

# Future-Proofing the Network with CENIC

CCC Technology Center | June 1, 2023

## Thank you for joining us!

- We will start at noon.
- Captioning is available via the Zoom CC button.
- Today's session will be recorded and will be available in 5-10 days.
- Please use the chat tool for questions and comments.

# Agenda

## Future Proofing the Network with CENIC

- Introductions
- CENIC Overview
- Tech Center Role
- Services Available to Colleges
- Q&A with CENIC



# CENIC | NonProfit

Corporation for Education Network Initiatives in California

CENIC is a 501(c)(3) with the mission to advance education and research statewide by providing world-class network essential for innovation, collaboration, and economic growth

## Goals:

- Provide cost-effective, high bandwidth networking support to the missions of their members
- Respond to the needs of members' faculties, staff, students, and associated research groups
- Facilitate excellence in scientific, education, government, and private sector collaboration and innovation

# CENIC | Governance



- Governed by [Representatives of Charter Associate Institutions](#)

- California K-12 System
- California Community Colleges
- California State University System
- University of California System
- California Public Libraries
- Stanford, Caltech, USC, Naval Postgraduate School

- **FY22-23 CCC Board Member Representatives**

- John Hetts, Executive Vice Chancellor, CCC Chancellor's Office
- Bill Moseley, Dean of Academic Technology, Bakersfield College
- CCC Representative #3, vacant

