

Internet2 Resources for Iowa Libraries

Stephanie Stenberg
Director, Internet2 Community Anchor Program (CAP)
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What we'll cover

1. What is Internet2, the Community Anchor Program, and why should I care?

HIGH-QUALITY FREE RESOURCES!

2. Free CAP resources for libraries

- Presidential Primary Sources Project

FREE interactive sessions for grades 4-12

- Distance Learning Scholarship Program

FREE virtual field trips for K-12 school librarians

- Curated K-12 Curriculum Resources

Our favorite links in one place

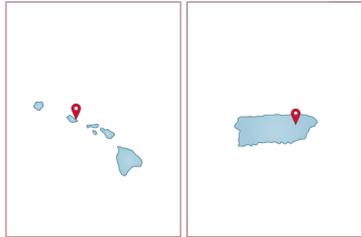
- Toward Gigabit Libraries Toolkit

FREE toolkit to help your library's IT and broadband



About Internet2

Not-for-profit organization providing a secure high-speed network, cloud solutions, research support, and services tailored for the research and education community



*Internet2 is a **collaborative community** that help its member and partner organizations solve technology challenges and create innovative solutions:*

300+ Higher Education members

80+ Industry members

40+ Affiliate members

40+ R&E Network members

65+ Int'l partners reaching

100+ Nations

80,000+ Community anchor institutions

Meet the CAP team: Stephanie and Therese

Stephanie Stenberg (sstenberg@internet2.edu)

- Director, Internet2 Community Anchor Program (CAP)
- Past 10 years in distance learning and education
- Board Member, Global Video Conferencing for Education Group
- BA University of Michigan, JD Wayne State University



Therese Perlowski (tperlowski@internet2.edu)

- Program Manager, Internet2 Community Anchor Program (CAP)
- Former middle school science and technology teacher
- Runs CAP's Presidential Primary Sources Project
- BA Kalamazoo College



About the Internet2 Community Anchor Program (aka “CAP”)

CAP works with 46 state/regional nonprofit research and education networks like the **Iowa Communications Network (ICN)** to help **K-12 schools, libraries, and other community anchor institutions** use their connection to transform teaching and learning.

Over **80,000*** community anchor institutions connect to Internet2:

- 65,098 K–12 Schools (49%)
- **3,549 Public Libraries (21%)**
- 1,119 Colleges and Universities
- 983 Community or Vocational Colleges
- 1,253 Health Care Organizations
- 498 Museums, Science Centers, Zoo, and Aquaria
- 8,125 Federal, State, and Local Government Buildings

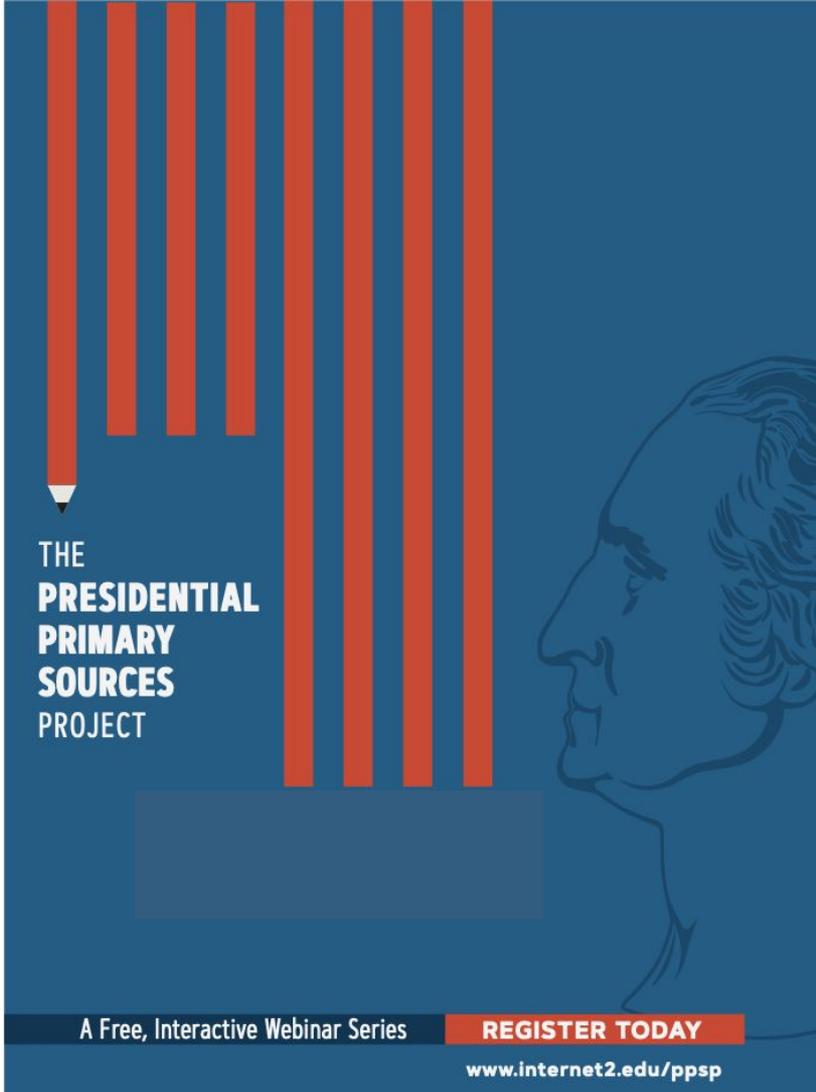


**Based on a 2019 connectivity survey of the connected research and education networks.*

Presidential Primary Sources Project (PPSP)

Engage your students in **live, interactive discussions with presidential historians** and use primary source documents to transport your students to places that helped shape our presidents.

This free, standards-based interactive web series is the result of a partnership between Internet2, the National Park Service, and the National Archives.



