ESnet Energy Sciences Network

news

Network Boost for Princeton Lab

A project is under way to significantly boost the network speed and capacity for scientists in different research labs within Princeton University.

ESnet is working with partners to build a 10-gigabit-per-second network that will replace the 45-megabit-per-second one between ESnet's main network and the Princeton Plasma Physics Laboratory (PPPL). The new network also will benefit high energy physics researchers and climate modelers at the Geophysical Fluid Dynamics Laboratory (GFDL), both of which also are located on Princeton University's Forrestal Campus.

With the availability of cutting-edge instruments and supercomputers, the researchers are able to carry out larger experiments that also produce a tremendous amount of data. As a result, they require a more robust network to easily send and receive data.

"By providing a larger, dedicated link, ESnet will greatly enhance our ability to share our data and to collaborate with other scientists," said Jeff Flick, network engineer and security officer at GFDL. "This new network represents an important enhancement to NOAA's GFDL IT infrastructure."

ESnet is working with MAGPI (Mid-Atlantic Gigapop in Philadelphia for Internet2), a nonprofit optical network developer to set up the new network from Washington, D.C. to the campus, where an ESnet router will distribute data among PPPL, GFDL, and high energy physics researchers. The project began in May, and it's scheduled for completion before October this year.

PPPL (shown here) and GFDL are both located on Princeton University's Forrestal Campus.

Nuclear Physics Workshop Provides Forum for Networking Discussions

Scientists and program managers attended a DOE workshop in May to identify the ESnet networking requirements for nuclear physics research.

Sponsored by the DOE Office of Science, the Nuclear Physics Network Requirements Workshop provided a forum to communicate with ESnet about the ways in which scientists from the nuclear physics research program use the network. ESnet will incorporate the feedback into its infrastructure and service planning processes.

The workshop is part of the ESnet governance structure, and is designed to help ensure that ESnet meets the needs of researchers from all six program offices within the Office of Science. ESnet held workshops for scientists in Basic Energy

ESnet serves user facilities of the Office of Nuclear Physics including (clockwise from upper left): the Argonne Tandem Linac Accelerator System (ATLAS) at Argonne National Laboratory, the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory, the Continuous Electron Beam Accelerator Facility (CEBAF) at Jefferson Laboratory, and the Holifield Radioactive Ion Beam Facility (HRIBF) at Oak Ridge National Laboratory.

Brian Tierney Joins ESnet to Lead Advanced Network Technologies Effort

Starting August 1, Brian Tierney will join ESnet as the Coordinator of the Advanced Network Technologies Effort. Tierney currently heads the CyberInfrastructure Development Group in Lawrence Berkeley National Laboratory's Computational Research Division.

In his new role, Tierney will investigate approaches that have the potential to enhance ESnet's ability to enable the collaborative science that is the mission of the Office of Science. Tierney will take on the role as PI on some of the future ESnet research activities such as testbeds and other proposals. He will also be working with the ESnet engineering group to present current research activities to sponsors.

Over the past 15 years, Tierney has been focusing on performance issues in data intensive distributed computing and has been the PI for several research projects in network and Grid monitoring systems. He was the principal designer of the Distributed Parallel Storage System (DPSS), where many of the ideas for GridFTP originated, and the first version of the
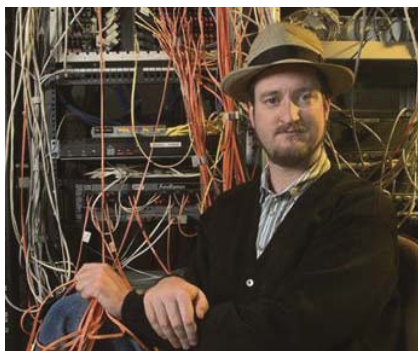
Brian Tierney

NetLogger Toolkit (http://acs.lbl.gov/NetLoggerWiki/). He is currently co-PI of the SciDAC Center for Enabling Distributed Petascale Science (http://www.scidac.gov/compsci/distpeta.html), and has also been working on the Bro Intrusion Detection System (http://www.bro-ids.org/).

Tierney was co-chair of the 2nd International Workshop on Protocols for Long Distance Networks (PFLDnet) in 2004. He received his MS in computer science from San Francisco State University, and has been working at Berkeley Lab since 1990.

Nuclear Physics Workshop Forum *continued from page 1*

Sciences (BES) and Biological and Environmental Research (BER) programs last summer. A workshop for the Fusion Energy Sciences program took place in March this year. Each year, ESnet runs workshops for two program offices.

"We don't ask the scientists what their network requirements are, but what their science process is — how they use the network and move their data," said Eli Dart, an ESnet engineer who organized all three workshops. "The workshop goals are to understand how the scientists use the network, and how their usage will change over time."

Participants gathered at the Marriott Bethesda North Hotel and Conference Center for the invitation-only nuclear physics workshop. For a day and half, they discussed research trends and shared experiences about how they use the scientific network to advance their work.

Networking requirements can change because of new research facilities, upgrades to existing facilities and changes in the science process, as well as funding and policy changes. For example, the opening of the Molecular Foundry at Berkeley Lab in 2006 has provided cutting-edge instruments and other resources to the international nanoscience community. Last year, DOE announced plans to spend $375 million for building three Bioenergy Research Centers nationwide. These changes enable researchers to create simulations and experiments that generate a large amount of data, which in turn requires a high-bandwidth network and dynamic services.

