The CT Institute for the Blind Expands State Services Through Siemon Infrastructure

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Founded in 1893 as a school for blind children, The Connecticut Institute for the Blind/Oak Hill expanded its mission in the early 1980's to serve people with severe multiple disabilities, including mental retardation, and opened its first group home in the community. Today CIB/Oak Hill serves a broad range of individuals with disabilities in community-based programs and from its home base atop Hartford, Connecticut's highest elevation. From the numerous antennae upon its roofs to data centers below the ground, CIB/Oak Hill is completing its 6-year plan to consolidate remote timekeeping services statewide while positioning itself as a managed networks provider for non-profit organizations in other regions as well.

John Rettenmeier, CIB/Oak Hill's Director of Information Services, manages all IT resources with regard to facilities and business integration. He has maintained a strategic, long-term relationship with Fusion Cable Systems of Brookfield, CT, one of Siemon's most experienced and long-standing certified installers. Siemon is a world-leading designer and manufacturer of high-performance cabling infrastructure systems.

CIB/Oak Hill's relationship with Fusion's reads like the timeline of an IT history book, dating back to the late 1980s' installation of Category 3 cabling to upgrade CIB/Oak Hill's turn-of the century, manually operated switchboard interconnects.

Fusion was there again in the 1990s to replace intra-campus telecom and electrical conduits. Today, supervising the installation of all new cabling, patch panels and fiber infrastructure is Fusion's president, John Burke, and Siemon Consultant Rick Foster, RCDD. John's relationship with both Siemon and CIB/Oak Hill began with its 1999 strategic expansion beyond services exclusively for the blind.

THE NEW ENGLAND ASSISTIVE TECHNOLOGY (NEAT) MARKETPLACE INITIATIVE

In 2003, CIB/Oak Hill held a grand opening for The New England Assistive Technology (NEAT) Marketplace. This revolutionary program brings people with disabilities together with products that minimize the effects of their disabilities and enhance their independence. At The NEAT Marketplace, people with disabilities, their families and the professionals who work with them can find out about the many devices available such as specialized software, I/O devices, hearing and visual aids, adapted toys, computers, seating systems, special switches, memory prosthetics, communication devices, talking clocks and many other innovations that enhance the quality of life for 3 million people with disabilities and elderly in the region.

Installed by Fusion Cable Systems, The NEAT Marketplace is located in a renovated swimming pool building. Floor and side walls are cabled with Siemon dual Category 5e jacks to support exhibitor booths every 10 feet. "It was a small building, but a big project," said Burke. "Each jack supports both an analog and a digital connection back to the Intermediate Distribution Frame (IDF) to allow both IP and dial-up connectivity among visitors and participants."

NEAT's extra-wide hallways sport donated equipment which is refurbished and then sold to consumers for a savings of 50% to 80%. The ergonomic computer lab and training center on the same floor look like a combination body shop, toy store, house wares showroom and doctor's office. Here, Assistive Technology specialists provide training and assist people in finding the most effective and cost efficient equipment.

Professionals, people with disabilities and family members are introduced to audio-enabled software and instructed in the installation of joysticks, keyboards and adaptive headsets. Bandwidth capacity for talking devices, audio-enabled websites and other multimedia applications are designed into the cabling and network topology. Connectivity components include Siemon 10G 6 jacks, patch panels, fiber rack mount interconnect centers (RIC3s) and color-coded Mohawk cabling.

At the core of the network, below ground level and behind thick concrete walls, The NEAT Marketplace also houses the school's second main distribution frame (MDF), where a Cisco Catalyst® 6500 switch is interconnected across campus to its redundant twin in the primary data center by 48 singlemode and 24 multimode fiber runs. A second DS3 D-mark (not yet installed at this writing) at The NEAT Marketplace MDF will complete CIB/Oak Hill's redundancy/disaster recovery topology.

Redundant load-sharing power to the NEAT MDF is supplied from separate grids originating in neighboring Bloomfield and Windsor, Connecticut. In the event of an outage, local, independent UPS systems support both data centers until CIB/Oak Hill's larger, central diesel generators rise up to power the entire campus. Centralized climate and environmental controls for data centers (as well as other campus facilities) are achieved as needed via remote administrator software. Mounted to the concrete behind the router rack are Siemon connecting blocks for pagers and other uses.

EXPANDED SCOPE OF SUPPORT

Already known as a "center of gravity" for information technology among people with disabilities in the region, CIB/Oak Hill forecasts an escalating need for both its expertise and its virtual/IT facilities. In today's less-than-

robust economy, funding sources are evaporating for many statewide non-profit organizations. With long-standing corporate and individual sponsors downsizing contributions, and State budgets under unprecedented constraints, many charities face their most difficult operating conditions in many years. Increasing labor costs and increasing demand for services force many charities to make do with outdated (but paid-for) technologies, further compounding revenue shortfalls with lack of IT proactivity.

CIB/Oak Hill's DS-3 WAN connection maps the main data across telecommunications company SBC Communications's RLAN ATM backbone, expanding CIB/Oak Hill's presence as a managed network provider delivering centralized, state-of-the-art IT resources to Non-Profit Organizations across the state — with a degree of cost-effectiveness smaller organizations could not match on their own.

