



Leading the Way to Tomorrow's Internet

The Corporation for Education Network Initiatives in California

California's Public Libraries and CENIC: Frequently Asked Questions

What is CENIC?

CENIC, the Corporation for Education Networks Initiatives in California, a California non-profit corporation, is the shared network services organization serving California's education and research institutions since 1997.

California's education and research communities leverage their resources under the umbrella of CENIC in order to obtain high quality, cost effective networking and network-based services. CENIC enables members of California's education and research communities to obtain cost-effective, high bandwidth networking via shared services to support their missions and respond to the needs of their faculty, teachers, staff, and students.

CENIC designs, implements, and operates CalREN, the California Research and Education Network, a high-bandwidth, high-capacity Internet network specially designed to meet the unique requirements of these communities, and to which the vast majority of the state's K-20 educational institutions, from K-12 to research Universities, public and private, use as their source of networking from their institutional networks to the rest of the world.

CalREN consists of an owned 3,800-mile CENIC-operated fiber optic backbone network to which over 10,000 schools, colleges and Universities in all 58 of California's counties connect via fiber-optic cable or leased circuits obtained from telecommunications carriers. Over ten million Californians use the CalREN network every day.

How is CENIC governed?

CENIC is governed by its member institutions. CENIC's members compose its Board of Directors, who have fiduciary responsibilities and set its priorities and directions. These member institutions also donate the expertise of their staff through participation in various committees and councils designed to ensure that CENIC is managed effectively and efficiently, and to support the continued evolution of the network as technology advances. The five current governing segments, known as "Charter Associates," are UC, CSU, private colleges (Caltech, Stanford, USC), California Community Colleges, and California K12. Libraries would constitute a sixth governing segment. Each Charter Associate appoints three members to the CENIC Board of Directors.

What are the benefits of joining the CENIC community?

- CENIC Charter Associates – University of California, California State University, California Community Colleges, California K12, Caltech, Stanford, and USC – are stakeholders in the provisioning of networking, network assets and services, via CENIC’s governance and advisory groups. Libraries will be among the Charter Associates.
- A strong voice on issues relating to networking nationally and within California.
- Highly reliable, high-speed Internet connectivity among libraries, schools, and colleges in California, through an innovative leading-edge network
- Non-measured commodity networking as a part of CENIC membership, with use limited only by speed of connection (circuit size) from member institutions to CENIC’s CalREN backbone network.
- Reliable access to other national networks such as Internet2, ESnet (Department of Energy) and National LambdaRail via CalREN’s multiple connection points.
- A Network Operations Center (NOC) that understands member institutions and is focused on meeting the needs of such organizations — ready to provide advanced network services 24 hours a day, 7 days a week, 365 days a year.
- Access to consulting services and project management for installing fiber to members’ sites.
- Participation with other libraries and educational institutions on networking issues, via various CENIC-sponsored events and working groups.
- Provisioning of high-speed networking services, customized where necessary, for researchers when pursuing research opportunities such as those offered by the National Science Foundation (NSF) and the National Institutes of Health (NIH), which require access to advanced, high-speed networks like CalREN, for educators when pursuing opportunities such as those through the Department of Education, and for libraries and museums when pursuing opportunities such as those offered through the U.S. Institute of Museum and Library Services.
- A statewide federal E-rate consortium managed by CENIC.
- Programs and partnerships focused on improved broadband capacity for CENIC member institutions in un- and underserved parts of California.
- Shared network services (e.g., “cloud services”) to support research, educational, and administrative missions of member institutions.
- Extremely cost effective circuits between CalREN and library, education, and research sites via an aggregated, statewide circuit RFP process managed by CENIC.
- National and global collaboration with other researchers, educators, and librarians via highly reliable, uncongested Internet services through an optical backbone infrastructure.
- Lastly, and importantly, libraries would become part of a statewide high-bandwidth intranet, connecting libraries to existing (and prospective) school and college partners.

Why should libraries' connectivity be managed at the state level?

Wouldn't it be better to leave that to local communities?

In today's economic times, libraries can be thought of as "economic first responders" for those who lack access to information technologies. As such, they require highly robust, high-speed connectivity. Today, many libraries do not have the connectivity required to serve their communities. By combining the buying power of California's 1100 libraries with that of K-20 education, significant one-time and ongoing cost savings can be realized.

In addition, a unified statewide library network will allow applications to interoperate in a way that would be difficult if libraries were connected to disparate network providers. These applications might include shared licensing (for both content and business applications), broad-based content sharing, cloud computing applications, and system or multi-system library cards.

How would libraries connect to CalREN?

Libraries would typically be aggregated through system libraries and physical connectivity to library sites can be achieved by a variety of means, including

- Connecting library systems using CENIC-managed fiber or circuits leased from telecommunications providers;
- Connecting library systems to K12 or Community college sites currently participating in CalREN;
- Connecting libraries and/or library systems as participants in network rings currently serving K12 and Community college sites; and
- A combination of the above three options.

Circuit costs to connect to the CalREN network are funded by library systems or individual libraries.

