



Connecticut's Trusted Internet Partner

Strategic Plan

2019-2024



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Letter From the Director

Dear Colleagues,

We are pleased to share with you the Connecticut Education Network (CEN) 2019-2024 strategic plan. This document provides the context, goals, and strategies that further the collaborative approach at the heart of CEN's delivery of Internet and network services to Connecticut's community anchor institutions.

The services CEN provides remain critical to the mission of its members throughout the state. The CEN model represents a unique approach to services at scale that directly impact Connecticut's success in education, research, government, healthcare, and economic development. Our state's community anchor institutions continually navigate a complex and dynamic landscape, all to address a relatively common set of challenges. The Network has supported that work for nearly two decades, and this Plan charts a course for the coming years.



Over the past months, CEN reached out to its members for input and guidance, with dozens of local leaders offering their time and expertise in the design of this document. Members of CEN have informed our understanding of the significant role that the Network has played since its founding, as well as our collective vision for the future. We appreciate each and every one of your contributions.

CEN is a unique asset to the State of Connecticut, one of few networks nationally that have comparable reach throughout its state. We have a strong history of success and a future that holds great opportunity. Internet and network services will continue to play a critical role in our members' success, and I am excited to lead CEN's efforts to provide value to the connected community we serve.

Regards,

Ryan Kocsondy | Director CEN

Executive Summary

The Connecticut Education Network (CEN) is a tremendous asset to the State of Connecticut that provides critical network services to the research and education community that in turn encourage workforce and economic development. CEN is the leader in high-performance Internet for Connecticut's schools, libraries, colleges, and towns, providing equitable and efficient services throughout the state through a collaborative model that few states can rival.

This strategic plan reflects the collective needs and vision of CEN's member institutions, representatives of which provided direct input on the sections that follow. It is a plan built by and for stakeholders, not stockholders, to address the needs of the community and to provide transformative opportunities throughout the state. Through this approach, the plan remains both practical and aligned to support economic and workforce development through education, research, government, healthcare, the arts, and open access members.

The goals and strategies herein represent the needs of the community and the overall approach to what CEN must do to remain competitive and relevant (Goal 1), to differentiate itself from commercial counterparts and ensure continual alignment with our members (Goals 2-4), and to provide foundational support of the overall platform on which all other goals depend (Goal 5).

2019-2024 Strategic Goals

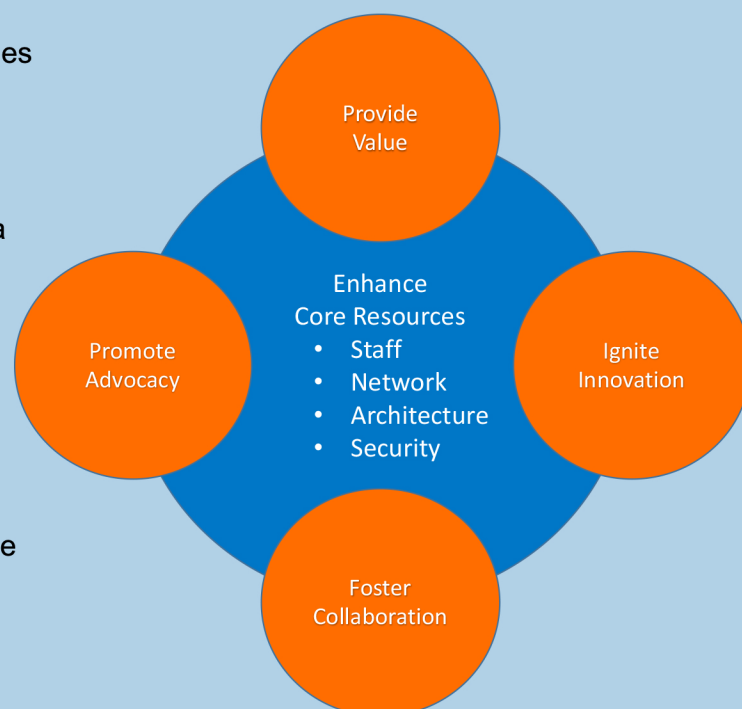
Goal 1: Provide Value - Expand the service portfolio to provide value and enhance Internet and network capabilities at scale, heighten security, and increase the overall knowledge and understanding of those technologies and services.

