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Intelligent IT at Hearst HQ
AESTHETIC CONNECTIONS

New Hearst headquarters gets wired with networked IT

BY DAN DALEY

The networked IT infrastructure connecting every square foot of the interior of the new Hearst headquarters is as impressive as the diagrid exterior of the new building. Photos by Michael Ficeto/Hearst Corp.
When you first encounter the new Hearst Tower, located on Eighth Avenue in Manhattan, there is an urge to climb it. The diagrid exterior of the new headquarters building, tubular angled framing chosen by architect Norman Foster, holds in thousands of square feet of glass and makes it look like a set of monkey bars for adults. Inside the foyer, looking up at the mezzanine lobby area and the massive cantilevered supports that let the structure shoot up 46 stories from within the six-story façade of the old Hearst headquarters, vertigo is instantaneous until you get acclimated to the angles.

But it’s what you don’t see that makes the new Hearst building an icon of its age: a networked IT infrastructure that would probably impress even the building’s notoriously crusty namesake—the late media mogul, William Randolph Hearst.
"This is one of the biggest IT networking projects ever undertaken," says Christopher Resch, associate director of technical services for Hearst, part of the mostly inhouse team that led the design and integration of the building's communications and media backbone.

Conduits in the floor and cleverly concealed in the Erector Set-like walls carry a combination of Cat-6e, fiber-optic, and RG-9 coax cabling for voice, video, and data traffic throughout the building. The Cat-6e cable runs from each desktop on every floor to each floor's telephone closet (probably an antiquated name at this point in history). From there, each closet has an access switch running on 50-micron multimode fiber, supplied by Comscope's System Max wire division, to the data center. (The Amino AmiNET110 converter then converts the video-over-IP signal for use with television sets.)

Wiring between floors is done through two vertical risers on the north and south sides of the building that run to the street level, where telecom and data lines come in through separate entrances. Satellite receivers on the roof collect and distribute 60 AV channels from Hearst's own Argyle group of television and radio networks and affiliates, linking the Tower's 2,000 employees to each other and the rest of the world. All cabling runs back to a data center on the 10th floor.

At the heart of the building is yet another important step forward—a Cisco-based Wi-Fi system that covers 856,000 square feet, with 288 thin access points (AP) managed and secured using four Cisco 4404 WLAN controllers set up in an N+1 failover configuration. Each 4404 unit can handle up to 100 of the 802.11b/g APs on its own. Wi-Fi is propagated via a distributed antenna system (DAS) that delivers that signal and cellular communications throughout the building.

Resch says the goal was a convergent network of digital voice, video, and data, but one of the driving forces behind how the networks are configured is the fact that Hearst is—at its core—a print-based company.

"We had to keep in mind that the graphics and editorial departments of all the magazines would be moving very large graphics files around the building, and had to do so quickly and reliably," he explains. He adds that some ultra-high-resolution images used by the various publications can reach as much as 100 MB per file, and that entire magazine layouts are routinely moved around departments in PDF format. These requirements resulted in the installation of a 10 GB backbone to create a fast pathway between floors and to the blade storage array in the data center.

"All of the offices have digital workflow, and we needed a network that was as fast as possible for the image specialists," Resch says.

Overlaid on the system is a quality of service (QOS) protocol, a set of control mechanisms that provide priority to different users of data flows in the network nodes, and that guarantee, dynamically schedule, and monitor performance of the system. This was important especially for the VOIP telephone system chosen for the building, since these often require fixed bit rates and may be delay-sensitive. Because of this, Resch says that voice and data are programmed to take priority over video on the network in terms of bit rate and capacity allocation.
"But we doubt that will come into play other than rarely," he says.

BIG CHOICES

New York's The Shore Group was the integrator of the network systems, with cabling run by Local 3 IBEW union electricians. Dell Professional Services, headquartered in Austin, Texas, installed the Dell servers. Jersey City-based Walsh-Lowe acted as the project supervisor. Chicago-based Video Furnace installed the video-over-IP system, and Santa Monica, Calif.-based Ascent Media installed the videoconferencing system and plasma displays. (Each floor has two conference rooms equipped with 65in. NEC plasma monitors, each with its own mini-headend consisting of a DVD player and a PC for PowerPoint presentations.) All vendors were selected based on an RFP bidding process.

Before the first foot of cabling could be installed, Hearst's IT team had to organize the design, including a future-proofing strategy. This was not easy since the design phase began in 2001, and five years is an eon at the pace technology moves these days. They also had to keep the nine disparate Hearst locations in Manhattan, running and transitioning them seamlessly to the new central site that would be home to all the company's publications.

"That's why the team approach was critical," Resch says. "There would be a lot to monitor, so we had to allocate responsibilities early on."

The decision to go with a convergent network with three types of cabling came early, with wiring design following almost immediately. Actual wiring installation began in 2004, three years after design began and two years before the building opened. But five years creates plenty of opportunities to fall into dead ends and technological spider holes.

