



LEADING THE WAY TO TOMORROW'S INTERNET



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CENIC News

President's Message: CENIC's Foundation Is Built on Meaningful Partnerships

In the next three issues of CENIC Today, I would like to discuss the significant partnership relationships that have made CENIC successful over the past six years. In this first issue, the focus is on the how the educational institutions that formed and all those now served by CENIC are the keystone to carrying out the mission and programs of this organization.

When representatives from the California Institute of Technology, California State University, Stanford University, University of California, and University of Southern California came together in 1996 to collaborate on participating in the development of the California component of Internet2, skeptics were betting that institutional egos would get in the way of actually doing anything. They were wrong. Under the able leadership of Stuart Lynn, CIO at UC at the time, and the commitment of leaders of all five institutions, CENIC became a reality in August 1997.

The first project was to implement CalREN-2. This happened in October 1998. Because there was no central CENIC staff, this project was spearheaded by campus staff that came together to form the CENIC Technical Advisory Council (TAC). This group formed the team that designed and implemented CalREN-2. In essence, a partnership was forged as result of not having sufficient funds to develop a central staff. The TAC and its counterpart, the Business Advisory Council (BAC), continue to ensure that CENIC's high-end networking services are driven by the needs and requirements of the institutions served.

This strategy of partnership was again critical in the second CENIC project, the Digital California Project (DCP). In FY 2000/01, the State of California funded the University of California to have CENIC extend CalREN-2 out to the K-12 system. There were several dimensions of partnership in implementing this project. First, CENIC collaborated with CSU to have 4CNet, the network serving CSU and California Community Colleges for educational purposes, become an integral part of the backbone to serve K-12.

CENIC again engaged the users of the proposed network in the planning and development of the DCP. The California County Superintendent Educational Services Association (CCSESA) was asked to name 11 K-12 persons to form the Network Architecture team for DCP. It was this team that worked with CENIC to design and implement DCP and to serve as the liaison back to the counties and school districts. This team remains active today and is now linked into the TAC.

To make sure that CENIC will be responsive to the end users in this K-12 community on an ongoing basis, a large group has been formed comprised of coordinators at the over 71 node sites. Nearly 100 people are part of this group that meets annually and are part of an ongoing information/communications network.

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To provide oversight and strategic direction for DCP, the CENIC Board created the DCP Program Steering Committee in September 2000. Nearly 20 K-12 and higher education entities were invited to name a representative to the DCP PSC. All did and this group has been an invaluable in guiding this project over the past three years.

In addition to these groups, other task forces and work groups have been created to focus on specific tasks. As in the initial project, CENIC has found that engagement of those most impacted by the DCP has been essential to its success.

We are now in our third and most ambitious project, expanding CalREN and integrating 4CNet into a multi-tiered advance service infrastructure to serve the entire research and education community across California. This project involves implementing a CENIC owned fiber-based core backbone from San Diego to Los Angeles to Santa Barbara to San Luis Obispo to Sunnyvale, ringing the Bay area and then off to Sacramento and then back south to Stockton to Fresno to Bakersfield to Los Angeles and back to San Diego. Coming off this backbone will be fiber to the research universities and circuits to the CSU and CCC campuses and circuits to each of the 58 counties to serve K-12.

This project has prompted the CENIC Board to invite the California Community Colleges to become a full partner in the work of CENIC. The CCC Chancellor has named a representative to the CENIC Board. Work is proceeding to bring CCC representatives into all CENIC groups.

As we move forward all the California educational segments are engaged in driving the mission and programs of CENIC. Our challenge is to sustain and enhance the partnership relationship we have established with and among these California education groups. Our success depends on it!

Source: Tom West, President, CENIC

CENIC and Cisco Systems expand their strategic relationship

CENIC and Cisco Systems expand their strategic relationship changing the landscape of high performance networking for scientific research in the 21st Century; further demonstrating the value provided to the higher education and research community through private-public partnerships.

