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Federated data storage system prototype for LHC experiments and data intensive science

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Rapid increase of data volume from the experiments running at the Large Hadron Collider (LHC) prompted physics computing community to evaluate new data handling and processing solutions. Russian grid sites and universities' clusters scattered over a large area aim at the task of uniting their resources for future productive work, at the same time giving an opportunity to support large physics collaborations. In our talk we will cover deployment and testing of federated data storage prototype for WLCG centers of different levels and university clusters within one Russian National Cloud. The prototype is based on computing resources located in Moscow, Dubna, Saint Petersburg, Gatchina and Geneva. This project intends to implement a federated distributed storage for scientific applications with access from Grid centers, university clusters, supercomputers, academic and commercial clouds. The efficiency and performance of the system are demonstrated using synthetic and experiment-specific tests including real data processing and analysis workflows from ATLAS and ALICE experiments. We will present topology and architecture of the designed system and show how it can be achieved using different software solutions such as EOS and dCache. We will also describe how sharing data on a widely distributed storage system can lead to a new computing model and reformations of classic computing style.

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