Goal 2: Ignite Innovation - Empower members through a suite of services tailored to their needs that encourage excellence and innovation.

Goal 3: Foster Collaboration - Engage the local membership and national R&E community to provide technical and functional network services that serve the specific needs of CEN member communities.

Goal 4: Promote Advocacy - Pursue activities to enhance brand awareness such that members and policy decision makers are engaged in activities to help articulate CEN's value proposition and impact public policy initiatives.

Goal 5: Enhance Core Resources - Pursue opportunities to leverage, develop, and enhance CEN's core technology and human resources for the foundational success of the program in pursuit of member needs.



Introduction

The Connecticut Education Network (CEN) is a joint venture between the State of Connecticut, the program owner, and the University of Connecticut (UConn), the program operator. The Network operates as a cooperative, providing Internet and related services to member community anchor institutions within Connecticut. CEN's most basic goal is to provide value. Value as the primary motivator and driver to help make a difference to our member institutions in every town with daily reach to nearly half the citizens in Connecticut. CEN has comparable levels of service and connections to those of its research and education (R&E) network peers (for example Michigan's Merit and North Carolina's MCNC), and it has tremendous opportunity to grow and diversify its related services to better serve and provide additional value.

CEN has challenges that are both common among R&E networks and unique to Connecticut. As with other networks, CEN continues to articulate its value to stakeholders, compete and separate itself from commercial for-profit counterparts, and innovate to introduce efficiencies and new services. CEN's history of delivering stellar service also presents a challenge, in that many members only appreciate the Network in rare instances when they experience latencies. The loyalty of its members remains strong, especially in light of CEN's recent history of switching from a partially State-appropriated operation to a self-sustaining one. The program delivers strong value while remaining capital intensive and member driven, all with only 10 full-time staff.

CEN's growth since its creation in 2000 is a testament to the need and continued demand for advanced network services that support education, research, government operations, and the general citizenry. The Network's infrastructure provides a quiet but distinct advantage to Connecticut, positioning the state to compete in workforce and economic development, all while setting a high standard for similar services throughout the region. CEN has a near zero attrition rate, is a true partner aligned with its member community, and continues to expand into Connecticut's less-connected landscape, helping to bridge the digital divide.

The CEN strategic planning process was designed to create a foundation and framework for future success. Planning members include CEN staff and member representatives from core constituency groups: K-12 and higher education, libraries, municipalities, and state government. The successful completion of the activities outlined in this document will enable CEN to operate as one of the premier R&E networks in the nation, provide tremendous value to the state, and strengthen an already vibrant membership that is collectively greater than the sum of its parts.



VISION

CEN serves as the trusted partner through which Connecticut's digital and human networks connect, collaborate, and share resources to realize the full potential of digital learning, research, and citizenry.

MISSION

Empower our member institutions to execute their missions through technology, collaboration, and digital transformation with secure, reliable, and value-added network and Internet solutions.

VALUES

Member Focus	Provide unmatched value through a unique appreciation of member needs as a trusted partner based on a cooperative model.
Transparency	Be open in our processes, communication, and sharing of information to the membership and related stakeholder groups.
Integrity	Be honest and forthright in every way and consistent in our approach to doing the right things the right way.
Efficiency	Provide sustainable services efficiently and flexibly, using available resources.
Equity	Provide high-quality resources and products to all members for the benefit and growth of the statewide connected community.
Excellence	Demonstrate a commitment to continuous improvement, innovation, flexibility, accountability, and superior member outcomes.

Brief History of CEN

CT State General Statute 4d-80 to 4d-85 established the Connecticut Commission for Educational Technology (CET) in 2000. It identified the need for an advanced network across the state and laid the groundwork for defining policy goals. CEN was conceived shortly thereafter to attain the goal of “connecting all institutions of higher education, libraries, public elementary and secondary schools, regional educational service centers and other parties through a state-wide high speed, flexible network that will allow for video, voice and data transmission.”

Federal funding through the Broadband Technology Opportunities Program in 2009 helped refresh the infrastructure and expanded the scope to allow municipalities, state agencies, healthcare, and open access members to connect at a fair price. Episodic expansion of the network has created a statewide network connecting community anchor institutions throughout the state, creating the first and longest operated all-optical, high-speed R&E network in the country.

