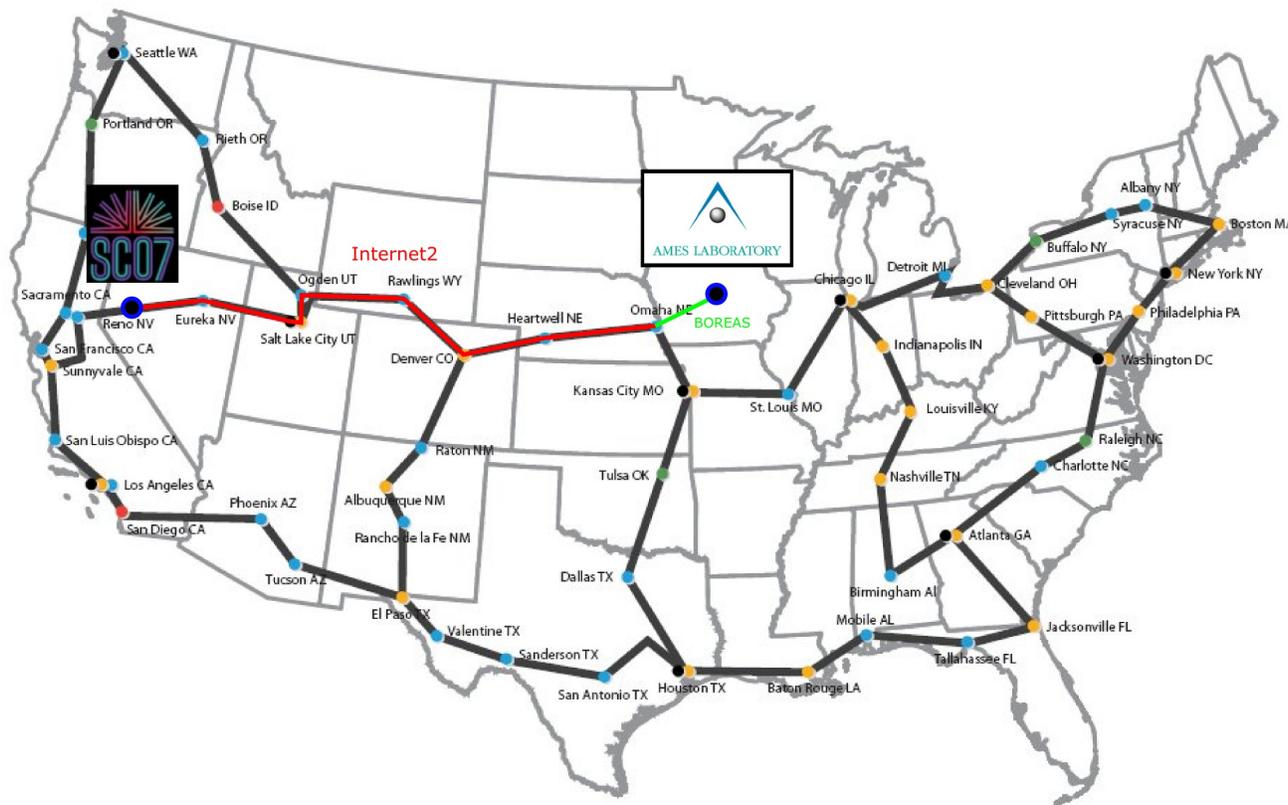# Routed InfiniBand PVFS storage - Xnet

US Department of Energy's Ames Laboratory teams with Obsidian Strategics to connect storage in Iowa with SC|07 using PVFS to drive InfiniBand traffic via Longbow XRs across a 1600 mile BOREAS/ Internet2 10Gigabit Ethernet link.

Background

For very large scale computing, storage is a critical element of the overall system architecture. Data sets must be moved into and out of memory very rapidly to maintain high processor utilization and system throughput. PVFS (Parallel Virtual File System) was developed by the US Department of Energy to provide fast parallel access to data for supercomputers – it operates natively in InfiniBand networks, typically connecting processors to storage within a machine room.

Bulk data must also move efficiently between supercomputers and storage that are located across the country or even around the world. TCP/IP has proved very difficult to configure for reasonable efficiency across high-latency, high-bandwidth networks.

Obsidian Strategics has solved this problem by fielding the Longbow family of products that allow the normally very short-reach InfiniBand protocol to ride global 10 Gigabit optical networks in a manner that is transparent to InfiniBand equipment at each end of a link. This capability unlocks InfiniBand's very high bandwidth efficiency for wide area bulk transport.

This demonstration uses several Longbow XR devices, which give InfiniBand global reach via encapsulation and protocol management over 10Gigabit Ethernet or SONET transports (Packet Over SONET or ATM AAL 5).

The Demonstration

At Supercomputing 2007, this Xnet exhibit demonstrates 1600+ mile InfiniBand PVFS disk transfers through Longbow XR devices driving a 10 Gigabit Ethernet WAN link comprising segments of BOREAS and Internet2 networks. Within the show floor, the link taps into the routed InfiniBand storage network. Longbow XRs – range-extenders that integrate the first InfiniBand router implementation – provide the means to connect otherwise independ InfiniBand subnets. This massively simplifies network administration, scalability, stability and security, by allowing local nodes to be serviced by their local subnet managers.

Ames Laboratory adapted the open-source PVFS to operate with the InfiniBand routers and is providing live demonstrations of high speed storage transfers between Ames, Iowa and Reno, Nevada.

Obsidian Strategics supports the OpenFabrics Alliance, and has contributed to the OFED InfiniBand stack/subnet manager sufficient code to provide qualified router support.

Applications

Scalable, fast and robust storage transport between remote InfiniBand-enabled computer facilities.