



Mid-Atlantic Crossroads

Advanced Regional Internetworking for
Higher Education and Research

Office: 8400 Baltimore Avenue
Suite 102
College Park, Maryland 20740
301.405.6666

May 31, 2008

Welcome

Welcome to the May 2008 edition of the MAX Newsletter. In these updates we highlight current technical activities and policy initiatives amongst our staff, our participants, the Regional Optical Network and national networking communities. Please let us know your thoughts, and especially your suggestions.

Executive Director Message

This time of year with the academic year finishing, graduations at all levels, fiscal years ending, new budgets being developed along with promising new initiatives, and the summer vacation interlude starting, seems particularly busy if not mildly frantic.

MAX is in the final stages of preparing for Phase 2 of the optical upgrade to the Fujitsu platform across the fiber ring that spans the District of Columbia to College Park. We expect this effort to be complete by the end of June.

Thanks to the willingness of Juniper and Fujitsu to loan MAX new 40G routers, interfaces, and transponder equipment and NASA GSFC to help participate in generating persistent large data streams, we will be setting up and conducting several experiments late June and early July. This is an exciting opportunity for us to learn more about the details involved in such aggregate bandwidth capabilities. And it comes at a good time since we are starting to receive serious inquiries for 10G interconnections to the MAX network infrastructure.

And to follow up last month's note on performance tuning, we've added a new page to the MAX website. Please let us know of additional

tools, sites, results, or papers you would like to see added.

<http://wiki.maxgigapop.net/twiki/bin/view/MAX/PerformanceTuning>

Peter O'Neil

MATP and MAX Extend Collaboration

Over the course of the past year MATP and MAX enabled participants from both consortiums to share Layer 3 routed gateway exchanges with Internet2 and NLR. We've now expanded our joint efforts to allow MAX to provision participants directly to NLR interfaces at Layers 1, 2, and 3 at the McLean node. Such an arrangement strengthens both consortiums and provides for MAX to become directly responsive to and responsible for its participant requests for NLR services. MAX is extremely appreciative of our MATP colleagues support and encouragement in developing this collaboration.

NLR Announces New Business Alliance

National LambdaRail (NLR) announced that they have formed a strategic business alliance with Darkstrand, Inc. The goal of this alliance is to leverage NLR resources and infrastructure in new ways that benefit NLR members, research groups within the member universities, and the marketplace in order to create a sustainable path to the future.



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The mission of the National LambdaRail is to support experimental and production networks that make possible advances in networking research and next-generation applications. Since its inception, the NLR has fulfilled that mission and maintained its position as the vanguard of new networking technology. In working partnership with Darkstrand, NLR now has an unparalleled and value-added opportunity to introduce these advances into the marketplace.

The mission of Darkstrand is to create a bridge between the researchers at NLR member institutions and the many cross-industry companies that need advanced production and infrastructure capabilities. Darkstrand's goal is to raise the public profile of NLR affiliated institutions by providing them with steady access to a corporate America that wants what they can offer -- advanced solutions to workflow problems and new networking technology as it evolves. Working with NLR institutions and state/local governments, Darkstrand will help drive the economic incentive initiatives that can make this happen.

The NLR and Darkstrand share many synergies, but both organizations are focused on one common goal: advancing global education and research development through networking technology. We believe this business alliance provides a solid foundation upon which we can build a viable and productive framework for the future.

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

<http://www.darkstrand.com/>

NIST Draft Key Derivation Function

NIST announced the release of draft Special Publication 800-108, Recommendation for Key Derivation Using Pseudorandom Functions. This Recommendation specifies techniques for key derivation from a secret key using pseudorandom functions (PRF). Please submit comments to draft-SP800-108-comment@nist.gov with "Comments on SP800-108" in the subject line. The comment period closes on June 28, 2008. The draft is available here:

http://csrc.nist.gov/publications/drafts/800-108/Draft_SP-800-108_April-2008.pdf

HHMI Launches Online Protein Game

Multiplayer online gaming brings to mind fabulously successful titles, such as "World of Warcraft" and "Ultima." On May 8, Howard Hughes Medical Institute (HHMI) researchers at the University of Washington are bringing the arcane world of protein folding to the online gaming arena with the launch of "Foldit," a free game in which players around the world compete to design proteins. The real world benefit: Scientists will test proteins designed by the game's players to see if they make viable candidate compounds for new drugs.

