Technology Plan
2022-2027

Knowledge At Your Finger Tips
Fontana Regional Library

1. Technology Plan for Fontana Regional Library, 2022-2027

2. Date Written: 12/9/2022

3. Library's Mission Statement

The Fontana Regional Library system (Library) provides the public of Jackson, Macon, and Swain counties with excellent service and convenient access to resources for their educational, informational, and recreational needs.

4. 2022-2027 LRP - IT Infrastructure Needs &

Year 1

Resource planning - Active now. ***(People/Planet/Performance)***

- Replace aging Staff and Public workstation - - ongoing, Year 1 starts with Triple bottom line in mind.
- Replace network Patch Panel integration to allow for consistent connections to individual workstations (Wired) Patch panel terminations to be replace by "Insert Couplers" so that each patch cable can be inserted by a modular plug vice wire punch down) - less troubleshooting/down time for network interfaces and quicker patch cabling replacements provides increase efficiency/availability to Staff and Patron resources.
- Recycling, more often to conserve facility storage space, IT normally makes recycling runs for old replaced equipment on yearly intervals, need to ensure a timelier recycling run is scheduled and maintained.

Year 1 to Year2

BWFN Fiber Speeds increase (WAN/LAN) Improvements needed for all services. Provides content and services for all online access. ***(People/Planet/Performance)***

- Increase Network WAN connections at all sites to 1GB
- Increase Network Internet bandwidth (all sites access) to 1GB

Note:

- *Year1 to Year2 -- Requires Infrastructure Upgrades to Bryson City location: Firewall, TPM(CIPA) & Main Layer3 Access Switch), around time of WAN & Internet increase.*
- *By Year2 – All locations will need LAN Switches (subnets) level2 switch upgrades for GB access.*

Year 3

Add Staff WiFi AP/Infrastructure and upgrade current FRL Wireless SSID network APs (Wi-Fi) - more wireless = less copper! - *contingent on WAN/LAN upgrades.* ***(People/Planet/Performance)***

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Year 4

Add Content Servers, in-house Streaming services at all/most library facilities (work in conjunction with FRL's DCC to determine type of streaming content needs. Provides informative & Library Program delivery services
Requires Additional infrastructure equipment to expand network resources - *contingent on WAN/LAN upgrades.* ***(People)***

Year 5

VoIP solution to replace POTs - ***(People/Planet/Performance)*** - *contingent on WAN/LAN upgrades.*

Planning and Rational:

- BWFN WAN & LAN fiber network speed increase
    - WAN increase to 1GB (Awaiting BWFN input) (x5 or 6) depends on NCL location.
    - LAN/Internet increase to 1GB (Awaiting BWFN input) (x1) Bryson City location (shared)

This upgrade is necessary as FRL is falling behind in the bandwidth services as a whole, which can best be termed "as an ongoing cycle".

- It should be noted that internet needs for the average business and public consumer doubles every year. Typically, business needs break down to 10-15Mbps per person/client device (25Mbps per client is recommended) to satisfy todays data and streaming connectivity requirements.
- IT infrastructure best business practices use 1-1.5Mbps as the rough for calculation on network needs both wired and wireless (this is the industry standard - best practices for the last decade), this factor is vastly underrating today's business needs on data & streaming services provisioning as a whole - but does have some merit in the fact that not all of our 203 clients (workstations) will be using the same services at once.
- With all factors being considered, and by IT best practices calculations on FRL bandwidth needs to satisfy our staff and patron bandwidth requirements this breaks down to the following:

    1) 203 clients within FRL WAN/LAN wired networks for internet access (Desktops/Laptops) for both staff and patron usage, would need at least 305Mbps connection speeds to sustain a best practices internet services for our library locations. (this can mean substandard services).

2) If using the newer 10-15Mbps (todays standards) as a reference for our calculations this would equate to 2.05GB - 3.05GB bandwidth needs. In IT best practices the fallback 1.5Mbps can best be used if slightly adjusted to a factor of 3-4.5Mbps for our considerations and can be reason that not all internet users (staff or patrons) will be streaming media content at the same time, in fact most of our needs will be general email/work data throughputs to maintain our library business data requirements for a day to day service needs to our patrons. On the other hand, it should be noted that more bandwidth requirements for our patrons will most likely fall into the streaming content data requirements as this is the data content model that most providers are moving towards.

