

Super Bowl Spotlights Stadium's Winning Fiber Net



By Mel Duvall

When the New England Patriots and the New York Giants take to field in Glendale, Ariz., this Super Bowl Sunday, millions of fans around the world will look satisfyingly on the brilliant green Alabama-grown turf, specially shipped in for the game.

What they won't realize is that the sod sits on an 18.9 million-pound tray that normally resides outside the stadium soaking up sunshine. On game days, it rolls back inside the stadium ready for action, complete with hash marks and team logos.

The roll-out grass field is a first for North American stadiums, but it's not the only technological marvel inside the University of Phoenix Stadium.

Hidden underneath the turf, for example, are more than 75 drop boxes, essentially plug-in locations for electric power and access to the stadium's sophisticated Internet Protocol (IP) network. When not being used as a football field, the drop boxes can be used for conventions or to support a trade show.

The converged IP network handles all data, voice and video communication traffic throughout the stadium. It supports the underlying computer systems used to operate the stadium, from the point of sale terminals in refreshment stands through to environmental and safety control systems, and even the video replays on the jumbo screen. In addition, the network powers more than 800 IP-based Cisco touch-screen telephones installed in luxury lofts, some 700 high definition flat television screens installed throughout the stadium, and more than 100 wireless access points that let fans play fantasy football from their seats via their laptops or PDAs.

And the network can grow on-demand.

The stadium features one of the largest deployments of air-blown fiber. Unlike traditional fiber-optic networks, where cables are laid with sufficient capacity to meet estimated current and future needs, air-blown fiber can be upgraded on demand. The University of Phoenix stadium uses FutureFlex fiber technology from Sumitomo Electric Lightwave of Research Triangle Park, N.C.

The technology addresses a difficult challenge faced by many IT departments: It is often difficult to forecast exactly how much capacity will be needed to run applications six months down the road, let alone six years.

But with its network technology, the \$450 million stadium has raised the technology—as well as the sports entertainment—game.

"In the early stages of planning the stadium, a tremendous amount of collaboration and thought went into what was technologically possible," says Steven Kedzior, vice president of client solutions for Insight Enterprises, a Tempe, Ariz., company that served as the chief technology implementation partner on the project. "But it all came down to what would ultimately improve the fan experience. At the end of the day, that's how success is measured."

A Wider Field

When the Arizona Cardinals began laying plans for their new home more than three years ago, hosting the Super Bowl was an obvious goal. But the stadium was built with much more in mind. When not playing host to the Cardinals, or college football's Fiesta Bowl, the stadium can be converted into a multi-use facility for soccer, concerts, business conferences and even rodeos.

Architect Peter Eisenman designed the stadium's exterior to look like a snake is wrapping itself down the barrel of a cactus, with the snake's head serving as the main entrance ramp. There are 63,400 permanent seats, with another 10,000 seats being added for the Super Bowl. The roof features a translucent fabric that opens in two sections to let the sun shine in on fair weather days.

The combination has earned the stadium rave reviews, and was called by Business Week one of the 10 most impressive sports facilities on the globe.

But Mark Feller, vice president of technology for the Cardinals, is equally proud of the technological features that won't be seen by fans this Sunday, such as the air-blown fiber network.

In most cases, the easiest solution is to lay enough fiber cable to accommodate even the most generous bandwidth estimates, but that can become an expensive proposition, particularly when you consider the scale of a football stadium.

Instead of installing standard cable, the Sumitomo technology uses a system of tubes. Once in place, fiber bundles consisting of the same glass used in conventional fiber-optic cables are blown through the tubes using compressed air or bottles of compressed nitrogen. Fiber can be blown into the tubes at speeds of up to 150 feet per minute. Two people can install one mile of fiber in about 45 minutes. When more capacity is needed at a later date, more fiber is blown into the tube.

"The FutureFlex infrastructure makes it possible for us to bring on new capacity in hours or days, rather than weeks or months," Feller said in a statement following the stadium's deployment of the technology. "It resolves many IT issues by providing immediate scalability and easy fiber installations, without construction crews disrupting operations or the facility."

Another interesting advantage of the technology, according to Sumitomo, is that the fiber can also be blown out just as easily as it is blown in, making it possible to swap out fiber in future upgrades.

Engaging Fans

Judging by the features the Cardinals have in place for fans, Feller may already be looking to blow in more fiber. Fans sitting in the stadium's luxury lofts have access to Cisco IP-based telephones with touch sensitive screens. Using the phones, they can pick players for their own fantasy football rosters during a game, keep tabs on scores around the league, and purchase food or beverages. They can also use the phones to shop at the Cardinal's online store or buy tickets for future games.

Similarly, fans in the general stadium will be able to tap into some 100 Cisco wireless access points around the stadium, to pick their own fantasy football teams.

Insight's Kedzior says the overall technology deployment went remarkably smooth, especially considering the tight deadlines involved in getting the stadium ready for the Cardinals' 2006 season. One challenge involved figuring out a way to make sure all 700 or so of the television screens deployed around the stadium were receiving feeds and not showing a blank screen. Insight was able to install software to monitor the screens and indicate when a feed is not being received, but it's not perfect. The software can't tell, for example, if a screen is blank because the television is broken. Most of the other challenges encountered involved deploying sensitive computer and networking equipment in the midst of a massive construction project.

"Technologically, it didn't prove to be that much of a challenge," he adds. "It was the physical aspects—working through a large construction project, under tight deadlines, and with dust flying all around—that provided us the most difficulty.

"We learned a lot in terms of project management from this."

Technology Supporting the Super Bowl

- A single, converged IP network, supporting all data, voice, and video communication traffic.
- 78 drop boxes supplying access to the IP network, as well as power, built into the stadium floor.
- A networking backbone using air-blown, fiber-optic tubes from Sumitomo Electric.
- Access from luxury suites and lofts to more than 800 Cisco IP-based phones, with touch sensitive screens.
- More than 100 Cisco wireless access points, allowing fans to connect with laptops or PDAs from their seats.
- A main antenna on the stadium roof, which receives cellular phone signals from carriers and distributes coverage to the stadium's nooks and crannies using 100 omni-directional antennas.
- More than 700 high definition flat screen televisions, which are fed and supported by the IP network.

Be first to comment this article



Write Comment

- Please keep the topic of messages relevant to the subject of the article.

Name:

E-mail

Comment:

Code:*

67233

I WISH TO BE CONTACTED BY EMAIL REGARDING ADDITIONAL COMMENTS

Send

POWERED BY AKOCOMMENT TWEAKED [SPECIAL EDITION](#) V.1.4.6
AKOCOMMENT © COPYRIGHT 2004 BY ARTHUR KONZE - WWW.MAMBOPORTAL.COM
ALL RIGHT RESERVED

TAG IT:

[Digg](#)

[Delicious](#)

[Reddit](#)

[CLOSE WINDOW](#)