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The LHCb Grid Simulation

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The LHCb Grid access if based on the LHCbDirac system. It provides access to data and computational resources to researchers with different geographical locations. The Grid has a hierarchical topology with multiple sites distributed over the world. The sites differ from each other by their number of CPUs, amount of disk storage and connection bandwidth. These parameters are essential for the Grid work. Moreover, job scheduling and data distribution strategy have a great impact on the grid performance. However, it is hard to choose an appropriate algorithm and strategies as they need a lot of time to be tested on the real grid.

In this study, we describe the LHCb Grid simulator. The simulator reproduces the LHCb Grid structure with its sites and their number of CPUs, amount of disk storage and bandwidth connection. We demonstrate how well the simulator reproduces the grid work, show its advantages and limitations. We show how well the simulator reproduces job scheduling and network anomalies, consider methods for their detection and resolution. In addition, we compare different algorithms for job scheduling and different data distribution strategies.

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Primary author: USTYUZHANIN, Andrey (Yandex School of Data Analysis (RU))

Co-authors: BARANOV, Alexander (Yandex School of Data Analysis (RU)); ARZYMATOV, Kenenbek (Moscow Institute of Physics and Technology (RU)); HUSHCHYN, Mikhail (Yandex School of Data Analysis (RU))

Presenter: HUSHCHYN, Mikhail (Yandex School of Data Analysis (RU))

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