

Open Cloud Consortium Wins Bandwidth Challenge at SC09 Conference in Portland, Oregon

Media Contact

Robert Grossman

Open Cloud Consortium

rlg@opencloudconsortium.org

December 7, 2009 Chicago -- At the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC09), a research team led by the Open Cloud Consortium won the Bandwidth Challenge competition for new technology to support data intensive applications over wide area clouds. In addition, the Open Cloud Consortium won in the Best Overall category of the SC 09 Bandwidth Challenge.

In addition to the Open Cloud Consortium (OCC), the research team included the Laboratory for Advanced Computing (LAC) at the University of Illinois at Chicago, the International Center for Advanced Internet Research (iCAIR) at Northwestern University, and the Naval Research Laboratory (NRL).

The team demonstrated three data intensive applications, each showing how such applications could span geographically distributed data centers when supported by the appropriate hardware and software infrastructure. The demonstration was based on four high performance data centers located in Chicago, Baltimore and San Diego and interconnected at the StarLight communications exchange by wide area 10 Gb/s networks using lightpaths provided through a partnership with the National Lambda Rail (NLR) and Cisco Systems, Inc.

The first application used the OCC's Open Cloud Testbed to process very large datasets over 256 servers in 4 data centers connected by wide area high performance networks. Data was exchanged at over 100Gb/s among the participating nodes. This application used a new version (version 1.24) of the open source software Sector/Sphere large data cloud, which was developed by Laboratory for Advanced Computing. A protocol called UDT (also developed by the Laboratory for Advanced Computing) is used by Sector/Sphere to achieve high performance, even over clouds that are distributed.

“With the Sector/Sphere technology demonstrated at the SC 09 Bandwidth Challenge, new classes of large data cloud applications are now practical,” according to Robert Grossman, who is the Director of the Laboratory for Advanced Computing and Managing Partner of Open Data Group.

The second application was an image rendering application developed by the Naval Research Laboratory that delivered very high resolution visualization (computed by remote cloud systems) over wide area Infiniband and IPv6. A hardware implementation of UDT was deployed to support the wide area Infiniband protocol.

The third application used a new protocol called UDX that is a lightweight variant of the UDT protocol. Using the UDXnet national networking testbed, UDX was able to sustain a data transfer rate of 9.2 Gb/s over a 10 Gb/s connection with a 200ms RTT (which corresponds to a 12,000 mile path, or long enough to reach half way around the world).

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About the Open Cloud Consortium

The Open Cloud Consortium (OCC) is a not-for-profit organization that: supports the development of standards for cloud computing and frameworks for interoperating between clouds; develops benchmarks for cloud computing; supports reference implementations for cloud computing; manages a testbed for cloud computing called the Open Cloud Testbed; and, sponsors workshops and other events related to cloud computing. (www.opencloudconsortium.org)

About the Laboratory for Advanced Computing (LAC) at the University of Illinois at Chicago

The Laboratory for Advanced Computing (LAC) at the University of Illinois at Chicago (UIC) was founded in 1990 and performs research in data-intensive computing, cloud computing, high-performance networking and related areas. (www.labcomputing.org)

About the International Center for Advanced Internet Research (iCAIR), Northwestern University

iCAIR accelerates leading-edge innovation and enhanced global communications through advanced Internet technologies, in partnership with the international community, and national partners. With its research partners, iCAIR conducts basic network R&D, designs large-scale experimental testbeds, and operates local, regional, national and international advanced prototype networks and facilities. (www.icaire.org)

About the NRL Center for Computational Science

The Naval Research Laboratory (NRL) was established in 1922 as the U.S. Navy's corporate laboratory. Today, NRL is aligned with the Office of Naval Research (ONR) to conduct a broadly based multidisciplinary program of scientific research and advanced technological development. The Center for Computational Science (CCS) is an Information Technology Division (ITD) organization engaged in both

Research and Development (R&D) in support of DoD and Government sponsors as well as an IT service provider to NRL/ONR users. The CCS research mission is focused on rapid prototyping open source large data infrastructures to the DoD. Built of leading edge advanced computing, networking, visualization and information storage architectures, the vision of the CCS is to achieve Terabit data flows.

About the National LambdaRail

National LambdaRail is advancing the research, clinical, and educational goals of members and other institutions by establishing and maintaining a unique nationwide network infrastructure that is owned and controlled by the US research community. Ownership of the underlying optical infrastructure ensures the research community unprecedented control and flexibility in meeting the requirements of the most advanced network applications and providing the resources demanded by cutting-edge network research. (www.nlr.net)