CT Education Network:
Commission for
Educational Technology
Quarterly Update

March 6, 2023
1:00PM – 3:00PM
Virtual Meeting
MS Teams

Categories have been arranged for alignment with CEN's 2019-2024 [Strategic Plan](#).

1. Provide Value

- DDoS Mitigation Summary Review
  - New scrubbing appliance installed 1/18. Doubling current on-net capacity and extending capability and capacity grown for additional 5 years.
  - 2023-2024 Academic Year (August 1, 2022 – March 1, 2023)

Number of TMS Mitigations	Volume of Traffic Passed by TMS	Volume of Traffic Dropped by TMS	Volume of Largest TMS Mitigation	Rate of Largest TMS Mitigation	Duration of Longest TMS Mitigation
184	5.96 TB	27.66 TB	16.63 TB	25.26 Gbps	0d 23h 45m
↑26.90%	↓84.31%	↑57.08%	↓9.49%	↓15.08%	↓98.30%

Bottom row indicates increase or decrease from prior period (December 31 2021 22:58 - August 01 2022 0:00).

  - 2023 Calendar Year (January 1, 2023 – March 1, 2023)

Number of TMS Mitigations	Volume of Traffic Passed by TMS	Volume of Traffic Dropped by TMS	Volume of Largest TMS Mitigation	Rate of Largest TMS Mitigation	Duration of Longest TMS Mitigation
87	3.71 TB	22.72 TB	16.63 TB	25.26 Gbps	0d 23h 45m
↑38.10%	↑83.41%	↑442.48%	↑1145.20%	↑20.87%	↑510.21%

Bottom row indicates increase or decrease from prior period (October 29 2022 8:59 - January 01 2023 0:00).

  - Previous Year Summaries

Year	Number of TMS Mitigations	Volume of Traffic Passed by TMS	Volume of Traffic Dropped by TMS	Volume of Largest TMS Mitigation	Rate of largest TMS Mitigation	Duration of Longest TMS Mitigation
2022	242	40.36 TB	22.93 TB	18.32 TB	29.75 Gbps	58d 7h 42m
2021	537	25.41 TB	59.74 TB	6.00 TB	38.42 Gbps	150d 2h 20 m
2020	844	20.84 TB	45.83 TB	6.49 TB	19.99 Gbps	86d 10h 47m
2019	978	2.18 TB	12.04 TB	3.74 TB	20.03 Gbps	2d 17h 54m

  - 2022 Insights:

    Number of TMS mitigations are trending down year over year, initially attributed to pandemic response and prevalence remote work/learning, though is again down for a year where in-person activities has largely resumed. This may be due to changes in typical behaviors of the attackers, effectiveness of the CEN mitigation system and lack of effort to stress, or other unknown reasons. Interestingly, even though number of mitigated (actively scrubbed) attacks are down, volume of Threat Management System (TMS) mitigation has significantly increased. This is concerning in that when attacks do happen, they are becoming larger and for a longer duration than previous attacks when quantity was higher and volume was lower. Trending nationally and internationally: attacks, volume, and duration are all increasing.

- CT Library Fiber Consortium – Fiber to the Library (FTTL)
  - 3/1/23 Update: Stamford West Side complete; Gales Ferry – fiber complete, CEN turn up pending; Phoebe Griffin Noyes (Old Lyme) – install pending.
  - Project to connect libraries through federal E-rate and matching State Library bonded funds.
  - Many project sites connect underserved communities where connectivity options have remained relatively unchanged for decades. This project provides high-quality service at

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reasonable costs to bridge gaps in the digital divide and help libraries continue to thrive as community assets.

- o Phase 8: Awarded February 21, 2022. 64 libraries are eligible and 3 are moving forward. This is the final phase of the program.
- o The current project across all phases (1–7) will bring total fiber-connected libraries to 146 representing 76% of all 191 libraries statewide.
- o The remaining libraries, not currently connected to CEN are eligible to connect with ARPA-CPF funds. The CEN ARPA project is tentatively scheduled to commence in January of 2023 pending US Treasury approval and authorization of funds.
- CT Library Fiber Consortium – Internal Connections (FTTL-IC)
  - o Program announced December 3, 2021. https://ctedunet.net/fttl-ic/
  - o Goal is to help libraries with internal network infrastructure to better serve library operations.
  - o Libraries will receive assessments, prioritized remediation plans, and awards to assist each.
  - o 3/6/23 High Level Status
    - ▪ 41 libraries in program; 41 assessments complete; 41 delivered to individual libraries
    - ▪ Meeting with stakeholders to review assessment and award
    - ▪ Meeting pending to review with State Library to prioritize awards
- New Members/Customers since the last Commission meeting (in order of turn up)
  - o Simsbury PD
  - o Litchfield Fire Department
  - o Bantam Fire Department
  - o East Litchfield Fire Department
  - o Northfield Fire Department

Current Member Count = 679

*Effective 12-1-21 member count process has been adjusted to reflect multi-site organizations as one member throughout the community.