The development of the online game is a natural extension of HHMI investigator David Baker's quest to understand how proteins - the building blocks of cells — fold into unique three-dimensional shapes. Over the past decade, Baker and his colleagues have made steady progress in developing computer algorithms to predict how a linear string of amino acids will fold into a given protein's characteristic shape. A detailed understanding of a protein's structure can offer scientists a wealth of information — revealing intricacies about the protein's biological function and suggesting new ideas for drug design.

Predicting the shapes that natural proteins will take is one of the preeminent challenges in biology, and modeling even a small protein requires making trillions of calculations.

<http://www.hhmi.org/news/foldit20080508.html>

http://fold.it/portal/adobe_main

UMD OIT Digital Forensics Lab

The University of Maryland's Office of Information Technology (OIT) received \$109,514 in funding from the CyberWATCH consortium to establish a regional Digital Forensics Lab (DFL) through a grant from the National Science Foundation. The DFL will be a "virtual lab" that will serve as a resource in the teaching of digital forensics at CyberWATCH universities and community colleges as well as serve as a resource for performing digital forensic investigations in the future. Also, it will offer sample curricula and curriculum materials, including forensic case studies, for use by CyberWATCH member institutions



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throughout the Washington, D.C. region in developing their own forensics courses.

An important part of the project involves making available computing power and software appropriate for the forensic examination of both network activity and digital media. The virtual lab will consist of virtual machines running on hardware hosted at the University of Maryland, College Park that will function as forensic workstations. These machines will be used by the member institutions to offer courses in forensic examination of digital media and network activity.

“The University of Maryland has been a part of the CyberWATCH consortium for many years, and we are excited to host this shared Digital Forensics Lab that will be used to provide hands-on experience and education to the next generation of information security professionals in the region,” said Dr. Jeffrey Huskamp, Vice President and Chief Information Officer, University of Maryland.

Funded by the National Science Foundation, the CyberWATCH consortium is composed of higher education institutions, businesses, and government agencies from across the region focused on improving cybersecurity and safety through education.

OIT expects to officially launch the DFL at the 2008 C3 (Cyberethics, Cybersafety, and Cybersecurity) Conference in October during National Cybersecurity Awareness Month. The first full semester the DFL will be available for use in courses will be spring 2009.
<http://www.cyberwatchcenter.org>

OECD Workshop on FTTH

The OECD Directorate of Science, Technology, and Industry recently held a workshop on investments in fiber networks and policy implications. While speakers primarily addressed such investments across Europe, Marvin Sirbu from Carnegie Mellon University also presented.
http://www.oecd.org/document/56/0,3343,en_2649_3422_5_40460600_1_1_1_1,00.html
<http://www.oecd.org/dataoecd/36/27/40460656.pdf>

ITIF Broadband Report

The Information Technology and Innovation Foundation (ITIF) released a report entitled “*Explaining International Broadband Leadership*.” The report begins by noting:

“It is hard to follow broadband telecommunications policy without hearing almost weekly that the United States ranks 15th out of 30 Organization for Economic Cooperation and Development (OECD) nations in broadband adoption.

But it is much less apparent why the United States is behind. Indeed, relatively little work has been done to understand why some nations are ahead, and why some, like the United States, are lagging. By examining OECD nations through statistical analysis and in-depth case studies of nine nations, including the United States, this report attempts to do just that.