How is the \$4.5M/year CENIC Charter Associate fee set, \$2.25M of which is requested from the General Fund? Specifically, how was the Public Library Segment fee derived?

CENIC is a not-for-profit 501(c)3 corporation providing advanced network services for California educational institutions and related organizations such as libraries and health care.

As a not-for-profit, CENIC's fees are set by its Board of Directors on a cost-recovery basis. These fees are currently set at \$4.5M/year for each of the multi-site segments (the University of California, the California State University, the California Community Colleges, and the California K-12 system). These fees cover the network infrastructure, network services procured from external organizations, and support costs such as salary for CENIC's staff of 50 (most of which are technical staff providing 24x7x365 services to the institutions connected by CENIC's network).

CENIC technical staff have performed an analysis of the traffic volumes projected for the approximately 1,100 libraries proposed for connection to the CENIC network. Based on this analysis, CENIC expects that network upgrades totaling \$18M will be required to carry this traffic.¹ This equipment is amortized over 4-6 years depending on specific equipment types. Accordingly, CENIC proposes to extend the \$4.5M annual fee to the California libraries, providing a four-year period in which CENIC will recover its direct costs, with the fifth-year fee serving as a prorated allocation to CENIC's support services.

The \$2.25M from the General Fund would be matched with a grant from the California Teleconnect Fund, which CENIC will work to secure.

How would a statewide E-rate consortium for libraries function?

CENIC's first E-rate application for the K12 node sites on the CalREN network dates back to 2002. CENIC is the applicant for the largest consortium E-rate application in the country, serving over 90 percent of K12 schools and districts in California. CENIC has more than ten years experience in securing federal E-rate discounts and California Teleconnect Fund discounts, the state equivalent of the federal E-rate program.

CENIC is in a unique position to organize and lead a statewide E-rate consortium for public libraries in California. Moreover, CENIC's buying power and experience with telecommunications service providers will result in an immediate benefit to public libraries and library systems across California. As it does for K12, CENIC would coordinate library circuit purchases through a common statewide Request for Proposals (RFP) process – a process that is attractive to telecommunications providers as it provides a single point of contact and purchase aggregation, and a process that provides significantly lower costs to libraries (as it does currently for K12, the California Community Colleges, the CSU, and UC). An E-rate consortium would include the following activities:

- Annual review of bandwidth use and upgrades
- Annual procurement of last-mile data circuits (Form 470 and/or RFP)
- Review Form 470 responses
- Award circuits and negotiate contracts
- Obtain needed data/statistics to complete discount calculations and cost-allocations, where applicable
- Prepare all data and Form 471 attachments
- Submit and certify E-rate application(s)
- Respond to annual Program Integrity Assurance (PIA) inquiries from the Universal Service Administrative Company's (USAC) Schools and Libraries Division (SLD)

¹ See attachment #1 for details on backbone costs.

Attachment 1

ATTACHMENT #1: Backbone costs to connect Libraries to CalREN over a 5 year period²

- Additional 180 head-ends needed with an assumption that 50% connect at 1GE, and the other 50% connect at 10GE
- New traffic on backbone: 90G+900G = 990G
- To achieve a 4:1 oversubscription, we need ~250G of new carrying capacity on the backbone. Each backbone segment will need to be upgraded.

| <u>Backbone segments</u> | <u>Optical costs</u> | <u>Router costs</u> |
|--|------------------------|---------------------|
| LA-Tustin | \$706,800.00 | \$636,000.00 |
| Tustin-San Diego | \$706,800.00 | \$636,000.00 |
| San Diego – Riverside | \$706,800.00 | \$636,000.00 |
| Riverside – Bakersfield | \$706,800.00 | \$636,000.00 |
| Bakersfield-Fresno | \$706,800.00 | \$636,000.00 |
| Fresno-Fergus | \$706,800.00 | \$636,000.00 |
| Fergus – Sacramento | \$706,800.00 | \$636,000.00 |
| Sacramento – Oakland | \$706,800.00 | \$636,000.00 |
| Oakland – Sunnyvale | \$706,800.00 | \$636,000.00 |
| Sunnyvale – Soledad | \$706,800.00 | \$636,000.00 |
| Soledad – San Luis Obispo | \$706,800.00 | \$636,000.00 |
| San Luis Obispo – LA | \$706,800.00 | \$636,000.00 |
| | | |
| Backbone Hardware Total | \$16,113,600.00 | |
| Basic assumption that 10% of new traffic has to go to paid transit: | | |
| -4-year cost of three new 10G ISP connections | \$1,077,120.00 | |
| -Hardware for three new ISP connections | \$954,000.00 | |
| | | |
| Total Hardware costs to add Libraries to CENIC phased in over 4 years | \$18,144,720.00 | |
| Fee for CENIC support services prorated in Year 5 | \$4,500,000.00 | |
| Total Hardware and Labor costs | \$22,644,720.00 | |
| | | |
| Revenue Requested at \$4.5M/year over 5 years | \$22,500,000.00 | |

² Hardware refresh cycles will begin in Year 6; repeating costs above