



Enabling Grids for E-scienceE

Generalities on gLite

Tony Calanducci

INFN CT, NA4

*Retreat between GILDA and ESR VO on gLite,
Bratislava, 27-30.06.2005*

www.eu-egee.org



Information Society



Service Oriented Grid Middleware

- **Job Management Services:**

- Workload Management
- Logging and Bookkeeping
- Computing Elements
- Worker Nodes

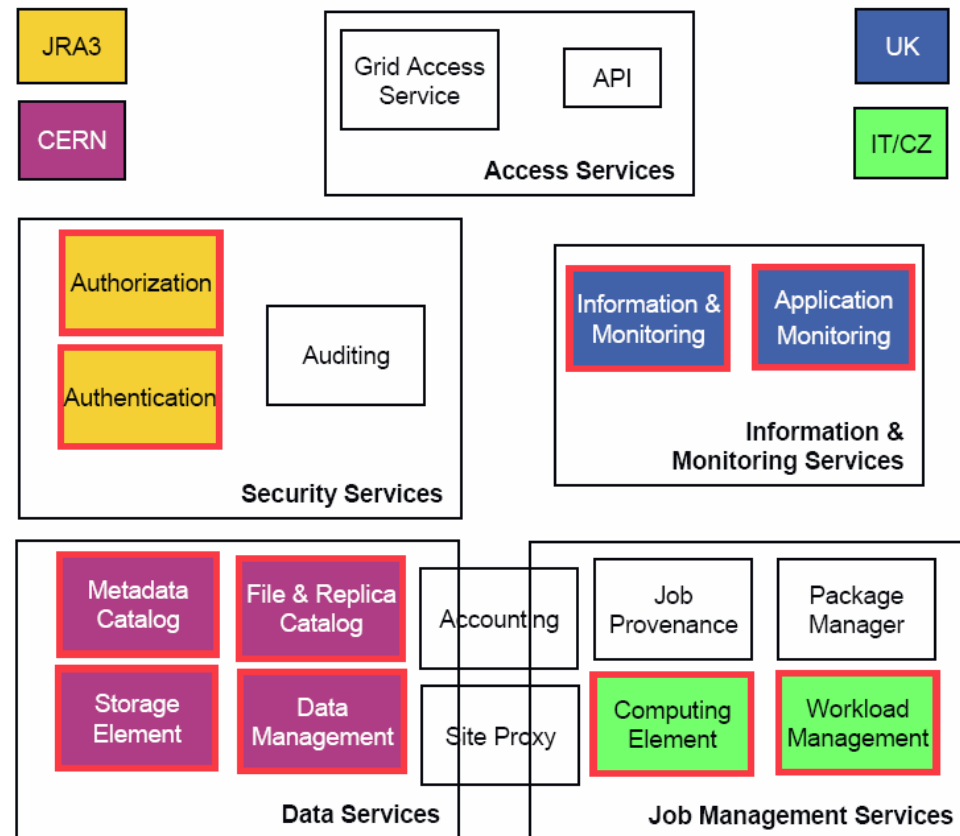
- **Data Management Services:**

- File and Replica Catalog
- File Transfer and Placement Services
- gLite I/O
- Metadata Catalog

