



Mid-Atlantic Crossroads

Advanced Regional Internetworking for
Higher Education and Research

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

April 30, 2008

Welcome

Welcome to the March & April 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

When you have to regularly send or receive large amounts of data, what do you do? Use your network or ship disk drives or tapes via commercial overnight carriers? If your shipping media rather than using the network, we would like to know and are offering to work with you to see if together we can change that workflow to emphasize using high performance networking.

Saying we're in the business of high performance networking is one thing, doing it well is something quite different. We fully understand that efforts to tune and help users and system administrators maximize TCP/IP performance on their computer systems must be matched by those systems your communicating with across the country.

This is an issue gaining interest across the Regional Optical Network community and MAX already has commitments from our colleagues across the US to also enter into discussions with their participants and members to improve tuning performance with those you depend on for critical data exchanges. If we can determine that the end systems and networks are sufficiently tuned and error free then effort can be directed elsewhere. We know from the NPAD project between PSC and NCAR that many applications do not perform well. Some applications cannot sufficiently com-

pensate for network delays with other processing, and is therefore subject to declining performance from the increased latencies associated with speed of light and the length of the path. Details can be found here:

<http://www.psc.edu/networking/projects/tcptune/>
<http://www.psc.edu/networking/projects/applight/>

Please contact me if ship tapes or disk drives and would be interested in discussing further.

Peter O'Neil

Spring All Hands Meeting

On Friday May 9th, MAX hosted its Spring All-Hands Meeting. Thanks to all of you who joined with us and helped contribute to the success of the meeting through your comments, questions, and suggestions. Slides are available here:

<http://wiki.maxgigapop.net/twiki/bin/view/MAX/Spring2008MMPresentations>

IPv6 Workshop

MAX also hosted, two 2-day hands-on IPv6 workshops May 13th & 14th and May 15th & 16th at our offices. Bill Cerveny, who developed the Internet2 v6 workshops lead the workshops with able support from MAX engineers.



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Participants learned to design and set up a functioning IPv6 network connected to the Internet2 IPv6 network, and thus to the rest of the global IPv6 network. Using IPv6 transition tools, participants also established gateway connections between the workshop IPv6 network and the global IPv4 internet.

Demand was very high and both workshops filled the available open slots. For those who are interested in the topic but were not able to attend, you can review the materials at:

<http://wiki.maxgigapop.net/twiki/bin/view/MAX/IPv6slides>

Jerry Sobieski Moves On

Effective April 30th, Jerry Sobieski resigned from MAX after eight years helping the fledgling networking effort off the ground and setting a research agenda. Jerry has been offered a role as Director for International Research Initiatives for NORDUnet organization. While NORDUnet is based in Copenhagen, he will be responsible for developing joint research programs between the five Nordic NRENs and organizations in the North America and Asia/Pacific regions and continue to be based here in the US. We all wish him well, will miss his contributions, and his highly animated powerpoint slide presentations. Jerry's new handle is [<jerry@nordu.net>](mailto:jsobieski@nordu.net).

Supercomputing 2008

This year's Supercomputing event will take place in Austin, Texas November 15-21. However, now is the time to place orders for bandwidth you may need for booths and demonstration projects.

SCinet Releases Call for Circuits, Deadline for Wide Area Circuits is May 30, 2008

The Lonestar Education and Research Network (LEARN) and its members in Texas are partnering with SCinet to provide WAN services support for the SC08 conference in Austin, Texas November 15th through 21st. In order to plan the wide-area and metro resources required to support conference participants we are asking that exhibitors

and network entities identify their WAN circuit requirements into the Austin Convention Center.

The SC08 WAN team will work with National Lambda-Rail (NLR), Internet2 and LEARN to implement the required circuits for SC08 from the NLR and Internet2 connection points in Texas to the Austin Convention Center.

The following WAN services are planned to be available at the Austin Convention Center: NLR PacketNet, NLR FrameNet, Internet2's IP Network, Internet2's Dynamic Circuit Network, ESnet and commodity Internet. If your organization will require any other wide-area circuits (e.g. NLR WaveNet, Internet2 WaveCo, another provider, etc), please respond to this message with the details of your particular requirements. It is required that the WAN team hear about your organization's wide-area circuit requirements and utilization needs by May 30, 2008.