THE
**PRESIDENTIAL
PRIMARY
SOURCES**
PROJECT

A Free, Interactive Webinar Series

REGISTER TODAY

www.internet2.edu/ppsp

Presidential Primary Sources Project (PPSP)

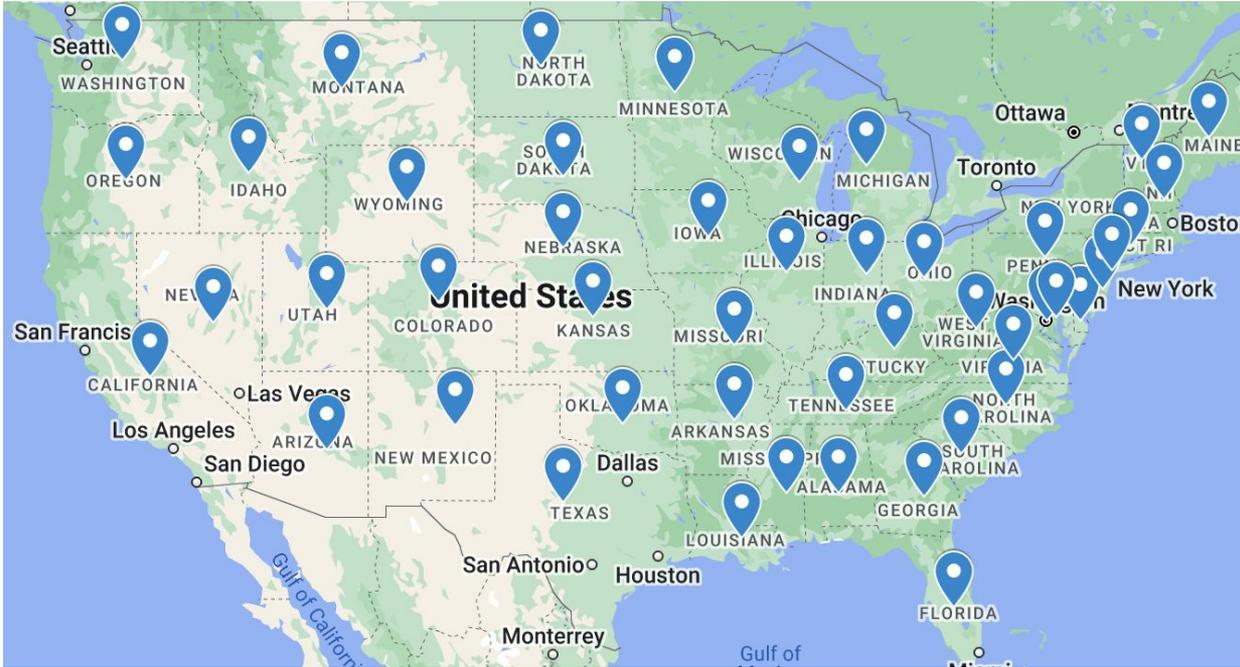
- View the sessions and register today at www.internet2.edu/ppsp
- All programs are live at 11 a.m. ET and 2 p.m. ET on their scheduled day
- For students grades 4-12



2024 Presentation Schedule: 11am-12pm and 2-3pm ET

Jan 16:	Public Lands, Public Lens: Establishing Protected Spaces
Jan 18:	The Lady Bird Special: A Deep Dive into Lady Bird's Whistle Stop Campaign Tour
Jan 23:	The Constitution and Presidential Powers
Jan 25:	The Journey of Renewal: President Clinton's 1994 State of the Union Address
Jan 30:	Happy Birthday FDR: The Life and Times of America's 32nd President
Feb 1:	Theodore Roosevelt and the Rough Riders
Feb 6:	The Interstate Highway System
Feb 8:	The Unexpected Presidents
Feb 13:	President Kennedy and the Civil Rights Movement
Feb 15:	A Life in Letters: Theodore Roosevelt as a Writer
Feb 20:	Did President Hoover's Childhood with the Osage Nation Influence his Decisions in the White House?
Feb 22:	Portraiture and the Presidents
Feb 29:	The Stages of Lincoln's Legacy
March 5:	President Grant and the Creation of Yellowstone National Park
March 7:	The Art of Being Lincoln
March 12:	Jimmy Carter & The Power of Diplomacy
March 14:	If I May, Mr. President?: Advisors from Washington's Cabinet
March 19:	Through Her Eyes: Eleanor Roosevelt & World War II
March 21:	Understanding the New Deal
March 26:	The Rise of the Cold War
March 28:	D-Day at 80: Eisenhower and the Great Crusade
April 9:	The Corrupt Bargain: The Election of 1824
April 11:	Ordinary People Doing Extraordinary Things: Truman and Civil Rights

Presidential Primary Sources Project (PPSP)



PPSP 2023 Recap

- 350 classrooms across 47 states
- 46 programs completed
- Over 15,545 students reached
- Record attendance surpassing previous high of 12,000 students in 2021 by over 3,000.



