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L-STORE: A FLEXIBLE LOGISTICAL STORAGE FRAMEOWRK FOR DISTRIBUTED, SCALABLE AND SECURE ACCESS TO LARGE-SCALE DATA

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Storing and accessing large volumes of data across geographically separated locations or cutting across labs and universities in a transparent, reliable fashion is a difficult problem. There is urgency to this problem with the commissioning of the LHC around the corner (2007). The primary difficulties that need to be over come in order to address this problem are policy driven secure access, mirroring and striping of data for reliable storage, scalability, and interoperability between diverse storage elements. This paper presents a flexible storage framework called L-Store (logistical storage) to address these issues. L-Store is conceptually designed using software agent technology and the Internet Backplane Protocol. The software agents provide scalability as the L-Store components can be distributed over multiple machines. L-Store provides rich functionalities in the form of certificate based authentication, mirroring and striping of data (fault tolerance), policy based data management, and transparent peer-to-peer interoperability of backend storage media. Keeping in mind the scenario where different Tiers and virtual organizations can have different types of storage elements (SE), L-Store is designed to have a common storage resource manager (SRM) compliant interface such that any SRM compliant SE can share data with an L-Store system. L-Store is agnostic to the underlying hardware and can be installed on simple personal computers having a disk cache to a full fledged hierarchical storage system (with tapes and disk backups).

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