Please address any questions or concerns and especially your requests to the SCinet WAN team:

[<wan-team@scinet.supercomp.org>](mailto:wan-team@scinet.supercomp.org)

<http://sc08.supercomputing.org/>

Internet2 Strategic Planning Process

As Jack Sues updated us at the All-Hands Meeting, the Internet2 community is well along the path of developing a new strategic plan. For more details and to view and comment on the draft see:

<http://www.internet2.edu/strategicplanning/>

<https://wiki.internet2.edu/confluence/display/I2SP/2008+INTERNET2+STRATEGIC+PLANNING>

CENIC Award

Pac-10 Internet Video Exchange, 2008 High-Performance Award Winner, Collegiate Athletics Enter the Digital Age via Reliable Broadband Networking

Today, the typical Office of Intercollegiate Athletics is a far different place than what most people knew as "the gym" in past student days. Walk into any coach's office and you will see, besides the normal sports gear, piles and



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piles of video tapes and DVDs. Video of athletes' performance is critical to coaching today, and all teams analyze their opponent's previous performance. However, to prevent wealthier schools from having an unfair advantage, NCAA rules disallow in-person scouting of opponents. Instead, and with the NCAA's blessing, each team videotapes its own games and exchanges these video files with their next opponent one week before a given game.

Prior to the 2005 season, these video exchanges consisted of exchanging physical media via courier services such as Federal Express. This was an onerous task for all schools, and was particularly so for those schools located long distances from airports or without appropriate courier services. It was also very costly; for example, at UCLA <<http://www.ucla.edu/>> these courier services could cost roughly \$6,000 per year per sport.

Many of the video coordinators at the 110 division I-A NCAA schools realized there must be an electronic solution, but attempts to use FTP (the Internet-based File Transfer Protocol) were deemed failures due to extremely long and unreliable file transfer times. For example, a single football game is typically an 18 Gigabit video file, and teams must exchange all of their current season's past games each weekend. A single game video transfer could take 10-15 hours and by the end of the season, a team may have ten or more games to transfer.

At a Pac-10 video coordinators' meeting prior to the 2005 football season, Steve Pohl of the University of Oregon <<http://www.uoregon.edu/>> suggested the Pac-10 look into using the high-bandwidth connections that academic colleagues already enjoyed through CalREN in California and interconnections across Internet2 to universities in other states. UCLA Video Coordinator Ken Norris contacted Chris Thomas of UCLA's Office of Information Technology asking for assistance. Together, the two men designed a pilot program involving four conference schools (UCLA <<http://www.ucla.edu/>>, USC <<http://www.usc.edu/>>, Stanford <<http://www.stanford.edu/>> -- all CalREN-connected CENIC member institutions, and the University of Wash-

ington <<http://www.uwashington.edu/>>, plus a site outside the Pac-10 conference, Notre Dame <<http://www.notredame.edu/>>. Instead of using commercial Internet connections, these sites interconnected via high-bandwidth links that all of these schools have to each other via advanced next generation Internet networks for high-speed FTP-based electronic video exchange for the 2005 season, using a specially tuned FTP implementation from the French National Particle Physics Institute <<http://www.in2p3.fr/>> in Lyon, France. The increase in speed of transfer over these links turned a previously unsuccessful solution into a viable option.

Based on the success of this pilot, all ten video coordinators for the Pac-10 voted unanimously to move to full electronic exchange for the 2006 season, and the new technology was an unqualified success. No Pac-10 school exchanged conference video via courier, and all participants were delighted by the time savings and ease of electronic video exchange. The success of the program in fact was a significant motivator for some schools to upgrade their connectivity and to improve their own campus networks to eliminate bottlenecks.

The ten Pac-10 video coordinators also responded to the outstanding reliability and predictability of CENIC's CalREN services, and in some particularly illuminating ways. At the beginning of the season, vide coordinators were downloading videos on Saturday night to be sure of meeting their coaches' 5:00 PM Sunday deadlines. As they gained confidence in the system, however, downloads began to take place after noon on Sunday, a clear expression of faith that the network could be counted on for quick, robust delivery of large video files on a regular basis.

Ken Norris and Chris Thomas of UCLA accepted the award.

This is a great example of using our networking capabilities to change workflows and save time and money.



