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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, expecially
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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