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Posted: Tuesday, 26 May 2009 11:28AM

# Merit Network Completes 10G Router Upgrades

Ann Arbor-based Merit Network Inc. Tuesday announced the addition of three high-performance routers in Chicago, Kalamazoo and Grand Rapids.

The additions give Merit s a total of seven 10 gigabit (10G) routers installed on its core backbone, and a new and improved network protocol to boot.

The 10G router upgrades and remodeled protocol are part of Merit Network's Equipment Refresh Schedule, a continuing effort to ensure that Merit Members will always have access to the most reliable, leading-edge network. The new routers bolster the Layer 3 mesh architecture of Merit's core backbone. The driving idea behind mesh architecture is to sustain data transmission by breaking longer distances into shorter paths. An increase in the total routed paths diffused across Merit's network translates to a higher degree of reliability and resiliency.

Merit's augmented Layer 3 mesh provides the network with improved convergence, the ability to restore network traffic in the event of a node failure. The network now reconfigures itself around broken or blocked paths at a much faster rate than before, with route fail reduced to 300 milliseconds. If a node becomes inoperable, the network achieves this by using Bidirectional Forwarding Detection (BFD) protocol.

In October of 2008, Merit began employing BFD, a network protocol used to detect faults between forwarding engines on its core backbone. This has also contributed directly to the faster rate of convergence experienced on the network.

Bob Stovall, Vice President of Network Operations and Engineering for Merit, applauds the new routers and protocol, citing ease in the task of network engineers and satisfaction on the part of Merit Members.

"Our network is more stable and more resilient than we could have hoped for," he said. "Interferences that would have previously created temporary outages resolve themselves before we even have a chance to react. For our Members and system controllers, connectivity is a snap."

Recently a disruption occurred on the Merit fiber line that connects Iron Mountain and Chicago. Twenty seconds later the Merit Network Operations Center was notified, but the problem had already been solved.

Traffic to and from Iron Mountain had been rerouted dynamically and was traveling at an optimal level by the time Merit's NOC was alerted. This is an excellent example of Merit's new technology at work and proof that network stability can prevail even in a comprehensive, high-performance framework like the Merit network.

The Iron Mountain to Chicago line is no weak link either. It handles a significant portion of the Upper Peninsula's Internet traffic. For a network to reroute dynamically in less than 20 seconds is an incredible feat, one that Stovall and the folks at Merit deem an indication of more great things to come.

Additional upgrades to Merit's network include an enhanced connection to Internet2, one of the largest nation-wide research and education networks. The access point in Chicago is now equipped to handle a flux of 10 gigabits of traffic. Merit recently built fiber to Toledo, Ohio, that connects the Merit backbone to OARnet, Ohio's Research and Education network. This has allowed for the completion of a second 10G path

to Internet2's node in Cleveland. The newest Cleveland connection improves reliability by providing the Merit network with two paths to separate regions of Internet2's dynamic backbone.

Merit has also completed a wireless connection to Ontario Research and Innovation Optical Network (ORION) across the Soo Locks in Sault Ste. Marie. ORION is operated by the Optical Regional Advanced Network of Ontario (ORANO). Merit has installed a 1G CSME network to provide full 1G redundancy to Merit Members in the Upper Peninsula as well.

Merit Network Inc., a nonprofit corporation owned and governed by Michigan's public universities, owns and operates America's longest-running regional research and education network. In 1966, Michigan's public universities created Merit as a shared resource to help meet their common need for networking assistance. Since its formation, Merit Network has remained on the forefront of research and education networking expertise and services. Merit provides high-performance networking solutions to Michigan's public universities, colleges, K-12 organizations, libraries, state government, healthcare, and other non-profit organizations.

More at [www.merit.edu](www.merit.edu)