Current status of gLite

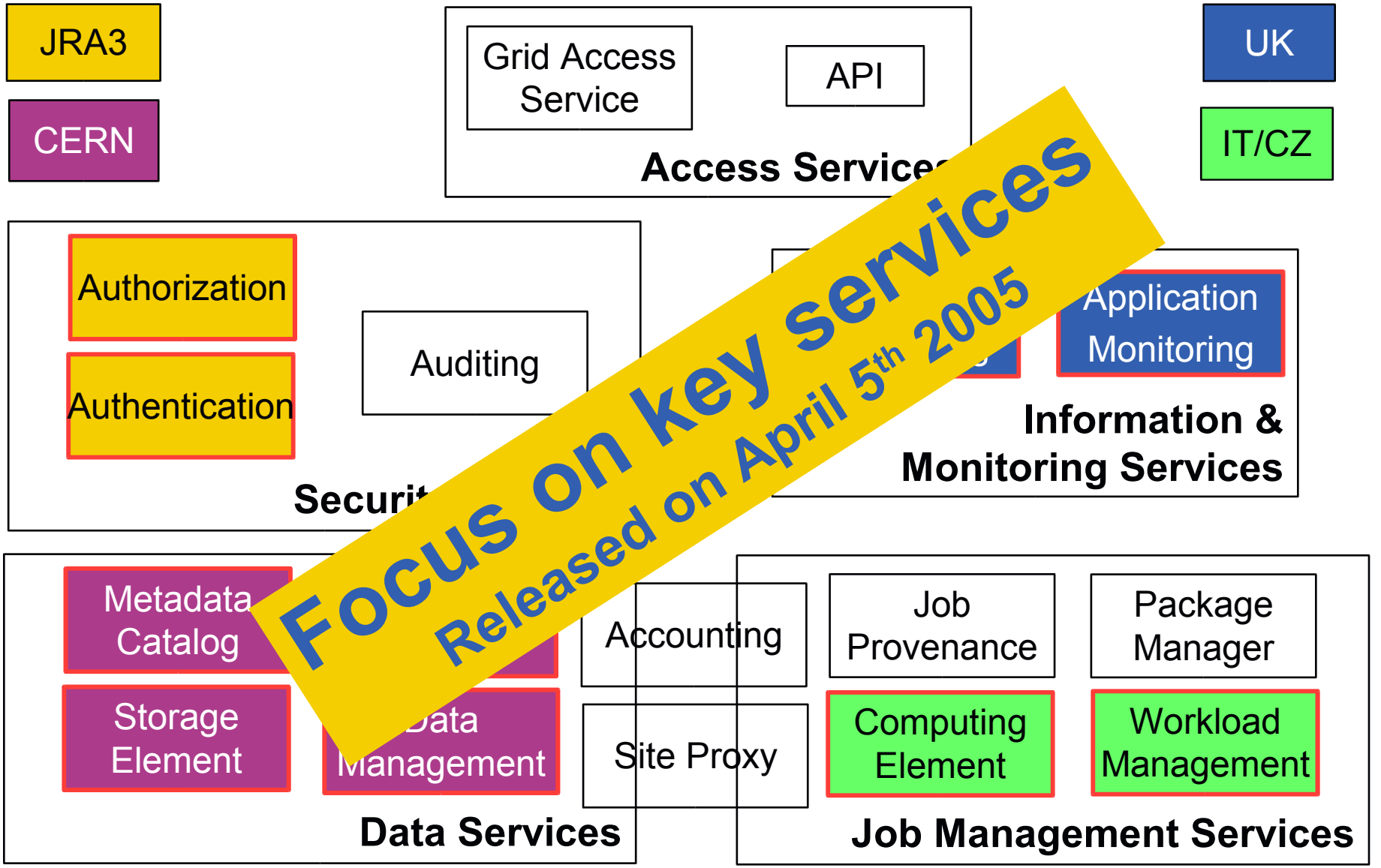
Erwin Laure, CERN

3rd EGEE Conference, Athens, Greece
April 18-22, 2005

Outline

- **Contents of gLite release 1.0**
  - Components, architecture, and service interplay
- **Major differences to LCG-2**
- **Major open issues**
- **Future plans**