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ARIN & CAIDA IPv6 Penetration Study

The American Registry for Internet Numbers (ARIN) and the Cooperative Association for Internet Data Analysis (CAIDA) conducted a survey during March to gauge the extent to which IPv6 was being implemented in the ARIN region. kc (Kim Claffy) reported on the results at the April ARIN meeting in Denver. Her presentation is here: http://www.arin.net/meetings/minutes/ARIN_XXI/PDF/monday/IPv6_Survey_KC.pdf

DOE Office of Science Workshop

The DOE held a workshop entitled *Advanced Networking for Distributed Petascale Science: R&D Challenges and Opportunities* during April to identify critical end-to-end networking technical challenges that should be resolved with research and development in the next decade to enable emerging distributed petascale science. Materials presented at the meeting can be found here: <http://www.bnl.gov/doenetwork/>

FEDERICA Project

The FEDERICA project will create a European wide “technology agnostic” infrastructure made of Gigabit circuits, transmission equipment and computing nodes capable of virtualization to host experimental activities on new Internet architectures and protocols. The FEDERICA project in Europe is similar in objectives to the U.S. GENI initiative. The FEDERICA network is based on the Research & Education multi-gigabit networks footprint. Circuits are terminated in Points of Presence (PoPs) of NRENs and GÉANT2, hosting FEDERICA nodes capable of virtualising hosts e.g. open source routers and end nodes. Virtual slices of FEDERICA’s infrastructure may be allocated to network researchers for testing even with disruptive experiments within a large production substrate.

<http://www.fp7-federica.eu/>
<http://www.geni.net/>

International HealthGrid Conference

The HealthGrid U.S. Alliance has finalized the program for the sixth annual International HealthGrid conference -

the first one to be held in the United States, “Global HealthGrid: eScience Meets Biomedical Informatics” June 2-4, 2008.

“As the first HealthGrid conference in the America's, this is an historic event,” says Jonathan Silverstein, M.D., President, HealthGrid.US, and Associate Director, Computation Institute, Argonne/University of Chicago. “The program will appeal broadly to the interdisciplinary eScience and biomedical informatics communities, including physicians, medical educators, students, epidemiologists, biomedical informaticians, military medicine specialists, computer scientists, security and policy makers, economists, and futurists.”

The conference begins on June 2 with a day of workshops and tutorials which will provide training and demonstrations, including basic Grid concepts, case studies and the most advanced topics on infrastructure and applications for computational biologists and public health informaticians.

The formal conference will kick-off on June 3, with welcoming remarks by Robert J. Zimmer, Ph.D., President of the University of Chicago. Following the welcoming ceremonies, Ian Foster, Ph.D., will provide a keynote presentation on “eScience meets Biomedical Informatics.” Scientific papers will be complemented with a roundtable discussion from U.S., European, and Asian government leaders on “Government eScience and Cyberinfrastructure Programs for HealthGrid,” moderated by Michael Cowan, M.D., Chief Medical Officer, Bearing Point, and former U.S. Navy Surgeon General. Cowan will precede the government roundtable discussion with a keynote presentation on “The Role of Government in the Future Knowledge Society.”

“The main importance of the meeting, apart from communicating information about research programs, is for partners to meet and network. The annual HealthGrid conference provides an opportunity to plan and prepare for future joint collaborations of global scale.” says Vin-



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cent Breton, Centre National de la Recherche Scientifique and co-chair of the Program Committee.

The final day of the conference provides a major networking opportunity, starting with a keynote presentation by Peter Hunter, Ph.D., director, The Bioengineering Institute, University of Auckland, on the "Physiome Project," a worldwide public domain effort to provide a computational framework for understanding human and other eukaryotic physiology, i.e., organisms whose cells are organized into complex structures enclosed within membranes. It aims to develop integrative models at all levels of biological organization, from genes to the whole organism via gene regulatory networks, protein pathways, integrative cell function, and tissue and whole organ structure/function relations.

Because public private partnerships become increasingly important to global science, an industry roundtable will provide business models for HealthGrid in the emerging knowledge economy and the impact of industry innovation.

