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Handling of time-critical Conditions Data in the CMS experiment - Experience of the first year of data taking

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Data management for a wide category of non-event data plays a critical role in the operation of the CMS experiment. The processing chain (data taking-reconstruction-analysis) relies in the prompt availability of specific, time dependent data describing the state of the various detectors and their calibration parameters, which are treated separately from event data. The Condition Database system is the infrastructure established to handle these data and to make sure that they are available to both offline and online workflows. The Condition Data layout is designed such that the payload data (the Condition) is associated to an Interval Of Validity (IOV). The IOV allows accessing selectively the sets corresponding to specific intervals of time, run number or luminosity section. Both payloads and IOVs are stored in a cluster of relational database servers (Oracle) using an object-relational access approach. The strict requirements of security and isolation of the CMS online systems are imposing a redundant architecture to the database system. The master database is located in the experiment area within the online network, while a read-only replica is kept in sync via Oracle streaming in the CERN computing center and this is the one which is accessible by worldwide computing jobs. The synchronization of the condition data is performed with specific jobs deployed within the online networks, and with dedicated "drop-box"services. We will discuss the overall architecture of the system, the implementation choices and the experience gained in the first year of operation.

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