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LHCb Conditions Database Operation Assistance Systems

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The Conditions Database of the LHCb experiment (CondDB) provides versioned, time dependent geometry and conditions data for all LHCb data processing applications (simulation, high level trigger, reconstruction, analysis) in a heterogeneous computing environment ranging from user laptops to the HLT farm and the Grid. These different use cases impose front-end support for multiple database technologies (Oracle and SQLite are used). Sophisticated distribution tools are required to ensure timely and robust delivery of updates to all environments. The content of the database has to be managed to ensure that updates are internally consistent and externally compatible with multiple versions of the physics application software. In this paper we describe three systems that we have developed to address these issues:
- an extension to the automatic content validation done by the "Oracle Streams"replication technology, to trap cases when the replication was unsuccessful;
- an automated distribution process for the SQLite-based CondDB, providing also smart backup and checkout mechanisms for the CondDB managers and LHCb users respectively;
- a system to verify and monitor the internal (CondDB self-consistency) and external (LHCb physics software vs. CondDB) compatibility.
These systems are used in production in the LHCb experiment and have achieved the desired goal of higher flexibility and robustness for the management and operation of the CondDB.

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