Through the years, CEN's critical infrastructure has continued to grow and provide value through advanced network services and represents a unique asset that could not be re-built for its replacement cost today. The approach and not-for-profit delivery of CEN services are fundamentally different by practice, set the standard within CT for high-performance network and Internet-related services, and represent a unique value proposition, unlike any other program or service found in Connecticut or New England. Today CEN provides gigabit fiber Internet service more than 500 members and 1.8 million Connecticut citizens.

1.8 Million Citizens Served

Community Anchor Institutions	Public K-12 Districts	Public Colleges & Universities	Private Colleges & Universities	CT Public Libraries	CT Municipal Government	CT Govt Branch	Open Access
Connected	170	19	17	144	102	2	38
CT Total	170	19	20	238	169	3	n/a
% of Total	100%	100%	85%	61%	60%	66%	n/a

Governance

CEN utilizes a number of methods to ensure it is well aligned with the needs of its connected members to provide the services and content they desire. CEN is:

Governed by the CET. This Commission is the principal educational technology advisor for state government comprising a diverse set of state and local leaders, from both private and public sectors, and representing CEN's diverse connected member base.

A member-driven organization. As such, CEN maintains advisory councils co-chaired by and comprising its members and public and private sector leaders. The group provides guidance and insights on services, programs, technical advancement, engagement, and outreach activities.

Services Management Advisory Council

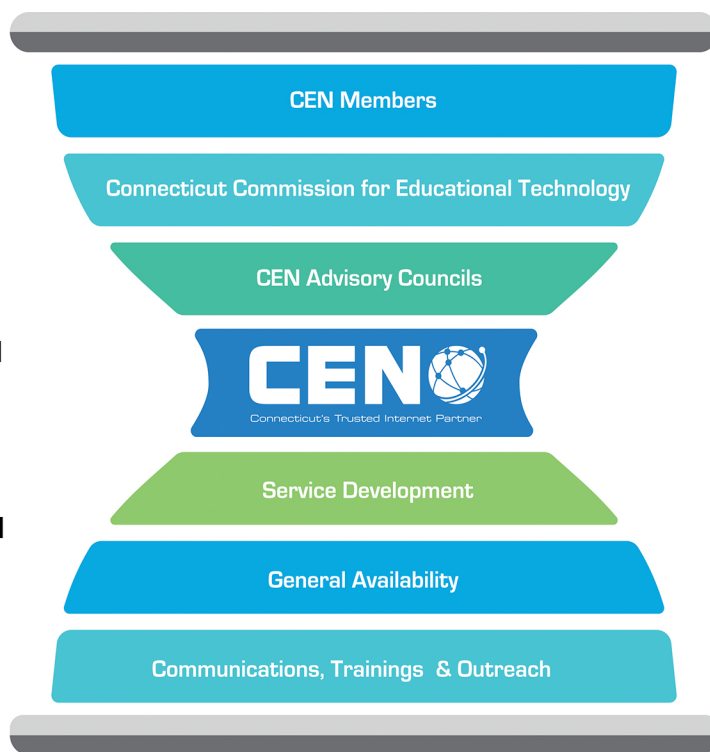
Provides advice and recommendations to CEN staff on matters related to existing and new services, addressing issues such as quality, cost, and adoption. The greater member community is encouraged to provide feedback to ensure service quality.

Technical Advancement Advisory Council

Provides input and advice, through education and exploration, on advanced technical ability and applications that meet the need of CEN member constituencies.

