- **Creighton University** adopted a new standard for future network upgrades and installation on campus.
- **York University** launched a pilot project using Sonic Foundry's Mediasite Live to capture, stream and archive lectures.
- **Saint Joseph's University** combined the traditional methods of teaching with the latest technology to create an interactive learning experience.
- **Harvard Life Sciences** implemented a new storage system to support their growing data loads.

Creighton University ▪ By Brian A. Young

Responding to Tomorrow's Technology

Creighton is among the first academic institutions in the nation to implement Blolite, an optical fiber system into residence halls—utilizing the maximum density of 12 Blolite fiber optic cables per tube.

A Forward-Thinking Approach

The concept of a blown optical fiber system involves installing a network of empty tubes, called Microduct. Fiber optic cable is then easily blown into the tubes as required by immediate or future network demands. Driven by the need to remain technologically competitive while challenged with IT funding, schools and universities, especially, benefit from the extraordinary design flexibility and "pay-as-you-grow" features of blown optical fiber networks.

When Rick Brokofsky, director of telecommunications at Creighton University encountered General Cable/NextGen Fiber Optics' Blolite blown optical fiber system (www.blolite.net), he was captivated by the technology and what it could mean for Creighton University. In a Blolite system, sections of Microduct tubes are joined together with push-fit connectors and installed throughout the campus to extend pathways to each network destination. Once the tubes are in place, a two-person crew uses specialized equipment that delivers compressed air to propel up to 12 optical fibers through each tube. Only the amount of fiber required by the network at the initial installation is blown into the tubes while spare tubes remain empty to accommodate future fiber installations.

Although fiscal limitations can often impede initial spending, a network infrastructure should be considered a long-term investment designed to support future network requirements. Because the information-carrying capacity of fiber optic cabling is essentially infinite, a blown optical fiber system will support Creighton for several decades. "For maximum cost effectiveness as we remodel or build new campus buildings, we have to strive to make them technologically sound for a minimum of 30 years," says Brokofsky.

The built-in adaptability and capacity of a blown optical fiber infrastructure provides complete design control now and in the future, ensuring maximum bandwidth for the highest value with the lowest possible risk. This gives Creighton a competitive advantage. Because the rate of technological change is increasing and network capacity is essential to enhanced learning, teaching, and campus communication, a flexible network design that allows for virtually unlimited growth in a simple, cost-effective manner is key to Creighton's future.

Photos Courtesy of Creighton University

Brian A. Young, vice president for IT at Creighton University, pictured with Blolite blown optical fiber that will seamlessly integrate technology into Creighton's learning environment.

An Ideal Infrastructure

Using blown optical fiber technology, Creighton University is currently upgrading its network infrastructure to a true star configuration, with the center of the star located in the lower level of the Reinert/Alumni Memorial Library, in the heart of the main campus.

When campus expansion called for the construction of the new Hixson-Lied Science Building, Brokofsky specified the Blolite blown optical fiber system to connect the new building to the campus network. Creighton University's recently renovated Rigge Science

Center and Criss Medical School are also connected to the network via several spare and populated tubes and nearly 70,000 feet of Blolite fiber.

Following completion of the new science complex, Creighton University adopted a new network standard of at least one Microduct tube for every room. "At least one outlet in every classroom, office, and laboratory will have a spare tube for future fiber connectivity," says Brokofsky. "Our minimum standard to the renovated residence life areas consists of three Category 6 cables, one coaxial connection for CATV, and one Microduct tube."