The closing session will highlight perspectives from GridAsia, by Simon Lin, Ph.D., Academia Sinica, Taiwan, as the HealthGrid continues to expand globally. "The international networking aspects of the HealthGrid benefit a broad range of biomedical informatics programs," says Mary Kratz, Executive Vice President of the HealthGrid.US Alliance and Senior Information Services Specialist, University of Michigan. "We are delighted with the strong work of the Program Committee to bring together an outstanding program for HealthGrid 2008." The selected papers will be published in the series /Studies in Health Technology and Informatics/, IOS Press (<http://www.iospress.nl/>), and referenced in MEDLINE.

Scheduling and other conference details can be found at <http://chicago2008.healthgrid.org/>.

Designing Malicious Hardware

Bruce Schneier noted this USENIX paper on how adding a few gates to microprocessor design can add hidden vulnerabilities. From the paper's abstract: "*Hidden malicious circuits provide an attacker with a stealthy attack vector. As they occupy a layer below the entire software stack, malicious circuits can bypass traditional defensive techniques. Yet current work on trojan circuits considers only simple attacks against the hardware itself, and straightforward defenses. More complex designs that attack the software are unexplored, as are the countermeasures an attacker may take to bypass proposed defenses.*" http://www.usenix.org/event/leet08/tech/full_papers/king/king_html/

Matt Blaze comments on this article in his blog: http://www.crypto.com/blog/hardware_security/

April 1st Humor

The IETF has a long tradition of issuing new tongue-in-cheek RFC's on April Fools Day. This year we call your attention to two such documents: <http://www.rfc-editor.org/rfc/rfc5241.txt> <http://www.rfc-editor.org/rfc/rfc5242.txt>

And thanks go to Dan for pointing out Comcast's acquisition of BitTorrent: http://www.theregister.co.uk/2008/04/01/comcast_acquires_bittorrent/

And this note from John Cleese informing us about certain government and behavioral changes confronting us:

Britain is Repossessing the U.S.A.

"A Message from John Cleese"

To: The citizens of the United States of America

In light of your failure to nominate competent candidates for President of the USA and thus to govern yourselves,



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we hereby give notice of the revocation of your independence, effective immediately.

Her Sovereign Majesty Queen Elizabeth II will resume monarchical duties over all states, commonwealths, and territories (except Kansas, which she does not fancy).

Your new prime minister, Gordon Brown, will appoint a governor for America without the need for further elections.

Congress and the Senate will be disbanded.

A questionnaire may be circulated next year to determine whether any of you noticed.

To aid in the transition to a British Crown Dependency, the following rules are introduced with immediate effect:

You should look up "revocation" in the Oxford English Dictionary.

Then look up aluminium, and check the pronunciation guide. You will be amazed at just how wrongly you have been pronouncing it.

The letter 'U' will be reinstated in words such as 'favour' and 'neighbour.' Likewise, you will learn to spell 'doughnut' without skipping half the letters, and the suffix -ize will be replaced by the suffix -ise.

Generally, you will be expected to raise your vocabulary to acceptable levels. (look up 'vocabulary').

Using the same twenty-seven words interspersed with filler noises such as "like" and "you know" is an unacceptable and inefficient form of communication. There is no such thing as US English. We will let Microsoft know on your behalf. The Microsoft spell-checker will be adjusted to take account of the reinstated letter 'u' and the elimination of -ize. You will relearn your original national anthem, God Save The Queen.

July 4th will no longer be celebrated as a holiday.

You will learn to resolve personal issues without using guns, lawyers, or therapists. The fact that you need so many lawyers and therapists shows that you're not adult enough to be independent. Guns should only be handled by adults. If you're not adult enough to sort things out without suing someone or speaking to a therapist then you're not grown up enough to handle a gun.

Therefore, you will no longer be allowed to own or carry anything more dangerous than a vegetable peeler. A permit will be required if you wish to carry a vegetable peeler in public.

All American cars are hereby banned. They are crap and this is for your own good. When we show you German cars, you will understand what we mean.

All intersections will be replaced with roundabouts, and you will start driving on the left with immediate effect. At the same time, you will go metric with immediate effect and without the benefit of conversion tables. Both roundabouts and metrication will help you understand the British sense of humour.

The Former USA will adopt UK prices on petrol (which you have been calling gasoline) - roughly \$6/US gallon. Get used to it.

