

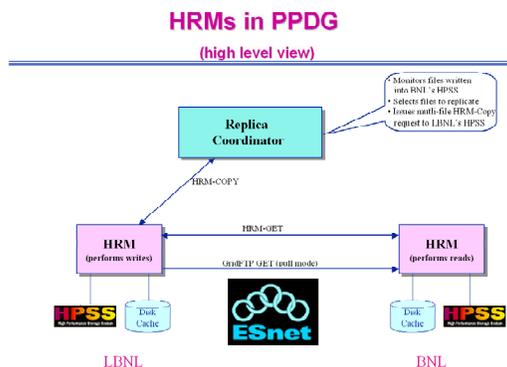
## Particle Physics Data Grid Collaboratory Pilot

Integrating Datagrid Technology with Physics Experiment End-to-end Applications.

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Members of the STAR experiment and the Scientific Data management group at LBNL have collaborated on deploying Hierarchical Resource Managers (HRM) to automate data transport between the RHIC Computing Facility (RCF) storage system at BNL and the NERSC storage system at LBNL. Data is carried over the ESnet production network between these two DOE laboratories.

HRM is an implementation of the Storage Resource Manager (SRM) service. It provides an interface to multiple types of storage systems (HPSS in this case) as well as cache management of the disk buffers used for staging. A single request to HRM can transfer a thousand or more files and the number of files transferred simultaneously at any stage can be specified to optimize the throughput. HRMs also provide recovery from transient failures of the HPSS systems as well as the network without any human intervention. GridFTP from the Globus Toolkit is used for the WAN stage of the transfer, as illustrated in the diagram below.



Since STAR began data taking two years ago 10's of TB have been transferred at rates of about 1 TB/week using ad hoc methods (with considerable effort). In tests with the new grid-enable implementation rates of up to 8 MB/sec



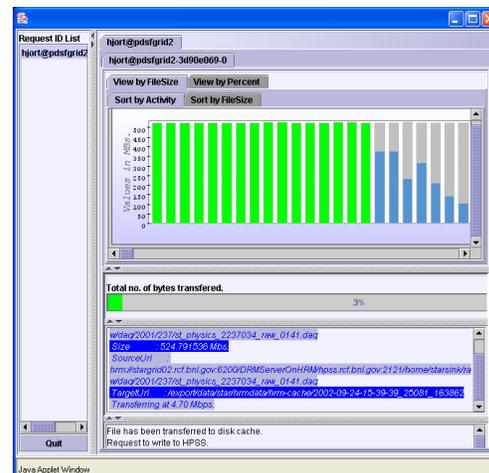
- SRM – <http://sdm.lbl.gov/srm>
- STAR – <http://www.star.bnl.gov/>
- ESnet – <http://www.es.net/>
- RCF at BNL – <http://www.rhic.bnl.gov/RCF>
- NERSC – <http://hpcf.nersec.gov/>
- Globus Toolkit – <http://www.globus.org/toolkit>
- SciDAC – <http://www.osti.gov/scidac/>



for the WAN stage have been achieved. After resolving some end-point configuration issues we expect that rates of 3-4 TB/week will be easily achieved during the 2003 data taking run for STAR.

This application shows collaborative work between the computer scientists and an Experiment group already in the middle of its data taking run.

The diagram below shows the graphical tool that can be used to check status and monitor progress of several file transfer requests, where each request if many files.



Working with PPDG the SRM group has defined a standard interface to storage systems and collaborated with developers who have implemented versions for Enstore at Fermilab, Jasmine at Thomas Jefferson National Laboratory.

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