

NASA Demonstrates Cross-Country Visualization Application Using Obsidian Longbows

PRESS RELEASE

Date Released: Thursday, November 23, 2006

Source: [Obsidian Research Corporation](#)

Obsidian Research Corporation, the leader in InfiniBand range extension, helps NASA bring the power of its top-rated Columbia supercomputer to SC06 by using the Obsidian Longbow XR to transparently extend the benefits of its InfiniBand network across a 6,400 km 10GE Wide-Area Network (WAN). Since many of NASA's important life science and engineering projects are too large to be solved by investigators in a single location, data distribution and collaboration among scientists is key to solving some of the most important challenges facing the planet. Obsidian Longbows enable this interaction to happen in real-time by supporting remotely located engineers and scientists with reliable access to high-end computing, simulation tools, and massive data distribution. "Obsidian is excited to be working with NASA to help them efficiently extend its compute resources across geographically-distributed scientific centers," said Dr. David Southwell, CEO of Obsidian Research Corporation, "The visualization demonstration at SC06 whereby fluid dynamic simulations from the new Orion spacecraft design are displayed in real-time across the country illustrates the power of InfiniBand range extension."

InfiniBand Range Extension Allows NASA to Bring Its Orion Project to SC06 NASA's Columbia supercomputer, located in Mountain View, California, uses InfiniBand interconnect -- with its low-latency, RDMA capability, and superior scalability -- to achieve performance levels necessary to tackle some of NASA's toughest science and engineering problems. For example, a thorough understanding of the fluid dynamics of the flow surrounding the Orion Crew Exploration Vehicle -- a new spacecraft designed to carry astronauts back to the Moon and later to Mars -- is key to a smooth descent and accurate prediction of the landing location. This requires the aerodynamics of the vehicle be characterized well into the subsonic flow regime, which is difficult to predict experimentally as well as computationally. Using the InfiniBand-based Columbia supercomputer is a perfect fit for this compute-intensive project and using NASA's OVERFLOW solver provides insights into the problem and potential solutions.

However, problems arise as these large aerodynamic data sets -- in excess of 1.5TBytes -- need to be visualized in other locations for analysis and collaboration. By utilizing InfiniBand range extension products, NASA can maintain the latency, efficiency and performance benefits of the local network across WANs. The Obsidian Longbow XRs seamlessly transport InfiniBand-enabled data sets across 10Gb/s optical WANs -- in NASA's case a 10GE link from National LambdaRail (NLR) -- while maintaining the quality-of-service characteristics necessary for interactive visualization experiences of sensitive data. "Our long-distance, ultra-fast InfiniBand connection will enable NASA engineers at multiple centers to concurrently explore and characterize, in real time (as data is being generated), the aerodynamics and other parameters of new spacecraft designs such as the Orion Crew Exploration Vehicle," explains Simulation Assisted Risk Assessment Project Manager, Jerry Yan.

Come See Orion Visualization Demo at SC06, NASA Booth #917

NASA will be visualizing data from its Orion program on a large Hyperwall screen system located in its booth (#917). This real-time display of fluid dynamic activity egresses the Columbia supercomputer via its InfiniBand I/O fabric. An Obsidian Longbow XR in California transparently encapsulates the InfiniBand traffic onto a 10GE path through National LambdaRail (NLR), which is safeguarded by IPsec cards installed into two Cisco Catalyst 6500 switches. Located 6,400 km away, a second Obsidian Longbow XR in the NASA booth at SC06 in Tampa, Florida receives

the NLR feed and regenerates an InfiniBand link, which is fed to and displayed by NASA's InfiniBand-based HyperWall system.

About Obsidian

Obsidian Research Corporation and the Obsidian Longbow LP are the developers of Longbow, a series of InfiniBand range extension products. Longbow technology allows an InfiniBand fabric, normally a short-range network used in high-performance computing, to be extended via optical fiber over varying distances. Longbow connects across Campus, Metro or Global networks to offer unparalleled high-bandwidth, low-latency access to InfiniBand compute and storage resources. Obsidian is available online at www.obsidianresearch.com.

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