

## Running interactive and parallel applications on the Grid –live demo - Visualization of Plasma Particles in Fusion Devices application example.

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**Describe the scientific/technical community and the scientific/technical activity using (planning to use) the EGEE infrastructure. A high-level description is needed (neither a detailed specialist report nor a list of references).**

We would like to present activity that aims supporting demanding interactive and parallel application with advanced visualization capabilities on the example of Visualization of Plasma Particles in Fusion Devices application. This activity is done within int.eu.grid (<http://www.interactive-grid.eu>) project. The infrastructure is complementary with the EGEE infrastructure and inter-operable with EGEE resources. We would like to interest new communities in the presented valuable grid features.

**Report on the experience (or the proposed activity). It would be very important to mention key services which are essential for the success of your activity on the EGEE infrastructure.**

The Computation and Visualization of Plasma Particles in Fusion Devices app. has been chosen as a good example of data intensive, interactive app. that requires powerful computing resources, advanced visualization and high network throughput. The purpose of this app. is exploiting the combined power of a high number of CPUs in order to visualize the behavior of plasmas inside fusion reactors. It is the most representative use case that makes usage of most interactive services developed in the int.eu.grid project. This concerns a user-friendly interactive desktop—the Migrating Desktop(MD), CrossBroker, advanced visualization services-GVid, usage of PACX-MPI on top of Open MPI and glogin. It exploits also such EGEE services, tools and components like LFC, CE, L&B, UI, shared resources like SE's, WN's. CrossBroker starts immediately jobs, and in combination with the MD video streaming service GVid

provides  
true steering of the simulation and visualization of the fusion  
parallel app.

**With a forward look to future evolution, discuss the issues you have encountered (or that you expect) in using the EGEE infrastructure. Wherever possible, point out the experience limitations (both in terms of existing services or missing functionality)**

There are several issues that could be improved. We would like to mention some of them (important for our community); It would be very useful to have web service access to lcg\_utils and lfc functionality; the job submission time could be reduced; the time interval between the actual job end and the availability of the end of the job information could be reduced. There are many appl. in different fields which rely on the possibility of having a fast answer that could benefit from these features.

**Describe the added value of the Grid for the scientific/technical activity you (plan to) do on the Grid. This should include the scale of the activity and of the potential user community and the relevance for other scientific or business applications**

The main added features of this scientific initiative are:  
-Distributed Parallel(MPI) Interactive Computing—interactive support for parallel applications, which may run remotely across several sites  
-User friendly interactive access to grid infrastructures through a Grid  
Interactive Desktop with powerful visualization  
Interactivity is an important feature that gives user possibility to interact with application in natural way giving the possibility to change parameters while application is running. This interoperable production-level e-Infrastructure for demanding interactive app. impact the daily work of researchers. There is identified number of app. and communities that could benefit from this e- infrastructure. This includes: in medicine (Ultrasound Computer Tomography), in Environment (Environmental Assessment of Climate-Change), in Fusion (Visualization of Plasma Particles in Fusion Devices). Project provides support for interactive and parallel app. not only at technical level.

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