FOR LIBRARY



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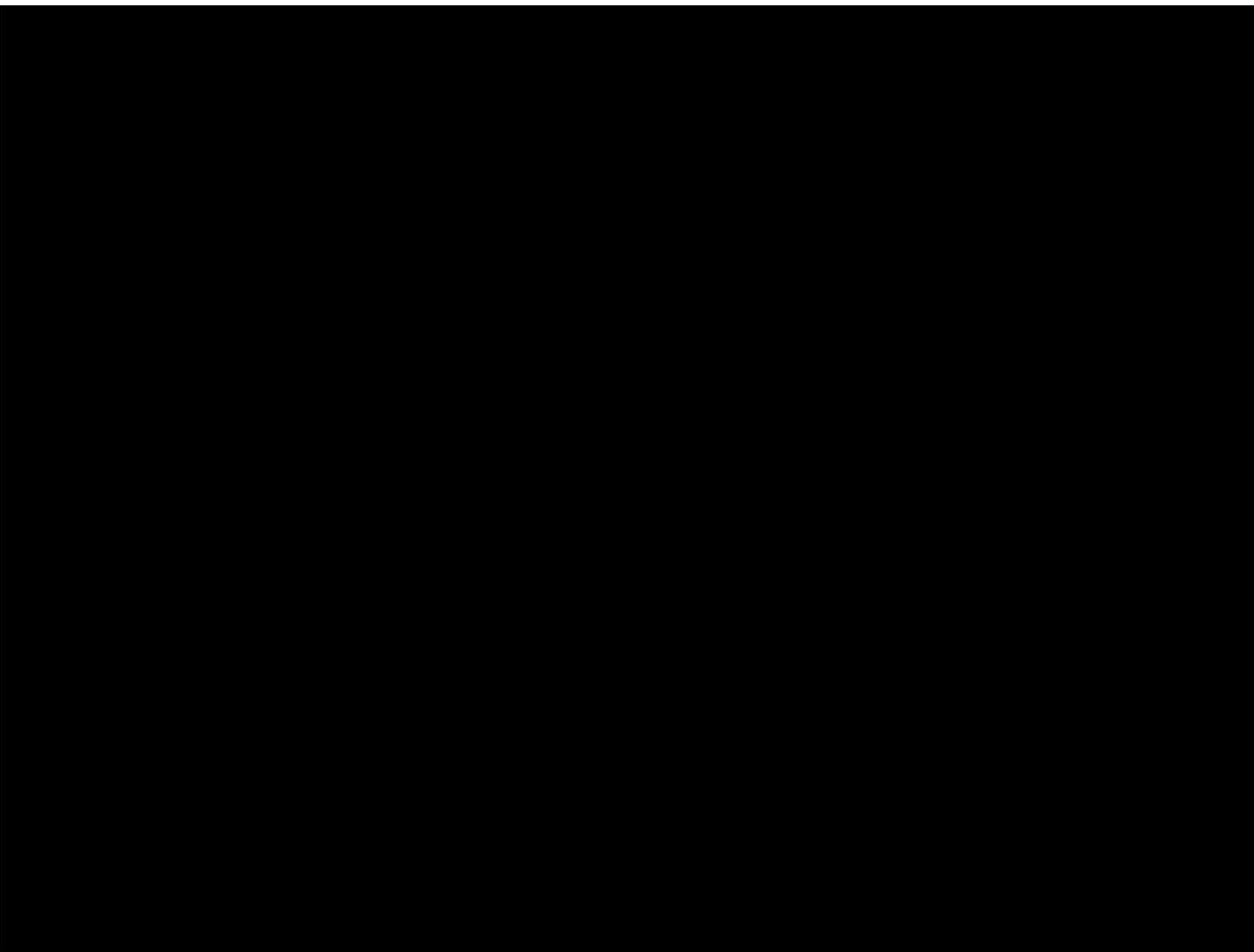
CAP's K-12 Curriculum Resources

Use CAP's K-12 Curriculum Resources page (<https://internet2.edu/k12curriculumresources>) to find fantastic online classroom resources.

** All programs are free unless otherwise noted*

- Arts/Culture
- Biology
- Earth Sciences
- Astronomy/Space
- Engineering Concepts and Cybersecurity
- History/Civics
- AR/VR
- Remote Instrumentation





About the Toward Gigabit Libraries Toolkit



The **Toward Gigabit Libraries (TGL) Toolkit and Broadband Improvement Plan** is a powerful, FREE tool to help libraries learn about and improve their current broadband infrastructure and internal information technology (IT) environment.

Using the TGL Toolkit and Broadband Improvement Plan, librarians will be better equipped to improve their broadband services and become stronger advocates for their libraries' broadband infrastructure needs.

<https://internet2.edu/tgl>

Download the Toward Gigabit Libraries Toolkit

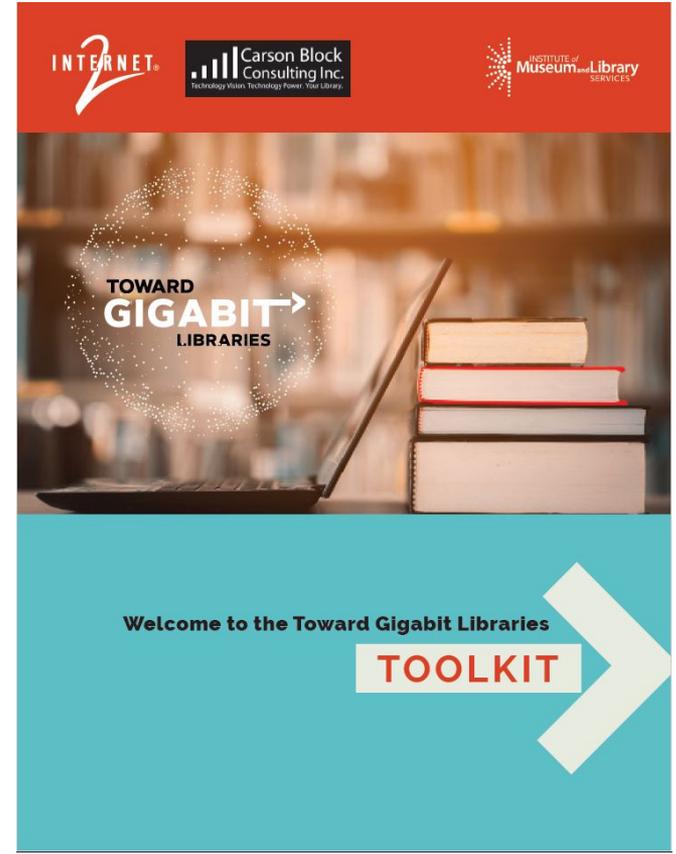
Download the latest version of the Toward Gigabit Libraries Toolkit:

<https://bit.ly/4bbWBaj>

Watch this fun, short video for a great overview of the TGL toolkit:

