Towards the ALICE Online-Offline (O2) control system

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The ALICE Experiment at CERN LHC (Large Hadron Collider) is under preparation for a major upgrade that is scheduled to be deployed during Long Shutdown 2 in 2019-2020 and that includes new computing systems, called O2 (Online-Offline).

To ensure the efficient operation of the upgraded experiment along with its newly designed computing system, a reliable, high performance and automated control system will be developed with the goal of managing the lifetime of all the O2 processes, and of handling the various phases of the data taking activity by interacting with the detectors, the trigger system and the LHC. The ALICE O2 control system will be a distributed system based on state

of the art cluster management and microservices which have recently emerged in the distributed computing ecosystem. Such technologies weren't available during the design and development of the original LHC computing systems, and their use will allow the ALICE collaboration to benefit from a vibrant and innovating open source community.

This paper illustrates the O2 control system architecture. It evaluates several solutions that were considered during an initial prototyping phase and provides a rationale for the choices made. It also provides an in-depth overview of the components, features and design elements of the actual system.

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