EMI

European Middleware Initiative

Project name
European Middleware Initiative

Project Acronym
EMI

Work programme topics addressed
Topic INFRA-2010-1.2.1
Subtopic 1.2.1.3: Middleware and repositories

Estimated project start date and duration
Start date between April and June 2010
Duration between 3 and 4 years (currently under discussion).

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Project abstract and goals
The European Middleware Initiative is a close collaboration of the three major middleware providers, ARC, gLite and UNICORE, and other software providers. It will deliver a consolidated set of middleware components for deployment in EGI as part of the Unified Middleware Distribution (UMD), PRACE and other DCIs and establish a sustainable model to support, harmonise and evolve this grid middleware.

European scientific research has benefited in the past several years from the increasing availability of computing and data infrastructures that have provided unprecedented capabilities for large scale distributed scientific initiatives. A number of major projects and endeavours, like EGEE, NDGF, See-Grid, BalticGrid, DEISA, WLCG and others, have been established within Europe and internationally to share the ever growing amount of computational and storage resources. This collaborative effort has involved hundreds of

participating research organization, academic institutes and commercial companies. The major outcome is a number of active production infrastructures providing services to many research communities, such as High Energy Physics, Life Sciences, Material Science, Astronomy, Computational Chemistry, Environmental Science, Humanities and more.

At the core of these rich infrastructural facilities lies the grid middleware, a set of interoperating High Throughput Computing (HTC) and High Performance Computing (HPC) software services and components that enable the users to access the distributed computing and data resources, execute jobs, collect results and share information. Middleware like gLite from the EGEE project, ARC from NorduGrid, UNICORE and other specific services for computing and data management have allowed thousands of scientific researchers to access grid-enabled resources and produce scientific results.

However, usage of the current infrastructures is hampered by inherent middleware incompatibilities, usability problems due to the complexity of the middleware and general operational issues in deploying, configuring and monitoring the running services. Historically, there are several reasons for these incompatibilities and complexities, the lack of commonly accepted standards and the lack of close coordination between European middleware developers are among the most important. Today users cannot easily access all possible resources due to the middleware incompatibilities or require deployment of different middleware implementations, often over the same resources, increasing the maintenance overheads. In addition, the lack of a sustainable middleware maintenance and development model has delayed standardization and consolidation and caused the middleware providers to rely heavily on Community support through short-term projects.

As part of the trend towards more sustainable, more reliable infrastructures of which the foreseen European Grid Initiative (EGI) is also a major player, EMI will address the identified issues with clear solutions. The incompatibility problem will be addressed by moving different middleware implementations towards a common adoption of standards; usability, reliability and scalability will be increased by consolidating and simplifying the services; manageability will be increased by providing standard service configuration and monitoring interfaces; stricter requirements and quality controls will be enforced and new emerging computing models like clouds and desktop grids will be investigated. The ultimate goal is to sustain the growing needs of the future pan-European and international research and provide easier and more efficient access to expanding communities of users.

The EMI project is where the collaborative effort among existing middleware providers from both the HTC and HPC worlds comes into place with the objective of empowering the future long-term research infrastructures, such as EGI and PRACE, and providing researchers with tools for stable, reliable and seamless access to vast and growing computing and data resources.

Project partners

Participant no.	Participant organisation name	Part. Short name	Country
1 (Coordinator)	European Organization for Nuclear Research	CERN	Switzerland
2	Centro de Supercomputación de Galicia	CESGA	Spain
3	CESNET, zajmove sdruzeni pravnickych osob	CESNET	Czech Republic
4	CINECA - Consorzio Interuniversitario	CINECA	Italy
5	Agencia Estatal Consejo Superior de Investigaciones Cientificas	CSIC	Spain
6	Stiftung Deutsches Elektronen-Synchrotron	DESY	Germany
7	Stichting voor Fundamenteel Onderzoek der Materie	FOM	The Netherland
8	Forschungszentrum Jülich GmbH	FZJ	Germany
9	Greek Research and Technology Network SA	GRNET	Greece
10	Istituto Nazionale di Fisica Nucleare	INFN	Italy
11	Lunds Universitet	LU	Sweden
12	National Information Infrastructure Development Institute	NIIF	Hungary
13	Science and Technology Facilities Council	STFC	United Kingdom
14	SWITCH - Teleinformatik für Lehre und Forschung	SWITCH	Switzerland
15	The Provost Fellows & Scholars of the College of the Holy and Undivided Trinity of Queen Elizabeth near Dublin	TCD	Ireland
16	Technische Universität Dresden	TUD	Germany
17	University of Copenhagen	UCPH	Denmark
18	University of Helsinki – Helsinki institute of Physics	UH.HIP	Finland
19	University of Oslo	UiO	Norway
20	Univerzita Pavla Jozefa Šafarika V Kosiciach	UPJS	Slovak Republic
21	Uppsala Universitet	UU	Sweden
22	Uniwersytet Warszawski	UWAR	Poland
23	Korea Institute of Science and Technology Information	KISTI	South Korea