



LLNL Redefines High Performance
Computing with Fusion Powered I/O

FUSION-iO

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 Fusion-io.

The Solution

LLNL used Fusion's ioMemory technology to create the world's highest performance storage array. Using Fusion's ioSANs and ioDrive Duos, the cluster achieves an unprecedented 40,800,000 IOPS and 320GB/s aggregate bandwidth.

Incredibly, Fusion's ioMemory allowed LLNL to accomplish this feat in just two racks of appliances—something that would take a comparable hard disk-based solution over 43 racks. In fact, it would take over 100 of the SPC-1 benchmark's leading all-flash vendor systems combined to match the performance, at a cost of over \$300 million.

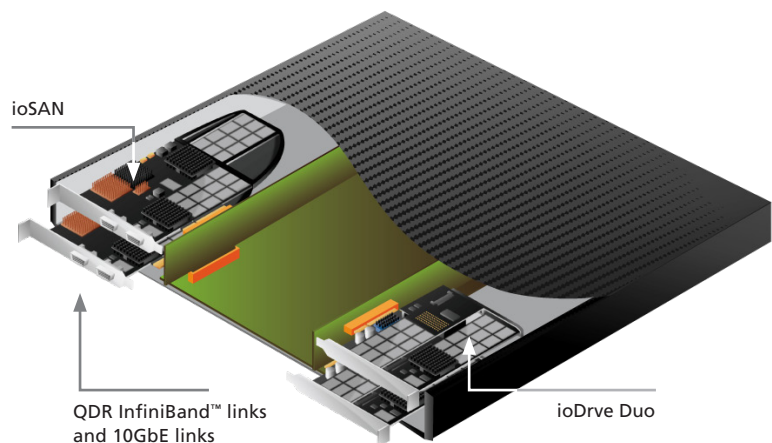


"This new technology will allow us to meet the performance requirements critical to fulfilling our national security missions well into the future, while dramatically reducing power consumption and satisfying new energy conservation initiatives."

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

SINGLE NODE SPECIFICATIONS

- Dual socket 1U storage appliance
- Two ioDrive Duo 320GB
- Two ioSAN 320GB connected via 2 x QDR InfiniBand™ links and 2 x 10GbE links



FUSION-io®

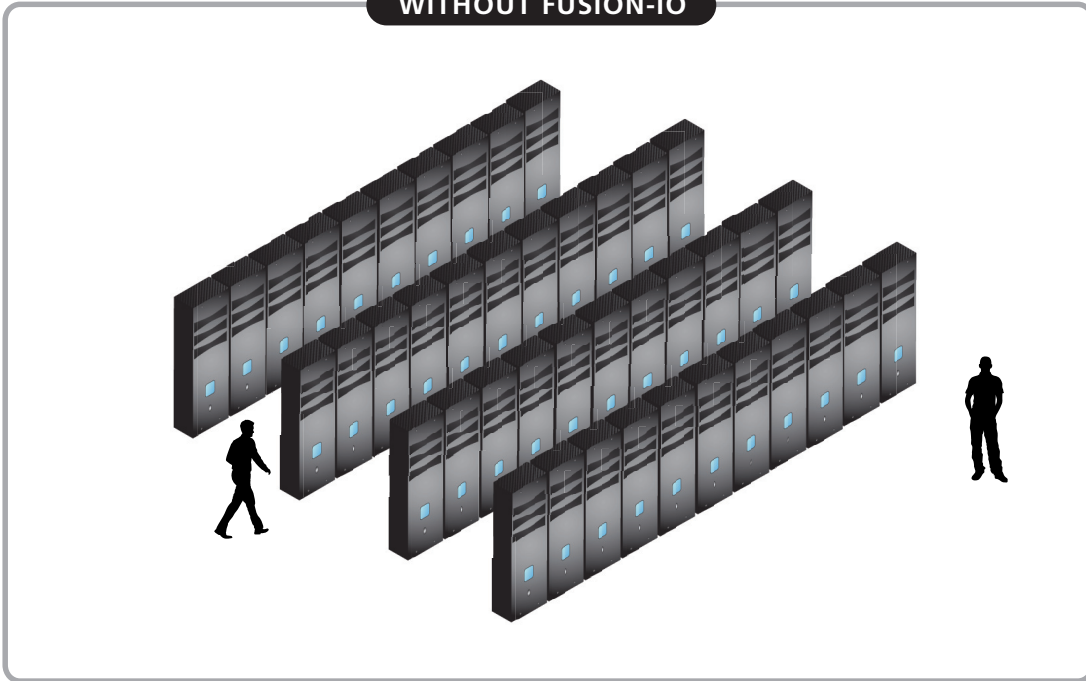
DATA CENTER FOOTPRINT WITHOUT FUSION-IO

- 132 nodes
- 9240 hard disks
- 66 SAN controllers
- 43 racks
- 264 DDR InfiniBand™ links

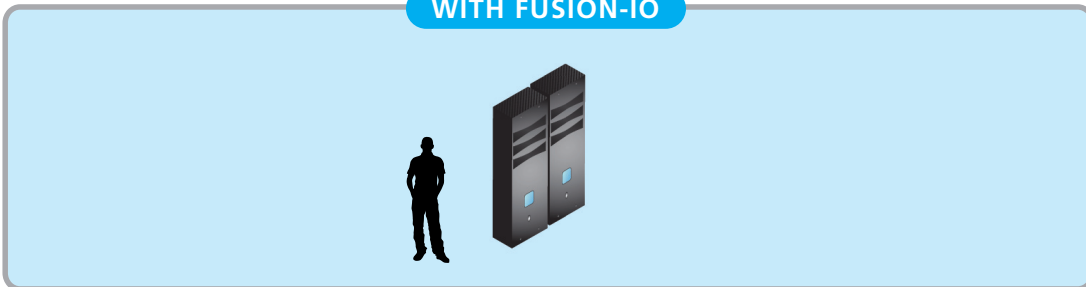
DATA CENTER FOOTPRINT WITH FUSION-IO

- 80 nodes
- 160 320GB ioDrive Duos
- 160 320GB ioSANS
- 2 racks
- 160 QDR InfiniBand™ links
- 160 10GbE links

WITHOUT FUSION-IO



WITH FUSION-IO



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