



Enabling Grids for E-science



EGEE Middleware reengineering

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EGEE-II Final EU Review (CERN)

8-9 July 2008

www.eu-egee.org

www.glite.org

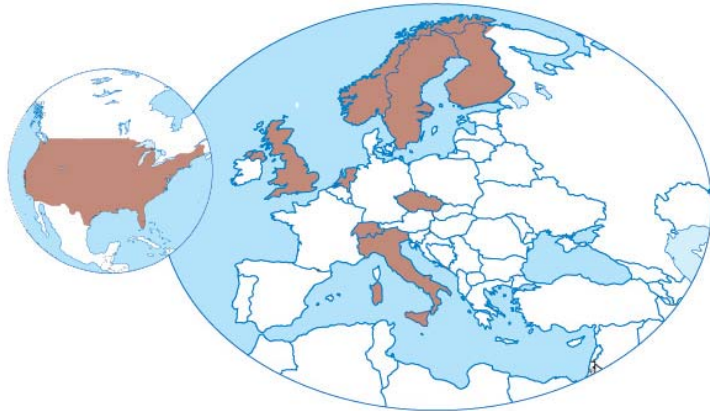


- **Activity goals and organization**
- **Achievements and description of work done**
- **Issues**
- **Future plans**
- **Summary**

- Continue to support and evolve the **gLite** open source implementation of application-independent grid middleware
 - Application-independent **foundation services**
 - Deployed at all sites connected to the infrastructure
 - Partly based on common Grid tools such as Condor and Globus (from the Virtual Data Toolkit, **VDT**)
 - Set of **higher-level services** working on top of the foundation
 - Deployed on-demand at specific sites
 - Follow a Service Oriented Architecture
 - Mostly based on web-services. Aim to comply with WS-I specifications
- Activity targeted to the support of the **Production System (PS)**
 - Gradually deploy new components on the PS, support and maintain them
 - Prompt fixing of bugs and support to the Global Grid User Support (**GGUS**)
 - Stability, scalability, manageability
 - Work in Technical Coordination Group Task Forces
 - Further evolve the middleware stack
 - Facilitating interoperability with other infrastructures
 - Addressing user needs
 - Attention to emerging standards

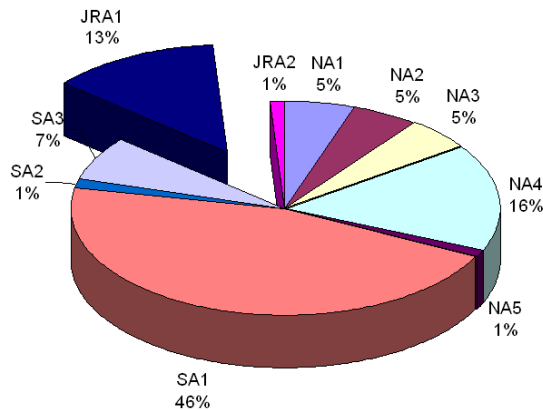


JRA1 Partners



Manpower: 11 partners, 9 countries, 51.5 FTE

EGEE-II Budget



Partner	Country	FTEs	People
CERN	Switzerland	3	3
CESNET	Czech Republic	5	12
CCLRC	UK	7	7
Elsag Datamat	Italy	5	9
INFN	Italy	20,5	25
SWITCH	Switzerland	3	4
UH HIP	Finland	3	3
FOM	Netherlands	2	3
UvA	Netherlands	1	3
UiB	Norway	1	1
KTH	Sweden	1	1
U.Chicago	USA		
U.South California	USA		
U.Wisconsin	USA		
Total		51,5	71

Security (J. White, UH.HIP – Security Architect: C.Witzig, SWITCH)

INFN, SWITCH, UH.HIP, FOM, UvA, UiB, KTH

Resource Access, Accounting, and Brokering (F.Giacomini, INFN)

INFN, Elsag Datamat S.p.A.