# CENIC | CalREN Backbone

California Research and Education Network

20,000,000 Californian's use CENIC

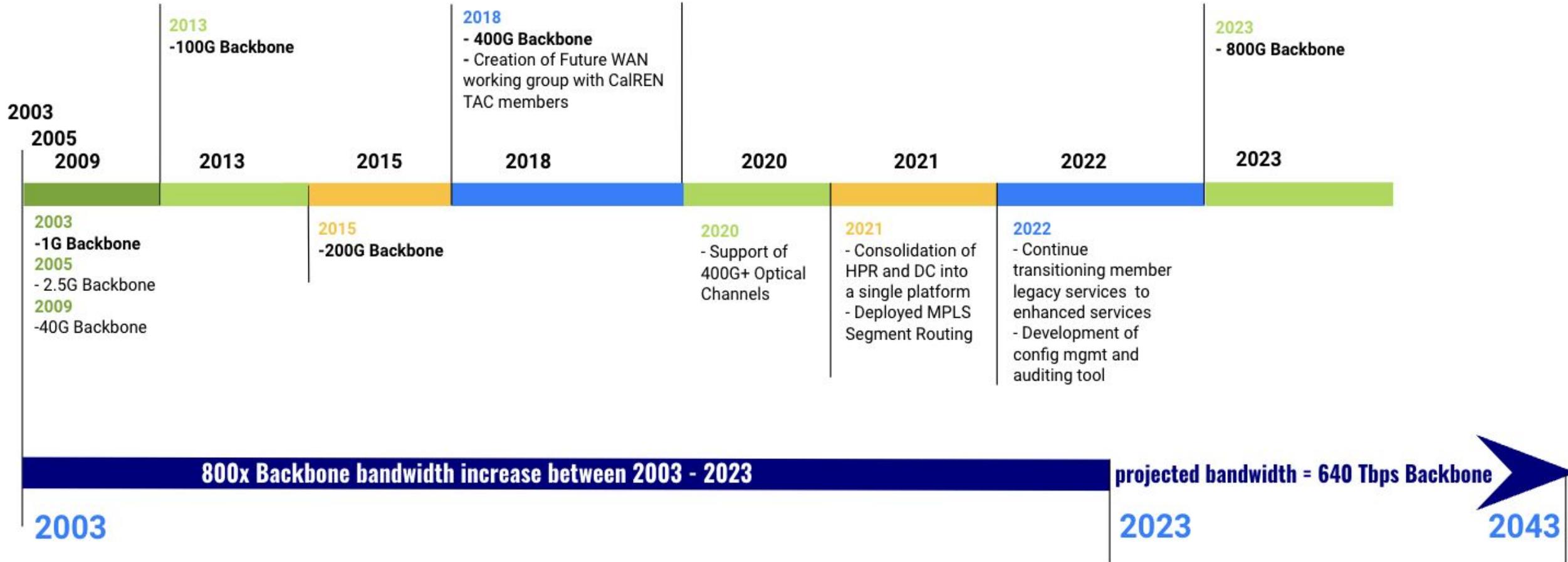


# CENIC | CalREN Backbone

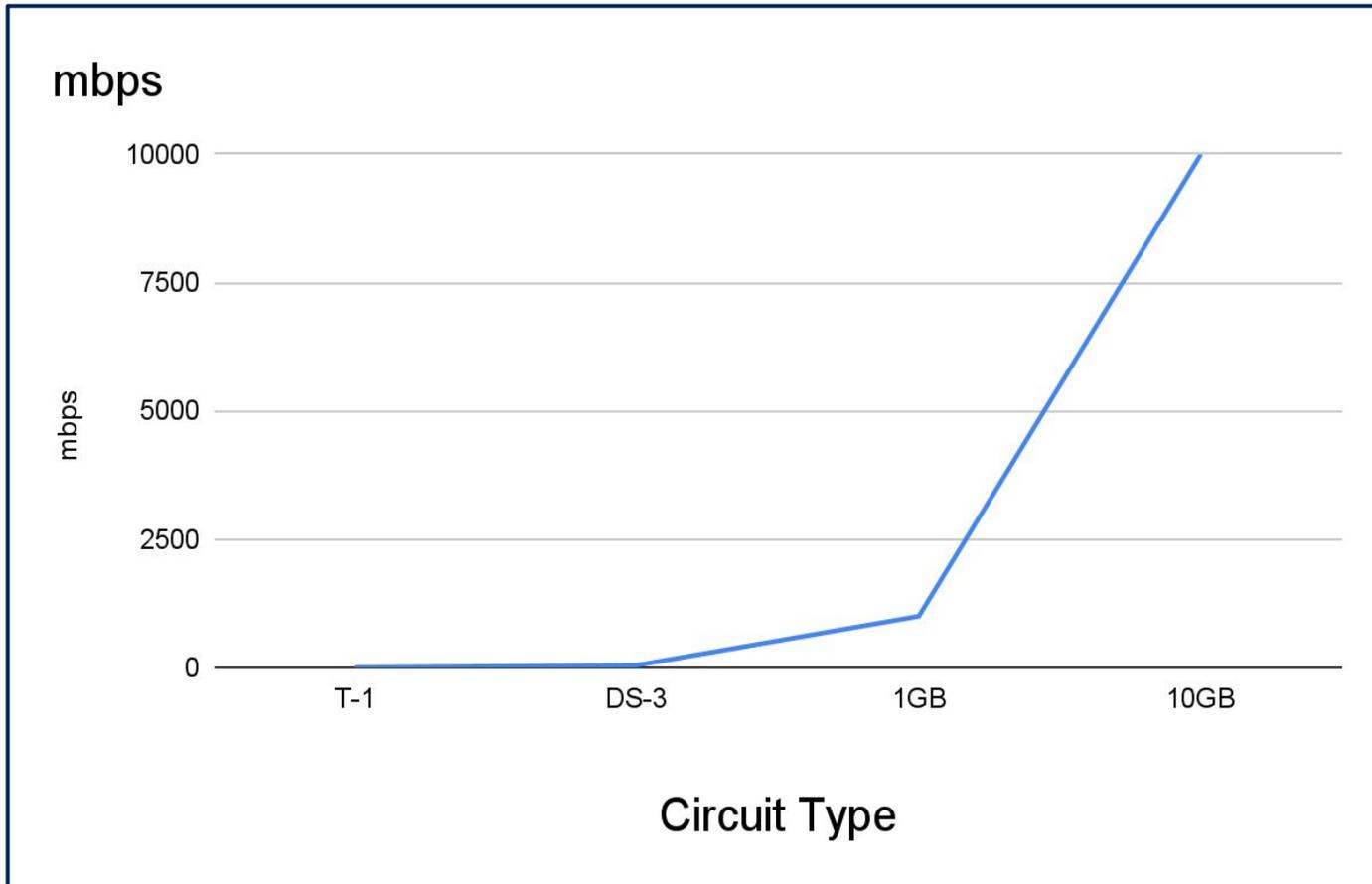
## California Research and Education Network

- CalREN is a high-capacity computer network with more than 8,000 miles of optical fiber managed by CENIC
  - CENIC is consistently looking at expanding their fiber footprint and enhancing their network infrastructure to serve the community
- Connections from CalREN to CCCs in all 58 counties via fiber optic cable or leased circuits from telecommunications carriers
- CENIC collaborates with many private sector partners and contributes >\$100,000,000 to the California economy

# CENIC | CalREN Backbone Upgrades



# CENIC | CCC Benefits of High Bandwidth



CENIC has *consistently increased availability of bandwidth* to its members over the years

Beginning 2021 all of CENIC's major network hubs are being upgraded to Next Generation Infrastructure (NGI) to *increase capacity, flexibility, and resilience*

## CENIC Bandwidth Capacity:

- 100GB in 2014
- 800GB in 2022

# CENIC | CCC Benefits in Serving Students

- High-Speed Internet Access: increases overall access to educational opportunities
- Collaboration and Networking: helping prepare for careers
- Cloud Services: access from anywhere and any time
- Cybersecurity: helps ensure that student data is kept private and secure
- Technical Support: access to the resources needed to be successful in their studies



