The Ohio State University

Just over twelve years ago, the first BACnet® project was installed at The Ohio State University by Building Control Integrators (BCI).

The project, known as Evans Laboratory, was "live" to the world via BACnet/IP in early September of 2000. Since then, BACnet has become the adopted control's standard for the university. The original project included three main BACnet panels, manufactured by Delta Controls, with only 128 total inputs and outputs. Today, there are approximately 150,000 physical points throughout 65 facilities. It sounds simple enough, but this is not a "conventional" collection of I/O. The OSU BACnet network is currently comprised of 19 different vendors with connectivity to multiple system types. For OSU, BACnet has become the catalyst for advancing controls beyond the traditional front. For instance, the university currently uses BACnet to monitor and/or control non HVAC/Lighting systems such as generator banks, laboratory rooms, critical patient rooms, fire alarms, air quality, power consumption, clock systems and so forth.

While still in its infancy stages, it remains apparent that the inclusion of these systems will become more prevalent. Perhaps the most interesting aspect is that OSU's use of BACnet appears to be proportional to the evolution of the ANSI/ASHRAE standard itself. The Ohio State University employs the BACnet protocol to its fullest extent and benefits greatly from the standardization of systems. Moreover, the university continues to profit from the bidding process as several contractors/manufacturers are readily available with BACnet product. At this point, only BACnet Testing Labs (BTL) listed gear is being considered for future installations. Most recently, there seems to be greater focus on integration expertise – both internally and externally. For OSU, the service offering or system integration experience is equally important. Kelly Bloomfield, the OSU Director of Building Automation, states "The product reveals the inherent capacity to interoperate while the service/support reveals the integral capacity to utilize the product comprehensively. "Moving forward, OSU plans to implement a continuous improvement program centered on internal training and contractor validation". Once complete, BACnet for OSU will evolve to yet another level – promising even greater flexibility than previously imagined.

Retrofitting older buildings to BACnet is an ongoing process at OSU. Today, many of the smaller projects are handled internally with OSU's Building Automation Division. Not only have they adopted BACnet, they are purchasing the gear from BCI and then designing, installing, programming and commissioning projects themselves. For larger projects, they are bid in strict adherence to OSU's Standard Controls Specification which includes "A fully integrated and fully programmable BACnet building automation system (BAS)." In addition, to ensure they have the control and flexibility on their front end, OSU's standard specifically states that all new controls "provide a seamless interconnection to the existing Delta Controls central graphic workstation, and build Delta Controls standard and customized graphics displays in accordance with the existing formats."

BCI recently was awarded the Chemical Bio Molecular Engineering and Chemistry Building (CBEC) and work will be fully underway in 2013. CBEC is a 225,000 square foot facility that will create laboratory space with the proper floor-to-floor height, structural dimensions, and environmental stability to support intensive research. The building also will adopt the sustainable design practices by Labs 21 in addition to a LEED Silver minimum. Integration of lab controls (Phoenix Controls) is a key component of this project.

Also underway at OSU is the installation of enteliWEB, Delta Controls Enterprise Energy Management Software. The benefits of this native BACnet application combine the power of enterprise dashboards with easy-to-use facility management tools. Customizable Energy Management dashboards and powerful energy reports give OSU the tools to reduce consumption and lower costs. A task-driven alarm management and system dashboard allows OSU to quickly visualize and prioritize their work, keeping the campus running comfortably and efficiently.

Number of Buildings	65
Special Features	One of the Largest BACnet projects in the region with 19 different manufacturers integrated into one single web based graphical user interface.
Products Installed:	The BACnet products include devices from several manufacturers, namely: ABB, Air Cuity, Amann, Automated Logic, Carrier, Critical Room Control, Delta Controls, Field Server, Johnson Controls, Liebert, Lithonia, McQuay, Phoenix, Reliable, Siemens, Sierra Monitor, Trane, Tridium, and York.
Equipment Installed	The integrated equipment includes: HVAC systems, Fire Alarm Systems, Electric Distribution Systems, VFDs, Lighting Systems, Laboratory Systems, Generator / Emergency Power Systems, UPS Systems, Data CRAC Systems, Smoke Evacuation Systems, Isolation Room Monitoring Systems, Air Quality Systems, Gas Detection Systems and Proprietary Control Systems.
Systems Integrated	Boiler, Chiller, CO2 Monitoring, Fume Hood, Geothermal, Heatpump, HVAC, Laboratory, Lighting, Power Monitoring, Smoke, VAV, Water Monitoring
Number of Devices	5,000
System Points	150,000
System Integrator	Building Control Integrators, BCI
Mechanical Contractor	Various Mechanical Contractors
Controls Contractor	Various, Primarily BCI and Siemens
BACnet Manufacturers	Delta Controls, Siemens, Phoenix Controls