Logging, bookkeeping, and provenance (A.Krenek, CESNET)

CESNET

Data Management (A.Fronher, CERN)

CERN

Information and Monitoring (S.Fisher, CCLRC)

CCLRC

US

Univ. Chicago and Univ. Southern California (GLOBUS),
Wisconsin Madison Univ. (VDT and Condor)

- **gLite 3.0 release**
 - Convergence of the LCG-2 and EGEE software
 - First production release of many EGEE components
- **Started using the new software process**
 - Including the continuous release process
- **Preview Test Bed**
 - New functionalities exposed to the users in an early stage of development
- **Experimental services**
 - Production-scale tests of services and fast development cycles
- **Shibboleth integration in gLite**
 - SLCS and VASH services
- **Significant improvement in the performance of the gLite Workload Management System**

- **gLite 3.1 release**
 - SL4 support
 - New version of VDT (including Globus Toolkit 4)
 - Full adoption of ETICS
- **Full adoption of the new software process**
- **Long term sustainability: *gLite restructuring***
- **Strategy for the Compute Element revisited (CREAM)**
- **Changes in authorization to support *pilot jobs* (SCAS)**
- **Review of gLite authorization – framework re-design**
- **Stability and scalability of WMS/LB and CE addressed**
- **Support of SRMv2.2 in Data Management components**
- **Encrypted Data Storage prototype delivered**
 - Used by EGEE Biomed community and also by EUIndiaGrid
- **Re-designed R-GMA implemented**

- The goals of the gLite restructuring have been presented in detail during the previous review
 - Address the long term sustainability of gLite, with particular attention to the portability to other platforms
- Started on 28/5/07 and continued to the end of 2007
 - Coexistence with other high priority activities and the support to the production infrastructure continued
- The dependencies of all packages have been critically reviewed by gLite experts (other JRA1 developers, SA3 and SA1 experts, etc...)
 - Code clean-up and re-organization
 - Rationalization of packages
 - Removal of obsolete components
 - Dependencies versions unified – prefer well supported distributions (e.g. Jpackage for Java libraries)
 - Client-server separation improved
 - Lighter and more portable clients to be installed on User Interfaces and Worker Nodes
- More attention to maintainability by the developers

service	SL4/SLC4/i386
glite-WN	Released
glite-UI	Released
glite-AMGA_postgres	Released
glite-BDII	Released
lcg-CE	Released
glite-FTM	Released
glite-LB	Released
glite-LFC_mysql	Released
glite-LFC_oracle	Released
glite-MON	Released
glite-PX	Released
glite-SE_dcache_*	Released
glite-SE_dpm_disk	Released
glite-SE_dpm_mysql	Released
glite-TORQUE_utils	Released
glite-TORQUE_client	Released
glite-TORQUE_server	Released
glite-VOMS_oracle	Released
glite-VOMS_mysql	Released
glite-VOBOX	Released
glite-WMS	Released
glite-AMGA_oracle	PPS
glite-CREAM	Certification
glite-FTA_oracle	Certification
glite-FTS_oracle	Certification
glite-SE_classic	Certification

- **Problems have been encountered while implementing VO access policies on resources (shares, pilot jobs, ...)**
- **The Milestone document MJRA1.7 has been re-scoped:**
 - “Authorization mechanisms in gLite”
 - Critical analysis of authorization mechanisms in gLite
- **A set of recommendations with changes to be implemented in the medium term (within 6 months) has been prepared and agreed with sites and applications**
 - Work-plan being finalized in the context of EGEE-III
- **A longer term solution (1 year) is being re-designed**
 - High level architecture already discussed and agreed with sites and applications
 - Finalization of the design and of the work-plan will happen in a meeting on 10-11 July '08 at SWITCH in the context of EGEE-III

Regular JRA1 plenary meetings



**Community-building
events for a group
distributed over
different countries**

- **The adoption of ETICS took much more than expected**
 - ETICS helped significantly in understanding the code but
 - Has been adopted when it was in an early stage of development
 - Its focus initially has been mainly on integration and packaging
 - Now addressing also developers' needs but it is still not completely satisfactory in terms of performance and functionality
 - Managing a large number of components, configurations and dependencies is still time consuming
- **The software process is weak in the phase of passing the code from JRA1 to SA3**
 - *Clusters of competence* created in EGEE-III
- **The support of the gLite-CE based on Condor-C had to be discontinued in favor of the CREAM CE**
 - Experience gained in the development of the gLite CE has been essential for CREAM (BLAH, glexec, ...)
 - A Condor-C based CE (including BLAH and glexec) will be available as part of Condor in Red Hat and Fedora distributions.
- **Limited use of the preview test bed**
 - The effort has been concentrated on the experimental services
- **Inconsistencies in the gLite authorization mechanisms**
 - Will be addressed in EGEE-III, as described above

- **JRA1 continues in EGEE-III with limited manpower**
 - Reduction of 2/3 w.r.t. EGEE-II
 - Concentrate on software maintenance to increase its robustness and to address the needs of the applications and of the production infrastructure
 - Address the limitations of the authorization framework
 - Address interoperability issues mainly through adoption of established standards
- **Continue the collaboration with other partners**
 - Several gLite components are included in VDT and used on OSG
 - Software of the gLite CE included in Condor and part of Red Hat
 - gLite used on infrastructures other than EGEE
- **Creation of a gLite Consortium**
 - Address the needs of middleware development in the **EGI** era