<https://youtu.be/PXWv3-HYm-I>

<https://internet2.edu/tgl>

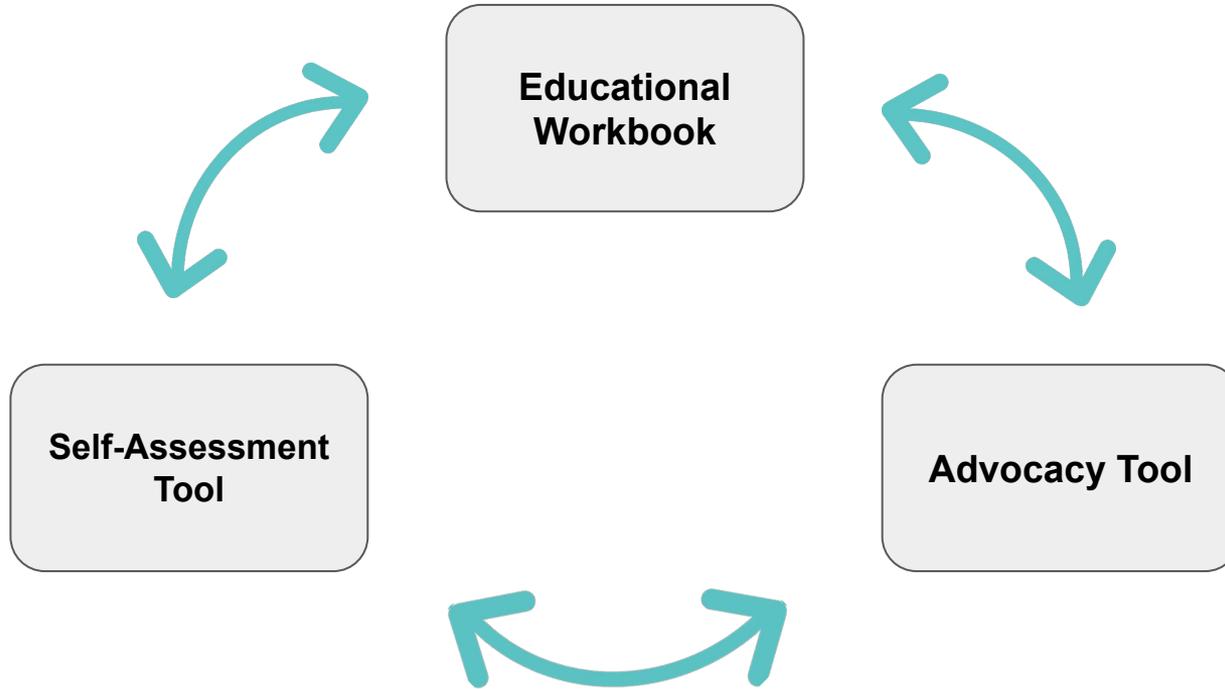




How to use the Toward Gigabit Libraries Toolkit



What is the Toward Gigabit Libraries Toolkit?



Toolkit Components and Process

- *Technology Inventory*
- *Broadband Connection*
- *Wired Network*
- *Network Devices*
- *Wireless/WiFi Network*
- *Computer/End User Devices*
- *Broadband Services and Activities*
- *Broadband Services and Activities*
- *Broadband Technology and Operations Support*
- *Building a Network of Support & Advocating for Your Library*
- *Broadband and IT Funding Opportunities*
- *Additional Resources and Best Practices*

Pilot Site

Intake Survey

Pilot Visit/
Toolkit

Broadband
Improvement
Plan

Periodically
Reassess

Toolkit Approach

Questions are presented first

Additional information and resources follow in text boxes to help you answer all the questions

Example: “How many hubs do you have?”

- *What the heck is a hub?*
- *Wait, what’s the difference between a hub, a switch, and a router?*
- *How do I tell which one I have?*
- *What do I do with this info?*

10. Does your library network have any hubs?

- Yes
- No

If yes, number of hubs? _____

On a network, a hub (which is different from a switch, even though they often look identical) is a device connecting multiple segments of a local area network (LAN) and containing multiple ports. When a hub receives information (in the form of a packet) in one port, it copies that information to all of the other ports.

Since they look the same from the outside, the only way to tell is by either reading any text on the device (specifying “hub” or “switch”) or looking up the make and model number online to find more information.

For a great explanation of the differences between a hub, a switch, and a router, see: http://www.webopedia.com/DidYouKnow/Hardware_Software/router_switch_hub.asp

Network “hubs” are obsolete networking technologies that perform poorly in modern data networks. If you have any “hubs” in your network you should consider replacing them with a network switch or switches.



Hubs and switches can look the same on the outside. But they are very different on the inside!

Using the Toolkit



iStock Photo

- Free, open-source technology learning, diagnostic, and advocacy tool
- Many ways to use the toolkit:
 - Record a shareable snapshot of your library's IT and broadband infrastructure
 - Prepare E-rate requests and budget cycles
 - Help open communication between library staff and tech workers
 - Address specific problems in your library by just completing certain sections
 - Get a baseline for proposed IT and broadband improvements
- ***The best part: No techies required!***

Toolkit Sections

Technology Inventory

In this section, you will inventory some of the key pieces of the technology inside your library, including your network, computers, and other important technology components.

This inventory will help you understand what sort of equipment you have now and determine if you need different or additional equipment for the future.

- Broadband Connection
- Network Devices
- Wired Network and Power
- Wireless Network and Power
- Computer and End User Devices

4. TECHNOLOGY INVENTORY—YOUR LIBRARY

In this section, you will inventory some of the key pieces of the technology inside your library, including your computers, network, and other important technology components. This inventory will help you understand what sort of equipment you have now, and provides a basis to determine if you need different or additional equipment for the future.

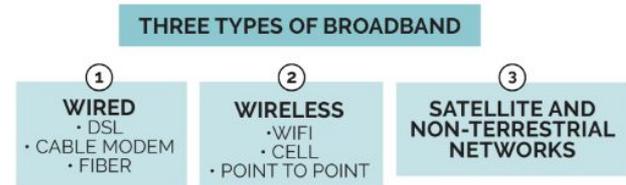
4A. BROADBAND CONNECTION

If you have more than one broadband connection, i.e., two different types of technologies or service providers, answer the following questions in this "Broadband Connection" question for each connection.

1. What type of internet connection does your library currently have? Choose all that apply.

- Cable Modem
- Digital Subscriber Line (DSL)
- Fiber Optic
- Satellite or other "Non Terrestrial" option
- Wireless
- Other _____

There are three primary types of broadband—wired (DSL, cable modem, and fiber), wireless, and satellite. Definitions for the types of Internet connections listed here are available at the FCC website: <https://www.fcc.gov/general/types-broadband-connections>



Broadband Services and Activities

This section covers the types of broadband services and applications.

The goal is to ensure that the library has sufficient bandwidth to support patron and staff use of various devices and applications both today and in the future.

- Bandwidth Needs
- Hot-Spot Lending
- Internet Filtering
- Offered Services

5. BROADBAND SERVICES AND ACTIVITIES

In this section, the types of broadband services and applications are discussed in order to ensure that the library has sufficient bandwidth to support patron and staff use of various devices and applications both today and in the future.

