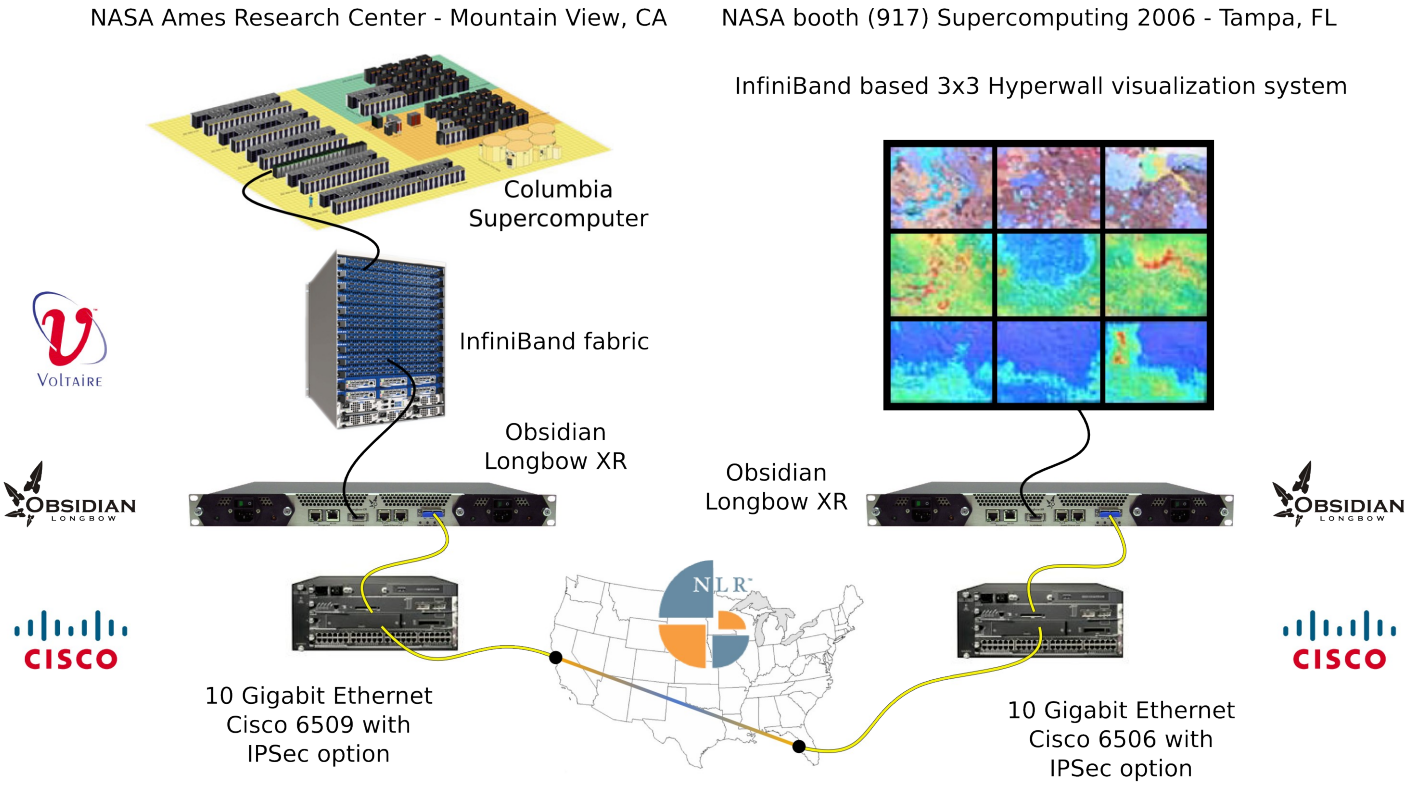
Remote Columbia InfiniBand Visualization

NASA's "Columbia" supercomputer is harnessed by an InfiniBand connection to its "Hyperwall" visualization facility. Using Obsidian's Longbow XR range extension technology, this same InfiniBand link is relayed from California to Supercomputing 2006 through the National LambdaRail 10Gigabit Ethernet WAN -- delivering high-fidelity visualization experiences with global reach.



Background

Supercomputers and large clusters are expensive, fixed resources. Wide Area Networks (WANs) can be used to move data to and from supercomputers, but it can be very difficult to reach acceptable transfer efficiencies using TCP/IP-based communications. Beyond bulk data transport, tasks such as remote interactive visualization demand Quality-of-Service (QoS) characteristics that further exacerbates the challenge.

The Obsidian Longbow XR offers a solution to these problems for InfiniBand-based computers, by seamlessly interconnecting remote InfiniBand fabrics across 10Gbits/s optical WANs.

The Demonstration

NASA and Obsidian are pleased to be demonstrating real-time visualization rendered directly from Columbia into the Supercomputing 2006 showfloor:

Thorough understanding of the fluid dynamics of the flow surrounding the Orion Crew Exploration Vehicle (this vehicle will carry astronauts back to the moon and later to Mars) during its descent and landing is important for the accurate prediction of its landing location. A computational simulation of the flow surrounding an Orion command module, based on NASA's OVERFLOW solver, provides some insight into the vehicle's dynamics.

The visualization data egresses Columbia through its Voltaire-supplied InfiniBand IO fabric. An Obsidian Longbow XR in California transparently encapsulates the InfiniBand traffic onto a 10 Gigabit Ethernet path through National Lambda Rail (NLR), which is safeguarded by IPSec cards installed into two Cisco® Catalyst® 6500s. A second Obsidian Longbow XR in the NASA booth at Supercomputing 2006 in Tampa receives the NLR feed and regenerates an InfiniBand link, which is fed to, and displayed by, NASA's InfiniBand-based Hyperwall system.

Applications

The Obsidian Longbow XR avoids bandwidth optimization problems associated with TCP/IP-based communications across global networks by extending InfiniBand flow control semantics across the WAN.

Obsidian Longbow XRs represent attractive solutions for migrating large data sets between supercomputers, or between supercomputers and data consumer and producers - either in a bulk batch mode or, as in this case, as high-fidelity remote-access streams providing direct access to supercomputer-driven interactive visualizations.

Supporting OC-192c SONET/SDH, ATM and 10 Gigabit Ethernet WANs, Longbows are a flexible network solution component suitable for sustaining speeds within a few percent of wire speed for routine exchange of Terabyte-scale data sets and beyond with a very low latency.

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