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## OptorSim: a Simulation Tool for Scheduling and Replica Optimisation in Data Grids

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In large-scale Grids, the replication of files to different sites is an important data management mechanism which can reduce access latencies and give improved usage of resources such as network bandwidth, storage and computing power.

In the search for an optimal data replication strategy, the Grid simulator OptorSim was developed as part of the European DataGrid project. Simulations of various HEP Grid scenarios have been undertaken using different job scheduling and file replication algorithms, with the experimental emphasis being on physics analysis use-cases. Previously, the CMS Data Challenge 2002 testbed and UK GridPP testbed were among those simulated; recently, our focus has been on the LCG testbed. A novel economy-based strategy has been investigated as well as more traditional methods, with the economic models showing distinct advantages in terms of improved resource usage.

Here, an overview of OptorSim's design and implementation is presented with a selection of recent results, showing its usefulness as a Grid simulator both in its current features and in the ease of extensibility to new scheduling and replication algorithms.

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