



Case Study: High Performance Computing Center at the University of Florida

RAID Inc.'s Storage Achieves 2GB/s Sustained Throughput with Lustre File System

About the University of Florida's High Performance Computing Center

The University's new High Performance Computing Center provides a powerful baseline of computation and storage infrastructure for the grid, coupled with high-speed communications. This center loosely binds existing resources in multiple independent facilities across campus for efficient and effective sharing of resources. It is being constructed in three phases over several years with a focus on the physical sciences, engineering sciences, and health sciences.

The University of Florida's High Performance Computing (HPC) Center chose RAID Inc. for a large implementation of more than 100TB of performance-intensive Fibre to SATA-2 storage. This innovative clustered storage system allows the university to not only shared access with research facilities across campus, but with academic and research facilities across the state.

The Challenge

Processing and analyzing gigabytes to terabytes of data is critical for cutting-edge research in many areas of science and engineering. Overall performance of any storage solution is crucial in analyzing such large amounts of data. This was the challenge at the University's High Performance Computing Center. Another major concern was the cost of any proposed solution.

“We found RAID Inc. to be the ideal partner for our challenging storage needs.”

-Charlie Taylor, Associate Director of the University of Florida's HPC Center

The Solution

The HPC Center sought best-of-breed providers that could push the technology envelope in support of its research projects. “We found RAID Inc. to be the ideal partner for our challenging storage needs,” said Charlie Taylor, associate director of the University of Florida's HPC Center. “Their Falcon product was a key component in the success of this project.”

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The university deployed a distributed storage solution consisting of six RAID Inc. Falcon III systems that consisted of over 140TB of storage. The expansive storage system was made available to users as a cluster file system (Lustre) hosted by two I/O servers and one Metadata server. The Fibre Channel HBAs provide access to the storage while the InfiniBand and Ethernet adapters distribute the file system to the HPC cluster (locally) and to the satellite facilities over the CRN. The storage is accessible by five satellite facilities via the 20Gb/s Ethernet Campus Research Network and to researchers across the state via Florida's research and education network.

The cutting-edge storage infrastructure at the University of Florida's HPC Center represents a new way of thinking about how external storage solutions can be best utilized for Academic, Corporate, or Government HPC laboratories. The advanced Falcon III chipset was designed to eliminate bottlenecks on the controller level, and utilizes an open-source file system optimizing throughput and allowing for virtualization of multiple physical storage devices into a single logical volume.

The Result: Sustained Throughput of up to 2GB/s

The resulting architecture was sustained throughput of up to 2GB/s (read and write) from both local and remote clients at a very attractive cost. This shared storage environment has already opened up opportunities for the University of Florida in Gainesville and Florida International University to collaborate: a major step forward for linking together geographically dispersed universities. Today, researchers at the two universities are working to find evidence of a hypothetical particle that has been theorized by physicists, but never observed. Soon the researchers will be working remotely with a new particle accelerator at CERN, the world's largest particle physics laboratory in Geneva, Switzerland. As this work continues, more research labs from across the state and the country will likely seek access to the same storage pool—opening up opportunities for important scientific discoveries.

About the University of Florida

The University of Florida is a major, public, comprehensive, land-grant research university. It is among the nation's most academically diverse public universities. The University of Florida has a long history of established programs in international education, research, and service. It is one of only 17 public, land-grant universities that belong to the Association of American Universities.

For more information, please visit RAID Incorporated at www.raidinc.com.

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5 Branch Street, Methuen, MA 01844 Phone: 1-800-330-7335 Fax: 978-683-6656 www.raidinc.com

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