ABSTRACT:

INTELLIGENT FAULT DETECTION AND HANDLING IN JAVA BASED GRID SYSTEMS

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Compute grids consist of remote services thus a failure in the network or the compute node can render the service unreachable or cause the execution of a program to stop. In job runtime environments, there is no guarantee that a job will run immediately or at a definite time in the future, hence error messages are received after substantial delays. However, an even more serious problem is that in most cases error messages are sent to the user as an e-mail message. Consequently, the human user has to deal with failure: restart execution or look for another compute resource manually. In an ideal grid, this would be done automatically.

In a Java based, service oriented grid infrastructure (such as JGrid, developed at the University of Veszprem), every service (like a compute node) is described by a Java interface. Communication with the service is performed via remote method invocations, which provides instant feedback in the form of Java exceptions. The Java exception reporting and handling mechanism provides the basis for providing automatic, programmatic and intelligent fault detection and correction.

In our talk, we will describe how to make grid execution apparently error-free for the human users (and client programs) using service specific and standard Java exceptions and handling them appropriately. Examples will be given on implementing this mechanism in alternative ways; either in the client program or transparently using the Jini smart proxy paradigm.