

# National Laboratory Delivers Supercomputing Performance using Fusion ioMemory™ Solutions

*“This new technology will allow us to meet the performance requirements critical to fulfilling our national security missions well into the future, while dramatically reducing power consumption and satisfying new energy conservation initiatives.”*

**Mark Seager,**  
Head of Advanced Computing Technology,  
Lawrence Livermore National Laboratory

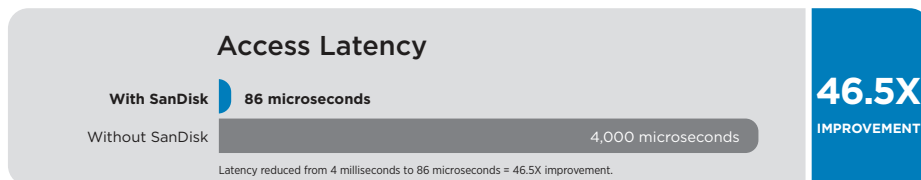
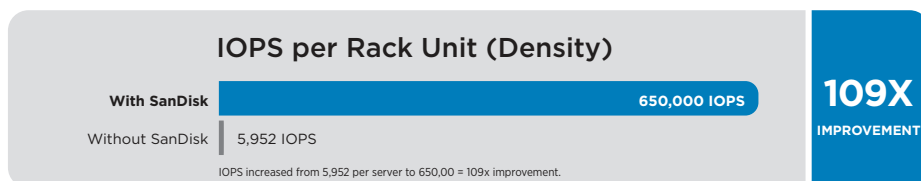
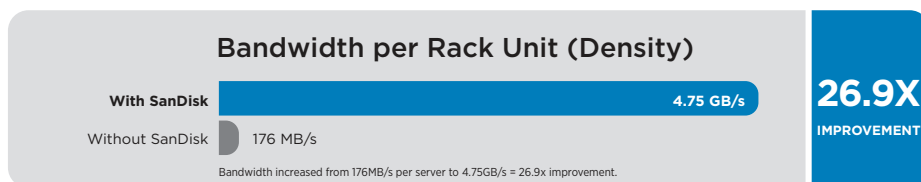
## The Challenge

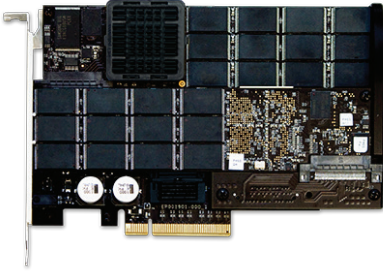
Lawrence Livermore National Laboratory (LLNL) knew it had a daunting task providing the Data Intensive Testbed for the National Nuclear Security Administration’s Advanced Simulation and Computing program’s Hyperion Project. It would need to deliver supercomputing performance, while at the same time reducing power consumption to meet new energy initiatives. Enter SanDisk®.

## The Solution

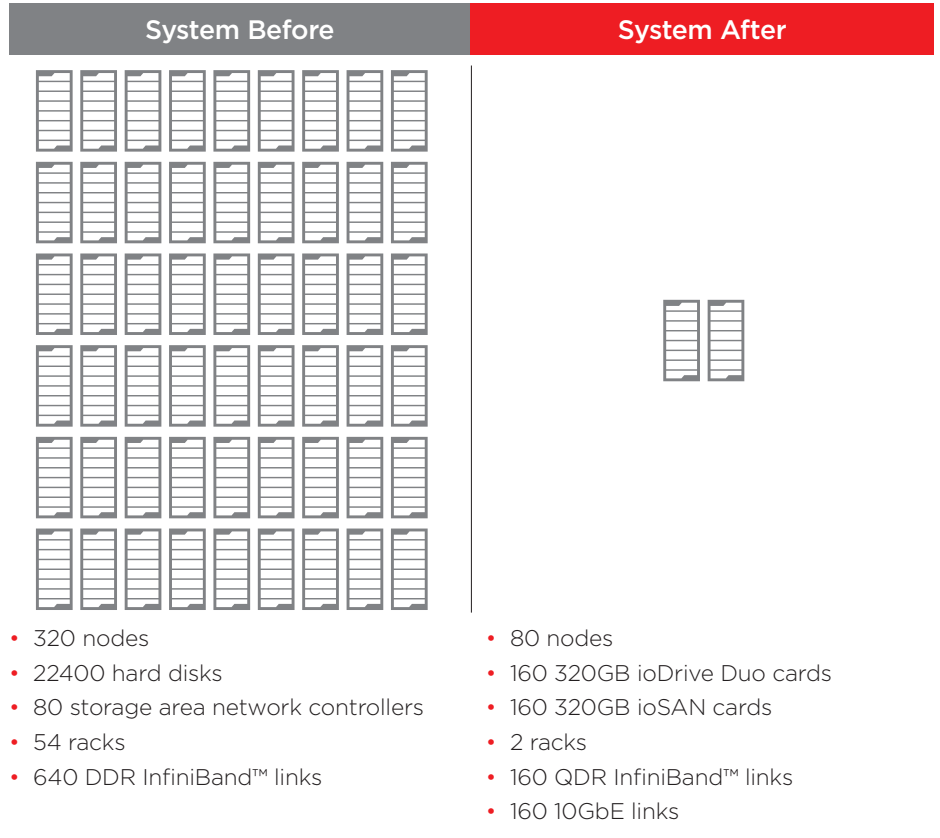
LLNL used SanDisk’s Fusion ioMemory system to create a high-performance storage array. Using Fusion ioMemory ioSAN® cards and Fusion ioMemory ioDrive® Duo cards, the cluster achieves more than an unprecedented 52,000,000 IOPS and 400GB/s aggregate bandwidth.

