Optical LAN supports hospital communications today — and tomorrow

Tellabs Optical LAN reduces Guthrie Corning Hospital’s CapEx investment and power consumption while supporting state-of-the-art health care technologies.

Customer’s goals — for a new hospital facility, select a communications infrastructure that:

- minimizes the required CapEx investment, ongoing OpEx and total cost of ownership (TCO)
- supports a broad range of advanced health care services, including image distribution
- reduces energy consumption and associated costs
- conserves physical space

Tellabs solution — Optical LAN with Gigabit Passive Optical Network (GPON) technology

- Tellabs® 1150E Optical Line Terminal (OLT)
- Tellabs® 709GP and Tellabs® 728GP Optical Network Terminals (ONTs) w/PoE+

Business results — Tellabs Optical LAN:

- reduces CapEx by 30%-50% and OpEx by 50%-70%, year-over-year, compared to a traditional copper-based active Ethernet LAN
- passive architecture delivers up to 30%-65% savings in energy, compared to copper-based LAN
- 709GP and 728GP ONTs w/PoE+ support multiple services — voice, data and video — simultaneously over a single fiber
- capacity design and utilization allow for flexible, cost-effective growth

Guthrie Corning Hospital in Corning, NY, is part of the Guthrie integrated health care delivery system, which serves south central New York and north central Pennsylvania. A brand-new facility situated on 67 acres, the hospital opened in July 2014 and features numerous advanced health care technologies, including electronic protected health information (ePHI). In addition to dozens of patient rooms, a 24/7 emergency department with an on-site helipad, five state-of-the-art operating suites and an on-site cancer center, Guthrie Corning Hospital offers extensive outpatient care, including laboratory and medical imaging services. To support the numerous technologies and functions throughout this 232,000-square-foot facility, hospital managers decided to install Tellabs Optical LAN.

They originally sought proposals for a traditional network but also asked respondents to provide any alternative networking options that would be more cost-effective and, in terms of power requirements and physical space, more efficient.

“Qypsys demonstrated that the Tellabs GPON-based Optical LAN solution is a simpler, easier-to-provision network than active Ethernet LAN.”

Qypsys, a Florida-based firm that designs and deploys advanced technology platforms, suggested that hospital managers consider the Tellabs Optical LAN solution. After designing a Gigabit Passive Optical Network (GPON) infrastructure for the hospital, Qypsys engineers laid out a comparison of the two architectures and showed that Tellabs Optical LAN clearly would save money and reduce network space and power requirements.

A simplified network needs less equipment and allows fast provisioning

Qypsys demonstrated that the Tellabs GPON-based Optical LAN solution is a simpler, easier-to-provision network than active Ethernet LAN. Because Optical LAN collapses the traditional LAN architecture, it requires less equipment and
Optical LAN supports hospital communications today — and tomorrow

Ceiling boxes feed copper to all the Ethernet devices in the building, such as telephones, laptop computers, printers, cameras and access controls.

Optical LAN supports hospital communications today — and tomorrow because the optical line terminal (OLT) features 90% greater density than active Ethernet switches. Optical LAN requires only one equipment rack and a total of 11 rack units within the equipment rack. Further, by reducing the amount of physical space required, Optical LAN brings with it fewer UPS, fire suppression and HVAC requirements, which in turn reduce overhead costs. The PON splitters, typically located in the telecom closet, are located in a fiber distribution hub (FDH) mounted on the wall, thus reducing the required floor space even more.

By delivering all of the above-mentioned cost savings, Tellabs Optical LAN allows Guthrie Corning Hospital to achieve a significantly lower total cost of ownership than with traditional copper-based LAN.

“Installers put in slightly more than 10 miles of Cat6 cable in the hospital, but traditional active Ethernet LAN would have required more than 60 miles of Cat6 cable.”

Optical LAN protects the environment and saves money

Because Tellabs Optical LAN produces fewer thermals than a copper-based active Ethernet LAN does, it can reduce the hospital’s energy cost by as much as 30%–65%. In addition, its passive architecture requires no power within the optical distribution network. Finally, because Optical LAN needs less equipment than copper-based LAN, it reduces the amount of equipment needed in other power-related areas, including distribution and switching, conversion, backup, fire suppression and cooling.

A powerful network with a small footprint for a low TCO

Qypsys also showed Guthrie Corning Hospital managers that Tellabs Optical LAN could conserve precious physical space, notably by reducing cabling, floor, rack and telecom closet requirements. For example, typical copper-based LAN serving up to 2,000 users requires 90 rack units of space. Active Ethernet LAN switches require one full rack for the switches and two additional racks for terminating the large bundles of copper cables associated with the switches — for a total of 18 seven-foot-tall equipment racks.