- **Information Services**

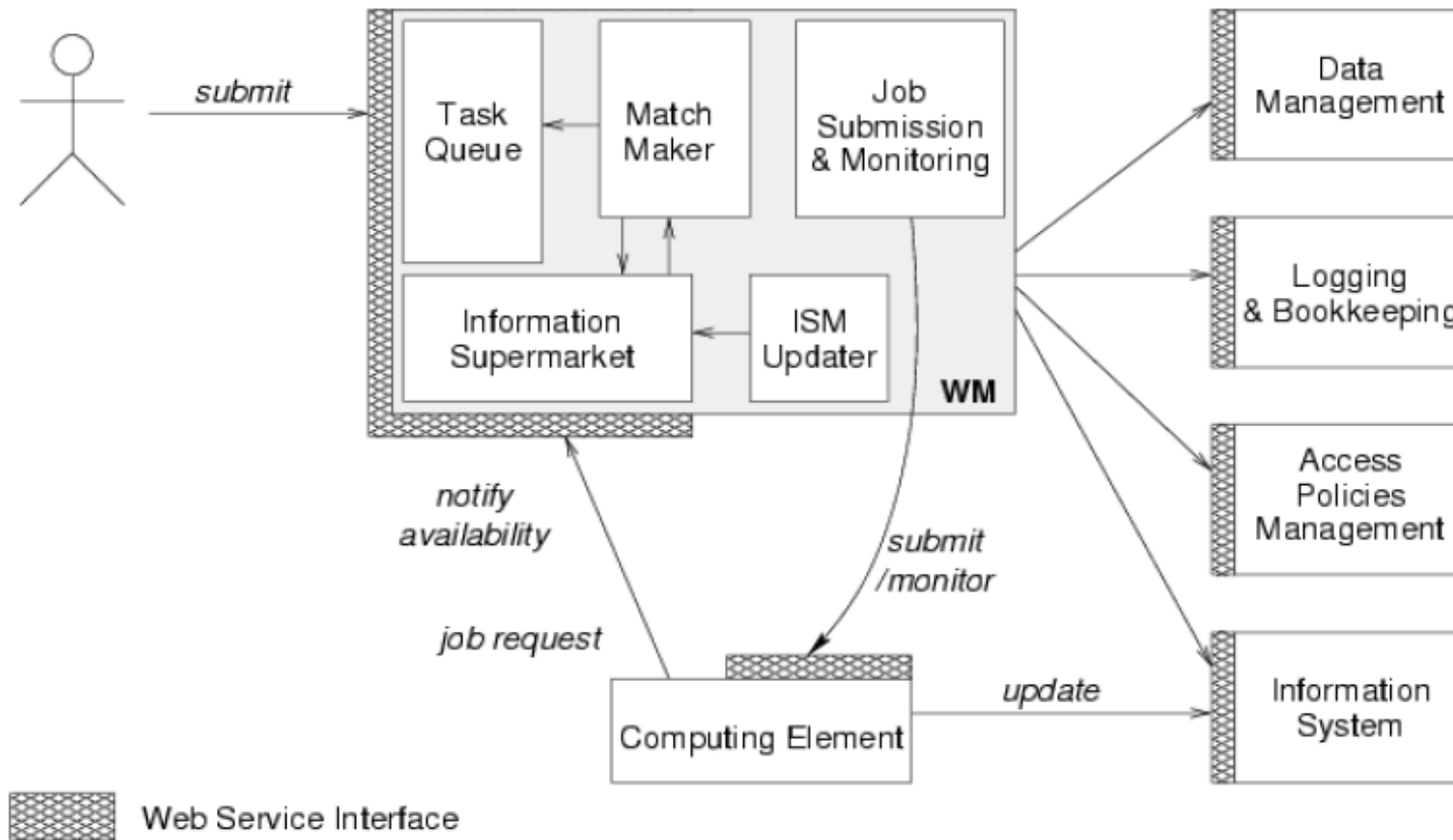
- R-GMA
- Service Discovery

- **Security**



Workload Management System: set of grid middleware components responsible for the distribution and management of tasks across grid resources, in such a way that applications are conveniently, efficiently and effectively executed.

- **Workload Manager (WM):** accept and satisfy requests for job management coming from its clients..
- **Logging and Bookkeeping service (LB)** keeps track of the job status information.
- **Computing Element (CE)** interfaces the local resource management system (e.g. LSF, PBS) to the Grid middleware.
- **Worker Nodes (WN)** behind the local resource management system host all the necessary clients to interact with the Grid middleware from within a job.



Started with LCG-2 Workload Management System (WMS)

- Support **partitioned jobs** and jobs with **dependencies (DAGs)**
- Support for different **file and replica catalogs** (LFC and FireMan)
- Modification of internal structure of WMS
 - *Task queue*: persistent queue of pending submission requests
 - *Information supermarket*: repository of information on resources
 - Better reliability, better performance, better interoperability, support push and pull mode

Computing Element (CE)

- CE moving towards a VO based local scheduler (Maui)
- Policy based notifications on changes of the CE (pull model)