Engagement & Development Advisory Council

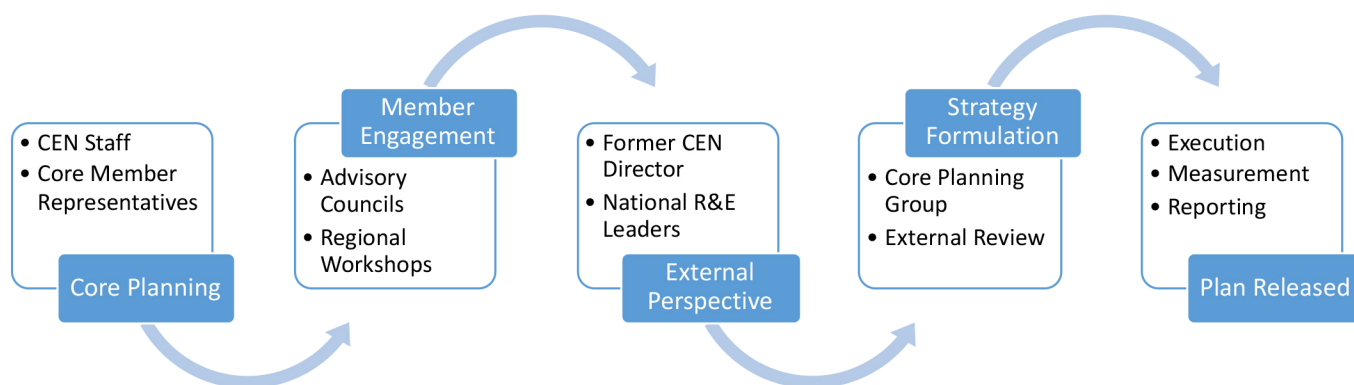
Provides leadership and insight into the development and delivery of technical, professional, and leadership info, training, and seminars for CEN members. The group is responsible for the development of the Annual Member Conference program.



Planning Approach and Engagement Process

CEN's strategic planning approach was designed to encompass the needs of the community it serves as well as potential new stakeholders throughout the state. The approach encompasses a number of engagements over the course of a year and included structured and informal feedback mechanisms consisting of the following:

- Establishment of the planning committee comprising CEN staff and member representatives
- Establishment of, and engagement with, the CEN Advisory Councils
- Workshops with planning staff and member representatives
- Regional workshops engaging members directly
- Interviews with former CEN Directors
- Discussions with regional and national leaders in the R&E space



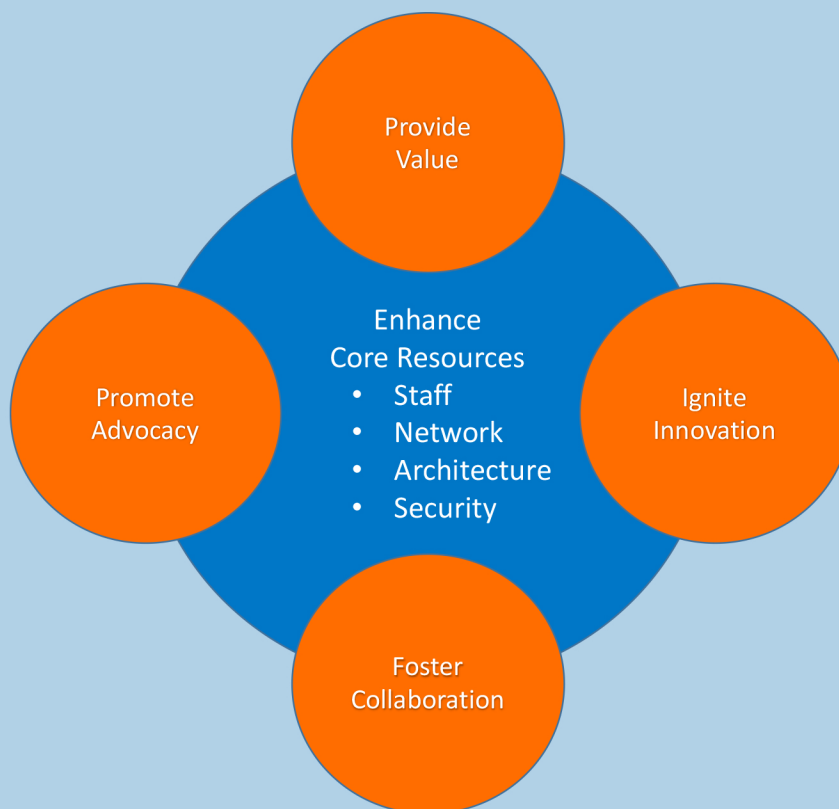
Strategic Goals

CEN will spend the next five years engaged in efforts that equip its members to make full use of technology to respond to and take advantage of the changing educational, research, civic, governmental, healthcare, and economic landscape.

Learning in the digital age requires dependable, secure, and robust connectivity, assets that also attract and support academic and scientific research. Citizens turn to online resources for learning and engagement, and local and state agencies require the technology infrastructure to serve their colleagues and constituents. The promise of a more efficient and unified system of healthcare — across patients, providers, insurance companies, and institutions — demands a safe, high-performance network. Private companies and not-for-profit organizations have shifted products, services, and support to online channels, making scalable broadband a requirement when considering startup, relocation, and expansion decisions.

