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An ATLAS distributed computing architecture for HL-LHC

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The ATLAS collaboration started a process to understand the computing needs for the High Luminosity LHC era. Based on our best understanding of the computing model input parameters for the HL-LHC data taking conditions, results indicate the need for a larger amount of computational and storage resources with respect of the projection of constant yearly budget for computing in 2026. Filling the gap between the projection and the needs will be one of the challenges in preparation for LHC Run-4. While the gains from improvements in offline software will play a crucial role in this process, a different model for data processing, management, access and bookkeeping should also be envisaged to optimise resource usage. In this contribution we will describe a straw man of this model, founded on basic principles such as single event level granularity for data processing and virtual data. We will explain how the current architecture will evolve adiabatically into the future distributed computing system, through the prototyping of building blocks that would be integrated in the production infrastructure as early as possible, so that specific use cases can be covered much earlier with respect of the HL-LHC time scale. We will also discuss how such system would adapt to and drive the evolution of the WLCG infrastructure in terms of facilities and services.

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