- 1. How much bandwidth do you need?** This can be tricky to estimate, with download speed recommendations ranging from 512 kbps to 1Mbps per simultaneous user. Read the article below to get a better idea of the amount of bandwidth your library needs.

Identifying how much bandwidth your library needs based on the types of services offered, number of devices connected, etc., can be difficult, especially as needs change over time and at different times of day.

Although not a technical measure, you may already know through experience if you have enough bandwidth or not. If you consistently experience a slow Internet connection when you have many people using your library computers and WiFi at the same time, it's possible that your broadband connection is too slow for the demand.

For E-rate applicants, the FCC says "With respect to libraries, the (E-rate) Order adopts as a bandwidth target the American Library Association's recommendation that all libraries that serve fewer than 50,000 people have broadband speeds of at least 100 Mbps and all libraries that serve 50,000 people or more have broadband speeds of at least 1 Gbps." <https://www.fcc.gov/general/summary-e-rate-modernization-order>

Would you like to dig more deeply? This article offers an excellent description of an approach to produce a number: http://www.broadband4education.nm.gov/uploads/FileLinks/a6cbda6b6c3345ecbadd0cafa50aa1ae/Edge_Benchmark_9.2_Bandwidth_Article_8.19.13.pdf

This approach requires you to do some counting (the inventory you may have performed earlier in this toolkit will come in handy) and also do a little math.

The Edge website also has resources on how to advocate within your community for better broadband: <https://www.libraryedge.org/>. This site requires a login.

Broadband Technical Operational Support

Technology in libraries is more than just a collection of gear. People—including library staff and those who provide technical support—are just as important.

In this section, you will learn more about the people who help make technology available in your library and determine where you could benefit from additional support.

- Available Technology Support
- Staff Training Resources
- ISP Technical Support
- ISP Service Requests
- ISP Service Guarantees

6. BROADBAND TECHNICAL OPERATIONAL SUPPORT

Technology in libraries is more than just a collection of gear. People, including library staff and those who provide technical support, are just as important. In this section you will learn more about the people who help make technology available in your library and determine if there are any areas where you could benefit from additional support.

1. Describe the technology support available to your library.

- Library staff expertise
- Community volunteer(s)
- Broadband provider
- IT service contract
- Consortium
- State library
- Local school district, municipal government or agency or other partnership.

Describe the technical support you receive from these sources below. What additional support does your library need?

Small, rural, and tribal libraries often have limited access or availability of technical resources to support the library's IT and broadband infrastructure and operations.

Your state library may offer technical support for your library ranging from online resources, site visits, and in person and online training programs for library staff.

List of state libraries and archives: <http://www.cosla.org/Directory>

See "[Section 9: Additional Resources and Best Practices](#)" below for links to even more technology support opportunities for your library.

Building a Network of Support & Advocating for Your Library

Improving your library's broad and IT takes a village.

In this section, you will explore your community networks and identify key people and groups who can support your technology work within your library.

- Identifying your library's unique strengths
- How to build relationships to expand support for your initiatives
- Creating and executing an outreach strategy
- Evaluating your efforts

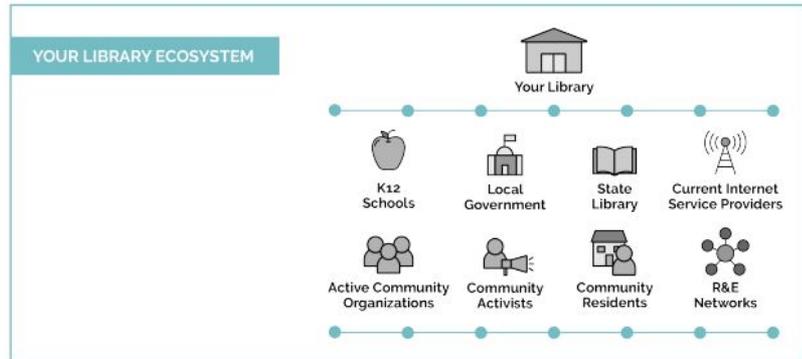
Create and Execute an Outreach Plan

11. Who are your priority partners for impacting your project?

Once you've crafted your message and identified potentially supportive members in your community, it's important to make a plan to begin the process of reaching out and connecting with them. It can be really useful to outline who the potential organizations and individuals are, the priority for outreach, and the type of support you hope to receive.

As you plan and prioritize your outreach to partners consider:

- Who do they serve? What is the overlap with community members the library serves?
- What is their stated mission and/or vision?
- Do you have any common friends – or foes?
- What is the history of interaction between each stakeholder group and the library?



Broadband and IT Funding Opportunities

Technology expenses are important budget considerations for all libraries.

This section outlines several opportunities that may be available to help fund your library's broadband connectivity.

- Building a technology budget
- Identifying projects to fund
- Estimating required resources and costs
- Maximizing E-rate funding
- Grants and other funding sources

Resources Required and Cost Estimate
<ul style="list-style-type: none">• 4 WiFi repeaters (\$500)• Installation to be done by library volunteer (\$0)
Timeframe to Complete
within 3 months

Example
"Resources
Required and Cost
Estimate" row
and "Timeframe
to Complete" row
from the Library
Technology
Budget Worksheet

Estimating Cost

Next, identify potential funding sources for each goal. To do this, look to multiple sources of information:

- Library's existing technology budget
- Library's technology plan
- [Library Grant Funding Opportunities Resources section](#)
- [Eligible equipment and services](#) that E-rate discounts
- Also review the [Support and Advocacy](#) and [Technology Plan](#) sections of the toolkit—since the majority of library funds come from local sources, it is essential to think about what local resources can you access that may help you achieve your goals
- See if your state library maintains a contract or pricing list
- Look into state or local consortia for technology discounts and pricing



Remember to identify all potential funding sources for each goal. For example, getting an E-rate discount does not cover the entire cost of certain equipment or services, so it is beneficial to identify other additional funding sources.

