Scientists Showcase Innovations
in 100 Gbps Network Services Required
for Next Generation Research and Discovery

For the Global LambdaGrid Event, Researchers Demonstrate the Path to Petascale Science

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Chicago—Oct. 26, 2012— Today for the 12th Annual Global LambdaGrid Workshop, sponsored by the Global Lambda Integrated Facility (GLIF), a consortium of researchers demonstrated a 100 Gbps optical network testbed established to develop advanced services and technologies for next generation data-intensive "petascale science." The testbed is a contiguous facility from the Washington DC area to the StarLight International/National Communications Exchange Facility in Chicago.

In contrast to more general implementations of 100 Gbps services, which aggregate many millions of small traffic flows, this facility supports extremely large-capacity data flows, including a 98 Gbps data transfer between a single pair of high performance servers with zero packet drops from the East Coast to Chicago and back (approximately 2,000 miles)The research consortium was established to investigate new networking techniques, technologies, and services for petascale science, with a focus on 100 Gbps end-to-end data flows, including disk-to-disk and memory-to-memory. These innovations were showcased during the demonstrations; for example, transporting extremely large-volume individual data flows over long distances with high performance and low latency. Members of the consortium include the NASA Goddard Space Flight Center, the International Center for Advanced Internet Research at Northwestern University (iCAIR), and the Laboratory for Advanced Computing at the University of Chicago (LAC).

To establish the petascale science optical-network testbed, the consortium formed a partnership with Sidera Networks, Ciena, Mid-Atlantic Crossroads (MAX), Metropolitan Research and Education Network (MREN) -- a seven state regional network, the StarLight consortium, and the Open Cloud Consortium --which manages the national Open Science Data Cloud testbed computational-science facility. Sidera Networks is providing a 100 Gbps low-latency path from the MAX exchange facility in Washington DC to the StarLight exchange in Chicago. Ciena is supporting this initiative with their high-performance 6500 Packet-Optical Platform and 5410 Reconfigurable Switching System. MREN and StarLight are providing support with StarWave, a multi-100-Gbps exchange facility.

Petascale science is comprised of many new techniques and methods scientists are using to undertake research in an increasing number of disciplines, including computational bioinformatics, high-energy physics, weather and climate simulation, earth science, computational genomics, nuclear simulations, cosmology, quantum chemistry, brain simulations, fusion science, and astrophysics. Petascale science requires both the generation of massive datasets using supercomputer, instrumentation, and experimental facilities and detailed computational data analysis at sites throughout the U.S. and the world.

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About NASA Goddard Space Flight Center

NASA's Goddard Space Flight Center is home to the nation's largest organization of combined scientists, engineers and technologists that build spacecraft, instruments and new technology to study the Earth, the sun, our solar system, and the universe. (www.nasa.gov/centers/goddard)

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

The International Center for Advanced Internet Research (iCAIR) at Northwestern University accelerates leading-edge innovation and enhanced global communications through advanced technologies, in partnership with numerous international community, and national partners. iCAIR partners with EVL at University of Illinois at Chicago, Argonne National Laboratory, and Calit2/UCSD, in collaboration with Canada's CANARIE and the Netherlands' SURFnet, to manage and grow the StarLight International/National Communications Exchange Facility. (www.icair.org)

About the MidAtlantic Crossroads (MAX)

The MidAtlantic Crossroads (MAX) is a regional optical network consortium founded by Georgetown University, George Washington University, the University of Maryland, and Virginia Tech. MAX serves Maryland, Virginia, and the District of Columbia region with a suite of advanced networking service capabilities, including advanced optical-based networking facilities in McLean, VA and College Park, MD. MAX is implementing 100G services, including 100G interfaces to interconnect with major national R&E networks and the NGIX-E exchange. (www.maxgigapop.net)

About Sidera Networks

Sidera Networks, LLC is the premier provider of tailored, high capacity communications services to carrier and enterprise customers. Sidera Networks offers a comprehensive suite of facilities-based services including: Ethernet, SONET, Wavelength, Dark Fiber, Internet Access, Colocation and more. With a fiber optic network leveraging unique rights-of-way that delivers connectivity to the major metropolitan areas from Maine to Virginia and out to Chicago, as well as access to Toronto and London, Sidera is committed to delivering cost-effective, custom solutions coupled with superior industry expertise, service and support. (www.sidera.net)

About Ciena

Ciena is the network specialist. Ciena collaborates with customers worldwide to unlock the strategic potential of their networks and fundamentally change the way they perform and compete. Ciena leverages its deep expertise in packet and optical networking and distributed software automation to deliver solutions in alignment with OP^n, its approach for building open next-generation networks. Ciena enables a high-scale, programmable infrastructure that can be controlled and adapted by network-level applications, and provide open interfaces to coordinate computing, storage and network resources in a unified, virtualized environment. (www.ciena.com)

About StarLight

StarLight is the world's most advanced national and international communications exchange facility. StarLight provides advanced networking services and technologies that are optimized for high-performance, large-scale metro, regional, national and global applications. With funding from the National Science Foundation (NSF), StarLight was designed and developed by researchers, for researchers. StarLight is managed by the Electronic Visualization Laboratory (EVL) at the University of Illinois at Chicago, the International Center for Advanced Internet Research (iCAIR) at Northwestern University, the Mathematics and Computer Science Division at Argonne National Laboratory, and Calit2 at University of California, San Diego, in partnership with Canada's CANARIE national networking organization and The Netherlands' SURFnet. (www.startap.net/starlight)

About the Metropolitan Research and Education Network (MREN):

The Metropolitan Research and Education Network (MREN), an advanced research and education (R&E) network provides services among seven states in the upper Midwest, including the management of a metro-area optical networking facility located at the StarLight International/National Communications Exchange Facility. The MREN facility exclusively focuses on providing service and infrastructure support for large-scale data-intensive R&E activities. (www.mren,org)

About the Laboratory for Advanced Computing

The Laboratory of Advanced Computing (LAC) at the University of Chicago performs research in the analysis of big data, data intensive computing, cloud computing and high performance networking. (www.labcomputing.org)

About the Open Cloud Consortium (OCC)

The Open Cloud Consortium (OCC) manages cloud computing infrastructure to support scientific research, such as the Open Science Data Cloud, cloud computing testbeds, such as the Open Cloud Testbed, develops reference implementations, benchmarks and standards, such as the MalStone Benchmark, sponsors workshops and other events related to cloud computing, and provides support to advanced research projects related to cloud technology. The Open Cloud Consortium is a consortium managed by the Center for Computational Science Research, Inc., which is an Illinois based not-for-profit corporation. (www.opencloudconsortium.org)