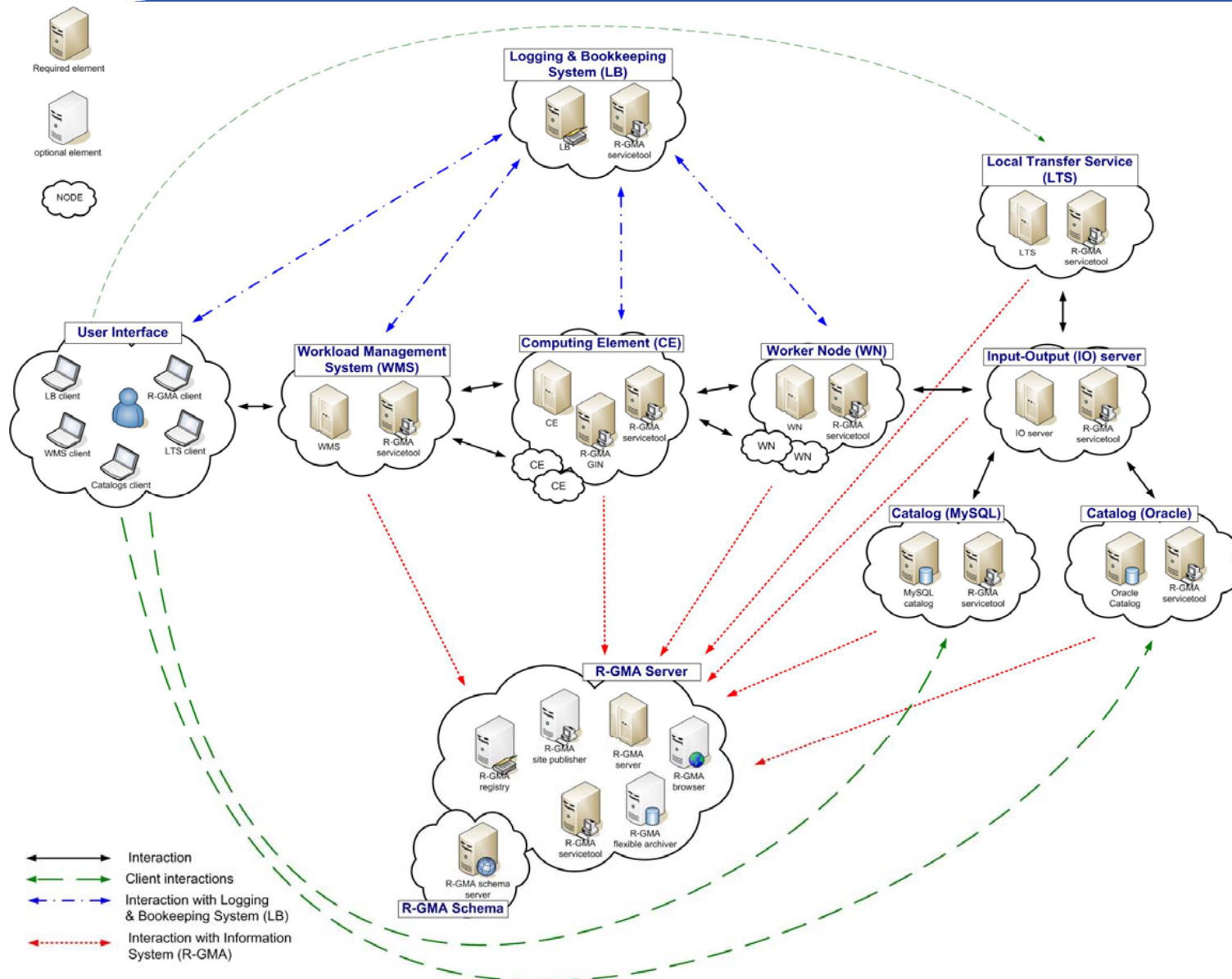
Backward compatibility to facilitate migration

- **Efficient and reliable data storage, movement, and retrieval on the infrastructure**
- Data is stored in an SRM based storage system (ex. Castor, dCache, dpm).
- The **gLite I/O** Server allows posix-like access to files stored in the SRM
- The **File and Replica Catalog** (FiReMan) resolves logical filenames (LFN) to physical location of files (URL understood by SRM) in the Storage Elements.
 - Hierarchical File system like view in LFN space
 - Single catalog for Release 1,1
 - Metadata Support (implementation will be ready in 1.2 release)
- The **Local Transfer Service** provides file transfer/file placement service (**FTS/FPS**) and it is used for moving files.
 - Transactional interactions with catalogs
- **Standalone Metadata Catalog**
 - No assumptions on the entries (a file, a job, etc..)
 - Groups of key/value pairs (attributes), defined within schemas
 - Permissions expressed via BasicPermissions and ACLs.

- **Efficient and reliable provision of Grid Information and Application monitoring data**
- **R-GMA (Relational Grid Monitoring Architecture)**
 - based on the Grid Monitoring Architecture (GMA) from the Grid Global Forum (GGF)
 - Consumer-Producer model
 - a *central registry* mediates the communication between producers and consumers
 - offers a global view of the information as if each Virtual Organisation had one large relational database

VOMS

- Virtual Organization Membership Service
- **Job Management Services**
 - WMS, LB, and CE implement authorization based on VOMS VO, groups, and user information
- **Data Services**
 - Authorization: ACL and (Unix) permissions
 - Fine-grained ACL on data enforced through gLite-IO and Catalogs
 - Catalog data itself is authorized through ACLs
 - Currently supported through DNs
 - VOMS integration being developed
- **Information Services**
 - Authentication based on VOMS certificates (being developed)



LCG

- **Security**
 - GSI, MyProxy
- **Job Management**
 - Condor + Globus
 - CE, WN
 - Logging & Bookkeeping
- **Data Management**
 - LCG services (GridFTP Based)
 - LFC, RLS
- **Information & Monitoring**
 - BDII
- **Grid Access**
 - CLI + API

gLite

- **Security**
 - VOMS (GSI Based)
- **Job Management**
 - Condor + Globus
 - CE, WN
 - Logging & Bookkeeping
 - Information Supermarker, Task Queue
- **Data Management**
 - gLite-I/O (SRM Based)
 - FiReMan
 - StandAlone Metadata Catalog
- **Information & Monitoring**
 - R-GMA
 - Service Discovery
- **Grid Access**
 - CLI + API + Web Services

Copyright 2004 by Randy Glasbergen.
www.glasbergen.com



**“My topic is ‘How To Give A Presentation Without Losing Your Audience’s Attention’.
The End. Thank you for coming.”**