You will learn to make real chips. Those things you call French fries are not real chips, and those things you insist on calling potato chips are properly called crisps. Real chips are thick cut, fried in animal fat, and dressed not with catsup but with vinegar.

The cold tasteless stuff you insist on calling beer is not actually beer at all. Henceforth, only proper British Bitter will be referred to as beer, and European brews of known and accepted provenance will be referred to as Lager. New Zealand beer is also acceptable as they are pound for pound the greatest sporting Nation on earth and it can



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only be due to the beer. They are also part of British Commonwealth - see what it did for them.

Hollywood will be required occasionally to cast English actors as good guys. Hollywood will also be required to cast English actors to play English characters. Watching Andie McDowell attempt English dialogue in *Four Weddings and a Funeral* was an experience akin to having one's ears removed with a cheese grater.

You will cease playing American football. There is only one kind of proper football; you call it soccer. Those of you brave enough will, in time, be allowed to play rugby (which has some similarities to American football, but does not involve stopping for a rest every twenty seconds or wearing full Kevlar body armour like a bunch of nancies). Don't try Rugby - the South Africans and Kiwis will thrash you, like they regularly thrash us.

Further, you will stop playing baseball. It is not reasonable to host an event called the World Series for a game which is not played outside of America. Since only 2.1% of you are aware that there is a world beyond your borders, your error is understandable. You will learn cricket, and we will let you face the South Africans first to take the sting out of their deliveries.

You must tell us who killed JFK. It's been driving us mad. An internal revenue agent (i.e. tax collector) from Her Majesty's Government will be with you shortly to ensure the acquisition of all monies due (backdated to 1776).

Daily Tea Time begins promptly at 4 pm with proper cups, never mugs, with high quality biscuits (cookies) and cakes; strawberries in season.

God save the Queen. Only He can!

John Cleese

Declassified NSA Publications

For those interested in the history of cryptography, the

agency, and signals intelligence, NSA recently declassified a number of documents.

http://www.nsa.gov/public/crypt_spectrum.cfm

<http://www.nsa.gov/public/publi00003.cfm>

Member Spotlight

Department of Veterans Affairs

MAX is pleased to welcome the Department of Veterans Affairs as a participant and to be able to help support them in achieving their strategic goals.

Mission Statement

"To care for him who shall have borne the battle and for his widow and his orphan."

These words, spoken by Abraham Lincoln during his Second Inaugural Address, reflect the philosophy and principles that guide VA in everything we do, and are the focus of our endeavors to serve our Nation's veterans and their families.

Vision

We will strive to meet the needs of the Nation's veterans and their families today and tomorrow by: (1) becoming an even more veteran-focused organization, functioning as a single, comprehensive provider of seamless service to the men and women who have served our Nation; (2) cultivating a dedicated VA workforce of highly skilled employees who understand, believe in, and take pride in our vitally important mission; (3) continuously benchmarking the quality and delivery of our service with the best in business and use innovative means and high technology to deliver world-class service; and (4) fostering partnerships with veterans organizations, the Department of Defense and other federal agencies, state and local veterans organizations, and other stakeholders to leverage resources and enhance the quality of services provided to veterans.



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For additional information on the VA and its many programs, visit <http://www.va.gov/>

Core Values

President Lincoln's words guide VA today. The men and women of VA are dedicated to fulfilling the Department's mission and vision and they commit their abilities and energy to continue the rich history of providing for those that have served America. In doing so, we will strive to uphold a set of core values that represent the basic fabric of our organizational culture. These core values are...

Commitment

Veterans have earned our respect and commitment, and their health care, benefits, and memorial services needs drive our actions.

We will value our commitment to veterans through all contingencies and remain fully prepared to achieve our mission.

Strategic and Enabling Goals

Strategic Goal 1 - Restore the capability of veterans with disabilities to the greatest extent possible and improve the quality of their lives and that of their families.

Strategic Goal 2 - Ensure a smooth transition for veterans from active military service to civilian life.

Strategic Goal 3 - Honor and serve veterans in life and memorialize them in death for their sacrifices on behalf of the Nation.

Strategic Goal 4 - Contribute to the public health, emergency management, socioeconomic well-being, and history of the Nation.

Enabling Goal - Deliver world-class service to veterans and their families by applying sound business principles that result in effective management of people, communications, technology, and governance.



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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