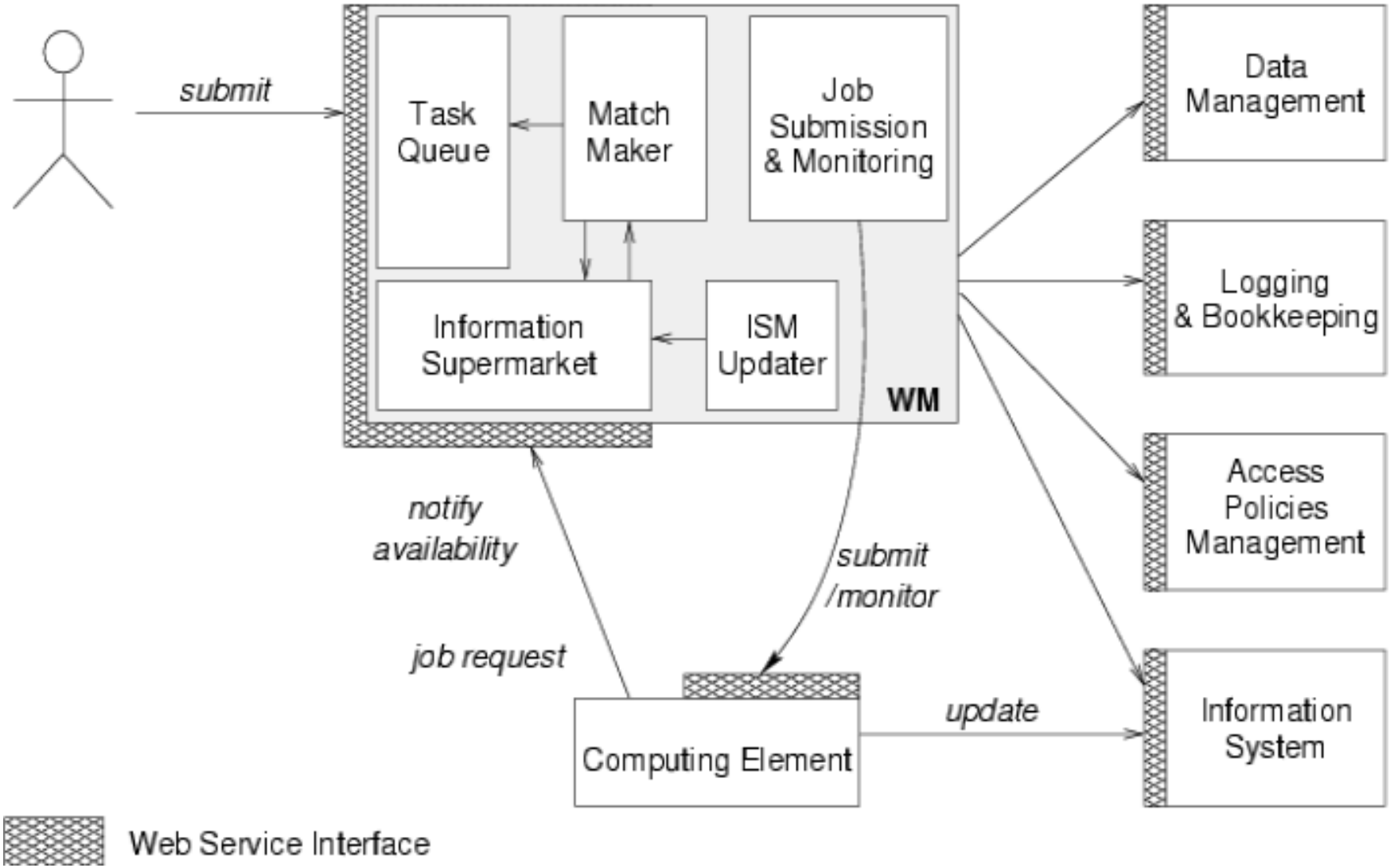
gLite Services for Release 1



gLite Services for Release 1
Software stack and origin (simplified)

