

# Cabling System Helps Crack Genetic Codes

By Carol Everett Oliver, RCDD

Cracking the code in genetics is the key to minimizing human scourges, such as cancer and heart disease. Defining the function of individual genes and studying their complex interactions is essential to unlocking their roles in helping to improve living conditions. According to an article published in *The Oncologist*, one in two men and one in three women are diagnosed with cancer in the U.S. Incidences of cancer are expected to more than double by 2050. With an estimated 99,000 new cases of cancer discovered in Florida per year since 2006, that state ranks second next to California with these occurrences. Recently the University of Florida opened its new Cancer and Genetics Research Complex to house much of the research efforts of the UF Shands Cancer Center, the Genetics Institute and the Interdisciplinary Center for Biotechnology Research. The complex consists of five stories on the south side and seven stories on the north side of a building joined by a four-story atrium area. It includes 280,000-square-foot of training facilities and labs, as well as a vivarium and greenhouse.

In that setting, UF scientists work to develop platforms and techniques for genomic research and analysis, as well as practical applications for microbial, plant, animal and human discoveries. Clinical trials aimed at finding therapies and cures for cancer and other diseases are expected to be an important result of the effort. Such extensive biotechnology research involves the use of reliable databases to store and receive vast amounts

of information as well as computer applications requiring high-bandwidth to perform experimental designs and analysis of complex data sets.

"Genetic sequencing is a bandwidth hog as experiments can run up to 10 days analyzing DNA, which can eat as much as 10 terabytes of data," explains Tom Livoti, RCDD, and assistant director of HealthNet Operations for the University of Florida. "Therefore, our challenge was to make sure that the networking infrastructure at the heart of the UF Cancer and Genetics Research Complex could meet requirements and assure its place as one of the premier academic research facilities in the Southeast."

"Apart from these case sensitive applications, which require high levels of guaranteed uptime, many other functions such as voice communications, security cameras, building access controls and video conferencing all use the same IP-based infrastructure," Livoti says. "Therefore we planned a 100 percent redundant system utilizing the NetClear® GT2 warranted Category 6 solution from Berk-Tek, a Nexans Co. and Ortronics/Legrand."



**I.T. PER PORT**

HealthNet is the entity responsible for the network design and management of the network infrastructure in the Health Science Center at the University of Florida, which is comprised of six colleges and five major research centers. It works in close collaboration with Shands HealthCare, a private, not-for-profit health care system associated with UF. "Back in the coaxial and mainframe days, every time a person moved, they would take the cable with them, so the next person in that space would have to re-cable, which created a cable management nightmare," explains Livoti. "Once we migrated to a structured cabling environment, it made more sense for us to centrally buy the equipment and have a centralized shop that solely handles the networking infrastructure."

"We answer to a Public Service Commission (PSC), which is made up not only of management representatives from all the colleges and major institutes in the Health Science Center, but also includes representatives from Shands HealthCare and University of Florida's main campus. The PSC approves HealthNet's annual budget and provides for governance and oversight, as opposed to the University of Florida main campus where many groups have their own internal I.T. department," Livoti explains. To arrive at a cost per port, the total cost for the operation is divided by the number of active ports.

"In total, we have about 11,000 active ports in the network and about 3,500 phones and 400 access points. At an average, it is a little more than \$13 per active port per month," states Livoti.

What is unique about HealthNet's approach is that it coordinates the project from start to finish, and subsequently manages each port throughout the life of the system. Each project has its own budget and takes into account the materials and labor.

The UF Shands Cancer Center and Genetics Institute project design called for approximately 6,000 ports, which includes data, phone, video, access points, access



**UF Shands Cancer Center and Genetics Institute complex in Gainesville, FL.**

control and security cameras. "Data is data – it's all bits. The cable does not differentiate between the end devices, and as long as there is an IP address, we utilize the UTP cable plant for a multitude of applications," Livoti notes.

**RFP BY TEAM**

HealthNet selected the NetClear GT2 Category 6 horizontal solution, based on the successful and positive experience with previous installations within the University of Florida. Selecting contractors, subcontractors and the distribution channel was accomplished through an RFP process. The RFP to select the installation company used a weighted scale that is not necessarily based on the lowest bid, but takes into account a combination of experience, locations and certifications of the staff.

"Whereas I selected the NetClear solutions in all the buildings because I know that I am getting a proven product set with a comprehensive warranty, I believe that selecting the vendors through an RFP process with a review team gives us better service and a better return-on-our-investment in the long run," explains Livoti.