Connecticut stands poised to respond to the ever-increasing demand for network and Internet-based solutions through the continued state and member investment in CEN. To steward these investments, CEN must continually reinforce its value, solidify long-term support of its technology assets, and continue to cover operational costs while delivering new services that support member needs. The health and growth of CEN will support Connecticut's education, research, and economic development through technological advancement delivered through a model of state efficiency.

The following goals address specific ways to advance the mission and vision of CEN to provide high-quality and efficient services at scale to our members.



Goal 1: Provide Value

Expand the service portfolio to provide value and enhance Internet and network capabilities at scale, heighten security, and increase the overall knowledge and understanding of those technologies and services.

- Expand existing network and Internet services and bundle services to tailor offerings to specific member constituent groups.
- Offer 'managed services model' for security services, heightening the visibility and overall protections surrounding members' key network assets.
- Organize workshops, formal classes, and Webinars of current and emerging network and security technologies, services, and trends available in the marketplace.
- Pursue ways to maximize service delivery and optimize approaches annually.
 - Direct Services - Services provisioned and managed directly by CEN staff that are part of our direct extension of core competencies.
 - Brokered Services - Services managed by CEN staff but subcontracted to third parties for day-to-day management or oversight (escalations remain within CEN).
 - Contract Vehicle - Products and services offered through contracts whereby vendors interact directly with CEN members, who receive preferential rates, discounts, and/or additional value-added services that would otherwise be unavailable on an individual basis.

Goal 2: Ignite Innovation

Empower members through a suite of services tailored to their needs that encourage excellence and innovation.

- Engineer the network for peak performance, while continuing to find ways to reduce the total cost of ownership when delivering services.
- Continually evaluate and provide guidance on emerging technologies being offered to the member community.
- Provide tools to help members better use, measure, analyze, and understand the network-based services they consume.
- Seek grant funding to support next-generation network activities.
- Pursue new and value-added services that members cannot easily obtain elsewhere, allowing CEN to continue to remain at the forefront of service delivery over commercial counterparts.
- Prepare the future network by providing thought leadership into new and evolving technologies and how they may impact the connected community in Connecticut.

Goal 3: Foster Collaboration

Engage the local membership and national R&E community to provide technical and functional network services that serve the specific needs of CEN member communities.

- Leverage CEN advisory councils to provide advice and counsel to CEN leadership in producing innovative, well-informed, and technically sound services and solutions that advance member needs.
- Expand engagement offerings in pursuit of a robust exchange of ideas, thought leadership, in-depth conversations, and sharing of best practices aligned constituent member groups.
- Expand the annual conference while maintaining a laser focus on the CEN community, industry best practices, innovation, collaboration, and advocacy.
- To the extent feasible, delegate coordination functions to responsible entities that represent the interests of the membership and/or effected parties.
- Establish partnerships with non-profit and commercial providers to increase CEN's effectiveness and ability to execute in areas where needed.
- Pursue regional collaborations to increase operational effectiveness and reduce costs to members when expanding the network into new and emerging markets.
- Participate in regional and national professional development opportunities and information exchanges.
- Support member affiliate groups and their events by providing expertise, meeting space, and logistical support to support the broader community.

