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Generalities on gLite

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Information Society

Enabling Grids for E-sciencE

- **Introduction**

- **LCG and gLite middlewares face to face**

- **gLite Components overview**

- **Expected functionalities**

- **Conclusion**

The Grid from a Services View

Applications	Chemistry		Cosmology		Environment
		Biology		High Energy Physics	

Application Toolkits	Distributed Computing Toolkit	Data-Intensive Applications Toolkit	Collaborative Applications Toolkit	Remote Visualization Applications Toolkit	Problem Solving Applications Toolkit	Remote Instrumentation Applications Toolkit

(Middleware)

Resource-independent and application-independent services
authentication, authorization, resource location, resource allocation, events, accounting, remote data access, information, policy, fault detection

Grid Fabric

Resource-specific implementations of basic services
E.g., Transport protocols, name servers, differentiated services, CPU schedulers, public key infrastructure, site accounting, directory service, OS bypass
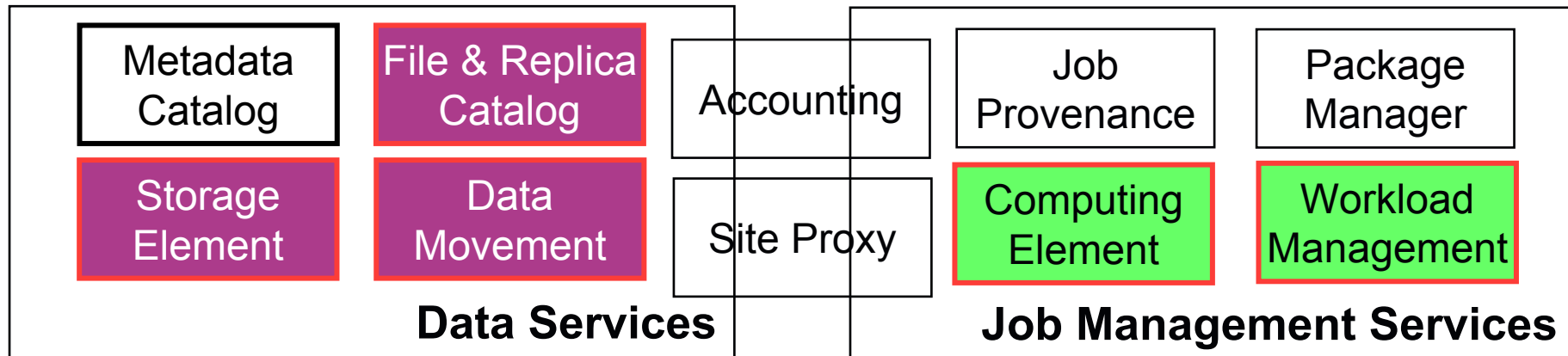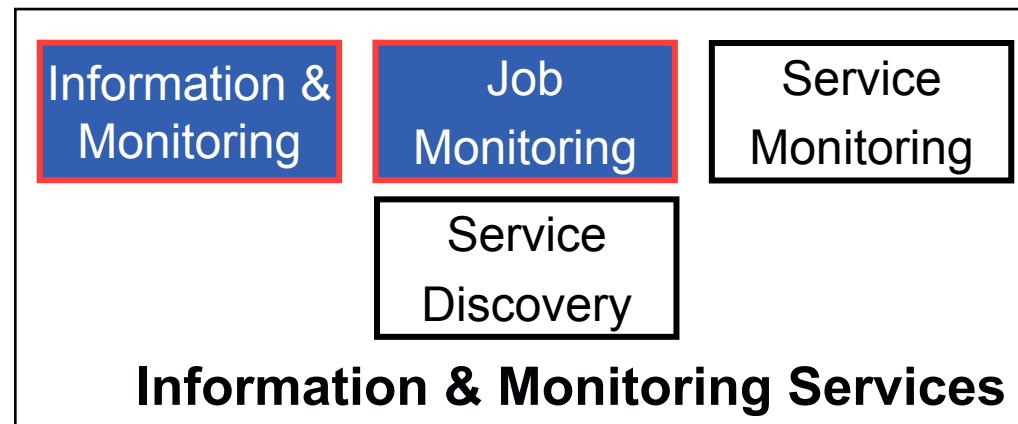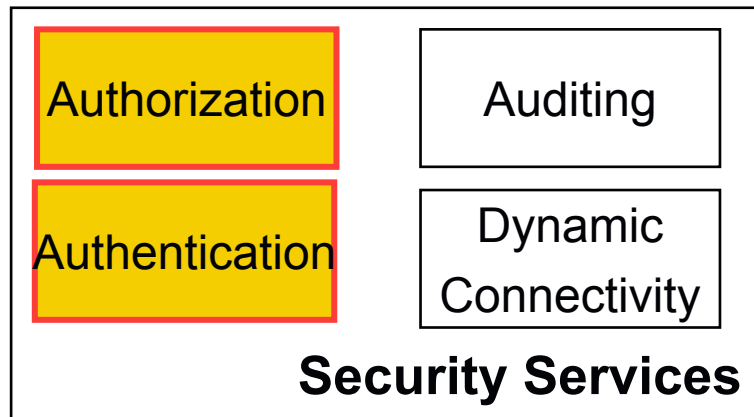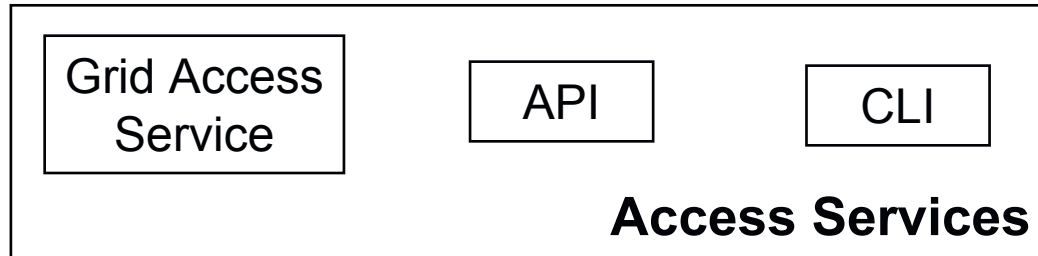
Enabling Grids for E-sciencE

