



The Computerworld Honors Program

Honoring those who use Information Technology to benefit society

Final Copy of Case Study

Status:

Laureate

Year:

2013

Organization Name:

Mellanox Technologies

Organization URL:

mellanox.com

Project Name:

Department of Veteran Affairs 40 Gb/s InfiniBand

Please select the category in which you are submitting your entry:

Health

Please provide an overview of the nominated project. Describe the problem it was intended to solve, the technology or approach used, how it was innovative and any technical or other challenges that had to be overcome for successful implementation and adoption. (In 300 words or less.)

The Department of Veteran Affairs (VA) operates the nation's largest integrated health care system, with more than 1,700 hospitals, clinics, community and counseling centers, domiciliaries, and other facilities for veterans of the United States Armed Forces. Each VA center produces, consumes and stores large quantities of data, creating an abundance of information and a need for efficient storage solutions. The VA needed data center interconnects solutions in order to better connect more than 200 servers across a large numbers of databases. The impact of storage latency can be significant on application performance. The VA had multiple issues with slow response times caused by slow storage latency. By adopting a Mellanox 40 Gb/s InfiniBand solution along with Microsoft SMB (Server Message Block), the VA was able to reduce latency and increase performance of its storage sub-system used in the data center. InfiniBand utilizes remote direct memory access (RDMA), which is in-box with Microsoft Server 2012. The RDMA with SMB reduced latency and enabled streamlined storage transfers within the VA's data center. When an application performs an RDMA read or write request, application

data is delivered directly to the network without the need to copy data to operating system data buffers, significantly lowering latency, offloading CPU cores and saving energy. Mellanox's 40 Gb/s InfiniBand solution with native RDMA created an average transfer rate of approximately 860 MB/s on initial transfer of sensitive files for the VA; applications able to take full advantage of RDMA achieved a transfer rate of 3GB/s, a much higher, faster rate than the department had experienced without InfiniBand solutions. Connecting 200 servers, the Mellanox's 40 Gb/s InfiniBand solution moves data quickly from server to server, making data more accessible and available for analysis across different applications.

When was this project implemented or last updated? (Please specify month and year.) Has it incorporated new technologies and/or other innovations since its initial deployment? (In 300 words or less.)

Phase one of the project was implemented in September 2012.

Is implementation of the project complete? If no, please describe the project's phases and which phase the project is now in. (In 300 words or less.)

The VA and Mellanox have completed the current project.

Please provide at least one example of how the technology project has benefited a specific individual or organization. Feel free to include personal quotes from individuals who have directly benefited from the work. (In 300 words or less.)

By lowering the latency of storage operations, the data transfer rate jumped, dramatically improving application response time. The VA is able to save valuable time and resources, benefiting veterans and the health and wellness providers that serve them across the department's service units. Faster interconnect means faster servers and computers. Critical medical information can be pulled and analyzed throughout the VA's departments and services thanks to a faster back-end solution. "We do a lot of data transfer. Being able to move the data at InfiniBand speeds from server to server has been a big boost for us." -- Augie Turano, a solutions architect at the VA.

Would this project be considered an innovation, a best practice or other notable advancement that could be adopted by or tailored for other organizations and uses? If yes, please describe that here. (In 300 words or less.)

As demand for more computing power and access to data continues to increase, application owners and IT managers are seeing the important role fast interconnect plays in optimizing application performance and delivering a higher return on investment of their servers and storage systems. InfiniBand solutions can be adopted and added on to any data center that may need faster and more efficient data retrieval. This means that through an InfiniBand solution, organizations will experience: improved system utilization, improved system performance, faster access to data, and reduced cost of operations. This has been quite an innovation for us to be able to transfer data at InfiniBand speeds. Reducing the amount of time required to access and move data in our environment is a major accomplishment, increasing productivity for researchers and improving services and access for our veterans.



If there are any other details that the judges should know about this project, please note them here. (In 300 words or less.)

Deploying InfiniBand on the latest Operating Systems such as Windows 2012 greatly improved our results and allowed us to take full advantage of InfiniBand's capabilities. Windows 2012 with SMB 3.0 fully supports RDMA, a feature known as SMB Direct, which allowed us to increase throughput threefold over 10Gb Ethernet. Moving from 10Gb Ethernet to 40Gb InfiniBand using RDMA with Microsoft SMB was a simple operation. Once the IB switch was deployed, we simply installed the IB cards in the system and assigned the appropriate drivers.