CASE STUDY

NetClear®
STRUCTURED CABLING

Building an IP-Based Hospital Megaplex:
Johns Hopkins Hospital, Baltimore, Maryland

The new 1.6 million-square-foot Johns Hopkins Hospital, located in the heart of Baltimore, MD, is replacing a 50-year old facility and includes NetClear® fiber and copper structured cabling solutions for their diverse applications.

VERTICAL MARKET:
HEALTHCARE

HEALTHCARE SERVICES HAVE BECOME ONE OF THE FASTEST ADOPTERS OF THE LATEST IP COMMUNICATIONS TECHNOLOGY.

"To maintain our number one status, we realized that a redevelopment plan was vital, not only because of the growing need for additional research and clinical space, but because of the inadequacy of existing spaces, designed for an earlier era of medicine when infrastructure, equipment and delivery of care were much less complex," states Matthew Odell, Project Manager for Johns Hopkins Information Technology Department. "We wanted to build a hospital that would have all of the newest technologies and incorporate everything IP," he adds. The new $900 million hospital, which includes two connected 12-story towers—one focusing on cardiovascular and critical care and the other for pediatric care and women's health—was designed to utilize the network infrastructure for all IP applications—data, voice, video and other patient services.

The planning and installation of the cabling infrastructure at Johns Hopkins Hospital coincided with the creation of a new cable industry standard, ANSI/TIA-1179 Healthcare Facility Telecommunications Infrastructure Standard, which recommends cabling methods and best practices to support a broad scope of application-specific systems. Odell, who participated on the standard's committee, adopted many of the suggested cabling installation practices to address high bandwidth, multiple IP applications and dense workstation outlets in a hospital environment.

With a solid physical infrastructure in place, Johns Hopkins' network is moving towards total electronic health records (EHRs), which follows the plan of the Office of the National Coordinator for Health Information Technology (ONCHIT) to promote the exchange of data via a national health information network.

CUSTOMER CHALLENGES

Johns Hopkins required a reliable, warranted high-speed system that could guarantee years of network reliability and scalability that could address their unique environment. Network challenges include high-bandwidth data, packed and diverse pathways and a myriad of mixed outlet densities, depending on the location and application.

High Bandwidth Requirements

- Backbone: 40 Gb/s core—redundant 20 Gb/s to every IDF, 10 Gb/s to ever access layer
- Horizontal: 1+ Gb/s to each workstation outlet including Category 5e for voice and Category 6 for data and other IP services (nurse call, real-time location systems, physio monitoring). 10 Gb/s to special locations through multimode fiber

Pathways and Spaces

- Diverse and redundant pathways to four telecommunications rooms (TRs) on every floor, located in quadrants "A, B, C and D"
- Separation of services in two separate IDFs within each TR in each quadrant: IDF (Intermediate Distribution Frame) houses all the premise-owned data and low-voltage cabling, which is secure and only accessible by internal I.T.; External IDF (EIDF) contains all the outside services, such as TV, A/V, CCTV, Distributed Antenna System (DAS) which is accessible to the service provider vendors.
- Separation of services through color coding of cable: blue cable for data cabling, white for the telephone cable, yellow for physio monitoring, green for TV and orange for nurse call and the RLTS system
- All data cables in basket tray
- Separation of data cables in tray from conduits containing gases and fluids

Multiple Density Workstations

Following the ANSI/TIA-1179 standard that creates a matrix for areas with low, medium and high counts of workstation outlets, Johns Hopkins specified ample workstation outlets for present and future applications that exceeded the standards (Refer to the ANSI/TIA-1179 for general guidelines):

- 8 outlets per patient room
- 30+ outlets in the operating rooms
- Color-coded workstation outlet icons
- Dedicated fiber runs to critical areas

THE NETCLEAR SOLUTIONS

The warranted NetClear® solutions include NetClear MM10 for high-bandwidth multimode fiber backbone cabling between the MDF, EIDF and IDF and NetClear GT2 Enhanced Category 6 for the horizontal cabling. Specific products selected for this environment include:

OSP

- Redundant 192 strands of Berk-Tek outside plant to the 50 buildings for WAN to 30,000 users

MDF to EIDF & IDF

- 48 strands Berk-Tek premise distribution cable, single mode
- 24 strands Berk-Tek premise distribution cable, multimode
- 12-strands of Berk-Tek interconnect cable, multimode
- Additional riser cable—48 strands of single mode and 24 strands of multimode cable that connects directly to the intensive care operating rooms
- Ortronics® OptiMo® FC (Fiber Cabinet) Solution: FC cabinet, Adapter Panels, Duplex LC-SC patch cords

Horizontal Cabling

- LANmark-350™ for phone, LANmark-1000 for data and IP devices
- Dedicated multimode fiber cable for special services
- Ortronics Mighty Mo® cabinet with cable management
- Ortronics wall-mount rack
- Ortronics Clarity®6 Category 6 48-port patch panels & patch cords
- Ortronics TracJack® modules and faceplates with color-coded shutters

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Pulling the horizontal cable from the IDF and EIDF areas to all of the different rooms and locations, created a highway of ducts, conduit and cable tray in the ceiling spaces. Hospitals are not limited to the usual HVAC system, but also have an intricate piping system for transporting airs and gasses and fluids.

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Additional site information for Johns Hopkins Hospital

SITE DESCRIPTION

THE NEW 12-STORY COMPLEX WILL CONSIST OF:

- 560 private patient rooms
- 96 adult intensive care rooms
- 35 obstetric rooms
- 205 pediatric rooms

THE CONSTRUCTION SITE ENCOMPASSES:

- 2,500 tons of steel
- 44,500 cubic yards of concrete
- 1,370 miles of copper cabling
- 1,703,364 linear feet (322 miles) of conduit (round trip between Baltimore and Ocean City, MD)
- 3.5 million pounds of ductwork for HVAC
- 244,000 square feet of glass window walls and windows
- Over 4,000 plumbing fixtures

An aerial shot (courtesy of Johns Hopkins Hospital) of the construction of the 1.6 million-square-foot Johns Hopkins Hospital, located in the heart of Baltimore which consists of two connected 12-story towers; one focusing on cardiovascular and critical care and the other for pediatric care and women's health.

Together, Berk-Tek, a Nexans Company, and Legrand | Ortronics offer NetClear® cabling solutions, total end-to-end cabling systems with a 25-year warranty.

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