to many clients and to a large number of entries; address performance issues seen with EDG RLS

- **Fireman**
 - Fireman = File and Replica Manager
 - Also interfaces to metadata catalog
 - Implements all file management interfaces
 - Using replica catalog: manage replicas using GUID
- **File Authorization Service**
 - Request authorisation - based on the DN and the Groups from the user's delegated credentials
 - the FAS and Catalog interfaces are implemented by the same service
- **Metadata Catalog – not yet!**
 - Metadata are application specific
 - All files in a directory have the same schema
 - (Many directories can share a schema)

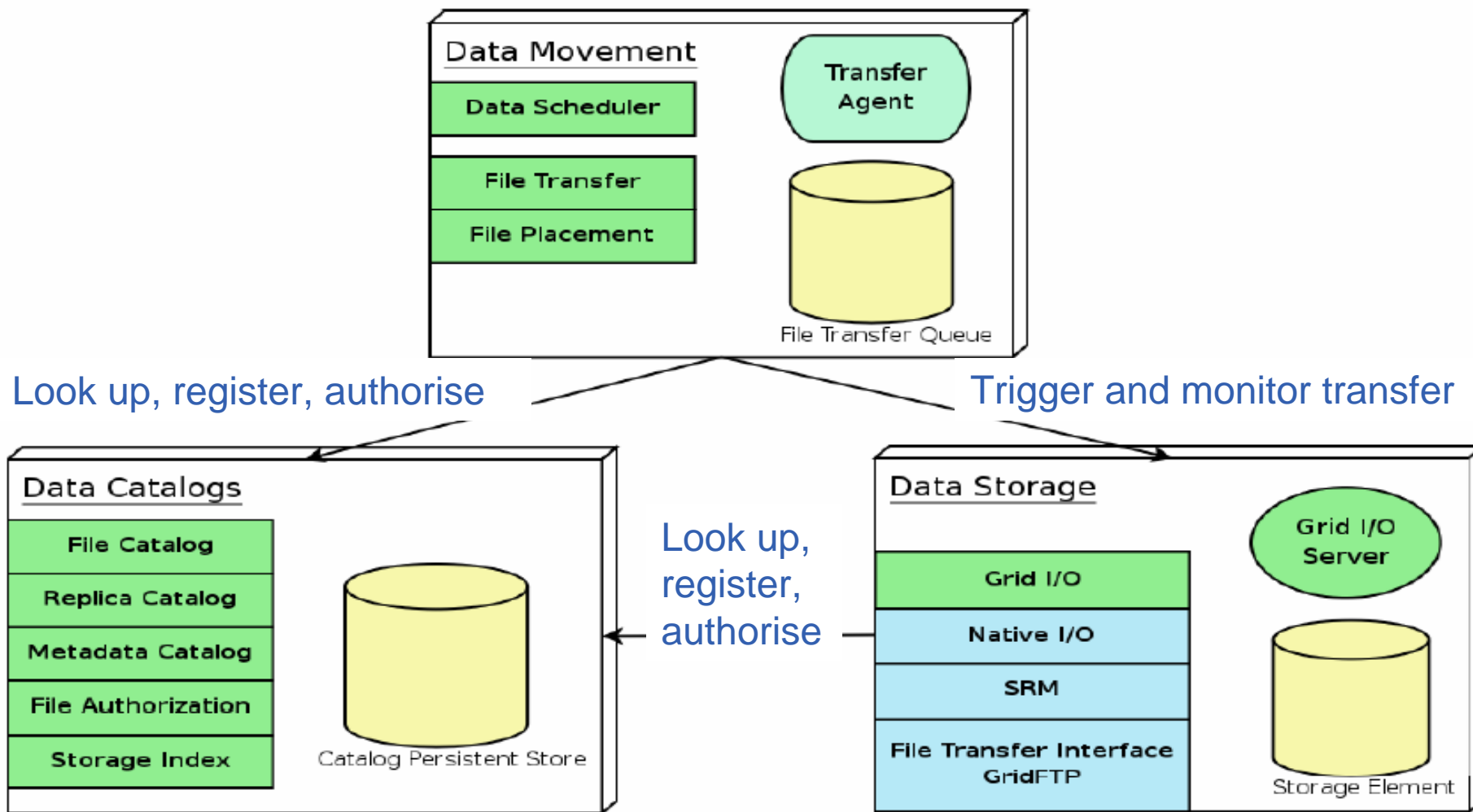
- **FiReMan Catalog**
 - Release 1: Single Central deployment model only
 - Release 2: Distributed catalog according to design using Java Messaging Services to propagate updates between catalog instances
- **Storage Index**
 - Already in Release 1
 - Main interaction point with Workload Management
- **Metadata Catalog**
 - Release 1: Base Implemented by FiReMan
 - Also a standalone service, single central instance
 - Release 2: distribution using a messaging infrastructure