In identifying factors that have spurred broadband performance in other nations, we present key findings that government and the technology industry must recognize if we are to find the right course for the United States. And we propose key policy recommendations that will drive greater broadband performance.” The full report: <http://www.itif.org/files/ExplainingBBLLeadership.pdf>
The executive summary including key findings and recommendations can be found here: <http://www.itif.org/files/2008BBExecutiveSummary.pdf>

Atlantic Wave Supports EXPReS

Members of the EXPReS project (Express Production Real-time e-VLBI Service) conducted a live demonstration of the first ever real-time, electronic Very Long Baseline Interferometry (e-VLBI) observations to simultaneously use telescopes in Africa, Europe, North America and South America.

JIVE director Huib Jan van Langevelde was pleased with the milestone in e-VLBI development. “These results are very significant for the advance of radio astronomy; it



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shows not only that telescopes of the future can be developed in worldwide collaboration, but that they can also be operated as truly global instruments."

The observation of 3C454.3 and other targets included four telescopes new to e-VLBI capabilities of the European VLBI Network (EVN): Arecibo (Puerto Rico), Effelsberg (Germany), Hartebeesthoek (South Africa) and the Transportable Integrated Geodetic Observatory (TIGO, Chile). They were joined in this observation by regular e-EVN participants Medicina (Italy), Onsala (Sweden) and Westerbork (the Netherlands).

Data from all seven telescopes was routed across numerous networks, including: AtlanticWave, AMPATH, Centennial, DFN, GÉANT2 (operated by EXPReS project member DANTE), Internet2, Netherlight (operated by EXPReS project member SURFnet), NGIX, RedCLARA, Reuna, SANReN, StarLight and TENET.

MAX and Matt Siniscal were amongst those who contributed to this successful event.

http://www.expres-eu.org/TERENA08_networking.html

Eric Barron named to head NCAR

Eric J. Barron was named director of the National Center for Atmospheric Research (NCAR) today, following a rigorous international search. He joins NCAR from the University of Texas, where he is dean of the Jackson School of Geosciences and holds the Jackson Chair in Earth System Science. Barron will join NCAR on or before August 1.

Barron has authored or coauthored more than 120 peer-reviewed papers in geology, oceanography, and climate. He has chaired numerous NSF, NASA, and National Research Council (NRC) committees and panels, including the NRC Climate Research Committee, the NRC Board on Atmospheric Sciences and Climate, and NASA's Earth Observing System Science Executive Committee. He is a member of six professional societies and has been an editor of a number of climate and geology journals.

Barron's ties to NCAR range from student visitor to staff scientist, university collaborator, and most recently, chair of the UCAR Board of Trustees. He began his scientific career at NCAR as a geology graduate student. When he finished his Ph.D., he came to the center full time as a postdoctoral fellow and then an early-career scientist. Since moving to the university community he has remained a frequent collaborator with and scientific visitor to NCAR.

Barron plans to continue as an active scientist in his new position, in collaboration with other NCAR and university scientists. He is stepping down as UCAR trustee as of this appointment. Barron has been honored with the NASA Distinguished Public Service Medal, the Wilson Teaching Award from the Pennsylvania State University, and several other awards. He is currently chair of the Consortium for Ocean Leadership.

Before joining the University of Texas, Barron was dean of the College of Earth and Mineral Sciences and professor of geosciences at the Pennsylvania State University, and prior to that served as an associate professor at the University of Miami. He received a B.S. in geology from Florida State University and a master's degree and Ph.D. in oceanography from the University of Miami.

The National Center for Atmospheric Research is operated by the University Corporation for Atmospheric Research under the primary sponsorship of the National Science Foundation.

<http://www.ucar.edu/news/releases/2008/barron.jsp>

Global Lambda Integrated Facility MAPS

The Global Lambda Integrated Facility (GLIF) announced the availability of a new world map that showcases its advanced research and education multi-gigabit optical network infrastructure. The infrastructure has grown since the previous map was created a little more than two years ago, with participation from more National Research & Education Networks, countries, consortia, institutions and individual research initiatives, on more continents. These participants provide the physical



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lambda networks that are interconnected at GLIF Open Lightpath Exchanges, or GOLEs. GOLEs have the equipment necessary to interconnect and establish end-to-end lightpaths, which are used by international research teams who are working together to discover innovative solutions to complex problems of global importance -- from biodiversity, to global climate change, to health issues, to the origin of life itself.