Many states offer consortium pricing for libraries. For example, the [Connecticut Library Consortium](#) (CLC) allows libraries in the state to take advantage of group-rate pricing for discounts on library technology like computer stations. For more

information, watch the free edWeb.net webinar, [Cut the Cost of Digital Collection Building: Join a Consortium!](#) (you must enter your email address to watch), or read the 2NDGEAR article, [Don't Go it Alone: What You Need to Know About Participating in an E-rate Consortium](#)



Additional Resources and Best Practices

The topics listed here are designed to provide you even more insight and resources to improve your library's broadband connectivity and services. You may find these items helpful in gaining a better understanding of your broadband connection, data network, and computers.

- E-rate
- Content filtering
- Broadband networking
- Data backup
- Digital inclusion and equity
- Free technology-related training opportunities & resources
- Grant funding opportunities and resources
- Internet use policies
- Purchasing computers, software, and equipment

10. ADDITIONAL RESOURCES & BEST PRACTICES

The topics listed here are designed to provide you even more insight and resources to improve your library's broadband connectivity and technology services. You may find these items helpful in gaining a better understanding of your broadband connection, data network, and computers.

[Broadband and Networking](#) | [Content Filtering](#) | [Data Backup](#)

[Digital Inclusion](#) | [E-rate](#)

[Free Technology Related Training Opportunities & Resources for Librarians](#)

[Grant Funding Opportunities and Resources](#) | [Internet Use Policies](#)

[Purchasing Computers, Software, and Equipment](#)

Glossary

The glossary section explains all the terms used in the toolkit, including:

- Ethernet
- Firewall
- Latency
- Router
- WiFi Extender
- Wireless Access Point (WAP)

Transmission Control Protocol/Internet Protocol (TCP/IP)

The suite of communications protocols used to connect hosts on the Internet. TCP/IP uses several protocols, the two main ones being TCP and IP. TCP/IP is built into the UNIX operating system and is used by the Internet, making it the de facto standard for transmitting data over networks.

Voice over Internet Protocol (VoIP)

VoIP is technology that lets you make phone calls over your internet connection instead of a regular, analog phone line.

Wide Area Network (WAN)

Most networks consist of two major zones—the local area network (LAN) and the wide area network (WAN). A LAN is the *internal* network, regardless of whether it is a house with two computers or a high-rise office building with thousands. The WAN is the network *outside* the LAN; this is both other internal networks and the full Internet. A WAN port is the portal by which information passes back and forth between the LAN and the WAN.

WAN (Wide Area Network) Port

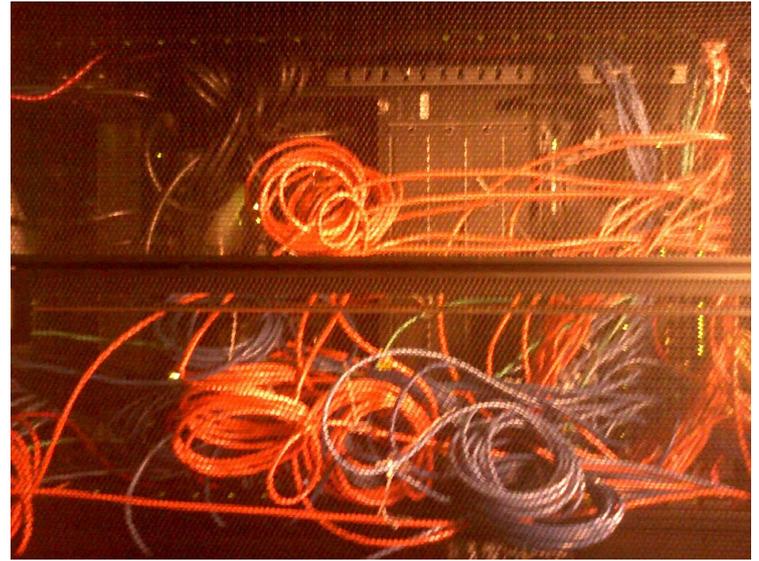
A WAN port, sometimes called an “uplink,” is the portal by which information passes back and forth between the LAN and the WAN. Most users will find a WAN port on a network router. A common home router has one WAN port and four LAN ports. Some routers refer to them as an uplink (for the WAN port) and wired connections (for LAN ports). The WAN port takes in information from the outside network or the Internet. The information is filtered through the router’s internal firewall and routing system. Then the information is sent to the proper LAN port or out over a wireless connection to a wireless source.

WiFi Extender

WiFi extenders communicate wirelessly with the primary WiFi system and receive the WiFi signal from the router and broadcast or “repeat” the signal into areas that need more WiFi coverage or signal.

Common Issues

- Insufficient bandwidth
- Insufficient data wiring
- Inefficient network setups
- Old and/or obsolete equipment
- Poor WiFi coverage
- Not participating in E-rate (funding mechanism for U.S. libraries)



"Bad network design" by [lazzarello](#)
is licensed under [CC BY-SA 2.0](#).

Is your issue listed here? What issues do you suspect your library has when it comes to broadband and IT infrastructure?

Broadband Improvement Plan

SAMPLE BROADBAND IMPROVEMENT PLAN

Short Term Action Plan

(0-3 MONTHS)

Action	
<i>Move WiFi router from back of library to central part</i>	
Intended Result	
<i>Improve throughout in library, reduce dead spots</i>	
Resources Required	Timeline
<i>Additional LAN cabling</i>	<i>One month</i>

Action	
<i>Obtain information on contract with broadband service provider, including speeds, SLAs, contract time, costs, etc.</i>	
Intended Result	
<i>Understand what speeds the library should be seeing, calculate cost per Mbps, understand if there is recourse for missed speeds.</i>	
Resources Required	Timeline
<i>Name of service provider and billing name/ information.</i>	<i>One week</i>

Broadband Improvement Plan

SAMPLE BROADBAND IMPROVEMENT PLAN

Long Term Action Plan

(3-12 MONTHS)

Action	
<i>Contract with an additional area broadband service provider and bond/combine with existing broadband capacity</i>	
Intended Result	
<i>Increase broadband capacity at library</i>	
Resources Required	Timeline
<i>Additional broadband connection and equipment to combine connection</i>	<i>6 months</i>

Action	
<i>Install WiFi repeaters</i>	
Intended Result	
<i>Reduce dead spots, increase access to WiFi outside of library for off-hour use</i>	
Resources Required	Timeline
<i>WiFi repeaters</i>	<i>5 months</i>

