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Dynamic sharing of tape drives accessing scientific data

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The data management infrastructure operated at CNAF, the central computing and storage facility of INFN (Italian Institute for Nuclear Physics), is based on both disk and tape storage resources. About 40 Petabytes of scientific data produced by LHC (Large Hadron Collider at CERN) and other experiments in which INFN is involved are stored on tape. This is the higher latency storage tier within HSM (Hierarchical Storage Management) environment. Writing and reading requests on tape media are satisfied through a set of Oracle-StorageTek T10000D tape drives, shared among different scientific communities. In the next years, the usage of tape drives will become more intense due to the growing amount of scientific data to manage and the trend to increase the reading traffic rate from tape, announced by the main user communities. In order to reduce hardware purchases, a key point is to minimize the inactivity periods of tape drives. In this paper we present a study of drive resources access patterns in case of concurrent requests and a software solution designed to optimize the efficiency of the shared usage of tape drives in our environment.

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