Goal 4: Promote Advocacy

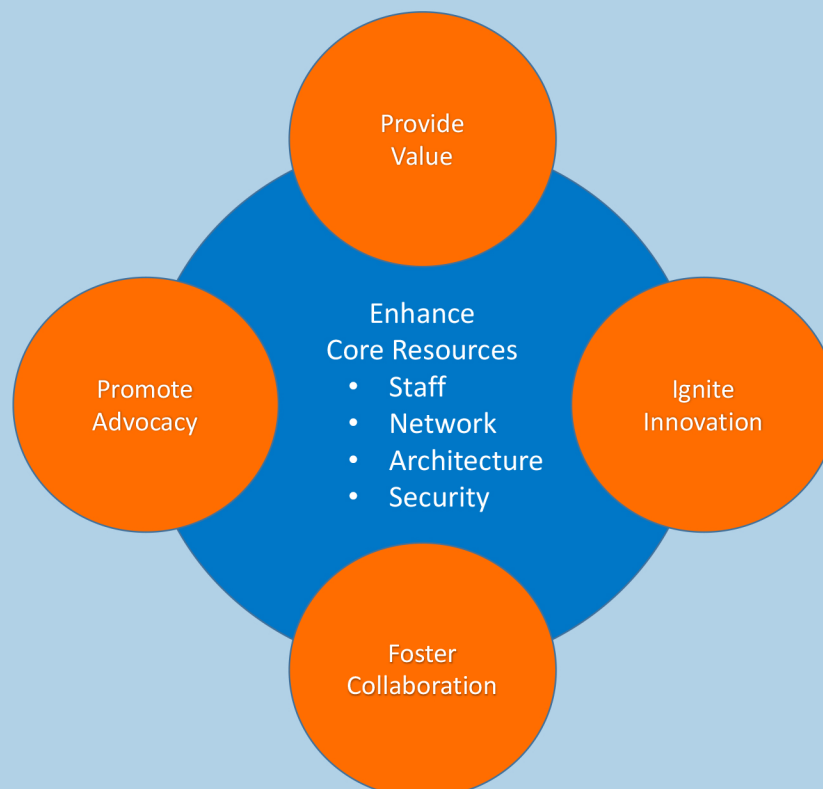
Pursue activities to enhance brand awareness such that members and policy decision makers are engaged in activities to help articulate CEN's value proposition and impact public policy initiatives.

- Clearly articulate CEN's value proposition to all members
- Equip key constituents in research, education, government, and public safety to advocate on CEN's behalf.
- Raise legislative awareness of CEN's value to support education, research, government, and economic and workforce development.
- Raise awareness of CEN's value among functional (non-technical) partners through ongoing communications.
- Leverage an outreach strategy that encompasses social media, Web, traditional marketing, talking points, conferences, and events.
- Advocate for increased investment in support of the overall program growth.

Goal 5: Enhance Core Resources

Pursue opportunities to leverage, develop, and enhance CEN's core technology and human resources for the foundational success of the program in pursuit of member needs.

- Optimize the scale of the network, its refresh cycles, and opportunities to find more efficient ways of adding capacity while reducing cost.
- Ensure business continuity and maintain high-quality service and support for CEN's members.
- Optimize growth while maintaining a member focus by pursuing opportunities that leverage CEN's core competencies to foster smart and connected communities statewide.
- Build CEN's individual resources by increasing depth, providing growth opportunities for staff to specialize, and continuing to support the membership to the fullest potential.
- Aggregate, where possible and appropriate, member demand for services, contracts, and licensing, and work with hardware and software vendors to reduce costs and improve efficiencies.
- Streamline business operations to ensure efficient use of resources and successfully compete in the marketplace.

