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Networking a network with an air-blown infrastructure

An air-blown fiber installation is providing the Time Warner Center in New York City with a network that's designed to adapt to emerging technologies.

In one of the largest construction projects of the decade in Manhattan, contractors have installed an air-blown optical-fiber solution for the sprawling Time Warner Center (www.onecentralpark.com) at 10 Columbus Circle. The twin building center, which was built three years ago, houses Time Warner Inc. (New York, NY; www.timewarner.com), CNN (Atlanta, GA; www.cnn.com), restaurants and condominiums.



An installer from Ascent Media Systems & Technology Services prepares to blow fiber into a section of the Time Warner Center.

The installation covers the center's connected north and south towers. It was designed to enable CNN to reach its 15 cable and satellite television networks,; two private place-based networks, two radio networks, and seven Web sites, including CNN.com and CNN Newsource. The air-blown fiber infrastructure supports the broadcast production operations of the 250,000-square-foot studio facilities for CNN's *American Morning* show and its prime time lineup.

The second stage of the project was launched two years ago, and to complete the work, Ascent Media Systems & Technology Services (Northvale, NJ; www.ascentmedia.com), used 35 employees to handle the technical design. Ninety-five low-voltage contractors worked onsite, with an estimated 1.5-million feet of optical fiber blown in to the facility.

This fiber-on-demand system will enable CNN to adopt the latest technologies quickly and easily. Contractors chose Sumitomo Electric Lightwave's (Research Triangle Park, NC; www.sumitomoelectric.com) FutureFLEX air-blown fiber for the job.

"They just seemed to have the whole package together and the products we wanted," says Steven Sabin, senior project manager, Ascent Media Systems & Technology Services. "They were ready to go, which was a big issue for a job like this that had such tight guidelines."

FutureFLEX features jacketed cables in bundles of 2 to 19 tubes. Each tube is 6-mm interior diameter,

and 8-mm outside diameter. Cable pathways can be interconnected between floors or buildings, and fiber can be blown into them. The fiber can be singlemode, 62.5/125- μm multimode, 50/125- μm multimode, or fiber that is capable of 10-Gbit Ethernet. It can be blown into the vacant tubes at 150 feet per minute, and can be connectorized, terminated and tested. Later, if need be, the fiber can be blown out and used elsewhere while the tube itself is freed up for new fiber.

Out with the old, in the with the new

“The blowing system allows for fiber to be easily and quickly blown in and out of the tubes so that an obsolete fiber type, or one that no longer meets your requirements, can be blown out and new fiber can be blown in, ensuring that your network keeps up with the exact pace of emerging technology,” says Kurt Templeman, product manager for enterprise networks, Sumitomo Electric Lightwave.

“On Day One, you may have installed an 18-count fiber bundle that is 62.5 μm , and a few months down the road, your growing network requires 10-Gigabit fiber,” Templeman continues. “With a conventional cabling infrastructure, that fiber exchange would be a monumental undertaking, but with the FutureFLEX system, it’s a matter of simply blowing out the old and blowing in the new.”

For the Time Warner installation, the fiber is the same conventional 250- μm fiber that is put into loose-tube or ribbon cable. CNN sought a high-bandwidth optical fiber that would enable it to easily adopt emerging high-bandwidth digital broadcasting technologies, such as HD-capable applications, Fibre Channel communications, and standard definition video.

CNN needs sufficient bandwidth to facilitate efficient operations for critical editing, data, control, live video and other broadcasting applications. The network sought a solution that would nullify the need to forecast the changes that future programming needs, data traffic expansion and emerging digital technology would force upon the optical-fiber infrastructure.

CNN also sought an optical-fiber solution that would let it achieve moves, adds and changes (MACs) in a fast, efficient, and economical manner. It was another reason why contractors chose an air-blown fiber solution, which is designed for easier MACs.

With production operations on various non-connecting floors, contractors realized that a conventional optical-fiber infrastructure would have delayed CNN’s network expansion by requiring the contracting team to acquire permission to pull fiber and undergo construction on each floor. Sabin says CNN was determined to have a solution that would allow for easy future-proofing. This solution would have to offer the ability to easily and quickly change to an upgraded fiber. Such changes, he said, would have been costly in a conventional structured cabling network.