- **gLite as further step in middleware develop**
- **New standards adopted**
  - Web services
- **New functionalities inserted thanks to user requirements**
  - HEP users
  - Biomedicine users
  - Other (Generic Application) users

LCG	gLite
• **Security**	• **Security**
– GAS	– VOMS
• **Job Management**	• **Job Management**
– Condor + globus	– Condor + blahp
– CE, WN	– CE, WN
– Logging & Bookkeeping	– Logging & Bookkeeping
	– Job Provenance
• **Data Management**	• **Data Management**
– LCG services	– gLite-I/O
	– FiReMan
• **Information & Monitoring**	• **Information & Monitoring**
– BDII	– R-GMA
	– Service Discovery
• **Grid Access**	• **Grid Access**
– CLI + API	– CLI + API + Web Services

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Access Services

| Grid Access Service | API | CLI |

Security Services

| Authorization | Auditing |
| Authentication | Dynamic Connectivity |

Information & Monitoring Services

| Information & Monitoring | Job Monitoring | Service Monitoring |
| | Service Discovery | |

Data Services

| Metadata Catalog | File & Replica Catalog | Accounting |
| Storage Element | Data Movement | Site Proxy |

Job Management Services

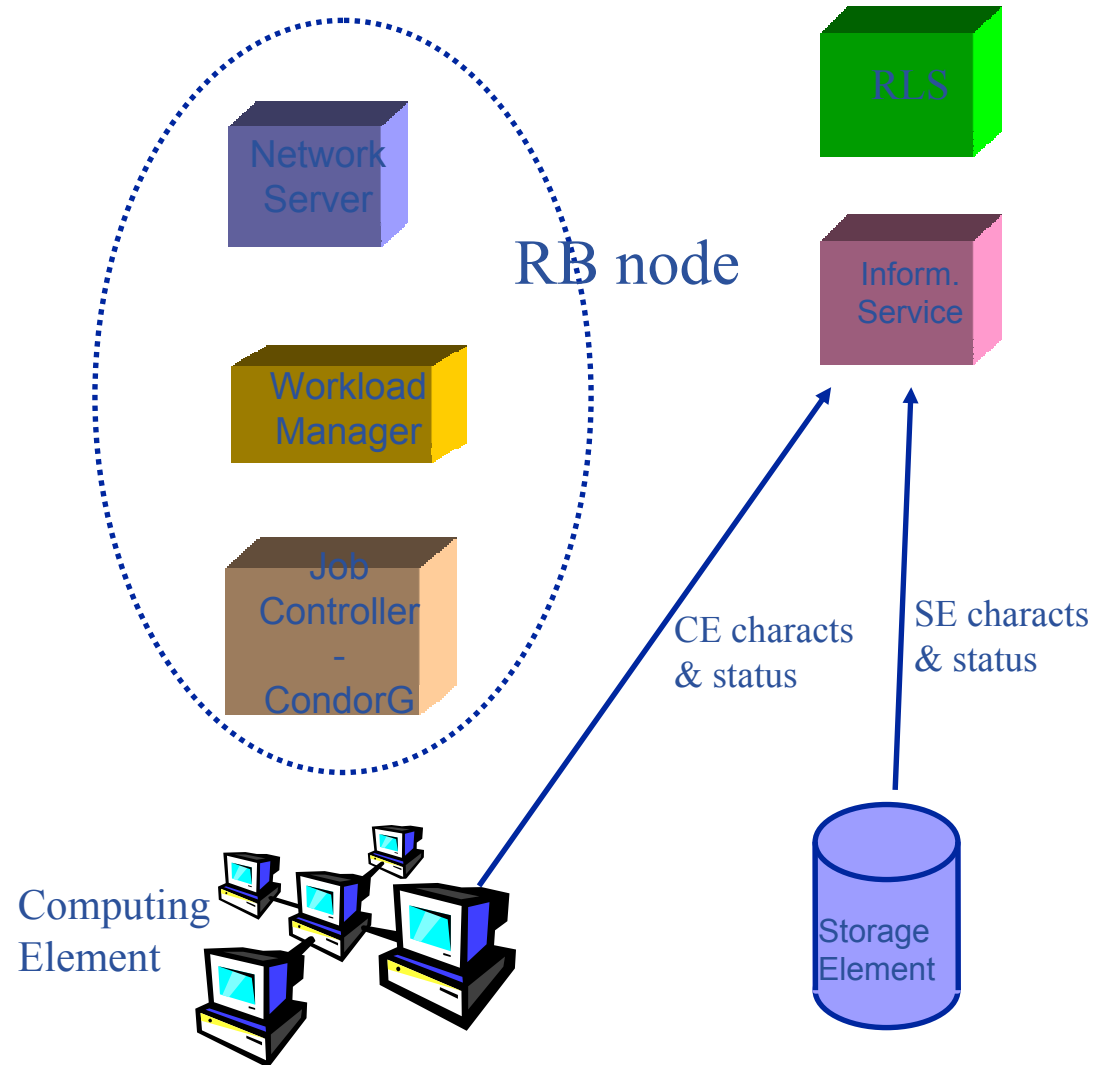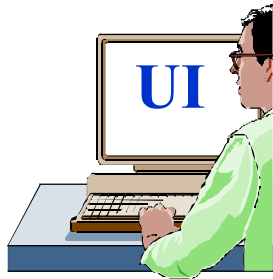| Job Provenance | Package Manager |
| Computing Element | Workload Management |