Scope:

I believe a GB WAN with a GB Internet - service plans (calculated at a factor of 3-4.5Mbps to keep up with today's rising bandwidth requirements) to FRL facilities will best help us to meet our needs during this LRP period. Increasing our bandwidth limits will enable FRL to meet the connectivity needs of our communities in our library provided services, some examples are:

- Meet todays expected data and internet provided online service needs to staff and patrons. ***(People)***

- Replace Decades old existing Frontier telephone lines (POTS) services with VoIP services. ***(People/Planet/Performance)***

- Providing in house streaming content services to our patrons with some additional equipment at each facility. ***(People)***

- Provide Staff Wireless solutions so that our FRL Wireless SSID APs (Access Points) can be dedicated to our patrons' vice working double duty to provide our facility owned devices wireless connectivity. This will allow two Wireless networks independent of each other - (Staff & Public WiFi), with some additional network equipment. ***(People/Planet/Performance)***

Triple Bottom Line: 3 P's, People / Planet / Performance - (Social / Environmental / Economic)

IT equipment procurement (Workstations & Network equipment)

- Whenever feasible to use computer & equipment manufacturer sources that take steps to lessen impact of environment and use less resources.

- Workstations: Whenever possible replace desktops with laptops/chromebooks or hybrid desktop workstations (smaller, less moving parts) "modular components that are more energy efficient".

- For Network infrastructure, modernization and efficient network equipment is a must, and ensure scalability for future growth.

IT Equipment Disposal - (Recycling)

- Ensure any equipment that can be recycled goes to County Recycling centers as appropriate upon disposition of old equipment and not just disposal.

5. Technology Goals and Strategies

Goal 1: Replace all Public and Staff workstations by December 2023.

Objective:

1.1 By March 2023, replace all public internet workstations with Windows 10/11 compliant PCs.

Technology strategies:

1. January 2023 - Acquire PCs and related peripherals for MCPL/NCL locations. note: Lead time delay may be expected. (early-December 2022 for quotes)
2. Configure PCs for public use and place in service at MCPL/NCL locations.
3. February 2023 - Acquire PCs and related peripherals for JCPL location. note: Lead time delay may be expected. (early-January 2023 for quotes)
4. Configure PCs for public use and place in service at JCPL location.
5. March 2023 - Acquire PCs and related peripherals for ACCCL, HUD and MBL locations. note: Lead time delay may be expected. (early-February 2023 for quotes)
6. Configure PCs for public use and place in service at ACCCL, HUD and MBL locations.

1.2 By December 2023, replace all staff internet workstations with Windows 10/11 compliant PC's

Technology strategies:

1. October 2023 - Acquire PC's and related peripheral for MCPL. Note Lead time - (early-September 2023 for quotes)
2. Configure PCs for staff use and place in service at MCPL
3. November 2023 - Acquire PC's and related peripheral for JCPL location. note: Lead time - (early October for quotes)
4. Configure PCs for staff use and place in service at JCPL
5. December 2023 - Acquire PC's and related peripheral for ACCCL, HUD and MBL locations. note: Lead time - (early November for quotes)
6. Configure PCs for staff use and place in service at ACCCL, HUD and MBL locations.

Goal 2: FRL Bandwidth WAN/Internet Speed Increase & Network Infrastructure Upgrade to Gigabit compliance.

Objective:

2.1 By Oct 2024, WAN/Internet bandwidth speed increase to GB.

Technology strategies:

1. January 2024 timeframe: Add LAN Server Desks at HQ, JCPL and MCPL IT work locations to provide server space and IT work areas for work space improvement.
2. Work with BWFN to provide increase bandwidth, (Planning in work)
3. May - September timeframe: Acquire and implement network infrastructure equipment upgrades to make use of increase bandwidth. (Firewall, TPM appliance at HQ/MBL & layer3 switches at all library locations (1 Firewall, 1 CIPA Appliance and 6 switches).
4. Increase bandwidth carrying capability at all sites to improve network throughput by upgrading layer2 (subnet) switches at all library locations (total of 20 switches) to GB ports. (Staff & Public networks)
5. Upgrade MDF/IDF patch panel connections to GB compliance at all locations, and replace MDF/IDF network racks (as appropriate) with network enclosures at HQ/MBL-MDF, JCPL-IDF, ACCCL-MDF, NCL-MDF (x4) locations.
6. Add NAS (Network Attached Storage) units at all locations for increase capacity and modernization of Data/Security backups. (Increase NAS Backup Storage from 2 locations to 6 locations).

Objective:

Goal 3: Upgrade The FRL Wireless Network AP equipment at all locations, and provide Staff Wireless solutions so that our FRL Wireless SSID APs (Access Points) can be dedicated to our patrons.

Objective:

3.1 By 2025, and at re-occurring replacement cycles (5 yrs.), Upgrade the Wireless AP infrastructure and look for another 2nd wireless solution to maintain a dedicated public wireless SSID separated from the existing wireless AP's (two separate wireless AP solutions) at each location for dedicated Public Wireless and a new dedicated Staff Wireless solution.

Technology strategies:

1. Work with Encore to replace aging AP equipment, and establish implementation of a possible new Staff Wireless network.
2. Acquire equipment, implement VLAN, and setup/install as needed.