For the first time in California history, the higher education and research community has acquired its own dark fiber and is lighting it with Cisco products. CalREN will become an end-to-end Cisco IP+Optical experimental and production facility serving all K-20 and research institutions throughout California.

The CalREN backbone at the optical layer will be powered by Cisco 15808 10GE Long Haul Dense Wave Division Multiplexing (DWDM) transport systems providing a total of 400Gbps capacity on each network span, Cisco 15540 DWDM metro systems, and 15530 metro gigabit aggregation systems. The IP component includes the GSR 12410 High End Routers. Implementation planning started in January 2003 and deployment commenced in March 2003.

Source: Carol Stillman, Cisco Systems

Why is an Optical Network Better?

Educational networks in California, and nationwide, have traditionally depended upon managed services provided by both traditional telephone companies and non-traditional companies like cable companies. Utilizing these companies' networks has required careful long-term planning to allow for the development of detail specifications, bidding, and then the building of the network. This process can easily take two years from the start of planning to the first segment of a new network becoming operational. The growing dependence on telecommunications networks, the explosive growth of traffic and peer-to-peer applications, and rapid changes in technology has meant that by the time a network upgrade is completed, it may be obsolete and the long-term contracts needed to be cancelled and/or renegotiated.

By making the transition to an "owned" fiber optic infrastructure with scalable network components, additional bandwidth may be added incrementally without the need to redesign the underlying technology. For example, the new CalREN/HPR (High Performance Research) network will use 10 Gigabit channels across CENIC's optical backbone to interconnect the HPR network components. If additional bandwidth is needed CENIC can add another 10 Gigabits to the backbone, basically overnight, by adding the appropriate interface cards to the network. Compared to the current managed services model where it takes anywhere from 3 months to a year for a new service to be delivered, the optical network's configuration flexibility will give California's educational and research institutions the best network feasible - and, one that will keep California at the forefront of network design and development.

Source: Dave Reese, CENIC Chief Technical Officer

Deadline Extended for CENIC's On the Road to a Gigabit Awards to March 31,2003

CENIC's On the Road to a Gigabit Awards will honor California visionaries who are applying network technology in innovative ways to encourage the development and implementation of a ubiquitous gigabit state-wide network by 2010.

The award ceremony will take place on May 7, 2003 in Santa Barbara, California, in conjunction with the CENIC 2003 annual conference to be held at the Fess Parker's Doubletree Resort. CENIC's goal of a one gigabit per second (Gbps) ultra broadband infrastructure for all California's represents more than a thousand-fold increase from today's commercial DSL and cable networks.

The On the Road to a Gigabit Awards will honor the best uses of high performance networking in the following areas:

* **Biggest, Fastest in the West:** The Biggest, Fastest in the West Award honors the fastest and most scalable high-performance networking application/technology.

* **Community:** The Community Award honors innovative uses of high-performance networking to overcome network disadvantages (economic and/or location based).

* **Education:** The Education Award honors innovative uses of high-performance networking in K-12 and higher education.

* **Gigabit or Bust:** The Gigabit or Bust Award honors the high-performance networking application/technology that best exemplifies what life would be like in a gigabit-connected world.

* **Innovation:** The Innovation Award recognizes innovative contributions to high-performance networking that best exemplify the creative spirit and the bottoms-up philosophy that created the Internet.

* **Partnership:** The Partnership Award honors the best use of high-performance networking developed by a private/public partnership.

Organizations interested in the competition can still apply through March 31, 2003 at <http://www.cenic.org/gb/awards/2003/winners.htm>. And, for more information about the On the Road to a Gigabit Awards, contact Molly Petrick, CENIC NGI Roundtable Director, molly@cenic.org.