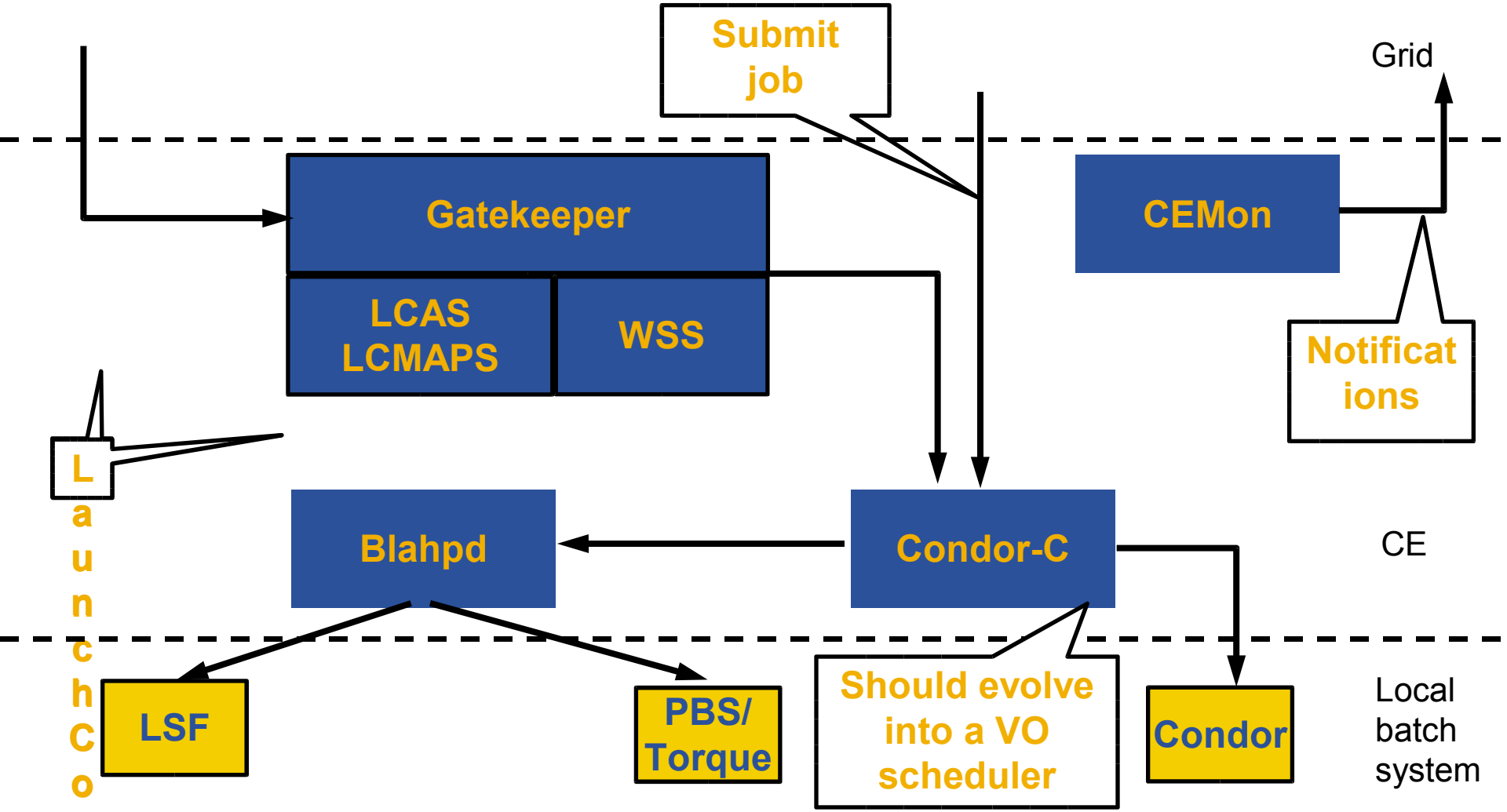
- **Computing Element**
  - Gatekeeper, WSS (Globus)
  - Condor-C (Condor)
  - CE Monitor (EGEE)
  - Local batch system (PBS, LSF, Condor)
- **Workload Management**
  - WMS (EDG)
  - Logging and bookkeeping (EDG)
  - Condor-C (Condor)
- **Storage Element**
  - File Transfer/Placement (EGEE)
  - glite-I/O (AliEn)
  - GridFTP (Globus)
  - SRM: Castor (CERN), dCache (FNAL, DESY), other SRMs
- **Catalog**
  - File and Replica Catalog (EGEE)
  - Metadata Catalog (EGEE)
- **Information and Monitoring**
  - R-GMA (EDG)
- **Security**
  - VOMS (DataTAG, EDG)
  - GSI (Globus)
  - Authentication and authorization for C and Java based (web) services (EDG)

