

## Fermi National Accelerator Laboratory LDRD Project Data Sheet - FY14

**Project ID:** FNAL-LDRD-2014-038

**Project title:** Application-Oriented Network Traffic Analysis based on GPUs

**Principal investigator:** Phil DeMar

**Project description:** (short description and explanation of cutting edge, high-risk, high-potential science or engineering)

The project is to design a computer-based architecture to move computer network information into a graphical processing unit (GPU) based system for analysis and recognition of network traffic patterns in a manner that allows for dynamic network reconfiguration for targeted traffic. The architecture will be implemented into a complete system to allow for evaluation.

**Tie to Mission:** (explain the project's relevance or anticipated benefits to Fermilab's and DOE's missions)

Network traffic such as distributing the next phase of LHC experimental data will potentially run into several bottlenecks even with planned improvements to network infrastructure. A system that is able to dynamically customize the network would enable certain types of data to be allocated prioritized resources. With the power of a novel GPU-based solution, the identification of the type of network traffic and its allocation of network resources could happen all with application-driven reconfiguration. Beyond the test case of LHC data, this project is expected to have wider applicability for a variety of network traffic flows designated to be of "special interest" including computer security.

**Previous year's accomplishments:** (as applicable) FY14, not applicable

**Work proposed for current fiscal year and anticipated / desired results:**

The proposed work for the project will be to investigate and begin to design and implement advanced GPU-based algorithms for network pattern recognition along with the architecture necessary to move the network traffic information into the GPU. This work will be required before integrating an actual system for measurement and evaluation. A final step that may be beyond the scope of the project will be to demonstrate dynamic network reconfiguration.

**Project funding profile:** (costs, budgets, projected budgets, and total)

Prior year(s) costs	FY14	FY15	FY16	Total
N/A	63000	258000	195000	516000