National Networking News

Announcing UCWrite, a Web Resource for Writing Instructors at the University of California

A new systemwide web resource for writing instructors and potential UC students has been launched. UCWrite (<http://ucwrite.org>), which was developed by an intercampus team with funding from the UC Teaching, Learning & technology Center, provides information about writing instruction on all of the UC campuses, including materials for instructors, such as sample syllabi and assignments, recommended textbooks, and computer-based exercises. The web site also provides guidance on writing requirements for potential students and their teachers. UCWrite was developed with the goal of increasing the effectiveness of writing instruction across the system, especially as UC campuses face dramatic increases in enrollment. <http://www.ucltlc.org/news/2003/03/ucwrite.html>

Source: UCltlc newsletter

Distance Learning and Telemedicine Grant Application Guide

On March 3, 2003, the Rural Utilities Service published the Notice of Application Filing Deadline for grant applications for the FY 2003 Distance Learning and Telemedicine (DLT) Program. For FY 2003, \$17 million is available for grants. Applications must be postmarked no later than May 2, 2003, for competition this fiscal year. For further information about the DLT Program, please download a copy of the application guide or contact the DLT Branch at (202) 720-0413.

Important Note: As part of the application process, the applicant must provide evidence that it has consulted with the USDA State Director -- Rural Development, concerning the availability of other sources of funding, and conformity with the State strategic plan. Therefore, applicants should contact the USDA State Director as early as possible in the application process! A listing of the State Offices can be found at Attachment 15 of the guide.

Notice of Application Filing Deadline: <http://www.usda.gov/rus/telecom/dlt/fy-2003-dlt-notice.htm>
FY 2003 Grant Application Guide: http://www.usda.gov/rus/telecom/dlt/pdf_files/dtlgrant-app-guide-2003c.pdf.

DLT Loan and Combination Loan-Grant Application Guide

For FY 2003, \$200 million is available for loans and \$100 /\$10 million is available for combination loan-grants (\$10 loan to \$1 grant). Applications will be accepted year round until July 31, 2003, and will be processed as received. Please refer to the FY 2003 DLT Application Guide for Loan and Combination Loan-Grant for instructions, forms and the program regulations. For further information about the DLT Program, please download a copy of the application guide or contact the appropriate Area Office.

FY 2003 Loan and Combination Loan-Grant Application Guide: http://www.usda.gov/rus/telecom/dlt/pdf_files/dltloan-grant-app-guide-2003.pdf

Hard copies of either application guide may be requested from the DLT Branch at (202) 720-0413.

For DLT questions, please contact:

Marilyn Morgan -- mmorgan@rus.usda.gov -- (202)-720-0413
Mary Pat Daskal -- mdaskal@rus.usda.gov -- (202)-720-0413

Caltech Computer Scientists Develop FAST Protocol to Speed up Internet

Caltech computer scientists have developed a new data transfer protocol for the Internet fast enough to download a full-length DVD movie in less than five seconds.

The protocol is called FAST, standing for Fast Active queue management Scalable Transmission Control Protocol (TCP). The researchers have achieved a speed of 8,609 megabits per second (Mbps) by using 10

simultaneous flows of data over routed paths, the largest aggregate throughput ever accomplished in such a configuration. More importantly, the FAST protocol sustained this speed using standard packet size, stably over an extended period on shared networks in the presence of background traffic, making it adaptable for deployment on the world's high-speed production networks.

The experiment was performed last November during the Supercomputing Conference in Baltimore, by a team from Caltech and the Stanford Linear Accelerator Center (SLAC), working in partnership with the European Organization for Nuclear Research (CERN), and the organizations DataTAG, StarLight, TeraGrid, Cisco, and Level(3).

For more information, visit http://pr.caltech.edu/media/Press_Releases/PR12356.html

Source: Caltech

About CENIC

CENIC is a not-for-profit corporation formed by the California Institute of Technology, the California State University, Stanford University, the University of California, and the University of Southern California to facilitate and coordinate the deployment, development, and operation of a set of seamless and robust advanced network services. The CENIC Associates program offers qualified companies the opportunity to collaborate with CENIC in pursuit of the goal of providing the most advanced network services for research and education. Cisco Systems, SBC, and the University and Community College System of Nevada are CENIC's Partner Associates.

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