

# GSA paves way for IT-based buildings

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In May, the General Services Administration issued an unusual statement, saying it was “working to integrate power controls into [information technology] operations.” By doing this, the agency expected big savings on energy consumption.

One example cited is the Charles E. Bennett Federal Building in Jacksonville, Fla., which cut energy consumption by more than half.

“We have just started to move in the direction of converging IT and facilities with our newer buildings,” said Diane Herdt, chief information officer at GSA’s Public Buildings Service. “Initially, we are looking at energy and water conservation, but it will be expanded to use IT for physical security, lighting and power management.”

And GSA is not alone. The best examples are occurring in the state government and educational sectors. The Missouri state government’s energy costs, for example, soared from \$42 million to \$74 million in a couple of years. Missouri now has a program to centralize control of building automation systems (BAS).

“We’ve saved \$15 million so far,” said Trent Blair, director of the technical analysis unit in the Division of Facilities Management, Design and Construction. “The goal is to reduce total cost of operations by about a dollar a square foot, with overall savings of \$30 million.”

Those gains will be spread across 27 million square feet of owned space and more than 800 buildings. The game plan is to harness IP to connect the various control systems and integrate everything into one system that collects all data to provide a unified maintenance and energy picture.

IP has been invading all kinds of zones during the past few years. Voice over IP converges voice and data over one network. IP Storage allows agencies to achieve economies of scale by managing storage capacity over the existing Ethernet-based network.

Now, the trend is for IP to invade BAS. Instead of separate data, building, access, physical security, elevator, HVAC (heating, ventilation and air conditioning), fire and energy systems — with separate control environments and their own console and monitoring programs — the goal is to use IP to centrally manage everything.

“It really makes sense to build an intelligent environment where a building is self-

contained through its controls of egress/access, heating [and] lighting” said Clive Longbottom, an analyst at QuoCirca. “By bringing the networks together, buildings can be managed far more effectively and efficiently.”

Blair said 5 million square feet and 25 buildings in Missouri are already completed. Another 12 million square feet will be added by year’s end. This is being achieved under the umbrella of the EnNET platform from GridLogix. EnNET software brings a wide array of proprietary building control protocols into a Web Services/XML framework. There, they can be easily integrated into ERP and enterprise monitoring platforms.

### **All adds up**

Blair laid out the math in simple terms. Using traditional building control technology, the only way to come anywhere close to this kind of an all-encompassing facilities network would be to go to one of the big vendors such as Siemens or Johnson Controls and consolidate everything on one set of proprietary hardware. That would involve ripping out some older systems, and the estimated payback period would be eight to 10 years. Using IP, however, the payback is a year.

“Putting this kind of system in place costs us 60 cents to \$1.20 per square foot,” Blair said. “It reduces energy costs by 10 to 20 percent and maintenance costs from 10 to 60 percent. And it does that without a major change in the building infrastructure.”

Ethernet cabling is used to feed data to a centralized monitoring site; some larger buildings may require an on-site server. IT can monitor building health and energy efficiency for all buildings from one data center.

If the level of disorganization that once existed at the facility level in Missouri is any barometer, federal buildings could experience similar benefits. Missouri had 16 organizations involved in managing facilities, but nobody managed energy. The energy expenditures were hidden in various departmental budgets.

“We’ve gone from ... having no standardized maintenance plan to having enough data to manage centrally,” said Blair. “We even returned \$2 million earmarked for energy costs to the state budget at year end [because] we didn’t need it.”

But GridLogix is far from the only game in town. Cisco Systems is very active in this area and partners with dozens of companies to bring BAS under IP. Its Cisco Connected Government initiative facilitates the use of the network to address BAS. The idea is to bring this technology to government. It can also be deployed to tie branches of government and the community together.

## **One community**

“Police, fire, maintenance, schools, courthouses and other public functions can be formed into one wireless or wired community,” said Brad Nacke, government business manager at Liebert, a Cisco partner focusing on power and cooling infrastructure. “Significant economies of scale can be realized when a number of agencies or municipalities are involved,” Nacke said.

Another Cisco partner is Richards-Zeta (RZ) Building Intelligence, a maker of building integration controls. One customer is Hotel 1000, a boutique hotel in downtown Seattle with 120 rooms and a residential tower with 47 condominiums. All building systems including HVAC, lighting, central chilled and hot-water plants, and electrical operate on the same network as the guest voice, video and data services. The system uses the RZ Mediator/OMEGA middleware platform, which integrates the building systems and presents data on Web-based floor plans.

“We used to have to go into various proprietary applications at different terminals to determine the cause of failure, and now we can do that remotely,” said Donald Kenney, IT manager at Hotel 1000.

Such systems have obvious applications at a federal level. In addition to ease of maintenance and energy savings, security systems could be tied to IT.

One possible use: location flags for all staff using the Global Positioning System or red flags for people in unauthorized areas.

Intelligent Buildings is another pioneer in the field of real estate technology, design and management. The company was a primary vendor at Ballantyne Village in Charlotte, N.C., where it worked with vendors such as Liebert, Panduit and Cisco. The idea is for IP to become the fourth utility — one that is readily available just as electricity, water and gas are.

“Some of the dozen applications operating on the fourth-utility infrastructure are converged physically via conduit, cable tray and fiber optics, and others are electronically converged by being switched through the Cisco infrastructure,” said Intelligent Buildings’ co-founder Rob Murchison.

This includes television, ambient music, digital signage on 35 plasma screens, energy submetering, Wi-Fi, VOIP, LED property lighting, point of sales and even lavatories that tell maintenance to bring more toilet paper or paper towels.

The 4-million-square-foot North Carolina Research Campus is another example. It is being built at a cost of \$1.5 billion. Anyone looking for the data center of the future would do well to investigate this property. It is being constructed from the ground up using central IP management.

### **GSA rollout**

But such grand schemes might be a daunting prospect at the federal level. As the largest public real estate organization in the country, GSA's Public Buildings Service has an inventory of more than 342 million square feet of work space. Its first major attempt at harnessing technology to ease the facilities burden came in the form of the computer maintenance management systems (CMMS) in use in eight of its 11 regions. According to Herdt, the agency is looking at consolidating this into one national system to track building maintenance and warranties.

This, however, is not being tied into IP initially. The CMMS in use is Alerton BACtalk. It uses the BACnet communication protocol. Regions have their own CMMS servers running Windows 2003. A database of all equipment and facility-related data is stored there. But a complete database requires a tremendous amount of manual data entry for more than 8,000 buildings.

"We will eventually hook CMMS data into IP," Herdt said. "This will enable us to better plan for the future on a national basis as opposed to bits and pieces. We can also consolidate purchasing and fix things before they break."