"We had to try to predict what would be leading-edge, what would be bleeding-edge, and what would be vaporware by the time we had to open," Resch says. "In retrospect, it looks easy, but at the time, we were facing a lot of possibilities to pick from."

For instance, Resch recalls a Microsoft product called the RingCam, which promised voice-activated 360-degree coverage for videoconferencing.

"We put it into the specifications, but the product kept getting delayed, and it became apparent that it would not come to fruition in the time frame we needed it.
Hearst Is Green

The Hearst Tower is the first skyscraper in the New York area to be awarded green status by the U.S. Green Building Council (USGBC). The building's diagrid frame uses 20 percent less steel than conventional perimeter frames and incorporates low-emission windows, which have the collateral benefit of keeping wireless signals from leaking out through transparencies. The building also uses low-vapor paint, as well as recycled and sustainable furniture and carpets throughout. Rainwater is collected in 14,000-gallon tanks in the building's basement for use to help keep the building cool during the summer. –DD

to," he says. "At some point, you have to make a decision to move on to another solution. That happened a lot on all of the technology fronts."

Carl Cagney, Hearst's director of technical information services, says one goal was to make sure that all devices on the network were manageable by IP, including video, telephony, and lighting. This allowed for the inclusion of Crestron controllers. Even printing at central printers on each floor can be controlled from desktop PCs in the building.

"We considered desktop-to-desktop videoconferencing but decided we had to draw the line somewhere," Cagney says.

"The network has a lot of capacity, but it still has to be allocated carefully since there will be peak usage times, and those are often unpredictable."

The building's central security system resides on the network, although it terminates not at the data center, but at the main portal in the foyer, which is separated from the main lobby by escalators as a way to control ingress to the building. An interesting feature, designed and installed by Ohio-based Diebold, is the ability for building occupants to "pre-register" guests, also in an IP-enabled manner, and to limit their movement within the building.

"For instance, you can have an outside guest pre-registered to go only to the 19th floor with access only between certain hours," Cagney explains. Elevators are activated in an area ahead of the actual elevator lobbies, and are tied to this system, further controlling access.

Jim Bazzano, Hearst's senior network engineer for information services, is cautious by nature. As a result, so is the Tower.

"Everything on the network is highly redundant," he says. "There is some risk in asking a VoIP system to do what a conventional PBX system has always done, and do it on an Ethernet network. So we did all the connections in pairs. Everything has a backup."

For instance, all dual-home servers are connected via two switches.

"One of the main concerns was to preserve reliability, so every floor is connected with dual fiber-optic connections capable of 10GB per second," Bazzano says. "We balance the traffic across those two links so if one should fail, we have a sub-one-second recovery time."

To reduce the overall number of jacks, though, most telephones act as computer

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The 10th-floor data center is at the heart of the new Hearst headquarters’ goal of an intelligent, convergent network that carries all the data that’s fit for print. Not only does cabling carrying voice, video, and data funnel to the data center, but the room is also at the center of a Cisco-based Wi-Fi system that covers 856,000 square feet, with 288 thin access points (AP) managed and secured using four Cisco 4404 WLAN controllers set up in an N+1 failover configuration.

interfaces onto the network, as well. “That cuts down the cost of the jacks and also halves the copper connections in the building,” Bazzano adds.

SOUNDS AND SIGNALS
The Tower also has an interesting audio aspect. A white-noise sound masking system is generated by a series of amplifiers in the data center and distributed to zones on each floor, through an average of 80 speakers per floor.

“What it essentially does is raise the noise floor throughout the building, to dampen the noise of chatter in offices and hallways,” Bazzano explains. “The cubicle wall heights are relatively low, so sound can really travel. It works very well.” A paging system, tied to the fire station at security, has its own separate audio system.

In what might be the single largest contiguous enterprise deployment yet of the 802.11 wireless standard, the Hearst Tower’s wireless signals (Cingular, T-Mobile, and Verizon are supported) for each floor are routed over the antenna system to and from the APs stored in a wiring closet on each floor. Traffic is routed back to the centralized controllers in the data center over coax cables.

Cisco worked with MobileAccess Networks to synchronize its Wi-Fi system with the firm’s DAS product, which is designed to carry multiple-carrier cellular and WLAN signals. Bazzano says this setup should make it easier to upgrade to new Wi-Fi standards.

“When 802.11n is available in 2008 or 2009, you can just replace these,” he says, pointing to the neat cluster of APs in the wiring closet.

In many ways, the Hearst Tower is a 21st-century version of the Hearst Castle that the newspaper mogul built 100 years ago in San Simeon, Calif. Both were state-of-the-art for their time, and both made a technological as well as aesthetic statement. And in both cases, if you look hard enough, you can get an idea of where this kind of technology is going next.

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