



Contribution ID: 214

Type: **Poster**

## Identifying gaps in Grid middleware on fast networks with the Advanced Network Initiative

*Tuesday 22 May 2012 13:30 (4h 45m)*

By the end of 2011, a number of US Department of Energy (DOE) National Laboratories will have access to a 100 Gb/s wide-area network backbone. The ESnet Advanced Networking Initiative (ANI) project is intended to develop a prototype network, based on emerging 100 Gb/s ethernet technology. The ANI network will support DOE's science research programs. A 100 Gb/s network testbed is a key component of the ANI project. The test bed offers the opportunity for early evaluation of 100Gb/s network infrastructure for supporting the high impact data movement typical of science collaborations and experiments. In order to make effective use of this advanced infrastructure, the applications and middleware currently used by the distributed computing systems of large-scale science need to be adapted and tested within the new environment, with gaps in functionality identified and corrected.

As a user of the ANI testbed, Fermilab aims to study the issues related to end-to-end integration and use of 100 Gb/s networks for the event simulation and analysis applications of physics experiments. In this paper we discuss our findings evaluating in the high-speed environment existing HEP Physics middleware and application components, including GridFTP, Globus Online, etc. These will include possible recommendations to the system administrators, application and middleware developers on changes that would make production use of the 100 Gb/s networks, including data storage, caching and wide area access.

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**Session Classification:** Poster Session

**Track Classification:** Computer Facilities, Production Grids and Networking (track 4)