Incredibly, Fusion ioMemory products allowed LLNL to accomplish this feat in just two racks of appliances—something that would take a comparable hard disk-based solution over 54 racks. In fact, it would take over 100 of the SPC-1 benchmark’s leading all-flash systems combined to match the performance, at a cost of over \$300 million.





Fusion ioMemory™ - ioDrive® Duo



### About Lawrence Livermore National Laboratories

As a premier national security laboratory, Lawrence Livermore's mission is to advance and apply science and technology to:

- Ensure the safety, security, and reliability of the U.S. nuclear deterrent
- Reduce or counter threats to national and global security
- Enhance the energy and environmental security of the nation
- Strengthen the nation's economic competitiveness

At LLNL, teams of physicists, chemists, biologists, engineers and other researchers work together to achieve technical innovations and scientific breakthroughs and transform these advances into solutions for nationally important problems.

We continually push the frontiers of knowledge to build the scientific and technological foundation that will be needed to address the national security issues of the future.

### About the Hyperion Data Intensive Testbed

Lawrence Livermore National Laboratories created the testbed for the National Nuclear Security Administration's Advanced Simulation and Computing program's Hyperion initiative, a project designed to accelerate the development of the high-performance computing capabilities needed to ensure the safety, security and reliability of the nation's aging nuclear deterrent without underground testing.

### About the National Nuclear Security Administration

NNSA is responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation, and naval reactor programs. It also responds to nuclear and radiological emergencies in the United States and abroad. Additionally, NNSA federal agents provide safe and secure transportation of nuclear weapons and components and special nuclear materials along with other missions supporting the national security.

#### Contact information

fusion-sales@sandisk.com

#### Western Digital Technologies, Inc.

951 SanDisk Drive  
 Milpitas, CA 95035-7933, USA  
 T: 1-800-578-6007

Western Digital Technologies, Inc. is the seller of record and licensee in the Americas of SanDisk® products.

#### SanDisk Europe, Middle East, Africa

Unit 100, Airside Business Park  
 Swords, County Dublin, Ireland  
 T: 1-800-578-6007

#### SanDisk Asia Pacific

Suite C, D, E, 23/F, No. 918 Middle  
 Huahai Road, Jiu Shi Renaissance Building  
 Shanghai, 20031, P.R. China  
 T: 1-800-578-6007

For more information, please visit:

[www.sandisk.com/enterprise](http://www.sandisk.com/enterprise)

**SanDisk®**  
 a Western Digital brand

At SanDisk, we're expanding the possibilities of data storage. For more than 25 years, SanDisk's ideas have helped transform the industry, delivering next generation storage solutions for consumers and businesses around the globe.

The performance results discussed herein are based on LLNL internal testing and use of Fusion ioMemory products. Results and performance may vary according to configurations and systems, including drive capacity, system architecture and applications.

©2016 Western Digital Corporation or its affiliates. All rights reserved. SanDisk is a trademark of Western Digital Corporation or its affiliates, registered in the United States and other countries. Fusion ioMemory, ioDrive, ioSAN and others are trademarks of Western Digital Corporation or its affiliates. Other brand names mentioned herein are for identification purposes only and may be the trademarks of their respective holder(s).