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Evolution of LCG-2 Data Management

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LCG-2 is the collective name for the set of middleware released for use on the LHC Computing Grid in December 2003. This middleware, based on LCG-1, had already several improvements in the Data Management area. These included the introduction of the Grid File Access Library(GFAL), a POSIX-like I/O Interface, along with MSS integration via the Storage Resource Manager(SRM)interface.

LCG-2 was used in the Spring 2004 data challenges by all four LHC experiments. This produced the first useful feedback on scalability and functionality problems in the middleware, especially with regards to data management.

One of the key goals for the Data Challenges in 2004 is to show that the LCG can handle the data for the LHC, even if the computing model is still quite simple. In light of the feedback from the data challenges, and in conjunction with the LHC experiments, a strategy for the improvements required in the data management area was developed. The aim of these improvements was to allow both easier interaction and better performance from the experiment frameworks and other middleware such as POOL.

In this talk, we will first introduce the design of the current data management solution in LCG-2. We will cover the problems and issues highlighted by the data challenges, as well as the strategy for the required improvements to allow LCG-2 to handle effectively data management at LCG volumes. In particular, we will highlight the new APIs provided, and the integration of GFAL and the EDG Replica Manager functionality with ROOT.

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