By contrast, Optical LAN can serve up to 8,000 users, and because the optical line terminal (OLT) features 90% greater density than active Ethernet switches, Optical LAN requires only one equipment rack and a total of 11 rack units within the equipment rack. Further, by reducing the amount of physical space required, Optical LAN brings with it fewer UPS, fire suppression and HVAC requirements, which in turn reduce overhead costs. The PON splitters, typically located in the telecom closet, are located in a fiber distribution hub (FDH) mounted on the wall, thus reducing the required floor space even more.

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Optical LAN accommodates the occasional need for copper

The primary components of the network are the Tellabs® 1150E Optical Line Terminal (OLT) and Tellabs® 709GP and Tellabs® 728 Optical Network Terminals (ONTs). The Qypsys crew installed the 4-port Tellabs 709GP ONTs, which provided high-power Power over Ethernet Plus (PoE+) connectivity in 128 fiber-fed ceiling boxes and placed the rack-mounted 24-port Tellabs 728GP ONTs in communications closets.

Alan Bertsch, president of Qypsys, says that the 4-port 709GPs in the ceiling boxes feed copper to all the Ethernet devices in the building, such as telephones, laptop computers, printers, cameras and access controls. By using ceiling boxes to bring fiber as close to the end-users as possible, Qypsys minimized
Tellabs Optical LAN supports the hospital’s communications systems, such as data, VoIP, IP cameras, access control, building-management systems, pneumatic tubes, Wi-Fi, and imaging.

the amount of copper required. Installers put in slightly more than 10 miles of Cat6 cable in the hospital, but traditional active Ethernet LAN would have required more than 60 miles of Cat6 cable.

Deploying Passive Optical LAN using zone ceiling boxes also addressed two major hospital issues: sanitation and patient privacy.

“Concealing the Optical Network terminals in the ceiling zone boxes eliminated the need for sanitizing the ONTs deployed in patient areas.”

Secondly, hospital managers did not want ONTs in patient room and examination room walls in case technicians had to troubleshoot any network problems. “By installing some of the ONTs in ceiling boxes, we made it possible to troubleshoot the network from a hallway rather than intruding into those patient-centered areas,” he explains.

Flexible support for a broad range of services

Within Guthrie Corning Hospital, Tellabs Optical LAN supports practically every communications service that the facility requires: data, VoIP, IP cameras, access control, building-management systems, pneumatic tubes, Wi-Fi and imaging, including the hospital’s picture archiving and communications system (PACS), which distributes images to doctors within the hospital as well as to health care personnel in other locations.

Hospital managers opted not to have any analog voice service. The only POTS connectivity available is for fax machines, and the hospital uses traditional hard-wired copper for that.

If communications closets are necessary, make the most of them

Bertsch also points out that although Tellabs Optical LAN typically minimizes or even eliminates the need for communications closets, the hospital’s telemetry network requires traditional switches with copper running back to the closet.

“With or without the Tellabs Optical LAN equipment and cabling, Guthrie Corning Hospital was going to build those eight closets,” he says. “We could have put all of our fiber into one closet and reached everywhere, but since the closets were there anyway, and we had to put a rack in each one, we used some of that rack space to house our fiber. By putting our fiber-distribution points in the closets, we also minimized the overall length of the fiber that we had to install.”

He adds that the Tellabs Optical LAN solution at least saved some space within the closets themselves. There is no free-standing UPS, which normally would go into a closet, and there is no chiller duct, which otherwise would have been necessary to cool the rooms within the facility.

Optical LAN affords plenty of growth flexibility

Depending on the port count needs for the area served, Qypsys installed five or six ONTs in each ceiling box, ran 12 strands of fiber to it and, from about 40 of the ceiling boxes, fed one of those 12 fibers to the hospital’s wireless distributed antenna system (DAS). Qypsys then coiled the remaining fibers into a service loop to accommodate future expansion.

In fact, Tellabs Optical LAN gives Guthrie Corning Hospital a good deal of room to expand services, easily and cost-effectively. Currently, the hospital is using 33 of 56 potential PON ports on the Tellabs™-1150E chassis, and although those 33 PON ports can support up to 1,100 ONTs, the hospital (so far) is using only 830.

Bertsch emphasizes that the Tellabs ONTs themselves offer the hospital even more flexibility to grow. With 10%-15% port capacity still unused, Guthrie Corning Hospital can still add many more Ethernet connections “without adding a single widget.”

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That growth strategy also alleviates health care organizations’ resistance to “above-ceiling work.” When cabling work requires installers to remove ceiling tile, hospital staff must deploy a tent and a HEPA filter to protect nearby equipment.

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“By putting the fiber-based LAN in there, we created enough capacity to support the next few generations of LAN speeds without having to pull out about 80% of the cabling infrastructure,” Bertsch says. “We also were able to leverage that fiber infrastructure to support the all-optic DAS. Upgrades to future generations of cellular technology will require only card changes in the data center rather than swapping out the infrastructure. Tellabs Optical LAN will support Guthrie Corning Hospital’s communications requirements for the next 25–30 years.”

Take the next step. Contact Tellabs today.