<http://www.glif.is/>

<http://www.glif.is/publications/maps/>

PAM NPAD Paper Available

The Passive and Active Measurement (PAM) conference was recently held at Case Western Reserve. One of the accepted papers includes "*Pathdiag: Automated Path Diagnosis*" that grew out of the NSF funded NPAD project between the Pittsburgh Supercomputing Center (PSC) and the National Center for Atmospheric Research (NCAR). This paper will be published in the Springer *Lecture Notes in Computer Science* series.

<http://pam2008.cs.wpi.edu/> The paper is also available on the MAX website:

<http://wiki.maxgigapop.net/twiki/pub/MAX/PerformanceTuning/PathdiagPAM08paper.pdf>

Gin, Television, and Social Surplus

Clay Shirky gave a talk called *Gin, Television, and Social Surplus*. In it, he argues that the "social surplus" soaked up in the latter half of the 20th century by television is now being put to better use on the internet.

"I was recently reminded of some reading I did in college, way back in the last century, by a British historian arguing that the critical technology, for the early phase of the industrial revolution, was gin..."

"For the first time, society forced onto an enormous number of its citizens the requirement to manage something they had never had to manage before--free time. And what did we do with that free time? Well, mostly we spent it watching TV. We did that for decades. We watched I Love Lucy. We watched Gilligan's Island. We watch

Malcolm in the Middle. We watch Desperate Housewives. Desperate Housewives essentially functioned as a kind of cognitive heat sink, dissipating thinking that might otherwise have built up and caused society to overheat."

<http://www.herecomeseverybody.org/2008/04/looking-for-the-mouse.html>

Member Spotlight

Southern University Research Association

The Southeastern Universities Research Association (SURA) is a consortium of over sixty universities across the US. SURA jointly operates the Thomas Jefferson National Accelerator Facility on behalf of the US Department of Energy through Jefferson Science Associates, (JSA) LLC - and runs the SURA Residence Facility. SURA also promotes initiatives in nuclear physics, information technologies, coastal research and technology commercialization.

SURA and JSA recently announced that Hugh Montgomery will become the new Director of the U.S. Department of Energy's Thomas Jefferson National Accelerator Facility in Newport News, Virginia. Currently the Associate Director for Research at DOE's Fermi National Accelerator Laboratory, Montgomery will take charge of Jefferson Lab on September 2.

"Hugh Montgomery is a superb choice for the Laboratory," said Dr. Raymond L. Orbach, Under Secretary for Science at DOE. "As Director, he will lead a world class center that can enable scientists to probe the innermost secrets of the atomic nucleus. I am confident that under Dr. Montgomery, Jefferson Lab will continue its outstanding scientific leadership."

In his new role, Montgomery also will serve as President of Jefferson Science Associates, a joint venture between the Southeastern Universities Research Association (SURA) and CSC Applied Technologies, that manages and operates Jefferson Lab for DOE.



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“Jefferson Lab and DOE are fortunate to have Dr. Montgomery coming on board as the new director,” said John T. Casteen, President of the University of Virginia and Chair of the JSA Board of Directors. “He is both a distinguished scientist and an experienced leader and manager within the laboratory system.”

With a Ph.D. in Physics from Manchester University in England, Montgomery has an extensive background in both nuclear and particle physics. His work at Fermilab focuses on particle physics, which seeks to understand the fundamental components of our universe and how they interact. Montgomery was involved with muon scattering experiments at CERN in Geneva and Fermilab, and in the DZero Experiment on the Fermilab Tevatron Collider at the time of the observation of the top quark. In his role as Associate Director, he oversees the particle physics and particle astrophysics research programs at the laboratory. He has served in his current position since 2002.