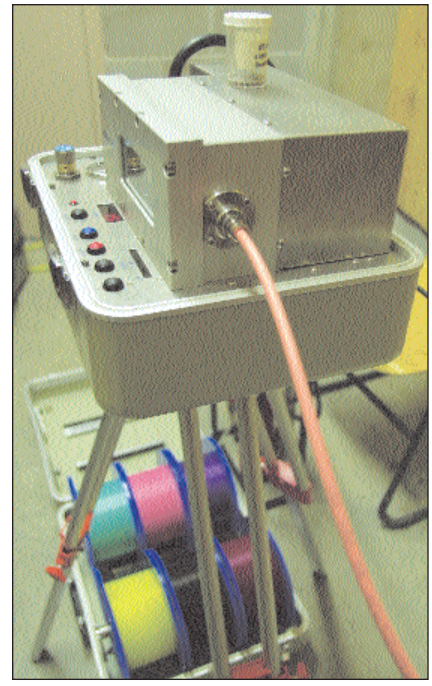
Creighton University is one of the first educational institutions to bring blown optical fiber into residence halls to ensure that students continue to have 24/7 access to the latest technology in all areas of the campus. Three new multi-bedroom residence halls for junior and senior students are connected to the network with blown fiber and include one empty tube to every "pillow" as part of the new standard.

A Future Cost Advantage

Information technology improves and strengthens all aspects of the academic environment. As computing applications become central to student life, enhanced teaching, better research, and improved administration operations, all members of the university will continually require improved technology, network uptime, and increased bandwidth. Therefore, the process of planning a campus network requires participation of all stakeholders and a funding strategy that covers continual network growth. A blown fiber system is a financially strategic approach that provides built-in network capacity.

Future network requirements can be difficult to determine, and Brokofsky admits that choosing a blown fiber system has put an end to the uncertainty of how many and what types of fiber to install. By allowing the university to install only the fiber needed today and easily add fiber to spare tubes in the future, blown fiber eliminates the cost, time, and guesswork associated with future proofing by installing dark (unused) fiber.

Because technology is rapidly evolving and academic environments like Creighton are prone to frequent moves, adds, and changes (MACs), the ideal campus network should easily accommodate modifications and the replacement of obsolete technology with as little down-



Compressed air is delivered to propel up to 12 optical fibers through each Microduct tube.

time as possible. With a blown fiber system, the existing infrastructure of tube pathways is already in place, which means minimal disruption to the physical environment of the campus during MACs. "Adding additional blown fiber requires much less labor cost than installing conventional fiber optic cable and allows us to get the network up and running that much faster. It's not at all disruptive to our campus life," says Brokofsky.

In a Blolite optical fiber system, obsolete fiber can be easily blown out of populated tubes and new fiber blown back into empty tubes when network requirements have changed. This saves on the labor costs associated with removing the obsolete fiber. While blowing a maximum of eight fibers per-tube was common practice at the time of the initial installation, Brokofsky had 12 Blolite fibers blown into populated tubes for maximum cost effectiveness. Creighton University is the first academic facility in the United States to blow all 12 Blolite fibers into the Microduct tubes, the highest fiber density available.

A Concept to Grow On

Moving forward, Creighton University plans to deploy the Blolite blown optical fiber system for its entire data network. Plenty of spare Microduct tubes will provide a way to easily expand the campus network, positioning the university for success in the 21st century and ensuring that students have access to nationwide and worldwide information and resources. An upcoming eastward expansion of the campus will include 28 Microduct tubes and over 250,000 feet of Blolite fiber for several buildings, including a new soccer arena.

Creighton University programs in medicine and dentistry involve research-based application access to remote devices at high speed, the movement of large-scale files, and even video conferencing. "We're performing significant amounts of imaging here like sending X-rays and EKGs over the network, and the growth in these types of applications is enormous," says Brokofsky. "With a blown optical fiber system, we're ready to increase bandwidth and go to 10GB whenever these applications call for it."

In addition to data, Creighton serves cable TV, remote telephone switches, environmental controls, CCTV, door access systems, and even the student debit card system for vending machines, laundry, and other purchases over its fiber network.

While bringing fiber to the desktop will not take place for quite some time, Brokofsky knows that technology is changing fast and that sufficient bandwidth is key to the evolution and improvement of every Creighton initiative.

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