- **Based on the GGF Grid Monitoring Architecture**

- **Implements a model with**
  - Producer
  - Consumer
  - Registry

- **Offers global views to VO**

- **Uses GLUE schema**

Relational Grid Monitoring Architecture

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Web Service Interface

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UI

Network Server

RB node

Workload Manager

Job Controller - CondorG

RLS

Inform. Service

CE characts & status

SE characts & status

Computing Element
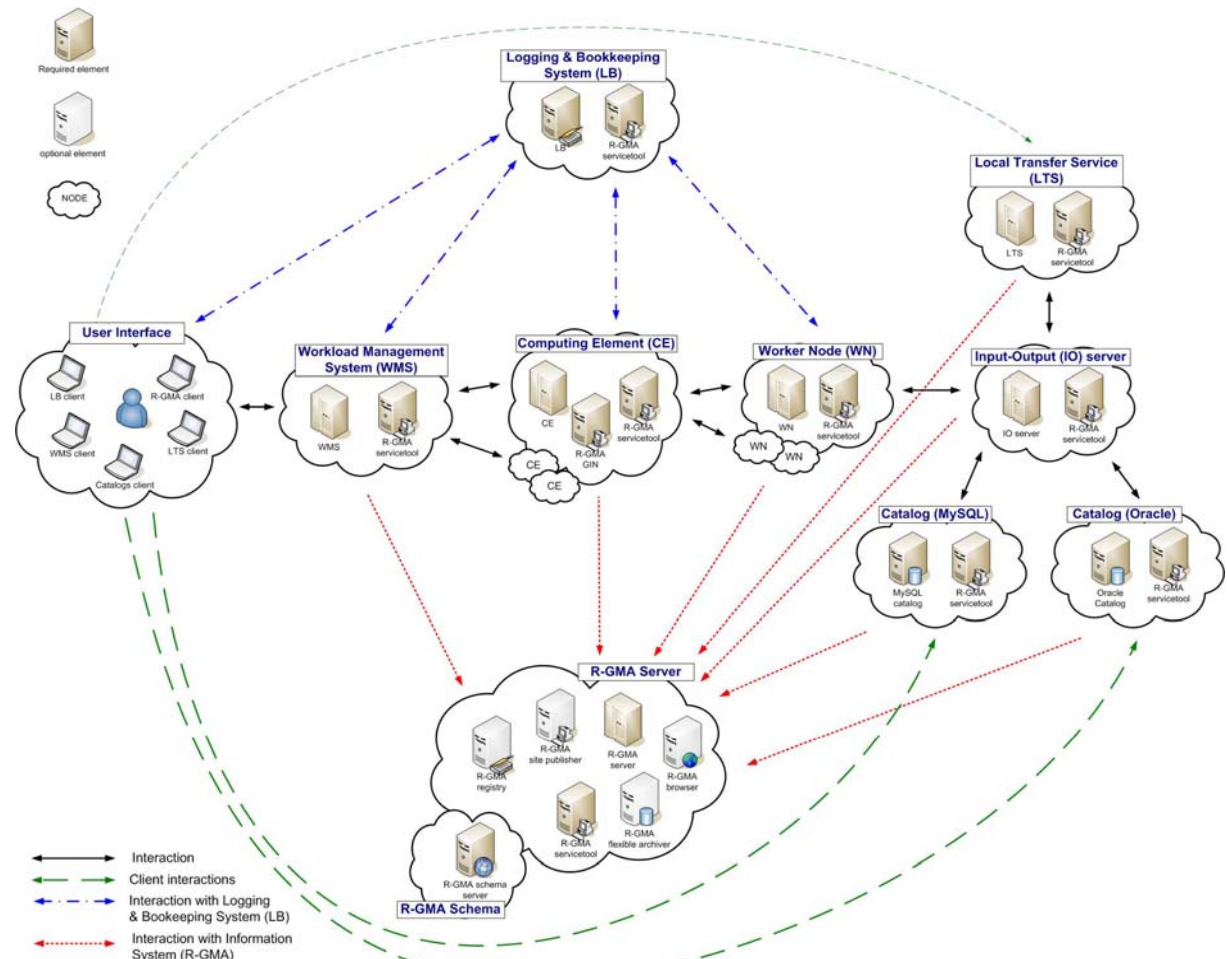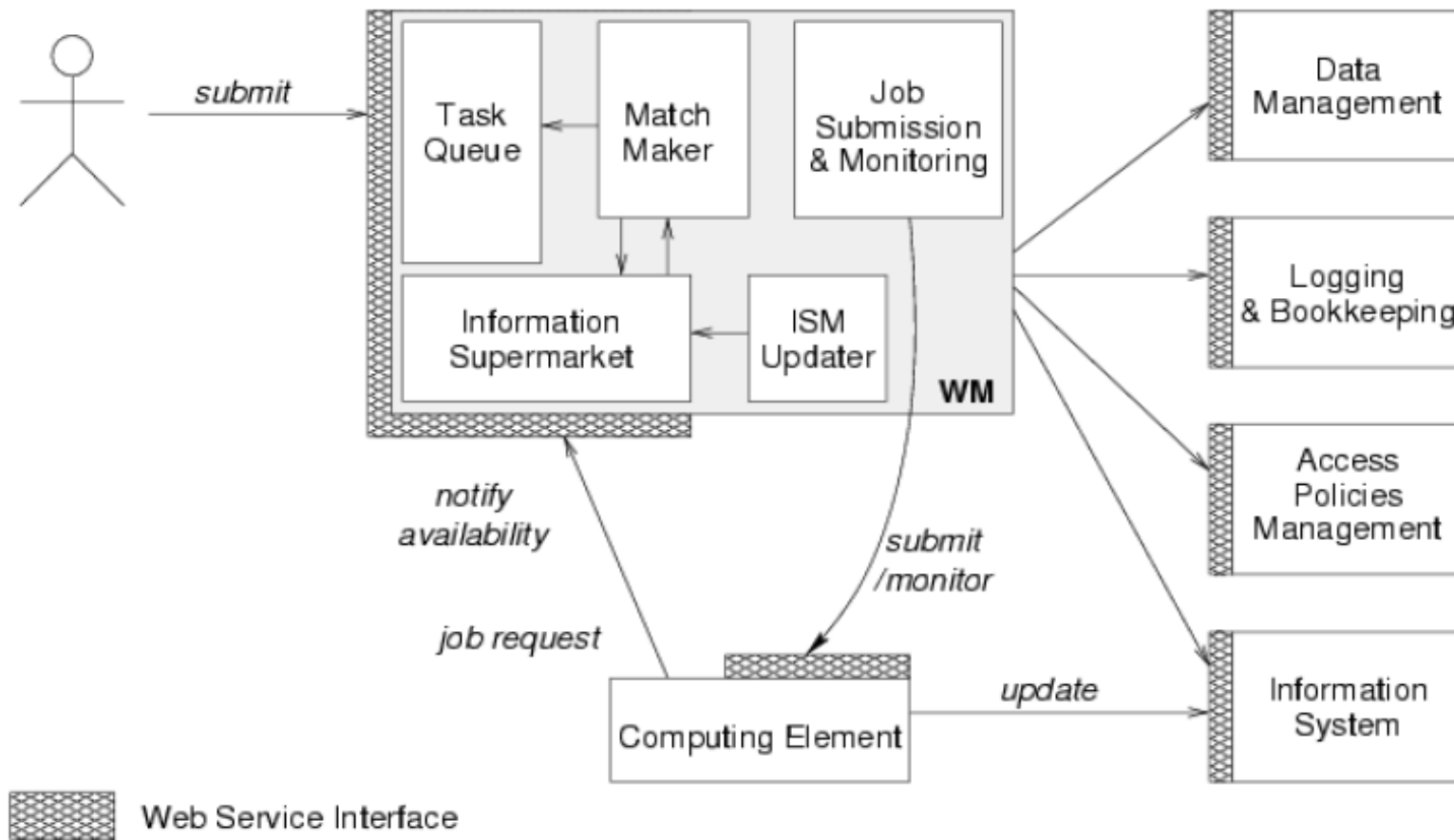
Storage Element