- **File movement is asynchronous – submit a job**
 - Held in file transfer queue
- **Data scheduler**
 - Single service per VO – can be distributed
 - VO can apply policies (priorities, preferred sites, recovery modes..)
- **Client interfaces:**
 - Browser
 - APIs
 - Web service
- **“File transfer”**
 - Uses SURL
- **“File placement”**
 - Uses LFN or GUID, accesses Catalogues to resolve them

- **gLite DMS being released in phases**
 - File placement and transfer in August
 - Metadata en route
 - Data scheduling later

 - **High energy physicists urgently needed better functionality than LCG file management middleware**

 - **Interim developed - LCF**
 - **LCG File Catalogue**
 - *LHC Compute Grid*
 - LHC = Large Hadron Collider
-
- **Effect: 2 data management middlewares temporarily:**
 - gLite (emerging), LCF (interim – production, GILDA)



- **JRA1 Data Management homepage**
<http://cern.ch/egEE-jra1-dm>
- **EGEE Middleware Architecture and Planning**
<https://edms.cern.ch/document/594698/>
- **gLite FiReMan user guide**
 - Overview
<https://edms.cern.ch/file/570643/1/EGEE-TECH-570643-v1.0.pdf>
 - Command Line tools
<https://edms.cern.ch/file/570780/1/EGEE-TECH-570780-v1.0.pdf>
 - C/C++ API
<https://edms.cern.ch/file/570780/1/EGEE-TECH-570780-C-CPP-API-v1.0.pdf>
 - Java API
<https://edms.cern.ch/file/570780/1/EGEE-TECH-570780-JAVA-API-v1.0.pdf>

- Relationship between SRB and SRM?

- **GLUE schema**

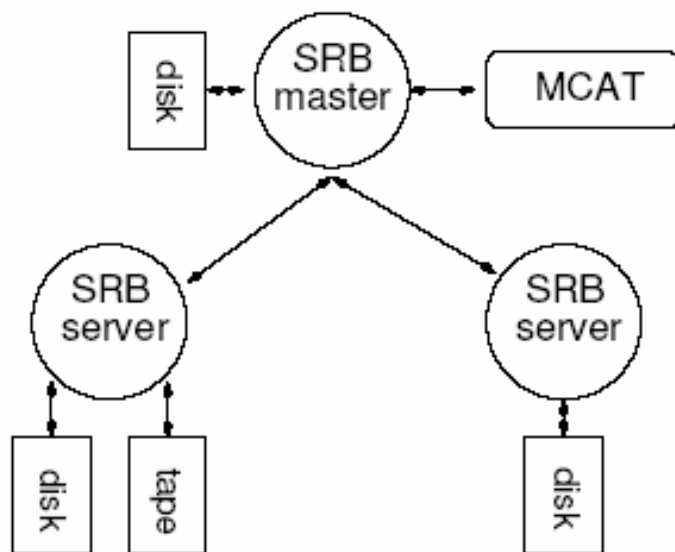
<http://infnforge.cnaf.infn.it/glueinfomodel/>

- **MASS STORAGE MANAGEMENT AND THE GRID**

- A. Earl, P. Clark , University of Edinburgh, Edinburgh, Scotland

<http://arxiv.org/ftp/cs/papers/0412/0412092.pdf>

- **SRB: Storage Resource Broker**
- **From San Diego Supercomputing Center**



- **SRM: Storage Resource Manager**
- **set of specifications for providing a Grid interface to storage management systems of various types**
 - **specification for Unix based systems**
 - **Web Service**

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