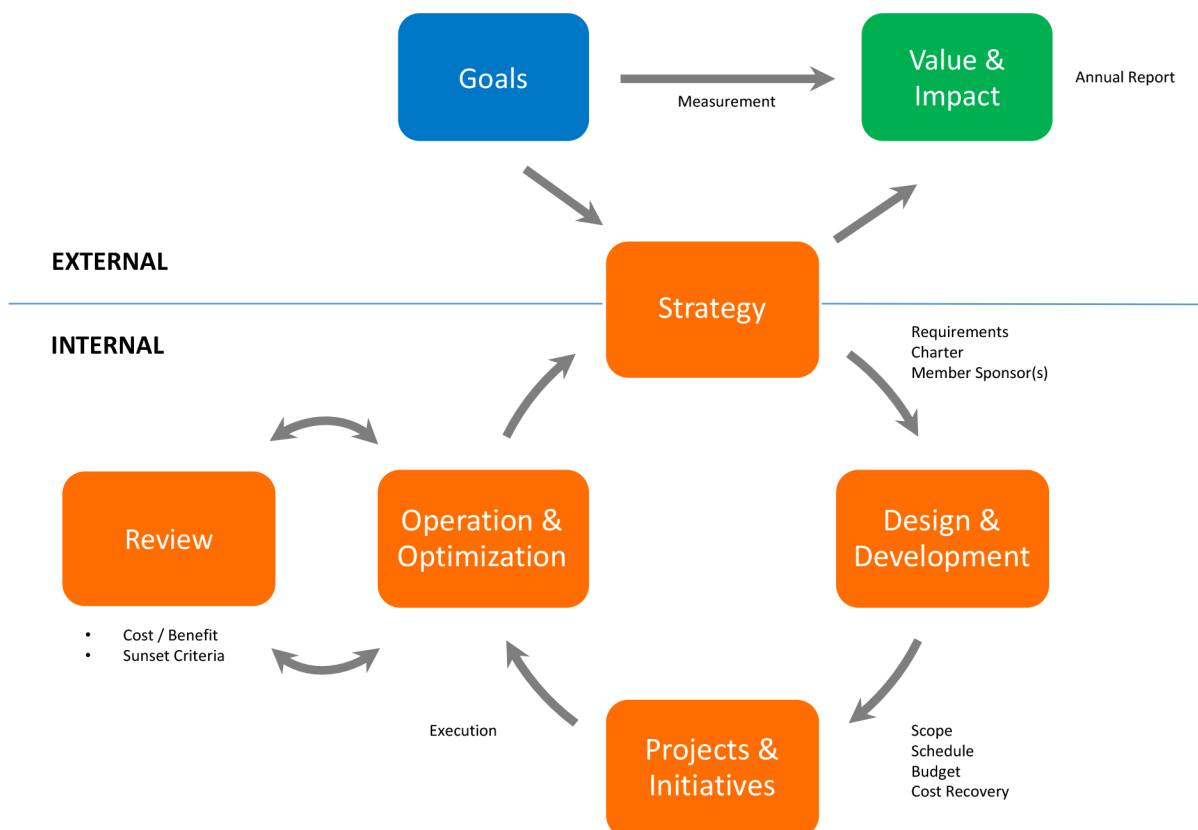


Measurement and Reporting

The framework laid out in this document will move CEN forward in the coming years by clarifying its value to the state and by advancing the needs of its diverse and expansive community. Goals represent high-level descriptions for how CEN will advance its vision and mission, and paint a picture of what future success looks like. They are organizational principles that can lead to a variety of actionable components. Strategies include broad, organizational approaches to meeting the Goals. Tactical items, both generated through this process and continually developed through the advisory councils in coming years, will help the plan come to life.

Outcomes of the Goals, serving as the overarching criteria for success, will serve as benchmarks for how we measure success both internally and externally. Internal activities include the execution of daily operations, initiatives, projects, and services. External functions relate to the overall value and impact to CEN members and their constituents.

Mechanisms to effectively report the internal and external success of the plan will impact and refine our goals, strategies, and successes. Activities supporting the goals will be reported annually as part of the CET required statute, as well as individually presented to the membership and key stakeholders as standalone communications.



Core Planning Council Members

(In alphabetical order by last name)

Raymond Carcano, Network Engineer, CEN
Douglas Casey,* Executive Director, Connecticut Commission for Educational Technology (CET)
Rick Cheung, Senior Network Engineer, CEN
Rachael Collard, Publicity and Marketing Coordinator, CEN
Stephen Cauffman,* RequestIT Coordinator, CT State Libraries
Ryan Kocsondy, Director, CEN
Richard LeFave, Volunteer and Advisor, CEN
Rafael Morales, Network Engineer, CEN
Michael Pennington, Network Engineer, CEN
Melanie Raczkowski, Administrative Services Specialist, CEN
Wendy Rego, Member Services Specialist, CEN
Kayla Rettburg, Financial Assistant, CEN
Paul Russell,* CTO, Town of Enfield; Co-Chair CT GMIS
Paul Tarsa, Member Relations Manager, CEN
Ralf Valenzisi,* Chief Digital Learning & Development, Norwalk Public Schools; Co-Chair CETEL
Karen Warren,* Deputy CIO, Wesleyan University