- **Storage Element**
  - Storage Resource Manager   not provided by gLite
  - POSIX-I/O   gLite-I/O
  - Access protocols   gsiftp, https, rfio, …

- **Catalogs**
  - File Catalog
  - Replica Catalog   gLite FiReMan Catalog
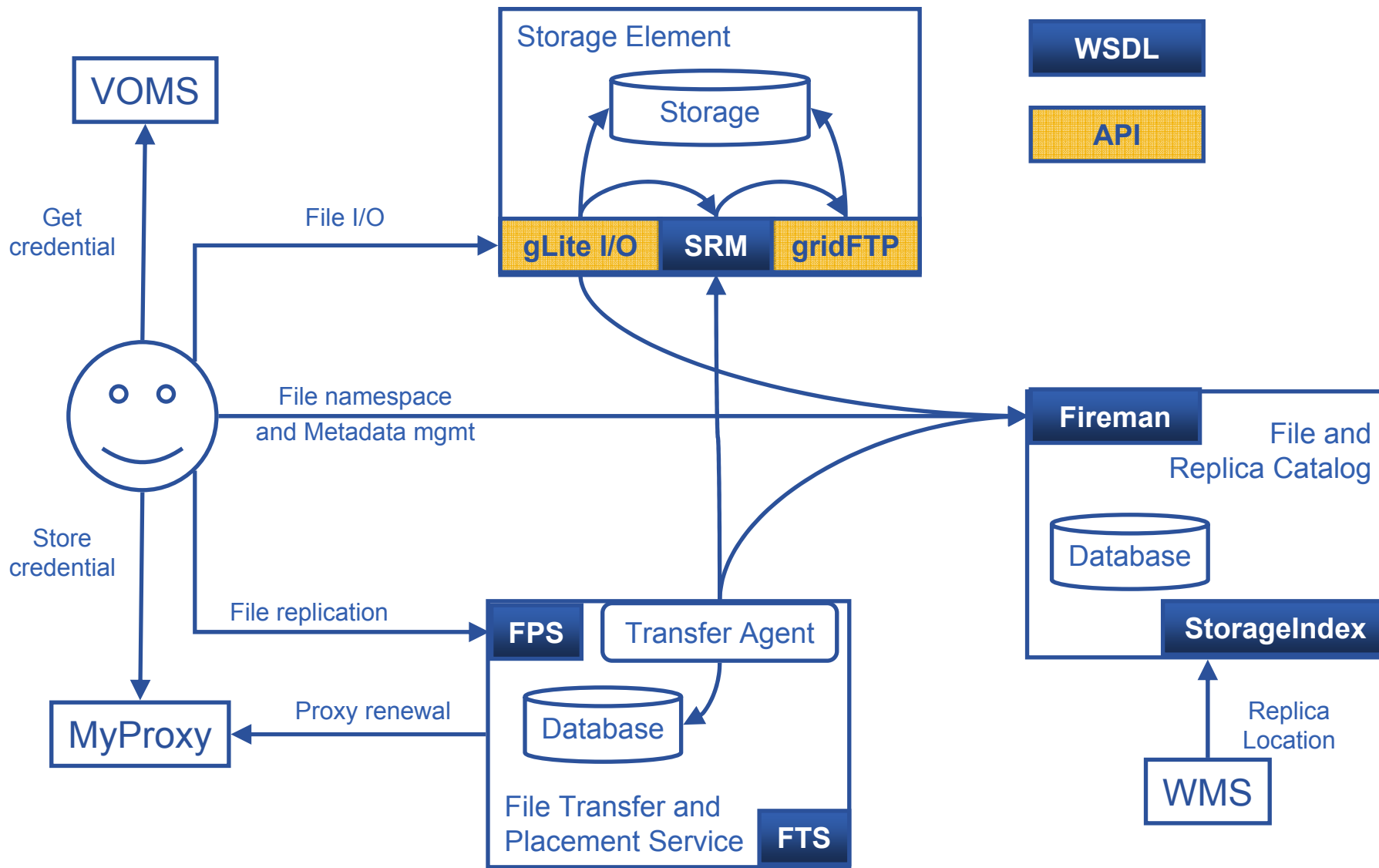 - File Authorization Service   (MySQL and Oracle)
  - Metadata Catalog   gLite Standalone Metadata Catalog