The workshops set out to chart short-term and long-range network requirements, which would help ensure that ESnet provides the necessary services to

GREEK TRANSPLANT CALLS ESNET HOME

Nearly a year after moving from Greece to join ESnet, Vangelis Chaniotakis has settled into his new life and tackled challenging work to develop a bandwidth reservation system for ESnet users.

Chaniotakis, 31, had been working as a network engineer at the University of Crete when ESnet recruited him to help finalize a service that would allow scientists to request and reserve circuits dedicated to moving their data at a particular time. The service, called On-

Vangelis Chaniotakis

Demand Secure Circuits and Advance Reservation System (OSCARS), will ensure that moving large amounts of data within ESnet, or between ESnet and other networks, would not be bogged down by network traffic jams.

Chaniotakis' experience makes him a good fit for the task. At the University of Crete, he designed and implemented web-based systems and services for the Greek Research and Technology Network (GRNET) and GEANT, a pan-European research and education networking organization. He helped develop a service similar to OSCARS called AutoBAHN for GEANT.

After nearly 10 years at the university, however, Chaniotakis was ready for a change. "It was a huge step from my previous job. The opportunity sounded very good," Chaniotakis said.

He packed his life into two pieces of luggage and a laptop, and set off on a new path across the Atlantic last August. He moved into a house in Berkeley and found a gym where he could continue his love of kickboxing.

At ESnet, he found supportive colleagues. Sitting in his sparsely decorated office, Chaniotakis said he has enjoyed working here and would like to stay longer. He originally was hired for a one-year term.

"I like the environment here. The dif-

ESCC Corner

By Scott Bradley, ESCC Chair

The ESnet Site Coordinating Committee (ESCC) has continued to play a pivotal role in advising the DOE community in networking best practices, and formulating strategy for addressing the extraordinary networking challenges being faced. The ESCC white papers on recommendations for deployment of DNSSEC (Domain Name Service Security Extensions) and IPv6 have gained much visibility throughout the DOE and beyond, with several other major agencies (e.g., NASA) having displayed much interest in our recommended approach. Our hats off to Kevin Oberman, Phil DeMar and others for their superb work driving the creation and staffing of these outstanding documents.

Scott Bradley

Phil DeMar

We have also continued to represent ourselves well in partnering with Internet2 to co-host the semi-annual Joint Techs network engineering conferences; much thanks to Matt Crawford, Phil DeMar, Joe Metzger and Kevin Oberman for their continued assistance in crafting a meaningful agenda that greatly benefits the community in keeping abreast of current and near-term technological challenges we all face. Of particular note is Joe Metzger's continued work furthering the capabilities and deployment of Perfsonar, which is rapidly becoming the de facto standard for network performance monitoring.

At the end of this fiscal year, I will be turning over chairmanship of the ESCC to Phil DeMar of Fermi National Laboratory. I would like to thank everyone for giving me the honor of chairing a committee of some of the most knowledgeable and hard-charging IT professionals I have ever had the pleasure to work with. I would also like to say that I feel Phil DeMar is a natural choice for this role, and I am very sure that under his leadership we will be realizing an even higher level of performance very quickly.

Forum

scientists in the immediate future as well as for years to come.

Before attending each workshop, the participants described their science and the way in which they use the network in a "case study" document. These documents serve as starting points for the discussions at the workshops. The case study documents and the workshop discussions are included in the workshop final report, which will be submitted to DOE program managers.

The final reports for the BES and BER workshops have been posted.

Vangelis

ference between Europe and the U.S. is that it's a lot easier to get things done here," Chaniotakis said. "People have their ducks in a row; they are more organized. It's a welcomed change."

He got to work on OSCARS soon after he arrived. He has been working on code development and ensuring that the service would work seamlessly and interoperate with other networks. The project reached a milestone at last year's Supercomputing Conference (SC07) in Reno, where ESnet and its partner Internet2, a consortium of U.S. universities and research institutions, demonstrated the services' ability to quickly transfer gigabytes of data among various national labs and universities in real time.

Since then, OSCARS has garnered strong interest among research centers and universities, Chaniotakis said. A workshop hosted by Internet2 in Washington, D.C. this past spring was packed with regional network and university operators, such as California Institute of Technology and University of Nebraska, asking for details about the on-demand service.

The service is in the pre-deployment phase. ESnet and Internet2 are training researchers to use it in order to get feedback and improve the service. Deployment is scheduled for later this year.

"In the short time that he's been here, Vangelis has demonstrated a keen ability to sort through the complexities of problems and produce highly effective solutions," said Chin Guok, Chaniotakis' supervisor on the OSCARS project.

About *ESnet News*

ESnet News is a quarterly that highlights the services and accomplishments by the staff of the Energy Sciences Network (ESnet), a high-speed communications network that serves more than 50,000 scientists and their collaborators at dozens of national labs and research centers funded by the U.S. Department of Energy. ESnet is headquartered at the Lawrence Berkeley National Laboratory. Learn about ESnet's services at http://www.es.net.

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