Particle Physics Data Grid - From Fabric to Physics

Particle Physics Data Grid

www.ppdg.net

Steering Committee (PI's in **bold**)

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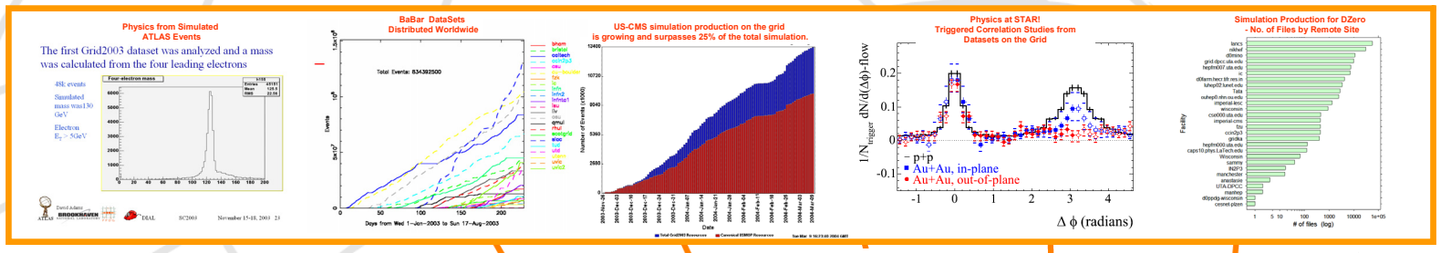
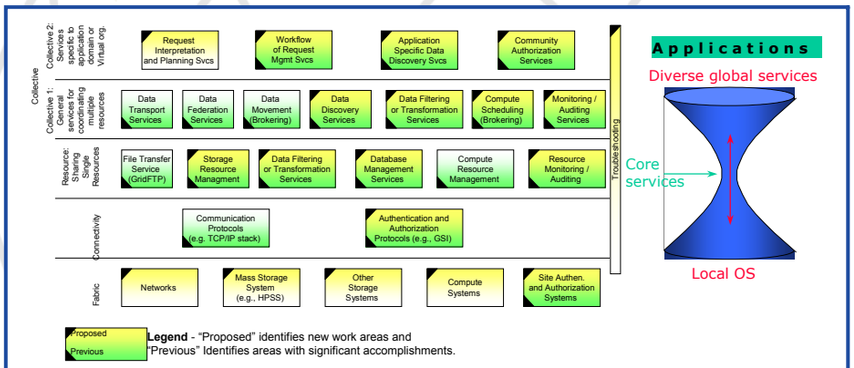
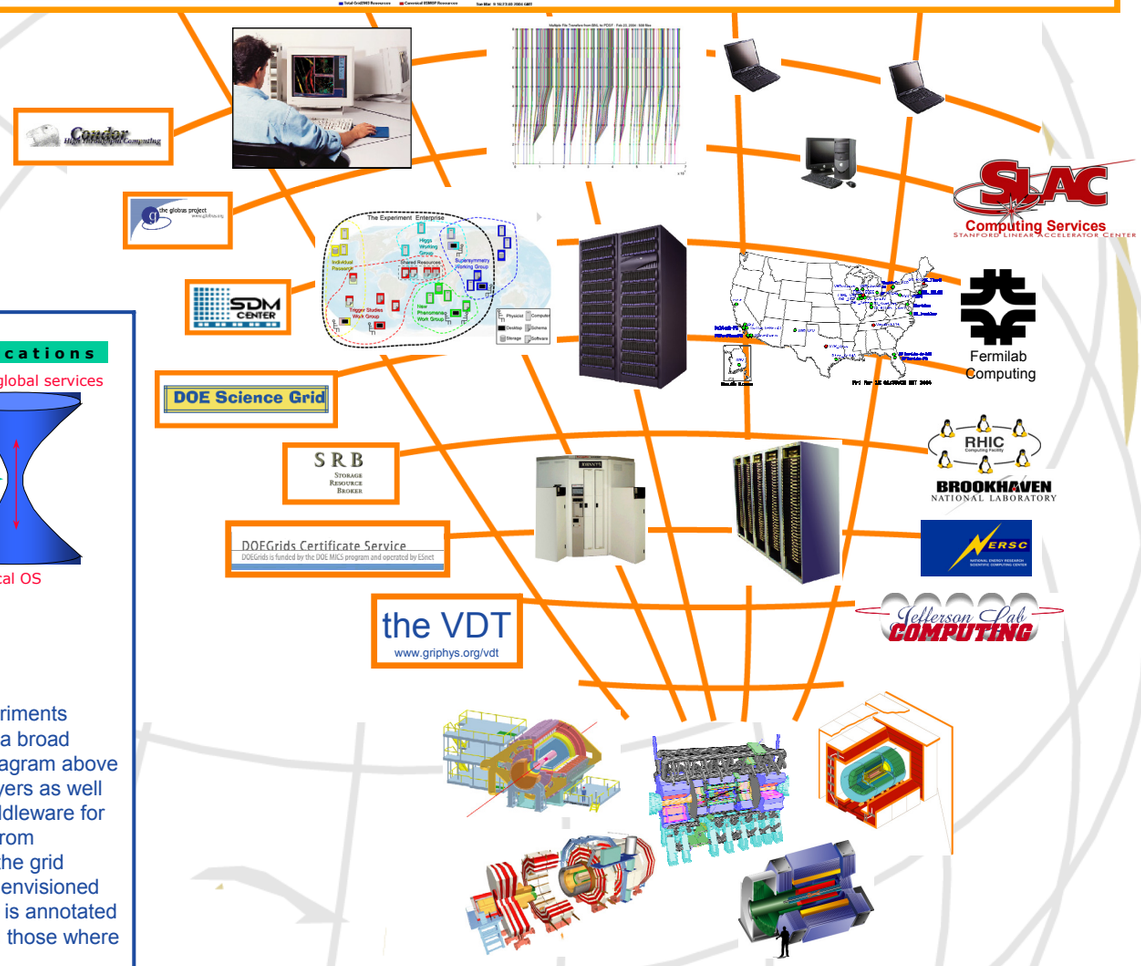