WMS Interaction Overview

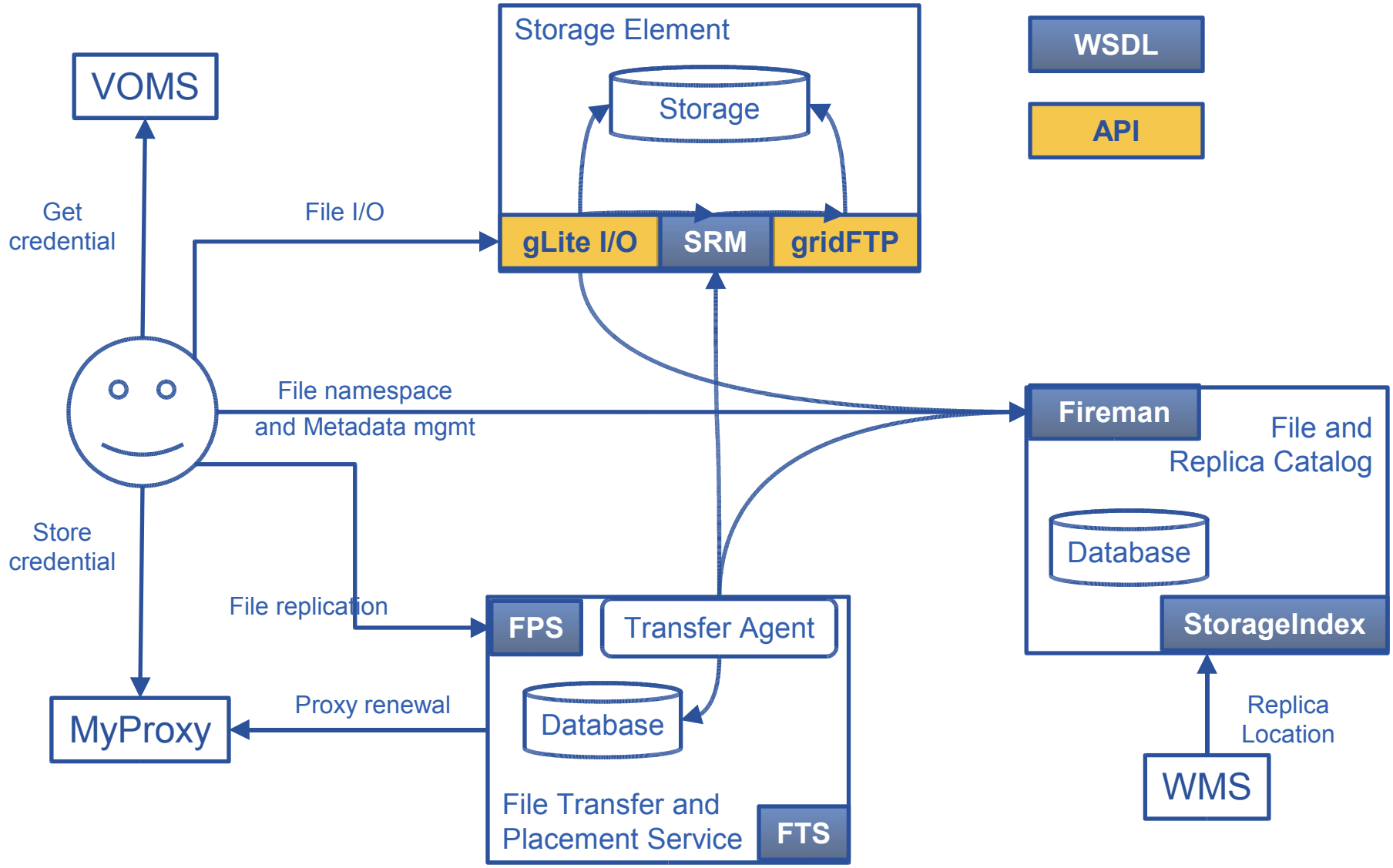


CE Interaction Overview

- Collaboration of JRA1 (INFN, Univ. of Chicago, Univ. of Wisconsin-Madison), and JRA3



DM Interaction Overview



WMS

- **Started with LCG-2 Workload Management System**
  - Support partitioned jobs and jobs with dependencies
  - Task Queue
    - Persistent queue for submitted jobs
  - Information Supermarket
    - Read only information system cache
    - Updated by
      - *Information systems (CE in push mode)*
      - *Notification of available resources (CE in pull mode)*
      - *Combination of both*
  - Push and pull mode
  - Interface to Data Management
    - EDG-RLS
    - StorageIndex
    - DLI
  - Condor-C
    - Reliable job submission between the WM and the CE
  - CE moving towards a VO based scheduler

WMS Cont'd

- **Major problems**
  - Failure rate ~12% (retrycount = 0), otherwise 100% success
    - Several reasons being investigated (e.g. race conditions)
    - Shallow re-submission (i.e. retry of submission, not execution) might help
  - Matchmaking is being blocked sometimes
    - Fix provided for Release 1.1 (end of April)
  - Condor as backend not yet working
  - Not yet final architecture of CE:
