



Contribution ID: 21

Type: Poster

The ATLAS Data Management System Rucio: Supporting LHC Run-2 and beyond

Thursday 24 August 2017 16:25 (20 minutes)

With this contribution we present the recent developments made to Rucio, the data management system of the High-Energy Physics Experiment ATLAS. Already managing 260 Petabytes of both official and user data, Rucio has seen incremental improvements throughout LHC Run-2, and is currently laying the groundwork for HEP computing in the HL-LHC era. The focus of this contribution are (a) the automations that have been put in place such as data rebalancing or dynamic replication of user data, as well as their supporting infrastructures such as real-time networking metrics or transfer time predictions; (b) the flexible approach towards inclusion of heterogeneous storage systems, including object stores, while unifying the potential access paths using generally available tools and protocols; (c) the improvements made to the real time monitoring of the system to alleviate the work of our human shifters; and (d) the adoption of Rucio for two other experiments, AMS and Xenon1t. We conclude by presenting operational numbers and figures to quantify these improvements, and extrapolate the necessary changes and developments for future LHC runs.

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Session Classification: Poster Session

Track Classification: Track 1: Computing Technology for Physics Research