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Interoperability and Usability of Grid Infrastructures

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What is OMII-Europe?

- **EU funded FP6 project (RI)**
  - Starting May 2006, initial 2 year duration
  - 16 partners (8 European, 4 USA, 4 Chinese)
- **Open Middleware Infrastructure Institute for Europe**
  - Complimentary to existing national programmes (OMII-UK, NMI, C-OMEGA, OMII-China…)
- **Goal is to provide key software components for building e-infrastructures**
- **Project will demonstrate "proof of concept" with expectation for a follow-on project in FP7**

OMII-Europe Project Partners

University of Southampton, **UK (coordinator)**	University of Chicago, **USA**
Fujitsu Laboratories Europe, **UK**	NCSA, University of Illinois, **USA**
Forschungszentrum Jülich, **Germany**	University of Southern California, Los Angeles, **USA**
Kungl Tekniska Högskolan, **Sweden**	University of Wisconsin-Madison, **USA**
Istituto Nazionale di Fisica Nucleare, **Italy**	Beihang University, **China**
Poznan Supercomputing & Networking Center, **Poland**	China Institute of Computing Technology, Beijing, **China**
University of Edinburgh, **UK**	Computer Network Information Centre, Beijing, **China**
CERN, European Organisation for Nuclear Research, **Switzerland**	Tsinghua University, **China**

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What will OMII-Europe do?

- **Initial focus on providing common interfaces and integration of major Grid software infrastructures**
- **Common services:**
  - Database Access, Virtual Organisation Management, Portal, Accounting, Job Submission and Job Monitoring
    - **These represent many of the outputs from the standards function groups**
  - Capability to add additional services
  - Emphasis on porting and re-engineering work, not developing from scratch
- **Infrastructure integration**
  - Initial gLite/UNICORE/Globus/CROWNgrid interoperability
  - Interoperable security framework

OMII-Europe guiding principles

- **Committed to standards process**
  - Implementing agreed open standards and working with standards process (OGF/Oasis)

- **Quality Assurance**
  - Published methodology and compliance test
  - All software components have public QA process and audit trail
  - Working with similar projects and organisations to agree policies

- **Impartiality**
  - OMII-Europe is "honest broker" providing impartial advice/information on e-infrastructures

What will OMII-Europe deliver?

- **Repository of open-source, quality assured software services for gLite, Globus, UNICORE and CROWNgrid**
  - Some services bundled with major grid distributions
  - Initial integration work with gLite, UNICORE and Globus
- **Public reports on grid infrastructures**
  - Initial benchmark results
  - Impartial advice and information
- **Evaluation infrastructure to "test" services**
  - User support and training for services

Why Globus, UNICORE, gLite and CROWNgrid?

- **Minimal significant set:**
  - gLite is a complete set of middleware developed within EGEE and is deployed to create a Grid containing more than 150 sites and 30 countries
  - UNICORE is a major EU and national middleware initiative and is deployed at many supercomputer sites, in particular those available through DEISA
  - Globus is the world-leading open-source platform for Grid computing developed within the USA and is used for many research projects world-wide
  - All three Grid platforms have significant user bodies within Europe
  - CROWNgrid is the middleware used on the major Chinese grid infrastructure

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OMII-Europe re-engineering activities

	OGSA DAI	BES	VOMS	RUS	Grid Sphere	Etc. Identified Components
gLite						
UNICORE						
Globus						
Etc. OMII-UK, USA, China						

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Database Service

- **Implementation of the OGSA-DAI specification from the DAIS-WG within the Data function group of OGF**
  - OGSA-DAI service federates data resources with different support mechanisms (Relational/XML Databases/flat files) allowing uniform access across these resources
- **Number of other data specifications emerging that may be considered later.**
  - transaction management; byte IO; Grid file systems etc
- **DAIS implementation already available for Globus 4 –**
- **Work is to port to UNICORE and gLite – Alpha releases scheduled for May 2007.**
  - Evaluating OGSADai4UnicoreGS

