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Handling of network and database instabilities in CORAL

The CORAL software is widely used by the LHC experiments for storing and accessing data using relational database technologies. CORAL provides a C++ abstraction layer that supports data persistency for several backends and deployment models, including local access to SQLite files, direct client access to Oracle and MySQL servers, and read-only access to Oracle through the FroNTier/Squid and CoralServer!/CoralServerProxy server/cache systems.

During 2010, several problems were reported by the LHC experiments using CORAL, involving application hangs or crashes after the network or the database servers became temporarily unavailable. CORAL already provided some level of handling of these instabilities, which are due to external causes and cannot be avoided, but this proved to be insufficient in some cases and to be itself the cause of other problems, such as the hangs mentioned before, in other cases. As a consequence, a major redesign of the CORAL plugins was implemented, with the aim of making the software more robust against these network glitches. The new implementation ensures that CORAL automatically reconnects to the database in a transparent way whenever possible and gently terminates the application when this is not possible. Internally, it takes care of resetting all relevant parameters of the underlying backend technology (such as OCI, the Oracle Call Interface). This presentation will report on the status of this work at the time of the CHEP2012 conference, covering the design and implementation of these new features and the results from the first experience with their use.

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