Action	
<i>Participate in E-Rate program</i>	
Intended Result	
<i>Obtain a subsidy for the broadband connection and inside wiring to improve broadband connections and connectivity</i>	
Resources Required	Timeline
<i>Support from State Library, E-Rate consultant (possibly)</i>	<i>12 months</i>

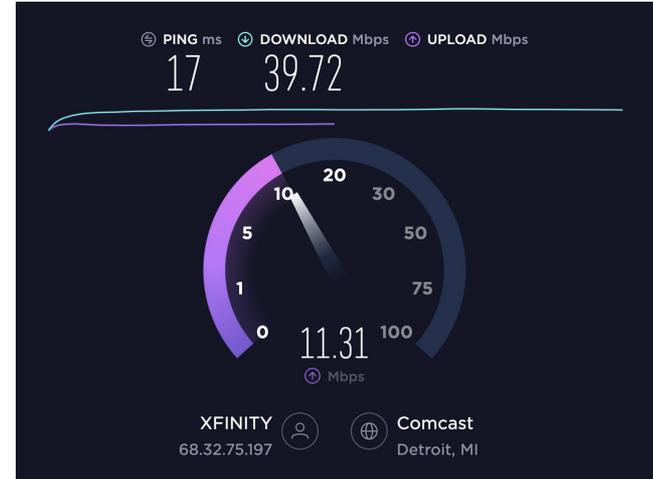
Tips and Takeaways

Conduct a Speedtest



Ookla Speedtest (download using QR code)

<https://www.speedtest.net/>



Alternative:

M-LAB Speedtest

<https://speed.measurementlab.net/>

Conduct a Speedtest

- Test at multiple times of day and on different days of the week
- Make sure to record all results
- Download and use this Speed Test Recording Worksheet: <https://bit.ly/2PIO8pu>

Speed Test Recording Worksheet

Speed Test (<https://speed.measurementlab.net/#/> <https://www.speedtest.net/>)

Date / Time	SPEED TEST RESULTS	Download	Upload		QUALITY TEST RESULTS			Notes
	Test #1 Measurement Lab			Mbps	Latency		Milliseconds (ms)	
	Test #2 SpeedTest.net			Mbps	Ping		Milliseconds (ms)	

Date / Time	SPEED TEST RESULTS	Download	Upload		QUALITY TEST RESULTS			Notes
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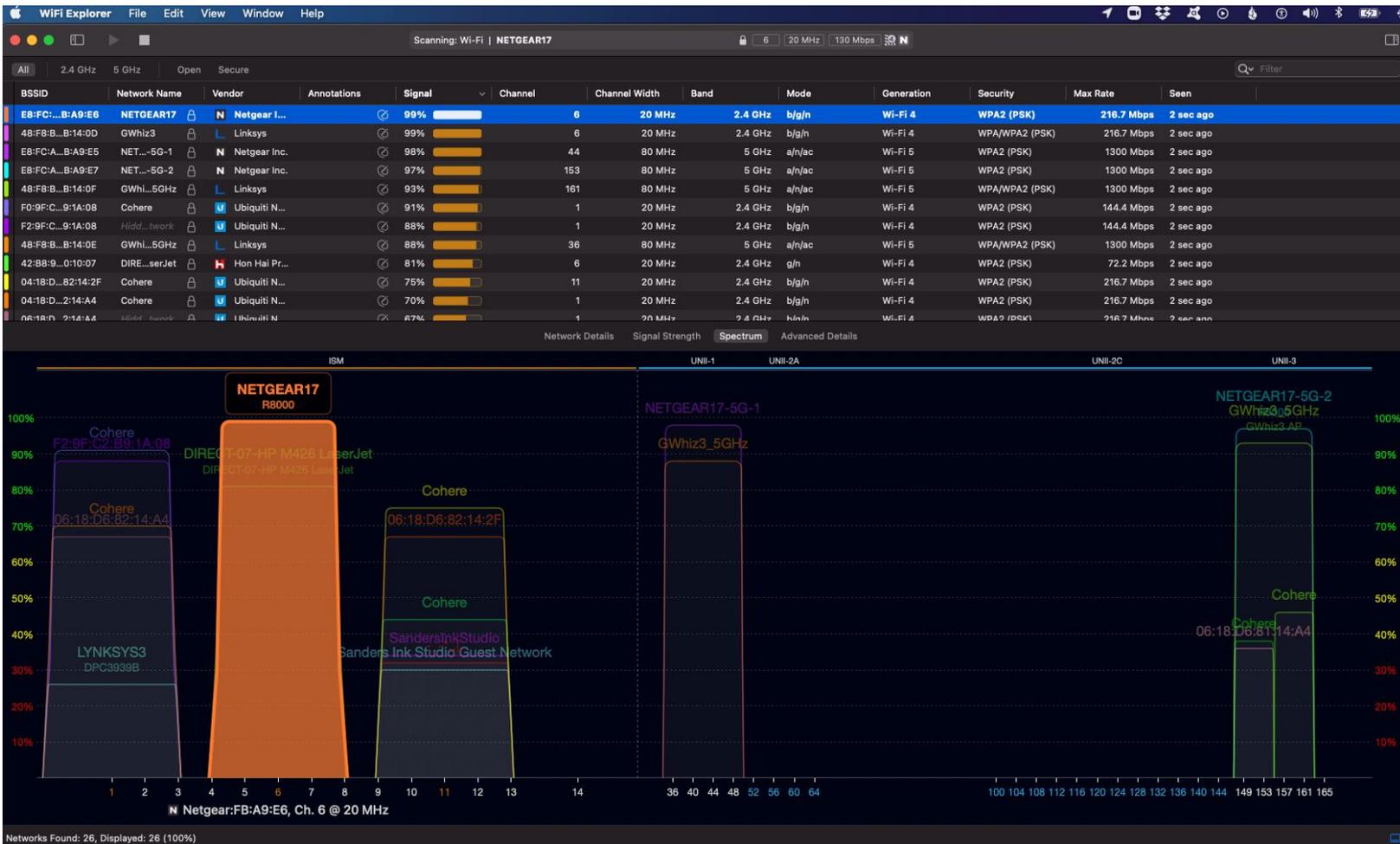
Date / Time	SPEED TEST RESULTS	Download	Upload		QUALITY TEST RESULTS			Notes
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Date / Time	SPEED TEST RESULTS	Download	Upload		QUALITY TEST RESULTS			Notes
	Test #1 Measurement Lab			Mbps	Latency		Milliseconds (ms)	
	Test #2 SpeedTest.net			Mbps	Ping		Milliseconds (ms)	

