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Astronomy and Astrophysics - requirements and experiences with use of MPI in EGEE

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Abstract

We report about our experience regarding the porting of High Performance Computing (HPC) applications MPI based to the GRID. In particular, we ported FLASH, a multi-dimensional, adaptive-mesh, parallel code capable of handling general flow problems in astrophysical environments. The HPC simulations performed using FLASH require a substantial amount of computational resources and intense and sustained communication activity among the processes.

We describe here the features added to the Grid Infrastructure of the COMETA Consortium in order to fulfill satisfactorily the requests of HPC applications: the adoption of a fast interconnection network with low communication latency; the gLite middleware extended to support MPI/MPI2 jobs; the newly developed license server and the specific scheduling policy adopted; the use of watchdog utility for job monitoring during execution; the long term proxy to allow the running of jobs whose execution is particularly time-consuming and requiring hundreds of processors.

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