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Providing uniform and standardised access to European Grid middleware with SAGA

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The Simple API for Grid Applications (SAGA), has demonstrated its ability to provide a simplified and uniform multi-language access layer to heterogeneous grid middleware stacks. SAGA already provides support for Unicore and gLite, and extensions to ARC via OGSA-BES as well as generic DRMAA support are already being developed or planned. First SAGA application integration tests within EGEE have been successful.

Detailed analysis

LSU's C++/Python implementation of OGF's SAGA standard (GFD-R-P.90) has been used successfully as a unified Grid access layer for scientific applications running on the TeraGrid (Globus, Condor, LSF, PBS), UK-NGS (GridSAM) and cloud infrastructures (EC2, Nimbus, Eucalyptus). Our current focus is on the development of extensions (adaptors) that enable SAGA to interface to three of the major European grid middleware projects: gLite, Unicore and ARC. Unicore access through GridSAM and parts of the gLite stack are already available. Adaptors for gLite have been developed as implementations of the SAGA Service Discovery extension (GFD-R-P.144). Support for further gLite components as well as a generic OGSA-BES extension that will allow native access to both Unicore and ARC are currently under development. To demonstrate viability of this effort, SAGA has been integrated with Ganga and Diane and successfully executed Lattice-QCD jobs simultaneously on EGEE and TeraGrid infrastructures.

Conclusions and Future Work

We believe that our current and future work will align well with future European efforts in a sense that it provides the right technology with the right level of abstraction that is required to leverage the development of truly distributed and portable applications in an expanding heterogeneous environment. In order to support a seamless integration, our future work will focus on additional bindings to gLite (WMS & CREAM) as well as native OGSA-BES and DRMAA bindings.

Impact

Although this work is still under development, its long-term impact on the European middleware can be inferred from our on-going work that currently fosters interoperability between the US TeraGrid, UK-NGS and NAREGI, as well as from first EGEE application integration tests. We have shown that using SAGA as a high-level middleware access layer not only makes application development and tooling easier (and faster), but also naturally results in portability and interoperability on a local, national and international level. We have demonstrated how a simple SAGA plugin enables Ganga/Diane to not only execute jobs on local CERN infrastructure, but also on the TeraGrid - an infrastructure that previously wasn't accessible through Ganga/Diane. Similar advances are being made with the UNICORE-based DEISA infrastructure. Extending further (e.g. to NAREGI and ARC), requires developing the appropriate SAGA adaptors and does not require modifying the application.

Keywords

SAGA OGF standard API interoperability

URL for further information

<http://saga.cct.lsu.edu/>

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