Intelligent Buildings: Connect Building Systems to the Network to Reduce Costs and Conserve Energy

Agencies seeking investments that provide large returns need look no further than the four walls around them. "Building operational and energy costs are second only to human resources in government budgets," says Ray Rapuano, Business Development Manager for Cisco's public sector group. "In fact, ongoing building costs, not construction itself, represent 75 percent of a building's lifetime costs."

Governments worldwide are reducing costs and supporting their sustainability by turning existing buildings into intelligent buildings. These buildings monitor real-time conditions and then automatically adjust heating, ventilation, air conditioning (HVAC), and lighting according to the agency's policies. "The savings can be invested in high-priority government programs like clean energy, healthcare, and education," Rapuano says.

IP Network as the Building's Brain
In most government buildings today, building systems (HVAC, lighting, smoke and fire, security access controls, and so on) are isolated on their own networks. Facilities personnel use a different management console for each one, and that console works only for a given building. Inability to get the big picture leads to unnecessary expense, like heating and cooling corridors when no one is present, powering systems overnight, or not detecting failing equipment that can cause a catastrophic event or is consuming more energy.

"Governments can save money by connecting their existing building systems to the IP network, which enables central monitoring and automatic enforcement of policies," says Jeff Critser, of Cisco's public sector group. For example, if the agency is not on target to meet a goal to reduce energy consumption, the network can automatically calculate and implement the needed actions, such as raising the temperature that triggers the air conditioning system from 72 to 75 degrees.

Early Return on Investment
The intelligent building approach, which Cisco calls Connected Real Estate, can be used in new construction as well as existing buildings. In most cases the return on investment is less than two years, according to Rapuano. Agencies save money because they can:

- **Monitor energy consumption in real time to more quickly discover inefficiencies:** The State of Missouri uses 250,000 building sensors and its Cisco network to retrieve room temperatures, utility meter readings, whether elevators are turned on, and more every 15 minutes. The system automatically sends an email message when something unexpected occurs, such as when an air handler begins operating 24 hours a day. The facilities department now finds out immediately instead of months later, when the bills are analyzed.

- **Prevent bigger problems:** "Finding out that a chiller plant is low on coolant or that a back-up generator didn't start can enable an agency to avert a data center crash," says Rapuano.

- **Reduce equipment acquisition costs:** The Cisco Connected Real Estate framework works with all building systems. This gives government facilities departments the flexibility to work with multiple systems and vendors instead of just one.

- **Extend equipment life:** Access to complete information about building systems helps facilities departments find ways to reduce the number of hours that systems operate. This can extend the lifetimes of assets ranging from compressors and transformers to light bulbs. "Extending equipment life also reduces industrial waste and the need to mine natural resources for new manufacturing," Rapuano says.

- **Acquire LEED certification:** LEED certification provides independent verification that a building project meets the highest green building and performance measures, and increases a building's resale value. "Cisco Connected Real Estate contributes up to five points and influences an additional 20 points," says Critser. "It's a very cost-effective way for governments to increase their LEED certification level from silver to gold, or from gold to platinum."

· **Participate in load demand response:** Utilities request that customers reduce their load on peak energy days. "For agencies with dozens or hundreds of buildings, it's just not feasible to send people scurrying around to change the cooling temperature and reduce lighting," says Rapuano. "If the buildings are intelligent, one person can use a centralized management interface to implement load demand requests from local utilities in one, some, or all buildings at once." Intelligent buildings can also become part of a larger ecosystem of smart grids.

Funding Sources

The economic stimulus program contains a provision for US$111 billion in infrastructure upgrades and $43 billion to conserve energy in buildings. "Adding the Cisco Connected Real Estate framework to all building projects, whether or not they are funded by the stimulus plan, is a good investment because it provides lasting returns and supports the environment," says Rapuano.

To read more about Cisco Connected Real Estate, visit: **www.cisco.com/go/realestate**
To read a case study on the State of Missouri, visit: **www.cisco.com/web/strategy/docs/gov/govconnect_042909_Missouri.pdf**

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