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Evolution of ALICE computing: model for LHC Run 3 and 4 and analysis framework for Runs 2 and 3

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The ALICE experiment is upgrading its hardware and software system during LHC Long Shutdown 2 in view of the next data taking periods, Run 3 and Run 4, whose start is scheduled in 2022.

One of the main challenge of the ALICE experiment is the change of the data acquisition paradigm to continuous readout mode in order to cope with the high interaction rate expected in Pb-Pb collision, up to 50 kHz for a raw data rate from detectors of about 3.5 TB/s.

A new online-offline computing system, called O² (Online-Offline), has been developed to compress the data synchronously with the data taking on two online farms, FLP (First Level Processor) and EPN (Event Processing Node).

An asynchronous phase is also foreseen to reprocess the compressed raw data using the final calibration to produce the reconstruction output (AOD).

The new framework, implemented using the newly developed data processing layer (DPL) based on message passing among processes, was developed also to benefit of a high level of parallelization and to exploit heterogeneous architecture (GPU).

The ALICE computing model was fully redesigned in order to improve performances for all workflows; namely simulation, reconstruction and analysis.

The state of the art of the project will be presented, focusing on most recent updates.

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