2. Ignite Innovation

- NTIA Middle Mile Grant Program
  - o 3/6/23 Update
    - ▪ NTIA asked Substantiation/Clarification questions 2/9, all were due and submitted by 2/15. Question/Response included 7 areas: previous federal funding, climate, 2 on pricing to end users, fiber pathways in relation to maps, unserved, and target communities
  - o CEN Submitted a proposal for the 'Connecticut Scaled Open Access Network and Anchor Resiliency' project (CT-SOANAR) on September 29, 2022 in response to a Notice of Funding Opportunity, NTIA-MMG-2022 announced May 5 2022, applications due Sept 30, 2022, notice of awards March 1, 2023.
    - ▪ Projects must be implemented within 5 years of award.
    - ▪ https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/MIDDLE%20MILE%20NOFO.pdf
  - o $20.7M Project, $12.2M requested from NTIA, $8M from CEN/CT, $500K in-kind contribution.
  - o The CT-SOANAR project will advance the Middle Mile Grant Program objectives and the strategic broadband goals of the State of Connecticut by accomplishing the following:
    - ▪ Encourage middle mile infrastructure expansion and extension to reduce the cost of newly connecting unserved and underserved areas to the Internet backbone
    - ▪ Promote broadband connection resiliency through alternative network connection paths that prevent single points of failure

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- Materially reduce end user broadband prices resulting from funded middle mile infrastructure
          - Materially reduce latency experienced by end users in remote or insular areas
          - Benefit high-poverty counties, persistent poverty counties, and/or a substantial number of end users/households that meet the defined criteria
          - Offer access to the funded middle mile infrastructure, in perpetuity, on an open access basis
          - The CT-SOANAR topology enables connection of unserved anchor institutions
          - Demonstrate the project's climate and natural disaster resilience
          - Use community benefit agreements
      - CT-SOANAR incorporated input from our key stakeholders, including planned last-mile providers, community and anchor institutions, existing CEN customers who will benefit from the proposed upgrades, and Connecticut's Office of the Governor. Additional state-level broadband stakeholders who were consulted include the Office of Consumer Council - State Broadband Office, the Bureau of Energy and Technology Policy's Office of Telecommunications and Broadband, the CT Commission for Educational Technology, and the Office of Policy and Management.
          - 19 letters of support reflect the agreement of all these stakeholders that this project is the highest priority middle mile initiative for Connecticut.
          - Governor Lamont has committed to the broader American Rescue Plan Act (ARPA), BEAD, and Digital Equity programs along with the Middle Mile Grant Program to define a holistic set of activities to address middle mile, last-mile, multi-dwelling unit, urban, and rural needs, and affordability across the state.
      - Grant Development team included CEN Director Ryan Kocsondy, CEN Team Leads Paul Tarsa, Peter Correia, and Rick Cheung; CEN Optical Engineer Raymond Carcano; Executive Sponsor Mark Raymond, CT-DAS CIO; State assistance from David Lukens, OPM, for GIS mapping; Michael Barrera, DAS, as Staff Council. Consultant team headed by Rob Vietzke, CEN's first director and now of https://insightinfraservices.com/, consisting of a project manager, grant writer, editor, and strategic broadband advisor. Note: CEN self-funded the consultants.

- eduroam https://www.eduroam.us/
    - 3/6 Update
        - Middletown Schools and Stafford Library Association potentially onboarding.
        - New Support Organization agreement between UConn/CEN and eduroam in procurement contracting. New agreement is more conducive to scale roll out.
    - Goal is to address digital divide issues impacting students' learning and provide a more seamless network access experience for students.
    - Tom Dillon helping coordinate activities as CET Infrastructure Advisory Council Chair, with CEN resources and fiscal support. This is a crossover item between CET Infrastructure Advisory and CEN Service Management Advisory Councils.
    - Pilots: Suffield Academy and Waterbury Public Schools. Darien Public Schools is expecting to launch this summer. Interest also received from Russell Library and Coventry Public Schools. Goodwin University has initiated their own license agreement.
    - 71 respondents to Secure WiFi & eduroam readiness in schools and libraries. Will re-send and collect more info.