- **The main achievement of JRA1 in EGEE-II is the consolidation of gLite, addressing the long term sustainability of the middleware**
 - Adoption of a software process and a build infrastructure capable of assuring the long term sustainability of the software
 - Reduction of the complexity of the software that did grow beyond a sustainable level, ensuring in future the possibility to port the software to new platforms
 - Consolidation of the key services to reach the stability and scalability needed by the infrastructure
 - Attention to the needs of the applications needing to inter-operate with other grid infrastructures, both by adopting international standards and by developing specific solutions
 - Consolidation of security practices in particular in the field of authorization

Security

VOMS, VOMS-Admin

Tool for Attribute Certificate management, including its WS-based administrative interface

LCAS/LCMAPS/SCAS

Framework for authorization and mapping to local user accounts; includes now a service (SCAS) offering the same functionality on a central site service; will converge in the revised AuthZ framework

TrustManager
Util-Java

Certificate validation tool and security utilities

gJAF

Framework for policy-based authorization in Java; will converge in the revised AuthZ framework

Delegation

WS-based framework for proxy certificate delegation

Job Repository

Auditing tool for Computing Elements

Glexec

Tool for local identity switching based on proxy and attribute certificates. Used on the Compute Elements and also on the Worker Nodes (for pilot jobs)

Test-utils Test suite to generate certificates used to test middleware

CGSI-gSOAP Library that allows gSOAP to use GSI authentication. Implements the https and httpg protocols

Proxy-renewal Tool for proxy and Attribute Certificate renewal. Talks to MyProxy and VOMS

G-PBOX Framework for XACML-based policies management. Includes a Policy Decision Point, interface libraries and GUI; will converge in the revised AuthZ framework

SLCS Service that issues Short-lived Credentials based on a successful authentication at a Shibboleth Identity Provider

VASH service Service that manages attributes flow from Shibboleth to VOMS

Resource Access

gLite CE Computing Element based on GSI-enabled Condor-C

LCG CE	Computing Element based on the Globus Toolkit 4 GRAM (by SA3)
CREAM/CEMon	WS-based Computing Element. Compliant with the current definition of OGF-BES and JSDL
BLAHP	Layer that interfaces a Computing Element to the local batch system
Job Management Services	
gLite Workload Management / ICE	Service responsible for the distribution and management of computing tasks on available Computing Elements. Includes a WS-based interface and multi language client tools
LCG RB	Service responsible for the distribution and management of computing tasks on LCG-CEs (by SA3)
Logging & Bookkeeping	Service to track jobs being processed by middleware components. Provides a query interface to the users
Job Provenance	Service to archive job information gathered from the Logging and Bookkeeping. Provides provenance information about the jobs and data mining capabilities.

Data Management Services

DPM	Lightweight Storage Element for disk pools offering a standard SRM interface
GFAL lcg_utils	Library to offer POSIX-like interface to SRM-based Storage Element Collection of tools that offer UNIX-like file management on Storage Elements
gLiteIO / FiReMan	Service providing secure remote access to files stored on Storage Elements / File and Replica Catalogue that offers a hierarchical UNIX-like view of files stored on grid Storage Elements
LFC	File Catalogue that offers a hierarchical UNIX-like view of files stored on grid Storage Elements
FTS	Service to manage file transfers on network channels between Storage Elements. Includes a WS-based interface
Encrypted Data Storage	Framework for access to encrypted data, including the Hydra secure key-store and the possibility to split keys over multiple servers with SSSS
AMGA	General purpose metadata catalogue (by NA4)

Information Services, Monitoring and Accounting

BDII	LDAP database populated with information of grid resources. Information is stored in standard GLUE format (by SA3)
R-GMA	Relational implementation of the OGF Grid Monitoring Architecture. May store any kind of information produced by grid components or applications
Service Discovery	Library providing a standard interface for services location. Uses BDII, R-GMA or flat files as back-ends
DGAS	Accounting service providing sensors to collect information on Computing Elements, databases for storage of usage records and a system for securely move them
APEL	Accounting services providing sensors to collect information on Computing Elements, and a framework based on R-GMA to pass usage records to the Grid Operation Centre (by SA1)



Lightweight Middleware for
Grid Computing

www.glite.org