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Lavoisier: A Data Aggregation and Unification Service

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It is broadly admitted that grid technologies have to deal with heterogeneity in both computational and storage resources. In the context of grid operations, heterogeneity is also a major concern, especially for worldwide grid projects as LCG and EGEE. Indeed, the usage of various technologies, protocols and data formats induces complexity. As learned from our experience on participating to the collaborative development of a tool set for LCG/EGEE operations, this complexity increases the risk of unreliable code, lack of reactivity and a extremely low level of reusability.

To reduce these risks, we need an extensible tool for reliably aggregating heterogeneous data sources, for executing cross data sources queries and for exposing the collected information for several usages.

In this paper we present "Lavoisier", an extensible service for providing an unified view of data collected from multiple heterogeneous data sources. This service transforms the collected data and represents it as XML documents: this allows for transparently and efficiently executing XSL queries on them. The service also exposes the data through standard protocols and interfaces (WSRF). In addition, its efficiency can be optimized by tuning the provided cache mechanisms, according to both the characteristics and the usage profile of the data coming out of each source (access frequency, amount of data, latency, ...). The consistency of the exposed data can be ensured by specifying dependencies between the cached data.

We also present some cases where Lavoisier has proven effective, like the usage that is now done by the "LCG/EGEE CIC portal" a central tool for the operations of the LCG/EGEE grid infrastructure. We see how in this particular case, Lavoisier allowed the portal developers to reduce its code complexity while increasing the number of offered features and provided the possibility to serve the collected data to other operations tools.

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