



## The Network for Advanced Research and Innovation

Owned by the U.S. research and education community, NLR is the ultra high-performance, 12,000-mile innovation platform for a wide range of academic disciplines and public-private partnerships. Learn more...

 

[HOME](#) [ABOUT US](#) [MEMBERS](#) [SERVICES](#) [RESEARCH SUPPORT](#) [PRESS ROOM](#) [CONTACT US](#)

### PRESS ROOM

[Press Room](#)  
[Press Releases](#)  
[Press Resources](#)  
[Featured Research](#)  
[Past Featured Research](#)  
[NLR and National Broadband](#)  
[NLR in the News](#)  
[Featured Research](#)



## NASA High-End Computing Testbed Runs Over National LambdaRail (NLR)

Optimizing Data Flows over 10, 40, and 100 Gbps Networks

**Cypress, CA, September 9, 2010** -- NASA has started to conduct end-to-end throughput performance benchmarking as part of its High-End Computing 20, 40 & 100 Gigabits per second (Gbps) Network Testbed initiative over a 4x10 Gigabit Ethernet (GE) infrastructure between Chicago and McLean, Virginia, deployed by National LambdaRail (NLR), the coast-to-coast, high-performance network owned by the U.S. research and education community.

Enabling time-efficient data flows over wide areas is a persistent issue impacting many advanced research disciplines. Even over 10 Gbps networks, throughput is often only about 10 Megabits per second (Mbps), so copying a single 10 Gbps file typically takes as long as 17 minutes. The objective of the NASA initiative is to optimize WAN file transfer over 10 Gbps as well as over emerging 40 and 100 Gbps networks by determining data transfer utilities and protocols that enable higher throughput and by preparing applicable testbeds to identify bottlenecks and explore possible solutions.

J. Patrick (Pat) Gary, computer scientist, Sciences and Exploration Directorate, Goddard Space Flight Center, NASA, said, "NASA is exceptionally pleased to be using the 4x10 GE deployment enabled by NLR between Chicago and McLean, Virginia near Washington, D.C. NLR has been very forthcoming, helping us deploy a set of robust, high-speed connections that are now serving as the underlying network platform supporting a wide range of strategic research projects at NASA, including in the areas of advanced networking, climate science, earth science and astrophysics."

Wendy Huntoon, acting NLR CEO and NLR CTO, said, "NLR has a unique focus on serving the country's leaders in advanced research such as NASA by providing individualized project support and network services and applications that meet demanding standards of ultra high availability, performance and security. We're delighted to be able to provide the testbed infrastructure for NASA's ground-breaking research."

NASA has shipped two of its high-performance network-test workstations and a 24-port 10-Gigabit Ethernet (GE) switch to Northwestern University's International Center for Advanced Internet Research (iCAIR) which has connected them with NLR via the StarLight international exchange point in Chicago. NLR turned up new 4x10 GE links between StarLight and the NLR Point-of-Presence (PoP) in McLean for NASA's maximum throughput testing. NASA then demonstrated 40 Gbps bi-directional memory-to-memory and 10 Gbps unidirectional disk-to-disk data throughput between its servers at the NASA Goddard Space Flight Center in Greenbelt, Maryland and StarLight. The Mid-Atlantic 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. The 4x10 GE connection traverses the MAX research infrastructure between the NLR PoP in McLean, Virginia and the NASA Goddard Space Flight Center in Greenbelt, Maryland.

These NASA network-test workstations, first publically demonstrated last November during the SC09 (Supercomputing 2009) conference in Portland, Oregon, individually have the capability to conduct 80-Gbps bi-directional memory-to-memory data transfers and 10 Gbps uni-directional disk-to-disk data copies (see Introduction to NASA High End Computing (HEC) WAN File Accessing Experiments/Demonstrations at SC09).

And from a newly created Earth Science Grid Data Node hosted in the recently re-named NASA Center for Climate Simulation, NASA is also using this NLR-enabled 4x10 GE pathway to flow 100's of terabytes of high-resolution climate forecasts from its Goddard Institute for Space Studies as well as its Global Modeling and Assimilation Office groups. These climate forecasts are expected to be major contributors to the Intergovernmental Panel on Climate Change's Assessment Report 5, scheduled to be published in 2013.

Additionally, plans are now under consideration to use the 4x10 GE testbed over NLR during the SC10 (Supercomputing 2010) conference in November. The testbed would be used to support NASA data exchanges in a set of individual experiments and demonstrations collectively titled "Using 100G Network Technology in

Support of Petascale Science". Operating between the NASA and Laboratory for Advanced Computing /ICAIR Exhibit Booths, these experiments will evaluate approaches to 100 Gbps networking using different sets of vendor equipment and NASA-built net-test-workstations capable of demonstrating >100 Gbps uni-directional memory-to-memory data flows enabled by the TCP/UDP network testing tool nuttcp.

In the near future, the High End Computing Network testbed will be interconnected using NLR to the Open Cloud Testbed to conduct additional network research experiments related to using novel cloud technology for data intensive science.

###

#### **About National LambdaRail (NLR)**

Owned and operated by the U.S. research and education community, NLR is one of the world's most advanced networks: 12,000 miles of high-performance optical fiber coast to coast, capable of speeds up to 100 Gigabits per second. Over 280 universities and federal labs use NLR as their network for leading-edge research. With no restrictions on usage or bandwidth, very high availability, a choice of next-generation network services and applications, and customized support for individual researchers and projects, NLR creates opportunities for collaboration, innovation and commercialization among the global research community and between private and public partners. For more information, please visit <http://www.nlr.net>.

#### **Media Contact**

Kristina Scott, NLR, 650.678.9034, [kscott@nlr.net](mailto:kscott@nlr.net)