

# Project DASH: Securing Direct MySQL Database Access for the Grid

*Tuesday 14 February 2006 17:20 (20 minutes)*

High energy and nuclear physics applications on computational grids require efficient access to terabytes of data managed in relational databases. Databases also play a critical role in grid middleware: file catalogues, monitoring, etc. Crosscutting the computational grid infrastructure, a hyperinfrastructure of the databases emerges.

The Database Access for Secure Hyperinfrastructure (DASH) project develops secure high-performance database access technology for distributed computing. To overcome database access inefficiencies inherent in a traditional middleware approach the DASH project implements secure authorization on the transport level. Pushing the grid authorization into the database engine eliminates the middleware message-level security layer and delivers transport-level efficiency of SSL/TLS protocols for grid applications. The database architecture with embedded grid authorization provides a foundation for secure end-to-end data processing solutions for the experiments.

To avoid a brittle, monolithic system DASH uses an aspect-oriented programming approach. By localizing Globus security concerns in a software aspect, DASH achieves a clean separation of Globus Grid Security Infrastructure dependencies from the MySQL server code. During the database server build, the AspectC++ tool automatically generates the transport-level code to support a grid security infrastructure.

The DASH proof-of-concept prototype provides Globus grid proxy certificate authorization technologies for MySQL database access control. Direct access to database servers unleashes a broad range of MySQL server functionalities for HENP data processing applications: binary data transport, XA transactions, etc.

Prototype servers built with DASH technology are being tested in ANL, BNL, and CERN. To provide on-demand database services capability for Open Science Grid, the Edge Services Framework activity builds the DASH mysql-gsi database server into the virtual machine image, which is dynamically deployed via Globus Virtual Workspaces.

The DASH project is funded by the U.S. DOE Small Business Innovative Research Program.

## Summary

Project DASH builds the grid-enabled MySQL database.

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**Session Classification:** Grid Middleware and e-Infrastructure Operation

**Track Classification:** Grid middleware and e-Infrastructure operation