“This is a New York City build, and the labor rates are quite expensive, especially if they have to be done during off-hours,” says Sabin.

The decision to go with an air-blown fiber solution was made after contractors considered how the job would require spanning multiple floors in the buildings. Contractors were faced with the challenge of installing the optical fiber cable in 56 stories of the towers, while coordinating the installation with other trade workers. For example, cable from the seventh floor of tower A had to be brought to the top of tower B, which is about 1,700 feet way.

High-rise challenges

Before choosing the air-blown solution, contractors faced the task of installing optical-fiber cable at the lobby in the front of the building, bringing it to the 22nd floor, then jumping it to the 80th floor. One scenario was to hire a pull team that would pull fiber from floor to floor. A second option was to choose an air-blown fiber solution that could be easily blown in from point to point with a three-man team.

Mark Willett, senior design engineer for Ascent Media & Technology Services, says the contractors chose the Sumitomo Electric Lightwave solution because it met CNN's bandwidth requirements, and met all of the industry specs, criteria and standards. Most importantly, the solution required a minimal amount of labor.

Sabin says the solution was also easy to use.

"Once we got the team trained on how to use the system, it became very easy," says Sabin.

The air-blown solution offered contractors the advantage of avoiding obstacles associated with making changes to a conventional optical-fiber backbone. Whereas a contracting crew for a conventional fiber installation would conduct construction work on ceilings, floors and walls, the air-blown fiber solution allowed installation without disrupting the facility or its operations, enabling contractors to install the fiber without costly construction changes or downtime in sections of the buildings.

For example, two people can blow in new fiber during regular business hours, and not disrupt already existing installations. CNN's broadcast IT department can make any upgrades, additions or reconfigurations to the network by blowing in the exact amount of the latest fiber type when it is needed; the fiber can also be blown into limited access and hard-to-reach areas.

"The new business technology changes all of the time, and they wanted to keep the place as future-proofed and ready for expansion as possible," says Sabin. "With news, it's all a matter of who has the best, first."

Sabin says an air-blown fiber solution fit perfectly with CNN's future expectations.

"It could come down the line that next week, something major is happening, and they have to increase their capacity by whatever fold," says Sabin. "Then it's got to be turned on and installed, and it gives them that flexibility that if they need something, it's very easily obtainable."

"As they expand, it makes it easier," says Willett. "They can hire a crew to come in there and just shoot something to the 22nd floor." Contractors can install the fiber following a "spoke" design that brings fiber out from a central location. Tubes would be blown to technical areas, retail areas and satellite transition areas, bringing out fiber in a spoke-like pattern. The final project includes 1.2 million feet of blown optical fiber, and thousands of cable drops. The project has required extensive amounts of coordination as contractors have dealt with multiple mediums of installed cable in the two 80-story twin towers.

Nothing left in the dark

The FutureFLEX solution is being used to connect edit room floors to the video servers where content is stored. It is brought to locations throughout the building, connecting the satellite room to equipment, interconnecting between the two towers, and providing a connection from the equipment center. To make these connections, fiber was blown through the tubing, then blown to a demarcation point in the equipment center, with fiber patches then going out again.

The air-blown fiber installation has cut down on costs because contractors did not have to spend money installing dark fiber for later use, leaving CNN's IT managers with the ability to plan and budget as projects arise.

"By using FutureFLEX, we can blow in what we needed, plus some spares, and it's very simple," says Sabin.

Willett says the cost of MACs will also be reduced. A contractor team of about 10 installers would be required to perform MACs on a normal optical-fiber infrastructure. With the air-blown fiber system, however, a crew of about two or three can perform the work. The contractors noted, for example, that

it took two installers only 17 minutes to blow fiber from CNN's technical gear room on the seventh floor to the retail camera panels on the first floor. In a conventional installation, the same work would have taken the equivalent of six installers pulling cable over a period of about three days.

Sabin says that with FutureFLEX, future network expansions or upgrades are estimated to average about a tenth of the time (saving 90% of the labor cost) than that of a conventional cabling backbone.

Today, the air-blown fiber infrastructure supports CNN's key digital applications, including centralization of video content, eliminating the need for videotapes; expansion of simultaneous signals from affiliate stations; facilitation of more live coverage; and the enabling of load share between Atlanta and New York City with real-time digital feed.

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