

## Grid Interoperability Project

# GRIP

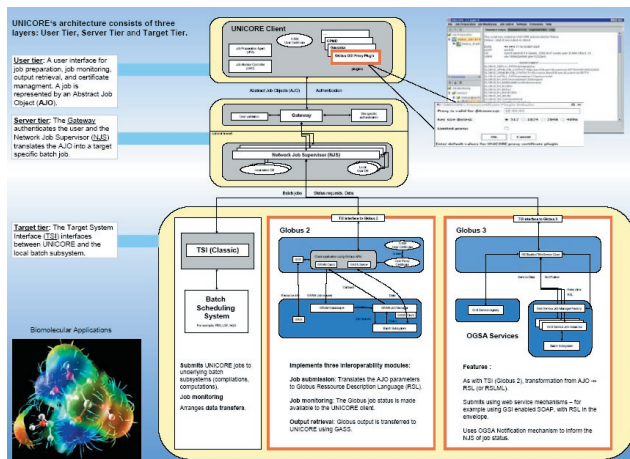


### Scope

The aim of the GRIP project has been to provide a mechanism by which UNICORE clients can access computational resources managed by the Globus Middleware. This one-way interoperability between the UNICORE and Globus was demonstrated by the project using applications in the molecular biology and meteorology domains. GRIP contributed to and influenced the international standard work in the Global Grid Forum and developed UNICORE interfaces to Web Services.

### Innovation and Functionality

The GRIP project's software bridges between UNICORE and Globus. It provides security certificate proxy generation, a job request interface for the translation of job descriptions, and an extended resource broker that is capable of using both UNICORE and Globus based Grid environments. Users may create and execute complex workflows that span not only heterogeneous systems but also multiple virtual organisations that have deployed either UNICORE or Globus or both.



### Positioning

The GRIP project addresses a key issue in heterogeneous Grid environments based on the UNICORE and Globus middleware, namely the interoperability of independently developed Grid middleware solutions. GRIP has enabled UNICORE based environments to utilise Globus based Grids by extending the infrastructure beneath the high level UNICORE user interface layer to interoperate with Globus without changing the applications.

**Contract number**  
IST-2001-32257

**Type of project**  
Cost-shared Research and Technological Development Action

**Project coordinator**  
Forschungszentrum Jülich GmbH

**Contact person**  
Dietmar Erwin  
Forschungszentrum Jülich GmbH  
52425 Jülich  
Germany

d.erwin@fz-juelich.de

**Project website**  
<http://www.grid-interoperability.org>

**Maximum Community contribution to project**  
EUR 1 340 000

**Project start date**  
1 January 2002

**Duration**  
26 months

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### Target Users and User Benefits

The GRIP project has targeted user applications that are enabled within a UNICORE environment, allowing them to also make use of Globus based Grids. In particular, the project has worked with biomolecular researchers and weather forecasting experts to enable their specific applications to use the developed UNICORE-Globus interface to demonstrate its capabilities. As an important result of the GRIP project, users now have access to a much wider range of computational, data, and software resources without the need to change their applications to use the Globus API.

### Maturity and Availability of Tools

The GRIP project has already been completed. Its deliverables have been successfully incorporated into the UNICORE software. The results of the GRIP project are made available under an Open Source BSD license as part of the UNICORE distribution that is maintained at [unicore.sourceforge.net](http://unicore.sourceforge.net) by the Research Centre Jülich (FZJ). FZJ and other centres use UNICORE in production. FZJ supports academic and research organisations as part of the Open Source development in deploying and using UNICORE.

### Compliance with Standards

UNICORE exploits established standards wherever possible. For example, security is based on X.509 certificates. Where needed the UNICORE architects defined their protocols and interfaces. GRIP project

members were active in the Global Grid Forum (GGF) to define future standards for GRID computing. The production experience with UNICORE gave credibility to the contributions and allowed to influence the emerging standards. Notably, the work on OGSA (Open Grid Services Architecture) and the specification of OGSi, which is being standardised by OASIS as Web Services Resource Framework (WSRF) are a major success. GRIP already implemented interoperability with standard web services as a first step towards OGSA compliance.

### Interoperability

The applications enabled by the GRIP project are executed and managed in a Grid environment using wrappers. UNICORE client-interface plugins provide system and environment independence for applications. Interoperability with Globus version 2 and version 3 has been achieved as well as the integration of web services into complex work flows.

### Value-Added Services and Next Generation Development

The results of the GRIP project have been integrated into the UNICORE distribution and will be supported by the Research Center Jülich. In addition, this work will be used and further developed by the new European UniGridS (Uniform Interface to Grid Services) project which targets interoperability with OGSA compliant Grid middleware.

### Project Partners

Organisation name and country

DEUTSCHER WETTERDIENST (DWD)	DE
FORSCHUNGSZENTRUM JUELICH GMBH (FZJ)	DE
INTEL GMBH (ex-PALLAS GMBH)	DE
THE UNIVERSITY OF SOUTHAMPTON, DEPARTMENT OF ELECTRONICS & COMPUTER SCIENCE	UK
UNI WERSYTET WARSZAWSKI, INTERDISCIPLINARY CENTRE FOR MATHEMATICAL AND COMPUTATIONAL MODELLING (ICM)	PL
THE VICTORIA UNIVERSITY OF MANCHESTER (UMAN)	UK