- o CEN's application for the Internet2 eduroam Support Organization program was accepted and will be one of 5 across the country. https://internet2.edu/internet2-announces-new-eduroam-support-organizations/
  - o Agreement reached with Internet2 on terms for extending eduroam purchasing agreement through the end of 2023, to be succeeded by Support Organization agreement in 2024.
  - o Support Agreement Signed or in progress for: Suffield Academy, New Haven School District, Darien School District, Waterbury School District

3. Foster Collaboration

- EDAC - Engagement and Development Advisory Council
  - o Co-Chairs, Karen Skudlarek, UCONN, and John Mercier, Regional District 17
  - o **10th Annual CEN Conference**
    - May 11, 2023 - Connecticut Convention Center
    - Full program announced 3/1/2023: https://web.cvent.com/event/e9db8eac-4941-4320-baeb-89e096c1c43f/websitePage:645d57e4-75eb-4769-b2c0-f201a0bfc6ce
    - Registration so far
      - Total attendees: 182
      - Sponsors: 29
    - Register here: https://web.cvent.com/event/e9db8eac-4941-4320-baeb-89e096c1c43f/summary
- SMAC- Service Management Advisory Council
  - o Co-Chairs: Matt Ross & Jonathan Garbutt
  - o Committee members organizing around community RFPs for
    - Unified Communications
    - Security Services
    - CIPA filtering
- Connecticut Higher Education Roundtable on Information Security (CHERIS) https://ctedunet.net/cheris/
  - o Co-Chairs: Brad Tudisca, CCSU; Owen Brandt, ECSU; Vince Spiars, Quinnipiac University
  - o Forum of Higher Education IT security professionals that meets quarterly to collaborate on IT solutions, discuss best practices, and share security challenges.
  - o Second meeting in April 2023
- Cyber Nutmeg
  - o CEN working with National Guard to organize Cyber Nutmeg 2023 and help expand its reach
  - o Targeting October, Cyber Security Awareness month
  - o Venue and program in early stages of development; venue tentatively committed

4. Promote Advocacy

- Governor's Biennium Budget, HB5037, American Rescue Plan Act - Coronavirus Relief Fund (ARPA-CPF)
  - o PA 22-118 https://search.cga.state.ct.us/2022/PA/pdf/2022PA-00118-R00HB-05506-PA.pdf Final Authorizations below
    - $10,719,936 – Everybody Learns WiFi Expansion + $719,936 from June session
    - $21,225,474 – Grant funding for municipalities and libraries to connect to CEN
    - $41,109,884 - CEN Next Generation Infrastructure Upgrades
    - $911,195 – Grant funding for charter Schools to connect to CEN
  - o All projects were submitted Sept 21 through OPM to US Treasury for funding allocations.

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- o Sept 23 - US Treasury announced they are low on administrative funding for the program, impacting approvals of proposals. No update since.
    - https://home.treasury.gov/system/files/136/Adeyemo-Administrative-Flexibility-Grantee-Letter_20220923.pdf
  - o 3/1/23 Update – still waiting on US Treasury
- 2023 CEN Outstanding Leader Awards (COLA) https://ctedunet.net/cola/
  - o 'CEN Members play a key role in the success of our community. To acknowledge those contributions, CEN presents the Outstanding Leader Awards annually to any individual from a CEN member organization who has provided extraordinary leadership, energy, ideas, and achievements for the advancement and development of the CEN community, its products and/or services, and/or its foundational mission, vision, and values.'
  - o Submissions are open: https://docs.google.com/forms/d/e/1FAIpQLSeGESK3EHyuMPY48Ag67k4uHNxNGTeeA-jsUhjjvweCLV-mVA/viewform
  - o Awards will be presented at the CEN annual conference.
- Everybody Learns WiFi - Program End https://ctedunet.net/eli-programend/
  - o After two successful years, the Everybody Learns WiFi Initiative is ending and subsidized support for the wireless access points will cease as of December 31, 2022.
  - o Equipment is property of the host entity. 3 of 5 years remain on pre-paid licensing. Options for equipment transition collected by form response are:
    - Member to claim licensing and self-manage moving forward
    - Remove access point or leave in place (optional to return to CEN or swap with another member).
    - Subscribe to CEN Managed firewall service.
  - o The Everybody Learns WiFi Initiative helped tens of thousands of students and adults connect to free, high-quality WiFi through the pandemic to engage in remote learning, telehealth, and state and municipal services.
  - o The program's success hinged on the trusted CEN community partnerships and is a testament to the community's willingness to step up and help during a crisis. In addition, the efficacy of the program paved the way for additional ARPA funds to be used in a similar manner.
  - o End of Program transition summary is as follows (approximately):
    - Owner self-manage APs: 69 members, 97 APs
    - CEN managed APs: 24 members, 72 APs
    - Turn down service: 19 members, 20 APs
- Entergy & Technology Committee Presentation 2/16
  - o BETP, CEN, CET, and OPM jointly presented to the General Assembly - Energy and Technology committee on broadband initiatives in each area. Organization and initiative are as follows:
    - DEEP-BETP – ARPA-CPF and IIJA BEAD
    - DAS-CEN – ARPA-CPF and IIJA Middle Mile Grant Program
    - DAS-CET – Digital Equity
    - OPM – Broadband Mapping & Analytics