# CENIC | Technology Center Role

## Project Management of CCC Broadband Infrastructure Upgrade

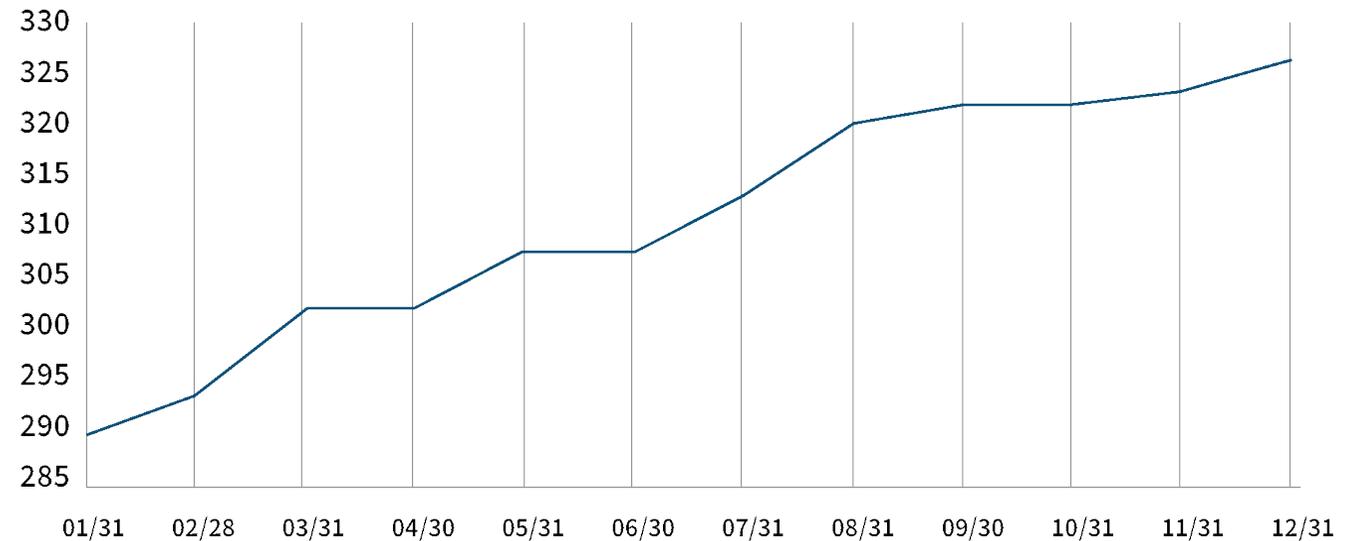
- **Management:** scope, schedule, and budget
- **Payment:** routers, equipment, monthly recurring circuits service, and maintenance
- **Maintain Eligibility:** CPUC 50% discounts on circuits service costs
- **Coordination:** upgrades with colleges and CENIC
- **Collaboration with CENIC:** order and schedule new and EOL circuit installations and approve circuit renewals
- **Maintain:** district network topology maps for circuit inventory
- **Prioritize:** redundancy and diversity with district network needs
- **Reporting:** CPUC (California Public Utilities Commission), Department of Finance, CCCCCO, and Districts/Colleges

