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SAMGrid Integration of SRMs

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SAMGrid is the shared data handling framework of the two large Fermilab Run II collider experiments: DZero and CDF. In production since 1999 at D0, and since mid-2004 at CDF, the SAMGrid framework has been adapted over time to accommodate a variety of storage solutions and configurations, as well as the differing data processing models of these two experiments. This has been very successful for both experiments. Backed by primary data repositories of approximately 1 PB in size for each experiment, the SAMGrid framework delivers over 100 TB/day to DZero and CDF analyses at Fermilab and around the world. Each of the storage systems used with SAMGrid, however, has distinct interfaces, protocols, and behaviors. This led to different levels of integration of the various storage devices into the framework, which complicated the exploitation of their functionality and limited in some cases SAMGrid expansion across the experiments' Grid.

In an effort to simplify the SAMGrid storage interfaces, SAMGrid has adopted the Storage Resource Manager (SRM) concept as the universal interface to all storage devices. This has simplified the SAMGrid framework, especially the implementation of storage device interactions. It prepares the SAMGrid framework for future storage solutions equipped with SRM interfaces, without the need for long and risky software integration projects. In principle, any storage device with an SRM interface can be used now with the SAMGrid framework. The integration of SRMs is an important further step towards evolving the SAMGrid framework into a co-operating collection of distinct, modular grid-oriented services. To date, SRMs for Enstore, dCache, local caches, and permanent disk locations are tested and in production use. This report outlines how the SRMs were integrated into the existing SAMGrid framework without disturbing on-going operations, and describes our operational experience with SAMGrid and SRMs in the field.

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