ASU Implements Advanced Fiber Network

Arizona State University modernized the telecommunications systems on its four campuses by pushing fiber deep into the network.

By Masha Zager / *Broadband Communities*

With more than 72,000 students enrolled at four campuses, Arizona State University (ASU) is the largest public university in the United States. As at every university, the students, faculty and administration are intensive users of telecom services, and the university is responsible for meeting their voice, video and data needs.

In 2010, the university decided to upgrade the cable networks that served its administrative offices, stadiums, dormitory rooms, dining halls and common areas. The new system would replace all the video services on the four campuses and about one-third of the data services. The university had several goals for the upgrade: It wanted the new system to be technologically advanced, it wanted to own and control the system and it wanted to pay for the upgrade without a budget increase.

ASU issued a request for proposals in 2010, using its Best Value RFP process. This process, which the university also licenses to other organizations, has supported the successful procurement and management of 1,600 projects, many of them large and complex. Nichol Luoma, the university's director of procurement and chief procurement officer, explains, "The proprietary process, which was developed by ASU's Performance Based Studies Research Group, focuses on finding the best available expert for a particular requirement. The process does not stop at contract award;

instead, it focuses on continual process improvement and cost competitiveness."

The selected vendor was Satellite Management Services (SMS), a Phoenix-based broadband video and data solutions provider that supports more than 650 multiunit properties. (SMS was recently awarded a similar project for the University of Arizona.) SMS began work on the project in September 2011 and has nearly completed construction for the existing buildings. Over the course of its five-year contract, it will also manage the network for ASU.

Don Bowen, CEO of SMS, says that, though his company owns the other networks it manages today, separating network ownership and management is not new for the company – in fact, it harks back to SMS's original business model in the 1980s. "We went to apartment owners back then and said, 'We'll build the network, you own it, and we'll manage it.' We built the company doing that in 1985. So we took a step back to our roots to do this deal."

DEEP FIBER

The path to upgrading the system was straightforward, if logistically complex: Install more fiber. To unify communications and to support demand far into the future, SMS's network design replaced much of the existing coaxial cable with fiber pushed as deep as possible into the plant. When the project is complete,

Headend equipment for Arizona State University's new telecommunications network

there will be more than 27 miles of fiber and 2,000 strand miles of single-mode fiber installed across the four ASU campuses. "There were so many aspects and moving parts," Bowen says, "just logistically, the amount of resources and raw fiber was huge."

The fiber runs from a headend at each campus through tunnels and conduits, with very little splitting, to intermediate distribution frames in or near the buildings. "To make it as trouble-free as possible, there are as few connectors as possible," Bowen says. "Everything is fusion spliced. We put in a tremendous amount of excess fiber. A 12-strand fiber has virtually the same labor and material cost as a six-strand fiber, so you might as well pull 12 fibers. Then, when they grow off the ends, there will be plenty of signal to split."

Because the coaxial cable inside the buildings was still sound, SMS saved money for the university by reusing it rather than bringing fiber to each endpoint. Wi-Fi access points allow the use of mobile devices in the dorm rooms and common areas. The result is a robust network that can support video, data (using DOCSIS 3.0), voice

and digital signage. "They no longer have to have separate telephone, cable and data systems," Bowen says.

Dave McKee, senior director of the University Technology Office, says, "The current fiber-coaxial architecture is expected to meet projected needs for the foreseeable future, or at least until we transition to an IPTV-based environment, in which case we believe

the fiber/copper Ethernet infrastructure will meet those needs."

Bowen adds, "The nature of construction on campus is that you're always tearing down the oldest buildings and replacing them, and as they do this, they will go even deeper with the fiber."

The state-of-the-art headends allow remote monitoring and management.

ASU'S BEST VALUE PROCESS

Over 17 years, the ASU Performance Based Studies Research Group has refined a business model that enhances the way organizations operate. The underlying concepts are simple:

1. Hire smart people, and allow them to demonstrate their expertise.
2. Preplan projects from beginning to end while identifying potential risks and their solutions.
3. Measure performance as well as any deviation from the plan.

Because the model is adaptable, it can be applied to any level of organization within any industry. Results include

1. Reduction of client management requirements
2. Motivation toward continuous improvement
3. Creation of accountability through measurement.

BROADBAND DEPLOYMENT

SMS designed a system with enough fiber to support the university's video and data needs into the foreseeable future.

"Technicians can get in from wherever they are, see if a channel is down and change it if they need to," Bowen says. Though each campus has a stand-alone system today, ASU plans to connect all four campuses with fiber. Once that happens, it will be able to manage all the headends as a unified system.

REDUCING COSTS

Because of fiber's greater reliability and lower power consumption compared with coaxial plant, ASU expects to see a 90 percent decrease in network operating expenses going forward. However, the university's brief to SMS was to upgrade the plant without incurring any additional costs during the construction period – and that, Bowen says, was "a tough nut to crack."

The answer lay in changing the cable programming packages that the university purchased. Previously, the university paid a cable provider $1.7 million per year in video programming fees, and a large part of this sum represented the fees for sports networks. Cable providers generally don't have the option to reject sports channels, but DISH Network offers a university package that does not include sports. (One reason ASU had to own and control its network was that this flexibility would not have been available otherwise.) Without sports, the university's annual content fees fell from $1.7 million to about $.5 million – enough of a savings to finance the capital costs of the network upgrade. Programming costs could potentially be reduced even further if ASU chooses to make additional programming reductions or takes advantage of new revenue opportunities.

SMS could still make sports programming available for $40 per month (plus a deposit on the receiver) to any student who wanted it, but most students do not have the resources for that kind of expenditure and usually resist paying for any cable programming. In fact, as of spring 2013, only seven students out of 8,000 on the new system had upgraded to the paid sports package.

How would students respond to being deprived of sports programming? Bowen says that when SMS discussed this plan with industry peers, the general reaction was that students would be "flipping cars over and setting them on fire." However, other universities, including Duke and Stanford, had successfully made similar changes without provoking insurrection, so the plan seemed worth pursuing.

Melissa Krewson, director of residential life at ASU, admits, "The response from students has been a challenge." To address this, she says, "ASU has provided the expanded service to residential community lounges, to include ESPN and Fox Sports."

This compromise was a success. As Bowen says, "If they have a choice to pay $40 per month or watch TV in the common area, they'll watch in the common area." With sports programming available in the common areas, only about 15 students took the trouble to comment on the change – not a large enough number to reverse a savings of $1.2 million per year.

Bowen concludes, "While this amount may not seem significant to taxpayers given the size of the ASU total budget, the progressive thinking and actions of redirecting funds in a very productive and fiscally prudent direction should be headlines." ❖

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