John Rettenmeier envisioned a variety of immediate cost savings for the school's 75 group homes, beginning with standardization and centralization of their timekeeping systems. "We have many roving employees and a great deal of responsibility. It takes many social workers, nurses, physical therapists, nurse's aides, and other specialists to support our clients. We must also be in compliance with various staffing requirements for clients with many different kinds of disabilities." Rettenmeier breathes a sigh of relief as he continues, "Until recently, it took us up to three hours to poll all the timekeeping devices in our area. When we had to locate an individual in a hurry, we had to physically track them down by phone. The new WAN allows for real-time employee time and attendance. As our associates swipe their cards entering and exiting one facility or the next, we can ensure quality of care as well as accuracy of payroll."

CIB/Oak Hill's latest, most aggressive three-phase infrastructure project began in July, 2002, with a complete campus LAN / WAN, fiber routing and new data center plan jointly designed by Fusion and network integrator Apex Technology Group from Cranston, RI, another long-time ally. Apex has worked with CIB/Oak Hill since their switch from a WANG to a server-based system in the early 1990s. The installation of a complete fiber backbone (both single mode and multi mode fiber), complete with Siemon SC connectors and rack mount interconnect (RIC3) fiber enclosures. Phase II included the creation of an entirely new (NEAT MDF) data center, with the third and largest phase retrofitting the existing data center.

Anthony Verrill of Apex, along with partners Brian Hubert and Christopher Dale, coalesced CIB/Oak Hill's long-term strategies into a tangible, flexible network infrastructure plan. "The opportunity to work with the Siemon Company from day one," said Verrill, "gave us a large measure of bandwidth capacity and flexibility to work within the network design."

SHIELDING OUT EMI/RFI

"There were extenuating circumstances from day one," said Rettenmeier, indicating with his eyes the rooftop complex of antennas from numerous third party services. While Hartford's highest elevation brings revenue from renting antenna space, such as ambulance dispatch towers of the City's emergency services, among others, "Our new system had to overcome a long history of radio frequency interference (RFI) problems due to legacy unshielded cable," said Rettenmeier. "Siemon's shielded cable and shielded 10G 6 MAX® jacks allowed us to keep our antenna revenue, a win-win scenario."

Burke's Fusion team performed the shielded installation. "It's slightly more difficult than standard punch-down (IDC connections). Cable preparation and termination adds a little more labor," said Burke, "but the costs were easily gained back in EMI/RFI elimination. It's also more secure — harder for anyone to tap." The system is designed for geometric growth in bandwidth capacity — with maximum horizontal runs of only 75 feet. Said Burke with confidence, "CIB/Oak Hill is now truly Siemon 10G-capable."

GROWTH ENGINES OF A NON-PROFIT ISP

"Its secure, expandable, high-bandwidth wide area network across an ATM backbone, redundant data centers with no single point of failure puts CIB/Oak Hill at the level of a growing commercial ISP," says Apex's Anthony Verrill. While CIB/Oak Hill's newer "Showcase" data center supports 75 group homes, its older original data center has been configured as a backup, soon to become a full mirror image of its counterpart. Out in the field, each group home has been cabled to support the same higher speeds. Adding to the challenge are state building codes for group homes, which require that cabling be "out of sight" in order to promote a homelike atmosphere for Oak Hill's disabled clients.

802.11 wireless hubs carry Internet and data traffic from over 100 remote sites, including group homes, residential centers and day services. Sixty are connected via Cisco 837 routers and DSL directly to CIB/Oak Hill's data centers, while others too far from central offices for DSL use Cisco 1721 routers over Frame Relay. "These are not VPN applications," says Verrill, "the entire network is private, with its own IP addressing scheme." The Cisco gear is upgradeable to a wireless 54 mbps with 802.11c, while the Siemon 10G *ip* architecture provides "plenty of capacity for us to layer voice and video when the time comes."

"Perhaps in the next budget cycle," Rettenmeier says. "We are already lining up nonprofit organizations in outlying areas of the state."

MEETING FUTURE INDUSTRY ADA DEMAND

As the economics of special care evolve, more non-profit organizations find it increasingly difficult to meet growing community demands while maintaining and improving levels of support. Compliance by schools and public institutions with the Americans With Disabilities Act (ADA) has resulted in broad-based R&D for Information Technology, network infrastructure, architecture and ergonomics. CIB/Oak Hill's own R&D at The Neat Marketplace breaks new ground every day.

Adaptations include a variety of specialized software in tandem with modified mice, joysticks and switches for users who cannot use their hands, including voice-activation, single-handed color-coded keyboards. Some systems are operated with eye, head or foot movements, others by breath-operated puff tube.

One-handed typing, American Sign Language adapters, print-to-Braille transcription, websites for the blind and speech-to-text software, are a few examples of technologies that extend Distance Learning to students with physical challenges.

CIB/Oak Hill's leadership roles as both human services and IT provider continue to grow in proportion to its availability beyond the immediate region. Siemon's shielded high performance 10G *ip* products, designed and installed to strict system requirements, will provide continuous economic elasticity and the needed bandwidth for tomorrow's business demands. ▲

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