The selection team included representatives from UF's main campus including facilities personnel, technology personnel and representatives from both Shands and HealthNet. Within the process, the installation firms provided a list of previous projects of comparable size and the review

team then interviewed and subsequently ranked the contractors. To select a local distributor, a comprehensive material list was created by HealthNet and separately sent out for bid.

"HealthNet does not allow any substitution of products, so price and availability were factors that led us to win the bid," states Scott Tillman, sales representative from Communications Supply Corporation (CSC), the selected distribution firm for all the electrical and low-voltage systems. "It took hours of number crunching, as well as pre-planning, to make sure the components were staged and ready for each shipment to the installation company," Tillman adds.

**SYSTEM LAYOUT**

Complete Network Solutions was selected as the installation contractor and provided the CAD drawings for the system layout. "We designed the infrastructure to be totally redundant and independently backed up on dedicated UPS systems," explains Bob Concelmo, RCDD, president of Complete Network Solutions. "All of the switches are on emergency power and generators with attached UPS systems, so the network will never suffer downtime," he adds. "The lights might go out and the building pitch black, but you will still be able to make a call."

For the backbone there are redundant fiber rings for complete fiber diversity between the North and South towers, which are connected through a middle bridge.



Right now the backbone is specified at one gigabit, but plans are to upgrade to a 10-Gigabit Ethernet backbone over fiber within two years. There are redundant fiber feeds to each telecommunications room (TR) located on each floor of each tower. Each TR is laid out the same for consistency and easy identification for future moves, adds and changes. Three Ortronics' Mighty Mo® racks house the active and passive equipment. The center rack holds the electronics (switches, routers, etc.) and the two side racks hold the patching fields for all of the IP applications.

"I suggested Ortronics' Clarity®6 angled patch panels versus flat patch panels to provide port density and to save space in the racks," explains Mike Berkman with Cabling Technologies, Inc., the manufacturer's rep. "Utilizing angled patch panels, the cable is managed on both sides of the Mighty Mo rack through vertical wire managers, which eliminates installing horizontal cable managers between the patch panels and essentially doubles your rack space," he adds.

From the TR's the horizontal cable totals 1.7 million feet of Berk-Tek's LANmark™-1000 to the 2,000 Clarity 6 workstation outlets, which contain an average of three ports per outlet, for data, voice, security cameras, distance learning, video conferencing, wireless or access control. "This is truly a converged network," states Livoti. "UTP is also running Power over Ethernet to the wireless access points

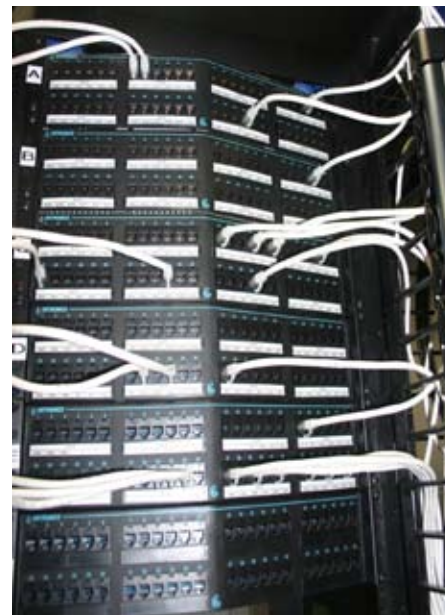
In the TR, Berk-Tek's LANmark-1000 Category 6 cable is terminated to the Ortronics Clarity 6 angled patch panels housed in the MightyMo racks. The angled patch panels eliminate horizontal cable management for better cable density.

and to the cameras," he adds.

Installing the cabling infrastructure took 14 months out of the project's total three-year construction schedule. "We were actually ahead of schedule, but we were waiting for the other trades as we had to cable after the conduits were installed by the electrical contractors and then wait for the ceilings and walls to go in to terminate to the ports," Livoti notes. After all the cable was installed and terminated, Complete Network Solutions tested and documented every port, which was part of the NetClear warranty program.

### PLAY IT AGAIN, SHANDS

This is the second building for which HealthNet has specified a NetClear solution and they are currently in the design stages for the next project, the Biomedical Sciences Building. "We are an auxiliary arm in the Florida University system and a partner with Shands hospital system in that they handling the engineering and active components and we handle the infrastructure," reiterates Livoti. "This was, by far, the smoothest installation and we hope that all subsequent buildings will be this easy," states Robert Snively, I.T. expert with HealthNet who is tasked with servicing all the installed facilities once it is complete. ■



The structured cabling between all of the TRs include redundant fiber and copper cabling. All IP devices are patched into the electronics in the TRs through Berk-Tek and Ortronics/Legrand's NetClear GT2 solution.

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