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## **Supporting 60 e-Science applications from Europe and Latin-America: Best practices and analysis extracted from the EELA-2 project**

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Investments to promote e-infrastructures within new scientific communities in several regions of the world have been attracting new research groups interested in porting their applications on the Grid. Such an expansion across many institutions/countries facing different maturity levels of IT infrastructures, network connections and e-science awareness represents new challenges to support a diversity of users/applications. This work aims at presenting a complete picture of all EELA-2 applications as well as to share some best practices and methodologies used to support them.

### **Detailed analysis**

Based on our experience supporting 60 applications in the framework of the EELA-2 project, we have noticed that Grid users may be broadly divided into three groups: (i) those participating in collaborative experiments which requires High-Throughput Computing across many computing and storage clusters; (ii) those that have true computational and storage demands that cannot be handled by their local resources in a reasonable time; and (iii) those with modest computational needs that could be easily handled by a local cluster or storage server.

The advantages of Grid Computing is clear for the first two groups of users, but what about the third group? Is Grid computing not suitable for them?

We surveyed all EELA-2 application groups in order to identify how they are using the Grid. We focused our analysis on four common aspects of applications that are ported on the Grid: (a) frequency of runs, (b) number of jobs submitted on each run, (c) average input file size and (d) job execution time. We have also investigated the use of MPI. The statistics of all these aspects –separated between Latin-American and European applications - will be presented in the paper.

### **Conclusions and Future Work**

In this paper we present the profile of 60 applications ported on the EELA-2 infrastructure and describe a successful methodology to support e-Science applications, starting from the experience of EELA and EELA-2 projects.

From the Latin-American side we have noticed that the affiliation of small laboratories with large Grid projects may opens exciting new opportunities to collaborate with other institutions belonging to the same Virtual Organization, and thus realise significant gains at institutional, national and international levels.

### **Impact**

On one hand, EELA-2 supports applications that runs thousands of jobs per week, lasting for many hours and handling Gigabytes of data, but on the other hand there is also “bag-of-task” applications that use to run 1 single job on an occasional basis and consumes a very few computing resources. Even so, the use of a Grid infrastructure to run this kind of application can bring some added value to them.

The analysis of the results can be a valuable study for several EGEE-like Grid projects collaborating with institutions from developing countries. Our report will discuss what are the potential advantages of using Grids for each kind of users/applications.

In addition, the best practices and tools used in EELA-2 can be shared with others application's support centers. It's worth mentioning that some EELA-2 supported applications are also running on the EGEE infrastructure. The implications of having applications playing in both sides are also discussed.

## **Keywords**

Application support EELA methodology

## **URL for further information**

<http://applications.eu-eela.eu>

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