- **File Transfer**
  - File Transfer Service   gLite FTS and glite-url-copy
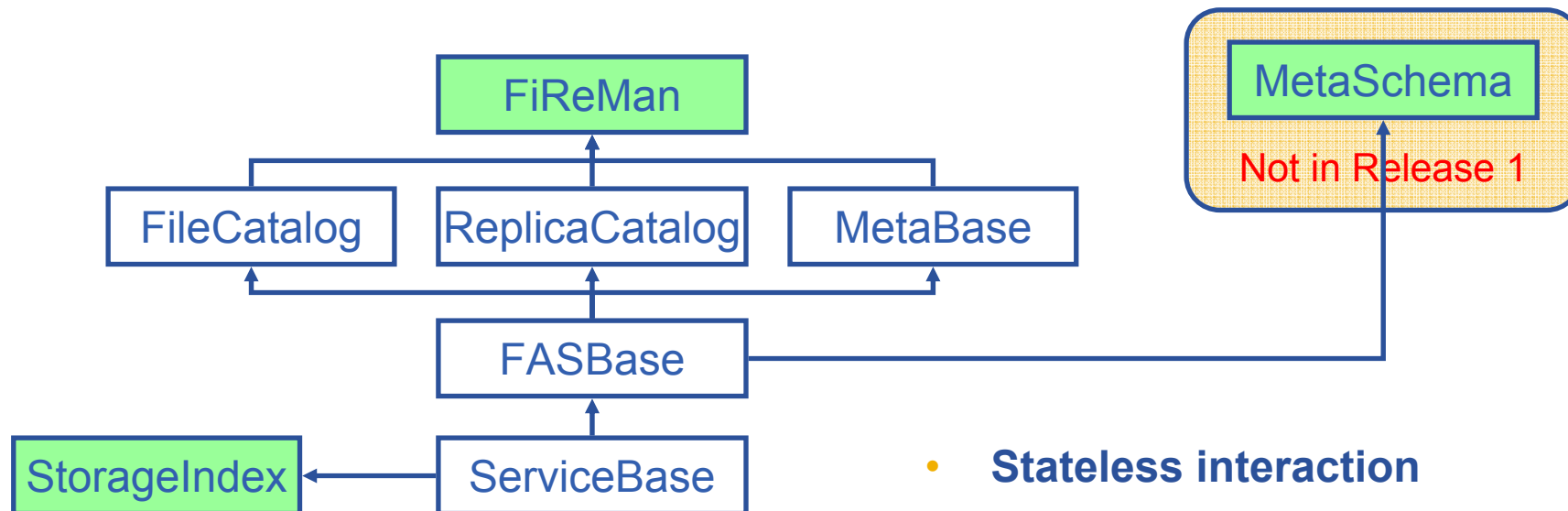 - File Placement Service   gLite FPS

