

A lightweight high availability strategy for Atlas LCG File Catalogs

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The LCG File Catalog (LFC) is a key component of the LHC Computing Grid (LCG) middleware, as it contains the mapping between all logical and physical file names on the Grid. The Atlas computing model foresees multiple local LFC hosted in each Tier-1 and Tier-0, containing all information about files stored in that cloud. As the local LFC contents are presently not replicated, this turns out in a dangerous single point of failure for all of the Atlas regional clouds. The issue of central LFC replication has been successfully addressed in LCG by the 3D project, which has deployed a replication environment (based on Oracle Streams technology) spanning the Tier-0 and all Tier-1. Anyway this solution is not suitable for Tier-1 - Tier-2 clouds, due to the considerable amount of man power needed for Oracle Streams administration/management and the high costs of the additional Oracle licenses needed to deploy Streams replication.

A more lightweight solution is to copy the LFC Oracle backend information to one or more Tier-2s, exploiting the Oracle Dataguard technology. We present the results of a wide range of feasibility and performance tests run on a Dataguard-based LFC high availability environment, built between the Italian LHC Tier-1 (INFN - CNAF) and an Atlas Tier-2 located at INFN - Roma1. We also explain how this strategy can be deployed on the present Grid infrastructure, without requiring any change to the middleware and in a way that is totally transparent to end users.

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