

GridICE: Requirements, Architecture and Experience of a Monitoring Tool for Grid Systems

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The Grid paradigm enables the coordination and sharing of a large number of geographically-dispersed heterogeneous resources that are contributed by different institutions. These resources are organized into virtual pools and assigned to group of users. The monitoring of such a distributed and dynamic system raises a number of issues like the need for dealing with administrative boundaries, the heterogeneity of resources, the different types of monitoring information consumers and the various levels of abstraction. In this paper, we describe GridICE, a Grid monitoring system designed to meet the above requirements and for an easy integration with local monitoring systems. It promotes the adoption of de-facto standard Grid Information Service interfaces, protocols and data models. Further, different aggregations and partitions of monitoring data are provided based on the specific needs of different users categories. Being able to start from summary views and to drill down to details, it is possible to verify the composition of virtual pools or to sketch the sources of problems. A complete history of monitoring data is also maintained to deal with the need for retrospective analysis. In this paper, we offer the details of the requirements that have driven the design of GridICE and we describe the current architecture and implementation. An important part will be devoted to the description of the result of a 3-year experience in the LHC Computing Grid production environment and we highlight how GridICE can be used for supporting VO users, operations and disseminations activities.

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