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Provides a limited POSIX-like access to LFN or GUID both to users and applications
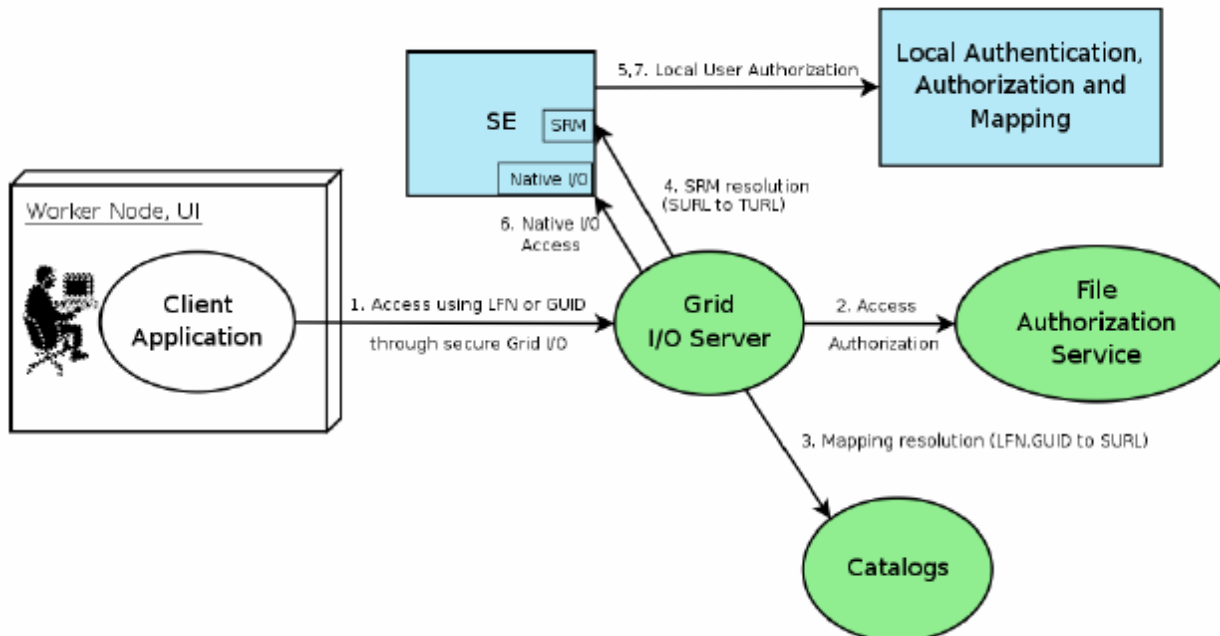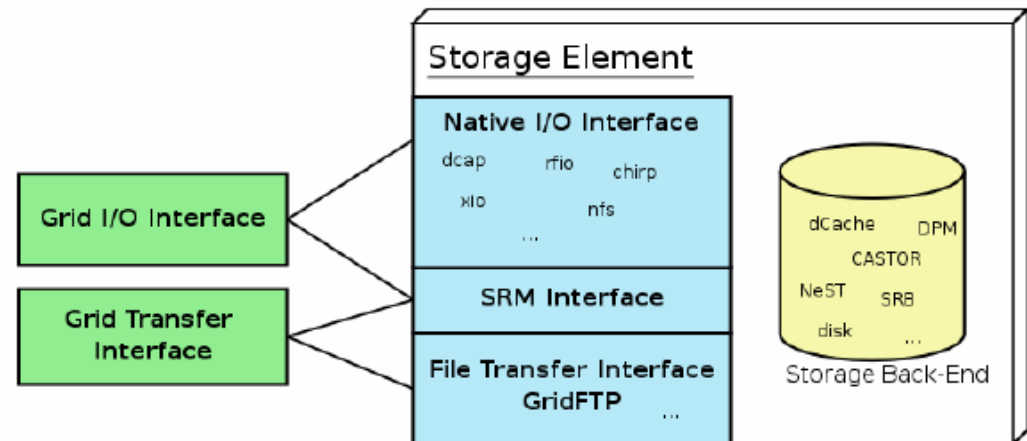
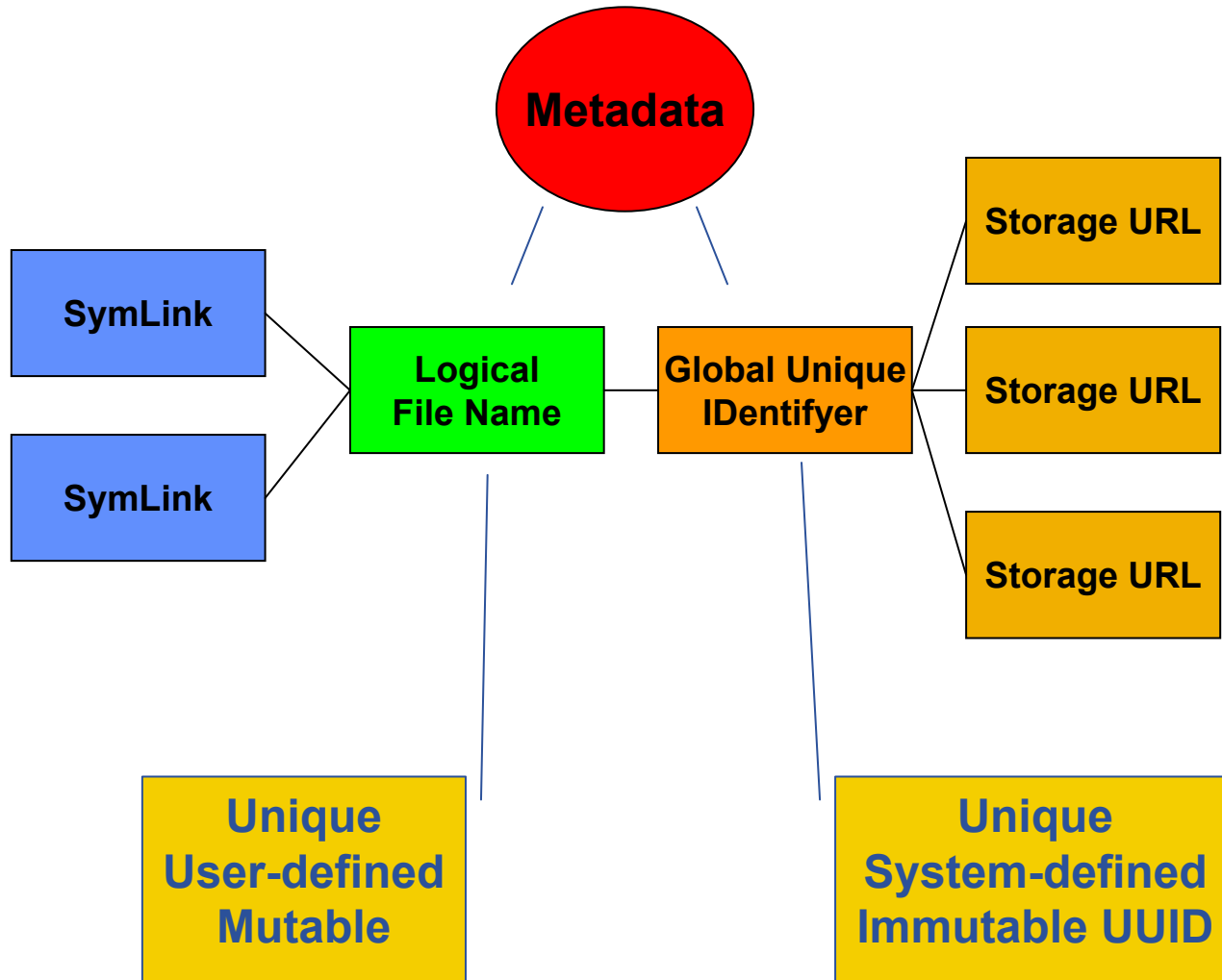- **Logical File Namespace management**   **FileCatalog**
- **Replica locations**   **ReplicaCatalog**
- **File-based metadata**   **MetaBase**
- **Metadata Management**   **MetaSchema**
- **Authentication and Authorization information (ACLs)**   **FASBase**
- **Service Metadata**   **ServiceBase**
- **WMS interaction and global file location**   **ServiceIndex**

```
                    FiReMan                      MetaSchema
                                                Not in Release 1
    FileCatalog   ReplicaCatalog   MetaBase

                      FASBase

  StorageIndex  ◄──  ServiceBase
```