5. Enhance Core Resources

- CEN Staff
  - o CEN currently has 13 full-time staff members, 4 part-time student workers, 1 volunteer (1 day /week), 1 fellow, and 1 special payroll.
  - o Searches

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- ▪ Senior   Network Systems, Security, Automation – failed search
  - ▪ Financial Assistant 1 – Nazneen Musani started February 24, 2023
  - ▪ Project Manager – Interviewing
  - ▪ Network Security Analyst – in HR approvals
  - ▪ Systems Administrator 1 or 2 – job description review
- Infrastructure Improvements/Investments
  - o CEN was allocated ~ $2.5M in CEPF funds for equipment maintenance improvements to the infrastructure. This was less than the requested amount and items are being re-prioritized, re-quoted, and sequenced based on price and availability of equipment.
  - o Of Note - Component delays are impacting lead times for items such as routers and switches. Lead times can be anywhere from 120-180 days for orders with little relief in sight. Some items are now projected to be up to a year.
  - o All other projects on hold due to manufacturing and shipping delays.
- Uninterruptible Power Supply and Power Distribution Unit (UPS & PDU) Hub Site Upgrades
  - o Project to replace the existing UPS and PDUs at all hub site that support our distribution nodes throughout the state. Capabilities include remote management of UPS and new per port power monitoring and management of Smart PDUs, and environmental sensors tracking temperature and humidity.
  - o Complete as of January 11, 2022
- Database Audit and True Up
  - o Goal is too true up all records in the network management database resulting in improved network operations, enhanced notifications to members, and more accurate billing operations.
  - o Scope includes documentation update, processes updates, node audit (servers, switches, routers), circuits, fiber inventory, interface descriptions, data structure hierarchies, CEN services, subscriber services, etc.
  - o Project target is May 2023 though slipping due to fiber subcontractor staffing and delay dependencies.
- Route Reflectors (RR)
  - o Project to replace existing route reflectors with new that have greater route scale and features, and enable Ethernet Virtual Private Network (EVPN) capabilities.
  - o Technical: A route reflector is a designated/dedicated router that will advertise and reflect routes learned from other iBGP peer routers in a service provider network. This allows all iBGP speakers within your autonomous network to learn about the available routes in a more efficient manner and without introducing loops.
  - o Status: *Three* of the four routers are in place. Need new DC power supplies for the other two and projected completion in June/July 2023.
- Filtering Capacity Expansion
  - o Project to expand on-net and in-line Children's Internet Protection Act (CIPA) filtering capacity for CEN Members by adding one iBoss NBC-14 to each of the Storrs and Hartford based clusters. Project Highlights include:
    - ▪ Increases capacity by 50% at each site; 84 nodes total
    - ▪ IPv6 enablement
    - ▪ Updated Status Reporting: https://status.net.cen.ct.gov/grafana/d/heUwCM_Mz/iboss-filter-connections?orgId=2
  - o Running smooth
- Managed Firewall
  - o Program growth necessitated expanding the analytics platform, by adding another FortiAnalyzer, to balance load for advanced analytics for subscribers.

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- Triangular Core Capacity   Augment
    - Early planning stages to augment the triangular core with 400Gbps links for capacity.