“After almost twenty five years at Fermilab, this move certainly represents a major change in my life,” said Montgomery. “The new position will be an enormous challenge for me but also an enormous opportunity to which I am looking forward. The provision of research facilities for a broad international community of physicists is something at which both Fermilab and Jefferson Lab excel.” Montgomery added, “I hope I prove worthy of the great team at Jefferson.”

Montgomery replaces Christoph Leemann, who came to Jefferson Lab from DOE’s Lawrence Berkeley Lab in 1985 and who has been director since 2000. Leemann announced his decision to step down from the directorship in March 2007. Prior to that, he was instrumental in the design, technology choice, and construction of the Continuous Electron Beam Accelerator Facility (CEBAF) – as Jefferson Lab was originally known. Leemann, who has continued to serve throughout the search process, will retain the title of Director-Emeritus.

The JSA Board of Directors appointed an internationally representative search committee that convened six weeks

after Leemann’s announcement. The 13-member committee undertook extensive outreach to solicit input, advice and nominations from international scientific leaders. It interviewed candidates and presented a unanimous recommendation to the JSA Board and DOE to approve the appointment of Montgomery as the Lab’s third director.

“We are all delighted that Hugh Montgomery has agreed to take on the leadership of Jefferson Laboratory at this critical time in its history,” said Thomas Appelquist, Professor of Physics at Yale University and JSA Board member, who chaired the search committee.

SURA was awarded the original contract to build the lab in 1984 and operated it exclusively until 2006. DOE released a request for proposal to re-compete the contract for the 700-employee facility in December 2005, and awarded the new contract to JSA, LLC in April 2006. Jefferson Lab is a renowned research facility with more than 2,000 international users. Nearly one-third of the Ph.D.’s awarded in nuclear physics in the U.S. result from research done at Jefferson Lab, and more than 90 new faculty positions in the nuclear physics discipline have been added to universities across the south since SURA brought the Lab to the region.

<http://www.sura.org/home/index.html>



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MAX Participants

Federal Labs and Agencies:

- ATDnet - NRL, LTS, DISA
- D.C. Government
- Energy Sciences Network (ESNet)
- Laboratory for Telecommunications Sciences
- Library of Congress
- NASA / GSFC
- National Archives and Records Administration (NARA)
- National Institutes of Health (NIH)
- National Institute of Standards and Technology
- National Library of Medicine (NLM)
- National Oceanic and Atmospheric Administration (NOAA)
- National Science Foundation (NSF)
- USDA, Beltsville Agricultural Research Center
- U.S. Department of Health and Human Services
- U.S. Department of State (through GWU)
- U.S. Department of Veterans Affairs
- U.S. Geological Survey
- U.S. Holocaust Memorial Museum

Higher Education:

- American University
- Baltimore Education & Research Network
- Catholic University
- GEANT
- Georgetown University
- George Mason University
- George Washington University
- Johns Hopkins University

- Johns Hopkins University - Applied Physics Laboratory (JHU-APL)
- Montgomery College
- National Consortium for Supercomputing Applications / ACCESS
- Network Virginia
- Smithsonian Institution
- Southern Universities Research Association (SURA)
- University of California, D.C. campus
- University Consortium for Advanced Internet Development (UCAID / Internet2)
- University of Maryland, College Park
- University of Maryland, Baltimore
- University of Maryland, Baltimore Co.
- Univ. System of Maryland Network
- University of Southern California, Information Sciences Institute / East
- Washington Research Library Consortium

Corporate and Non-profit:

- Columbia Telecommunications Corporation (CTC)
- Howard Hughes Med. Institute
- Fujitsu Labs of America
- Inter-American Development Bank (IADB)
- Northrop Grumman Corporation
- The Institute for Genomic Research
- Windber Professional Services, Inc.
- World Bank
- The Venter Institute