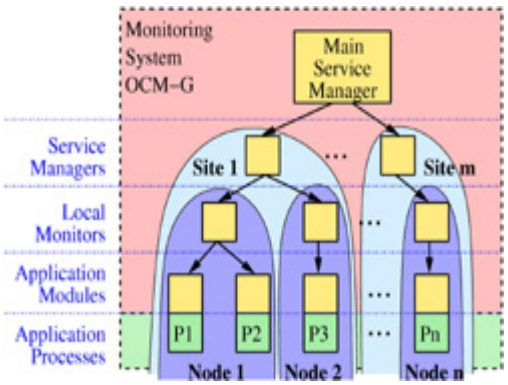
DevelOpment of GRID Environment for InteRaCtive ApplicationS

Results in Brief

Monitoring interactive applications on the Grid

With the advance of computing techniques, one question that arises is how the quality of the Grid infrastructure and the performance of applications running on the Grid can be measured. This information is essential for end-users, in addition to administrators.

DIGITAL ECONOMY



For industrial applications and for research, current needs of computational power can only be satisfied by using parallel and distributed architectures like multiprocessors and multicomputer systems. Among the central research topics of the CROSSGRID project, funded under the Fifth Framework Programme, was to investigate on-line monitoring methodologies for such parallel systems.

Project partners at the Technische Universität München worked on establishing a software layer that would connect the system running an application programme with tools observing and modifying its operation. Performance analysers and debuggers are examples of these tools that collect information about the application's execution and they are needed to set breakpoints. The OCM-G system was designed to provide the monitoring infrastructure required in developing interactive applications on the Grid.

The cluster of networked computers that act in concert to perform data-intensive applications such as simulations of surgical procedures and comprise the Grid, poses new requirements to the monitoring infrastructure. Designed as an autonomous structure, the services of the OCM-G are made available through the standardised interface OMIS (On-line monitoring interface specification). The latter suited the requirements for an interface that would provide a flexible set of monitoring services and made it possible to control them.

The monitoring services return low level information; however, OCM-G enables different pieces of information to be combined into high-level metrics with the semantics that end-users need. Due to the on-line approach adopted to monitor running processes, active instrumentation employed for gathering the essential information was kept to a minimum. To further reduce the monitoring intrusiveness, the rate of information retrieved was reduced to ensure high responsiveness. To use the OCM-G system, message passing interface (MPI) libraries need to be used so that each time a process is executed, relevant monitoring data are collected.

The first prototype of the OCM-G is continuously being improved to provide new services and the base for other types of tools supporting application development, specific for the Grid. The future plans include the implementation of new features to monitor the performance of dynamically changing Java applications and threaded applications on shared-memory machines.

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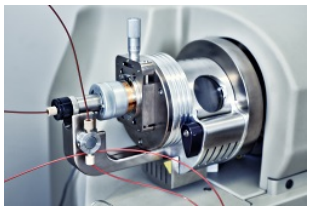

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Project Information

CROSSGRID

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