    - One Schedd per local user id
    - Need setuid services and head node monitoring (Globus+JRA3)
  - Not a lot of experience tuning the CE Monitor
    - Need some examples

Data Management Services

- **Mostly new developments based on (and re-using some) AliEn services**

- **Storage Element**
  - Storage Resource Manager — rely on existing implementations
  - POSIX-I/O — gLite-I/O
  - Access protocols — gsiftp, https, rfio, …
- **Catalogs**
  - File Catalog
  - Replica Catalog — eMan Catalog
  - File Authorization Service — and Oracle)
  - Metadata Catalog — gLite Metadata Catalog
- **File Transfer**
  - Data Scheduler — planned for Release 2
  - File Transfer Service — gLite FTS and glite-url-copy
  - File Placement Service — gLite FPS

Tech preview in release 1.0
Modifications for LCG SCs in Release 1.1

Data Management Cont'd

- **Addressing shortcomings of LCG-2 data management**
  - RLS performance
  - A non distributed catalog
    - Although only single catalog supported in release 1
  - Lack of consistent grid-storage interfaces
  - Unreliable data transfer layer

- **Fireman Catalog**
  - Hierarchical Name Space
  - Bulk Operations
  - ACLs
  - Web Services Interface
  - POOL Interface
  - Performance/scalability