# CENIC | CCC Broadband Infrastructure Upgrade

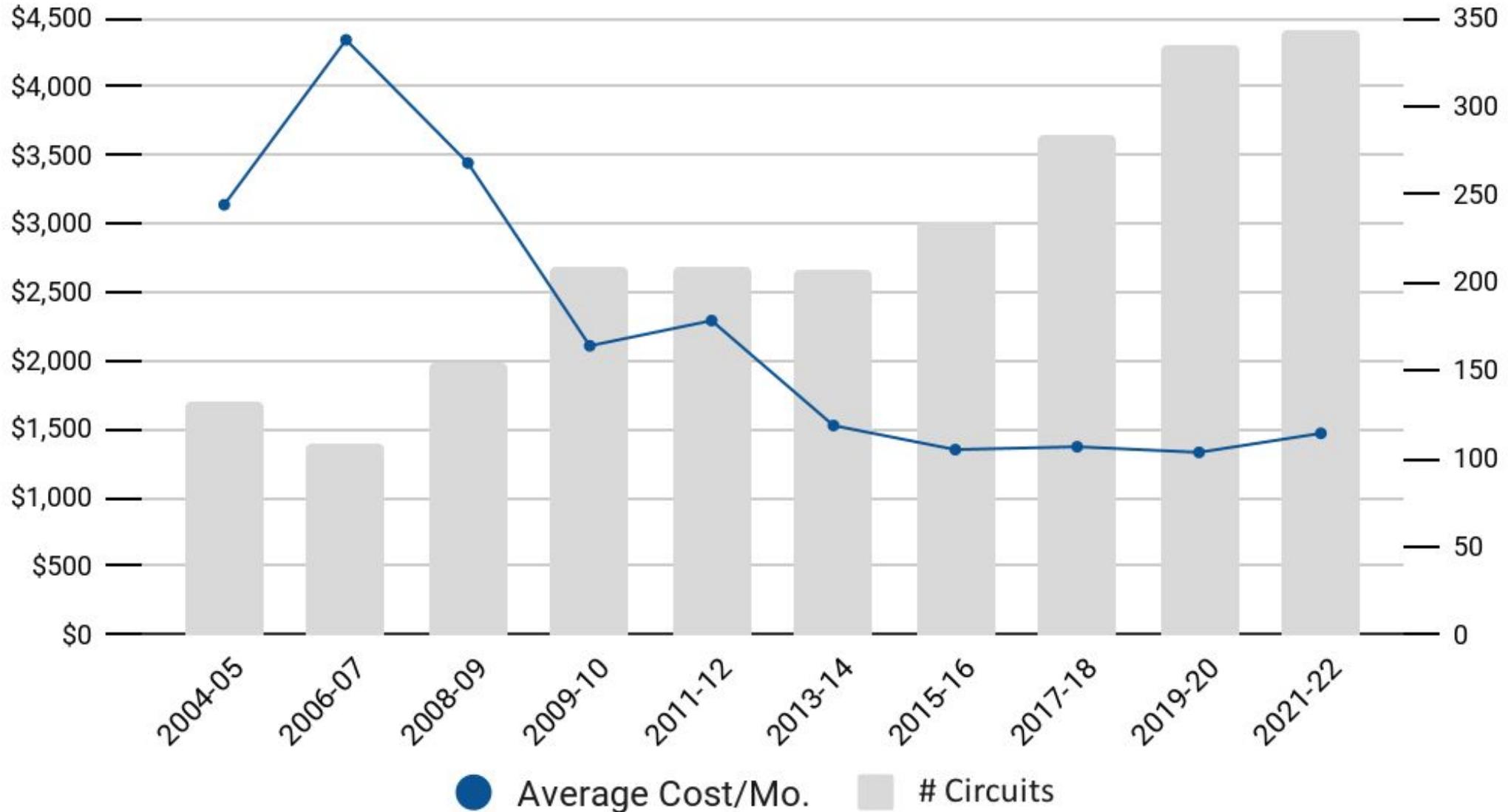
## Project Status to Date

- FY 21-22 Plan: 37 of 51 in Production, 7 in Implementation & 7 canceled
- FY 22-23 Plan: 40 of 62 in Implementation, 6 in Production, 3 canceled & 13 to be ordered
- FY 23-24 Plan: 56 circuits - 5 college upgrades to 10GB and 51 new 1GB for center sites

CENIC Updated Circuits (2022)



# CENIC | CCC Benefits of Costs



# CENIC | CCC Broadband Diversity

## Beyond FY 2023-24:

- Lack of True Circuit Diversity continues to contribute to outages
  - Circuits with diverse hub sites may travel along shared fiber paths
  - Circuits with diverse telecom carriers may share fiber lines

## Next Steps:

- CENIC and CCCTC will review circuits upgraded between 2017 and 2021
- Circuits without true or adequate diversity will be placed on a list
- CENIC will check diversity options with telecom carriers
- Circuits will be moved or replaced to obtain the best diversity feasible



# CENIC | CCC Connectivity Offerings

Districts are Eligible for:

- **Connection to CalREN** or between district, college, or center sites
- **Redundancy and Diversity** provided by Primary and Secondary circuits
- **Routers and Equipment** needed for circuit installations
- **Annual Maintenance** on routers
- **Equipment Replacement** at EOL or malfunction
- **CENIC Negotiated Contract** with local telecommunications companies
- **Emergency Response and Support** for natural disasters and fiber cuts

# CENIC | CCC Connectivity Offerings

## Circuit Speed Capacity: 100GB / **10GB** / 1GB

- **Colleges:** 2x 10GB circuits and Juniper MX204 routers
- **Centers/District Offices:** 2x 1GB circuits and Juniper MX204 routers
- **Other Sites:** reviewed and approved/denied on case-by-case basis as available funding allows



# CENIC | CCC Member Services

## CCC Network Service Offerings

- VPN Services
  - Layer 2 Virtual Private Network Service - E-LINE
  - Layer 2 Virtual Private Network Service - E-LAN
  - Layer 3 Virtual Private Network Service - IP VPN
- Layer 1 Services
  - Optical Services
  - Optical Spectrum Services



# CENIC | Additional Fee-for-Services

Digital California (DC) Service:

- DDOS Mitigation Service
- Internet2 Services:
  - Cloud Connect
    - AWS Direct Connect
    - Google Cloud Partner Interconnect
    - Microsoft Azure ExpressRoute



# CENIC | CCCTC Q&A or Feedback

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