- **Stateless interaction**
- **No transactions outside Bulk**

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Metadata

SymLink

SymLink

Logical
File Name

Global Unique
IDentifyer

Storage URL

Storage URL

Storage URL

Unique
User-defined
Mutable

Unique
System-defined
Immutable UUID

Virtual Organization Membership Service

- Advanced information handling
- Multiple VOs
- Multiple roles
- Intuitive WEB administrative interface
- Supports MyProxy
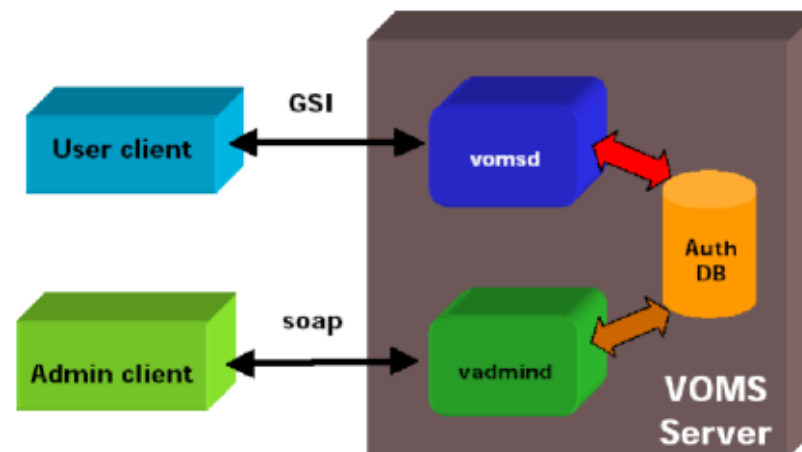
Not official!! Not confirmed!!

- **gLite v1.2**
  - Bulk submission (collections and parametric jobs)
  - Support to the Condor-pools batch system
  - MPI submission independent from local file system layout
  - Medata Catalog
- **gLite v2.0**
  - Pilot job submission
- **Other**
  - DataKey Management

Enabling Grids for E-sciencE

- **Middleware well structured**
- **Complaint with standards**
- **Testing gives good performances**
- **Several required features implemented**
- **Many requirements still pending**
- **New features expected**