*Core member constituent group representative

Note: <https://ctedunet.net/members>



Appendix A - Amalgamated SWOT

	Helpful (to achieving the objective)	Harmful (to achieving the objective)
Internal Origin (attributes of the environment)	<u>Strengths</u> Skilled & responsive staff Member driven focus Network performance Scale of the physical network Security of network Reputation & trust Value and bundled services Focus on public sector & non-profits Local understanding and domain expertise R&E Community of networks	<u>Weaknesses</u> Communication to membership Online presence Price of lower tier bandwidth offerings Staff size Articulation of value, ROI, why Marketing of services Product & project management State fiscal health & dependencies
External Origin (attributes of the environment)	<u>Opportunity</u> Expand on-net offerings Managed services / consulting Cloud connectivity Last mile connectivity options Content generation / sourcing Contract aggregation / consortia pricing Increase member collaboration Disaster recovery / business continuity options Expand the physical network / membership	<u>Threats</u> Security landscape / regulatory requirements Political awareness / influence Fiber contracts, renewals, diversity options Member awareness of CEN services vs alternates Commercial competitor offerings / marketing E-Rate awareness of quality differences Manage growth while maintaining quality Incumbent provider lobbying Awareness from non-tech member affiliates

Appendix B - CEN Through Time

- 1999 – Lt. Governor Jodi Rell is asked to make recommendations to ensure that Connecticut's schools and libraries are prepared to meet the computer and information technology needs of the 21st Century.
- 2000 – Public Act 00-187 Establishes the Connecticut Education Network under the auspices of a new Connecticut Commission for Educational Technology (Sec 35).
- 2001 – CEN Connects first school district, the Bristol Public Schools with a 155 Mbps OC-3, replacing its 1.544 Mbps T1 circuit. 5 more districts are completed with OC3 connections; CT Dept of IT and UConn sign a collaborative memorandum to further develop CEN and services like access to Internet2; CEN Collaborates with State Department of Ed for the first of several years prioritizing Educational Technology Funding in districts to help schools connect to CEN.
- 2002 – CET endorses the CEN Architecture Policies; State signs a master agreement allowing a private company to build fiber supporting CEN connections throughout the state; CEN Files ERATE application to match approximately \$5M in state funds with \$4.5M in federal E-Rate funds to support accelerated backbone buildout; CEN gains access to Internet2 through the Northern Cross Roads (NoX) in Cambridge, Mass.
- 2003 - August 25, UConn and Yale sponsor CEN members for Internet2 connectivity through SEGP (Sponsored Education Group Program)
- 2004 - December - Governor Rell enables 'go-live' of the CEN members connecting to NEREN
- 2005 - All K-12 districts connected to CEN, enabling new teaching and learning opportunities statewide for CT's next generation educated workforce. First in the country!
- 2006 - March - Gov. Rell announces funding boost to continue linking schools to CEN within districts. May - Aggregate traffic tops 1Gbps
- 2008 - K-12 districts report an average of \$20,000/year savings by connecting to CEN; All CT State Universities, System Office, and Community Colleges connected via fiber.
- 2009 - Co-awarded federal Broadband Technologies Opportunity Program (BTOP) block grant. \$35M (of \$90M) to CEN with new 'open access' provisions allowing municipal and state government, public safety, healthcare, 'any' member groups to join for a fair price.
- 2010 - Backbone capacity increased tenfold through BTOP upgrade and expansion.
- 2011 - Completed K-12 district upgrades enabling gigabit Ethernet connections in every district.
- 2012 - CEN welcomed a new Director. Annual conference started, providing a forum for collaboration, innovation, and community best practice. Approximately 300 in attendance.
- 2013 - CT PA 13-247 grant fund for municipalities and regional councils of governments (RCOG) to connect. Resulting in over 100 municipalities connecting over time.
- 2014 - Via NSF grant, completed a science DMZ; established 100 Gig research corridor between UConn Storrs and UConn Health in Farmington.
- 2015 - Completed 100 Gbps connection to Internet 2, becomes R&E 'regional connector'; DDoS service starts at no additional cost to members, mitigates 245 attacks in the first year, saves millions in productivity for the state.
- 2016 - Awarded 1st CT Library Fiber Consortia bid, begin connecting additional libraries with high-speed fiber; State appropriation to wind down to \$0 by 2019; become an E-Rate service provider.
- 2017 - CEN welcomed a new Director, re-established advisory councils, receives \$1.5M bond for equipment.
- 2018 - Upgrades network core capacity to 200 Gbps. Aggregate peak traffic tops 100Gbps. State appropriation swept for cost-cutting, in-year operational self-sustainment comes 1 year early. Cost avoidance to the state due to the existence of CEN calculated up to \$29M annually.
- 2019 - new strategic plan released!



Connecticut's Trusted Internet Partner

Connecticut Education Network | 55 Farmington Ave, Hartford, CT 06105

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