See WiFi Signals with a WiFi Analyzer (aka Stumbler)

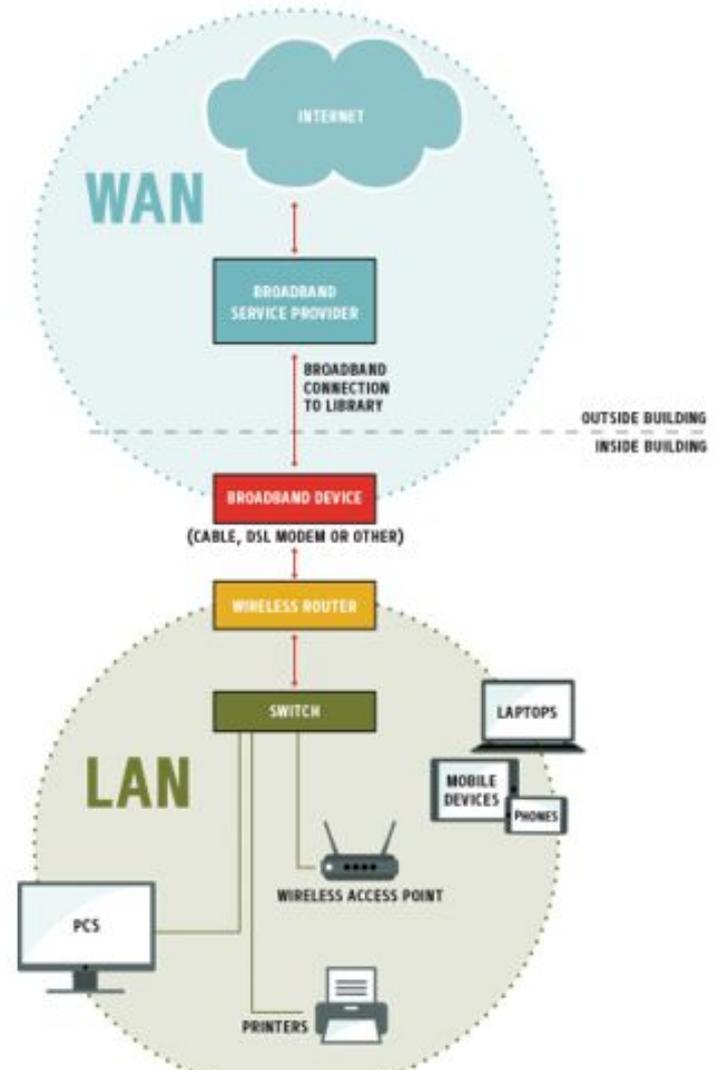
Network Analyzer Lite
(IOS; free):
<https://apple.com/39pLrk2>

WiFi Analyzer
(Android, free):
<https://bit.ly/31vae1v>



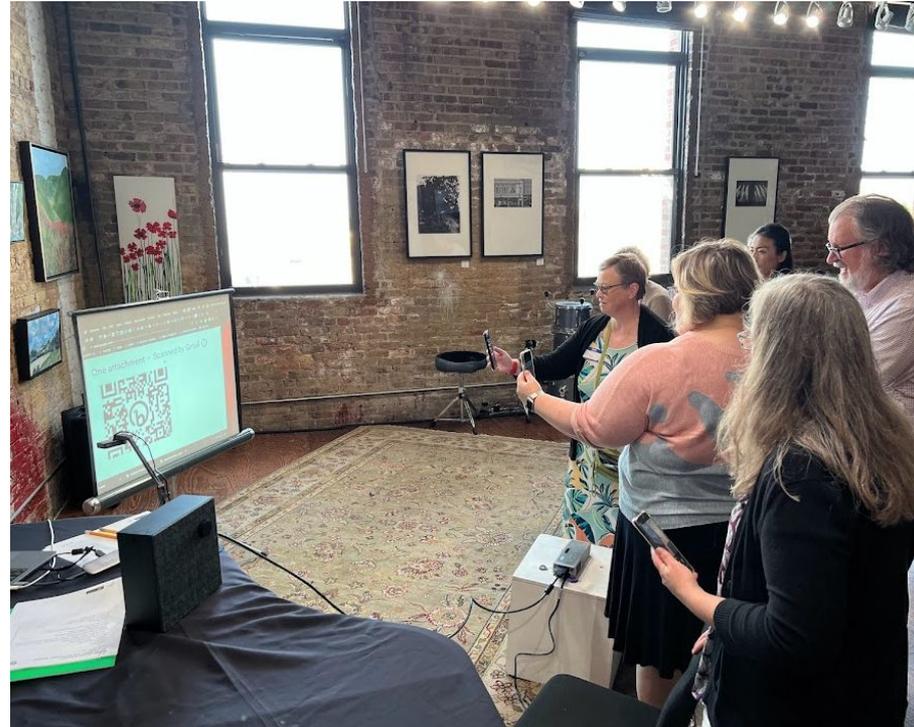
Draw a Network Diagram

- Get to know your network by mapping how everything connects
- Start with where the internet comes into your building and follow the wires
- Your network is only as good as its works component!



Interested in the Toward Gigabit Libraries toolkit? Arrange for a virtual or in person training session!

- We would love to arrange for an in-person or virtual training for your library or libraries.
- Training modules will also be freely available on the project website
- Easy to use and distribute for training purposes through research and education (R&E) networks, State Library agencies, E-rate, etc.
- “Train the Trainer” or “Train the Practitioner”



How to Stay Connected

Follow us on Twitter (X): [@TGLtoolkit](https://twitter.com/TGLtoolkit)

Visit us at: <https://internet2.edu/libraries>

Check out our PDF of Internet2 CAP
library resources:

<https://bit.ly/CAPlibraryresources>

Check out this
handout on CAP's
library resources!



Questions or Comments?

Feel free to reach out with any additional questions or ideas, we'd love to hear from you!

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