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The importance of having an appropriate relational data segmentation in ATLAS

In this paper we describe specific technical solutions put in place in various database applications of the ATLAS experiment at LHC where we make use of several partitioning techniques available in Oracle 11g. With the broadly used range partitioning and its option of automatic interval partitioning we add our own logic in PLSQL procedures and scheduler jobs to sustain data sliding windows in order to enforce various data retention policies. We also make use of the new Oracle 11g reference partitioning in the Nightly Build System to achieve uniform data segmentation. However the most challenging issue was to segment the data of the new ATLAS Distributed Data Management system (Rucio), which resulted in tens of thousands list type partitions and sub-partitions. Partition and sub-partition management, index strategy, statistics gathering and queries execution plan stability are important factors when choosing an appropriate physical model for the application data management. The so-far accumulated knowledge and analysis on the new Oracle 12c version features that could be beneficial will be shared with the audience.

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