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# Developing e-Infrastructure services for e-Science applications: the EELA-2 experience

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This work aims at presenting the results obtained in the joint research activity of the EELA-2 project. In order to satisfy all heterogeneous applications requirements and to simplify the access to the Grid infrastructure, in the context of this activity, a set of special services has been developed to enhance the functionality of the gLite middleware and provide users with a richer platform. The middleware services developed have widened the number of potential applications taking benefit of the grid e-infrastructure and, moreover, have speeded up the porting process.

## **Detailed** analysis

To meet all heterogeneous requirements of the applications involved in the EELA-2 project, a set of special services has been designed and developed. These services enhance the functionality of the gLite middleware giving the EELA-2 users access to a richer middleware, reducing the amount of application development, and generally accelerating the adoption of Grid technologies. The identification and the development of these services has been conducted with the goal of increasing the reach and the usability of e-Infrastructure by assembling/reengineering existing technologies and developing new ones that facilitates the installation, management and use of the grid infrastructure. By increased reach, we mean more sites belonging to the grid infrastructure, with more resources being shared, more users being served and a more diverse range of applications being supported. By increased usability we mean the addition of services that can ease the tasks of developing and deploying new applications, as well as installing, managing and deploying the core infrastructure.

#### **Conclusions and Future Work**

Several sites and applications involved in EELA-2 benefited of the additional services developed by the joint research activity. The usability improvement allowed more applications to be supported and attracted more users, increasing either the number of resources available or the institutions joining the grid. Considered the success of this methodology, we will continue to apply it, developing new ad-hoc services, to attract more e-Science applications and users to the EELA-2 e-Infrastructure.

#### Impact

The following infrastructure-oriented services have been developed to provide alternatives to ease the installation, management and use of the e-Infrastructure: (1) a gateway between gLite and Ourgrid, a simpler peer-to-peer technology; (2) the porting of the gLite User Interface and Computing Element to the Microsoft Windows platform; (3) the Storage Accounting for Grid Environments, a system to measure the usage of gLite storage resources. The following application-oriented services have been developed according to the feedback of the users and site administrators: (1) the Grid Storage Access Framework, an Object Oriented Framework designed to access and manage Data Grid via APIs; (2) the Secure Storage, a service for the gLite middleware providing users with a set of tools to store in a secure way confidential data; (3) OPeNDAP Meta-Finder, a tool to search geographical information data sets available at the Web through OPeNDAP servers; (4) the Watchdog, a tool that allow users to watch the status of a running job tracing the evolution of produced files.

#### Keywords

services, security, monitoring, accounting, application, peer-tp-peer, windows

### URL for further information

https://grid.ct.infn.it/twiki/bin/view/EELA2/JRA1Services

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