Job Submit and Job Monitoring Service

- **Implementation of the JSDL (job submission description language) and BES (Basic execution service) specifications from the Compute working group at OGF**
  - Common way to specify and control jobs (abstraction of OS and cluster controller)
- **Other specifications such as scheduling, but above are essential and well developed with implementations**
- **Work is to make BES and JSDL available on Globus, UNICORE and gLite**
  - Initial version for UNICORE available in May 2007
  - JSDL translator (using XSLT) for gLite in testing

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Virtual Organisation Management Service

- **Authorisation service available for Globus and gLite.**
  - Provides information on the user's relationship with Virtual Organization: groups, roles and capabilities
- **Work to make VOMS available under UNICORE and to extend VOMS with SAML support**
  - SAML (Security Authorisation Markup Language) from OASIS Technical Committee. (standard for XML exchanging authentication and authorisation data between security domains)
  - Alpha version for UNICORE with SAML support scheduled for May 2007

Accounting Service

- **Implementation of the Resource Usage Service (RUS) from the Management working group within OGF**
  - Tracks use of resources (accounting in traditional UNIX sense), but not concerned with payment
  - Closely related to Usage Record (UG-WG) within OGF
- **Specification available for public comment**
- **Alpha version of RUS (or equivalent) available in May 2007 for Globus, gLite and UNICORE**

Portal Service

- **Integration of the Gridsphere portal framework with Globus, UNICORE and gLite and provide portlets for job submit, accounting, etc…**
    - Provide application level portability at a portlet level
    - Portlets available for main OMII-Europe services

Additional Services

- **Current solution:**
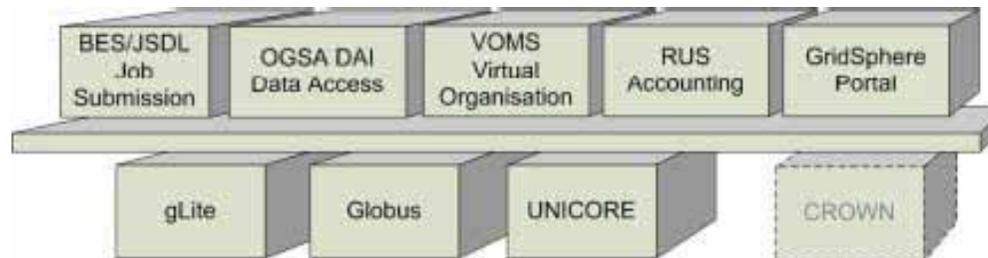
- **Chinese partners will make all services available on Chinese CROWNgrid infrastructure**
- **In May 2007, launch of the second round of service integration**

OMII-Europe Infrastructure Integration

- **This activity goes beyond the adoption of common services and focuses on full grid infrastructure integration through employing:**
  - A common security infrastructure
    - Much similarity (X.509) and differences (handling of proxies, authorisation, anonymity and auditing)
    - Intention to define a common security base
    - Provide a strengthened form of X.509 credential management through using myProxy
  - Job exchange between Globus/gLite/UNICORE
    - Builds on Globus/UNICORE Grip project
- **Close collaboration with OGF GIN WG**

Summary

- **OMII-Europe has support from the major Grid Infrastructure providers to deliver interoperability**
  - No point to be trying to solve the problem without vendor support
- **OMII-Europe's emphasis on standards provides a non-biased approach towards interoperability**
  - An open independent process needs to be used to arrive at technical decisions
- **Achieving interoperability is a long term goal, don't try and eat an elephant in one go!**
  - OMII-Europe will improve overall USABILITY of grid Infrastructures and improve INTEROPERABILITY of grid infrastructures over the next two years

OMII-Europe Vision

Will demonstrate that interoperable Grids can be built from standards-compliant Web Services and to deliver a set of quality-assured services, sourced from open source repositories, able to be used on the principal Grid infrastructures in use in Europe today.