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Middleware for the next generation Grid infrastructure

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The aim of the EGEE (Enabling Grids for E-Science in Europe) is to create a reliable and dependable European Grid infrastructure for e-Science. The objective of the Middleware Re-engineering and Integration Research Activity is to provide robust middleware components, deployable on several platforms and operating systems, corresponding to the core Grid services for resource access, data management, information collection, authentication & authorization, resource matchmaking and brokering, and monitoring and accounting.

For achieving this objective, we developed an architecture and design of the next generation Grid middleware leveraging experiences and existing components mainly from AliEn, EDG, and VDT. The architecture follows the service breakdown developed by the LCG ARDA RTAG. Our goal is to do as little original development as possible but rather re-engineer and harden existing Grid services. The evolution of these middleware components towards a Service Oriented Architecture (SOA) adopting existing standards (and following emerging ones) as much as possible is another major goal of our activity.

A rapid prototyping approach has been adopted, providing a sequence of more sophisticated prototypes to the EGEE candidate applications coming from the LHC HEP experiments and the Biomedical field. The close feedback loop with applications via these prototypes is indispensable for achieving our ultimate goals of providing a reliable and dependable Grid infrastructure.

In this paper we will report on the architecture and design of the main Grid components and report on our experiences with early prototype systems.

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