The goal and focus of PPDG is to achieve grid-enabled end-to-end applications of the experiments running on a distributed and shared grid fabric to enable frontier science for international virtual organizations.

Beginning in 2004 as the next phase, PPDG is partnering with the major DOE scientific computing facilities for high-energy and nuclear physics to form a shared grid fabric supporting the data analysis and simulations applications of all the experiments participating in PPDG. This effort and shared grid deployment is aligned with the Open Science Grid roadmap (www.opensciencegrid.org) and we expect this to be part of and help encourage an expanding shared grid for scientific computing.



As PPDG progresses from initial integration of grid middleware into the experiments end-to-end applications to deployment of these applications running across a broad shared grid fabric the program of work is being adjusted accordingly. The diagram above shows the various elements of a grid software architecture in the different layers as well as the "hourglass" illustrating the advantage of using a standard suite of middleware for core services that enables creativity and decoupling of fabric layer services from application functionality. PPDG endorses the use of the VDT packaging of the grid middleware as standard. VDT is increasingly used PPDG experiments and envisioned to be universally adopted as a kernal for Grid deployment. The architecture is annotated to show those elements where significant effort was devoted in the past and those where significant effort is being devoted for the future.



PPDG

End-to-End Applications over the Grid and End-to-End Grid Systems

Collaborating Communities of Scientists

PPDG is benefiting the Experiments:

- **Robust, sustained, hands-off, production data transfer of terabytes of data using GridFTP and SRM implementations.**
- **Grid-based job scheduling and execution based on Condor-G, DAGMan and GRAM**
- **Deployment and use of end-to-end Grid systems for experiment applications. In particular the recent Grid2003 shared by U.S. ATLAS and U.S. CMS (among others)**
- **Procedures, integration and support for ESnet's DOEGrids certificate-based authentication at all the facilities**
- **Demonstrations of interoperability and compatibility across the US and European Grid infrastructures of the experiments, in particular BaBar, D0 and CDF, US ATLAS and US CMS.**

PPDG is benefiting GLOBUS, CONDOR, SRB, SRM through contributions to:

- **Robustness**
- **Scalability**
- **Research directions**
- **Usability**

SciDAC Scientific Discovery through Advanced Computing

Office of High Energy Physics U.S. Department of Energy · Office of Science