Differences to LCG-2 explained in

http://egee-jra1-dm.web.cern.ch/egee-jra

- **gLite I/O**
  - Support of ACL's
  - Support of Fireman catalog in addition to RLS

- **File Transfer Service**
  - Did not exist on LCG-2

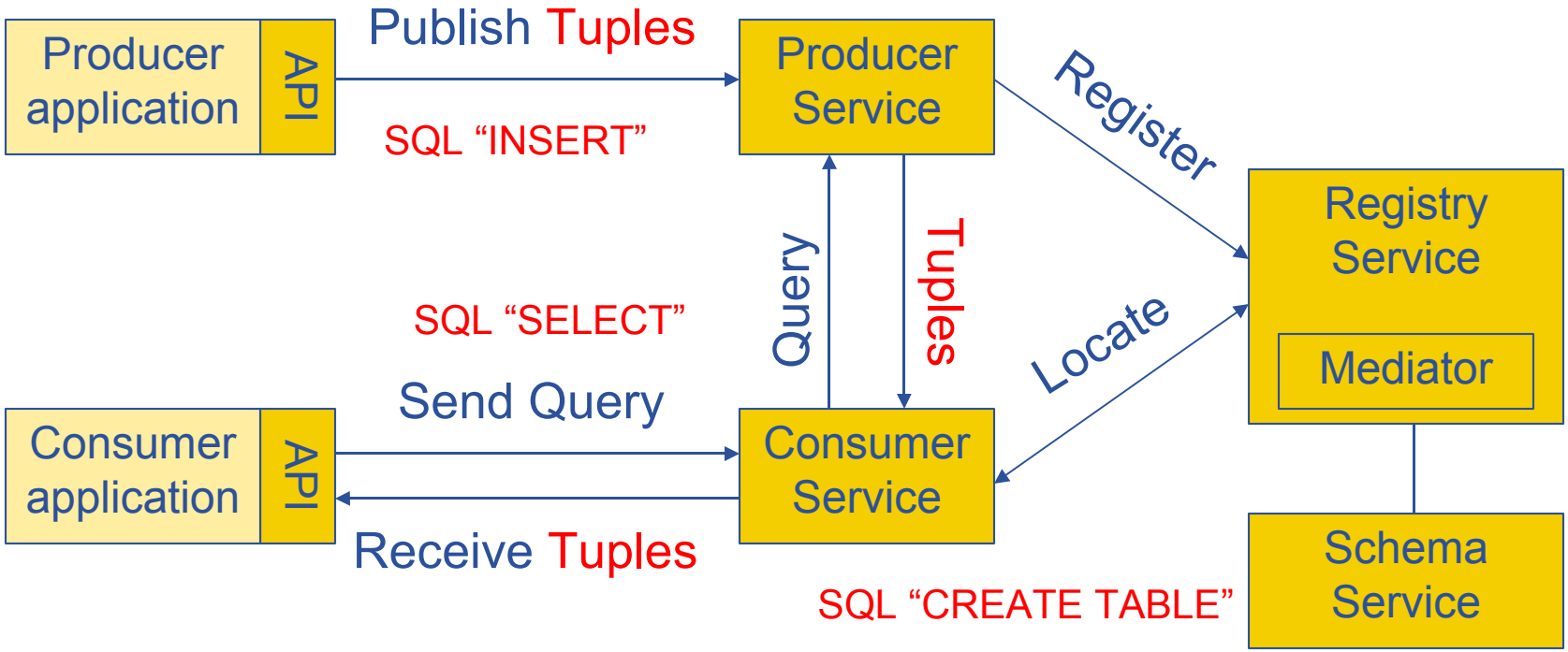
Data Management Cont'd

- **Major problems (Catalog)**
  - No ROOT interface available yet
    - Will be done in next weeks
  - Performance tuning
  - Problems with security configuration

