

## **Middleware extended and hardened by PPDG benefits other sciences**

A focus of the Particle Physics Data Grid (PPDG) project is to integrate, extend and harden middleware for distributed computing with the end to end applications of several experiments in high energy and nuclear physics. PPDG, together with the NSF funded GriPhyN and iVDGL projects (the Trillium consortium), has adopted the use of the VDT packaging of grid middleware and the enhancements, debugging and bug fixing resulting from this broad deployment across many particle, nuclear and astrophysics experiments is benefiting a much wider science community.

Extensions and robustness improvements in the Condor DAGMAN software, developed through the support of PPDG experiments, is now benefiting the biology community at the University of Wisconsin in their execution of BLAST. They have been able to increase the number of comparisons per run from the millions to over 4 billion. For the CNS/Cyana group successful computational runs have increased from several thousand to over 25000 CPU hours.

Accomplishments for the GADU, the Genome Analysis and Database Update system, benefited directly from several key deliverables of PPDG contributing scaling enhancements, reliability improvements, and feature development to the Grid services on which the GADU system relies: GRAM, Condor-G, DAGMan, GridFTP, and the Replica Location Service (RLS). From Aug 2003 through Mar 2004 more than 7.5M genome sequences were processed by GADU on Grid2003 resources at a throughput more than 5 times faster than the pre-Grid capabilities of this tool.

Storage Resource Management (SRM) middleware software was initially tested, deployed and improved by PPDG projects, and is now also included in the VDT. This technology was applied to the Earth Science Grid (EDG), and an SRM was adapted to work with a legacy mass storage system at NCAR. It is now deployed in several institutions for use by ESG projects, including ORNL, NERSC, NCAR, and LBNL. It is also installed and being use by a climate scientist at the University of Colorado, who is an ESG collaborator.

URL's:

VDT – [www.cs.wisc.edu/vdt](http://www.cs.wisc.edu/vdt)

Condor – [www.cs.wisc.edu/condor](http://www.cs.wisc.edu/condor)

Globus – [www.globus.org](http://www.globus.org)

SRM - [sdm.lbl.gov/srm-wg/](http://sdm.lbl.gov/srm-wg/)

PPDG – [www.pdpg.net](http://www.pdpg.net)