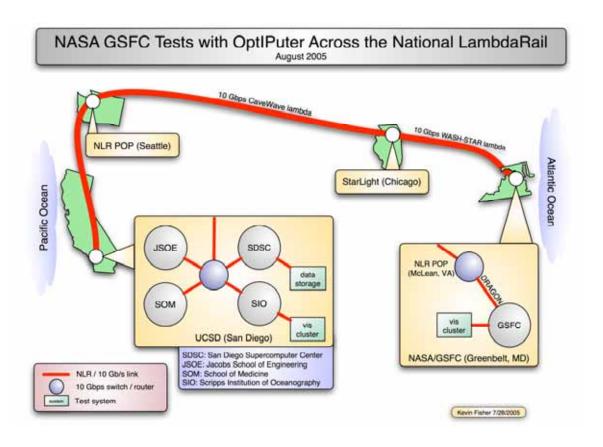**10 Gigabit per Second Coast-to-Coast Network Established Between the University of California, San Diego and Goddard Space Flight Center**

July 28, 2005 witnessed the installation of the last link establishing a 10-gigabit per second (10-Gbps) coast-to-coast, end-user-to-end-user network connection between the University of California, San Diego (UCSD) and NASA Goddard Space Flight Center (GSFC) in Greenbelt, MD. An exemplary multi-organizational collaboration made this connection possible. Key contributors include the National LambdaRail (NLR); the NSF-funded, UCSD-led OptIPuter project; the NSF-funded, University of Maryland, College Park-led DRAGON project; and the GSFC/Code 606.1-led Lambda Network (L-Net) project.

Prior to July 28, the 10-Gbps network extended across the NLR from UCSD only to McLean, VA, and was used by the OptIPuter and L-Net projects at the SC2004 Conference during November, as described in http://cisto.gsfc.nasa.gov/L-Netpdfs/L-Net_NLR_TechBrief.pdf. The DRAGON and L-Net projects jointly implemented the remaining 10-Gbps link between McLean and GSFC over an 80.9-kilometer dedicated wavelength of DRAGON's Movaz-equipped regional optical network (RON).

The illustration below provides an overview of the 10-Gbps connection between the computational, storage, and visualization clusters in UCSD's Scripps Institution of Oceanography, Jacobs School of Engineering, School of Medicine, and San Diego Supercomputer Center and those in GSFC's Sciences and Exploration Directorate.

The 10-Gbps link across the DRAGON RON uses L-Net-acquired Finisar pre-commercial, off-the-shelf, ITU-T G.698.1 DW100S1-2D-compliant, dense-wave division multiplexing 10-Gbps form-pluggable (XFP) transmitter/receiver optics. The end-points of the link are L-Net's Force10 E300 10-Gbps switch/router located in Level3's "carrier hotel" facility in McLean and L-Net's Force10 E600 10-Gbps switch/router located in a GSFC building.

Also on July 28, the DRAGON and L-Net projects implemented a second 10-Gbps link over DRAGON's RON. This time, they used DRAGON-provisioned standard 10-Gbps optical transponders from Movaz Networks. All DRAGON participants share this second 10-Gbps link. They currently access the link via DRAGON-deployed Movaz standard 10-Gbps transponders located at GSFC; McLean; DRAGON headquarters in College Park, MD; and the University of Southern California/Information Sciences Institute-East site in Arlington, VA.

As with the first 10-Gbps link across DRAGON, GSFC connects with the second 10-Gbps link via the L-Net's Force10 10-Gbps switch/routers in McLean and Greenbelt. Furthermore, the L-Net's Force10 E300 switch/router in McLean interconnects this second 10-Gbps link with the Internet2 Hybrid Optical and Packet Infrastructure (HOPI) project's new 10-Gbps network across the NLR.

With simultaneous use of both 10-Gbps links, GSFC-based scientists and engineers and their colleagues across the country can conduct projects that require up to 20-Gbps data flows to/from computational, storage, and visualization clusters at GSFC. In anticipation of this new network capability, researchers submitted proposals for new science initiatives to NASA's Research Opportunities in Space and Earth Sciences program. Proposed applications involve the Coordinated Earth Observing Program, hurricane prediction, global aerosols, remote viewing and manipulation of large Earth data sets, integration of laser and radar topographic data with land cover data, and large-scale geodynamics ensemble simulations.

Related Links:

DRAGON project <http://dragon.east.isi.edu/>

Finisar <http://www.finisar.com/>

Force10 <http://www.force10networks.com/>

HOPI project <http://networks.internet2.edu/hopi/>

L-Net project <http://cisto.gsfc.nasa.gov/IRAD_Lambda.html>

Level3 <http://www.level3.com/>

Movaz Networks <http://www.movaz.com/>

National LambdaRail <http://www.nlr.net/>

OptIPuter project <http://www.optiputer.net/>