- **Major problems (glite-I/O)**
  - Sensitive to SRM failures
    - Error codes not always explanatory
  - Interfaced to FireMan and RLS/RMC catalog
    - Interface to AliEn FC should be available in Release 1.1
  - Not yet interfaced to ROOT
  - Problems with security configuration

Information and Monitoring Services

- **R-GMA (Relational Grid Monitoring Architecture)**
  - Implements GGF GMA standard
  - Development started in EDG, deployed on the production infrastructure for accounting



Information and Monitoring Services Cont'd

- **R-GMA Producer, Consumer, Registry and Schema services with supporting tools**
  - Registry replication
  - Simpler API – matching the next (WS) release
    - Provides smooth transition between old API and WS
  - coping with life on the Grid: poorly configured networks, firewalls, MySQL corruptions etc
- **Generic Service Discovery API**
- **Major problems**
  - Difficult to deploy
  - Performance problems observed by LCG-2
- **Differences between lcg 2.4.0 and gLite essentially schema changes for service discovery and security turned on in gLite**

VOMS

- **Derived from DataTag and EDG**
- **Used for VO mgmt**
  - VOMS certificates understood by WMS and Data Mgmt (as of release 1.1)
- **RFC compliance**

- **Major problems**
  - Incompatibility with previous VOMS versions
    - Due to RFC compliance
  - Limited deployment options (only single VO)
    - Due to lack of communication among the involved parties
    - Fixed in Release 1.1

UI

- Clients for WMS, LB, Catalog+gLitel/O, R-GMA, and VOMS
- Fully re-locatable
- Can install with un-privileged accounts

Future Plans

- **Defect fixing has highest priority**
  - Done in the release 1 branch
- **Monthly release cycles**
  - Defect fixes
  - New functionality according to planning with SA1 and NA4
- **Quick fixes**
  - Patches that cannot wait for the monthly cycle
- **Release 1.1 due end of April**
  - FTS/FPS
  - Metadata catalog
  - VOMS with multi-VO configuration
  - Defect fixes (WMS matchmaking hanging problem, DM security configuration…)
- **Planning document for Release 2 distributed**
  - https://edms.cern.ch/document/573493/4

Future Plans - WMS

- **Move CE to final architecture**
  - One scheduler per VO (can be provided by VO)
  - Head-node monitor and fork/set-uid service
- **WS interface to WMS**
  - With better support for bulk job-submission
- **Support for pilot jobs**
- **Integration of network information (JRA4)**
- **Closer integration with Data Mgmt**
  - Common job and data transfer DAGs
  - Data matchmaking for ranking
- **“shallow” job-resubmission**
- **CE history used for ranking**
- **Use information from R-GMA in the information supermarket**

Future Plans - DM

- **Security in DM chain**
  - Delegation
  - Work out security model (local vs. Grid)
  - Support SRMs with native ACL support
  - VOMS roles for ACL's
- **Distributed/Partitioned Catalogs**
  - Need to define model
- **Integration of network information (JRA4)**
- **Explore xrootd**
- **Harmonize metadata interface (ARDA, PTF)**
- **Data Scheduler (equivalent to WMS for data transfer requests)**

Future Plans – I&M

- **R-GMA WS enabled and re-factored**
  - Should help with performance problems observed on LCG-2 (partial results are provided more quickly)
- **R-GMA Schema replication**
  - Remove single point of failure
- **Usage of service discovery for WMS and data mgmt.**
- **R-GMA using VOMS based authentication**

Future Plans - Others

- **Common configuration, instrumentation, and logging framework for gLite Services**
- **More information in L&B**
  - More error information
  - Basic job statistics (depending on information available from the resource)
  - Status of data transfer requests
- **Accounting**
- **Agreement service**
  - E.g. for advance reservation of networks (jointly with JRA4)
- **Package mgr**
- **GAS**

More information

http://www.glite.org

glite-announce@cern.ch

http://cern.ch/egee-jra1