CASE STUDY: LIMBACH

Ohio University

A multi-disciplined project team and the right technology creates customer success

About the Project

Customer Location

Ohio University is a U.S. public research university located on a 1,850-acre (7.5 km2) campus in Athens, OH. The university has more than 20,000 students on the Athens campus. The legacy Metasys® integration focused on three buildings that contained legacy JCI Metasys® BAS installations that were part of a larger project to improve operational efficiencies on the campus.

The Ping Center is one of the largest recreational facilities in the country. Covering 168,000 square feet on three floors, Ping houses a 36 foot, double-sided climbing wall, five basketball/volleyball courts, two multipurpose gymnasiums, an elevated four-lane indoor running track, eight racquetball courts and an enclosed glass fitness area. Ping Center also provides free weights, aerobics, fitness, combative sports, dance, and meeting rooms. The facility is open to university students, faculty/staff, and alums.

Baker University Center is a vibrant hub, welcoming and serving all members of our community--from university students, faculty, and staff, to parents, alumni, community members, and other campus visitors. The new Baker University Center is 183,000 square feet of space on five floors, plus a two-story parking garage (the bottom floor is underground.) The facility has more than 80 offices, along with numerous meeting rooms and lounges. The Center offers state-of-the-art conference and event spaces, extensive support for students and their leadership development, exciting dining options. It is home to art galleries, student organization offices, centers that support our diverse campus, services, amenities, and university departments.

The Life Science Research Facility is used by the departments of Biological Sciences and Biomedical Sciences. The building houses faculty and graduate student offices, as well as research labs.

Customer Needs

The entire campus of Ohio University has been working towards the upgrade of the building automation equipment to provide a single seat interface and energy efficiency improvements. Roughly 60 buildings were included in this phase of the project. These buildings include BAS technologies from Siemens, JCI NAE, Andover, Tridium, Honeywell, ALC, and of course legacy JCI Metasys® N2.

Customer Requirements

The primary requirement for these buildings was to assure they could continue to be maintained using the existing Metasys® configuration and commissioning utilities, while at the same adding the ability to view them from within the campus-wide, single seat interface, and achieving a goal of improved energy efficiency. The building operator made it clear that the ability to use HVAC Pro passthrough was an absolute must.

The S4 Open: BAnet-N2 Router was implemented in the three buildings containing legacy Metasys® installations to meet the immediate goals of the project and provide a long term migration path to current technology field equipment. These three building are the focus of this case study.

There were 300 Metasys® N2 VMAs in these buildings that needed to be integrated into the campus-wide BAS network.

Project Goals

One of the goals of the integration was to maintain all of the features that they had before. A big one was overrides – could they override every damper/valve/fan for troubleshooting purposes?

Another consideration was downtime – the team wanted to avoid any outages or downtime for the customer. They debated whether or not this work had to be performed during off-hours because they did not want to impact normal business activities.

Another requirement was the ability to use information from all of the VMA controllers in the sequence of operations. Can all VAV's be commanded to maximum flow during a smoke purge mode?

The customer wanted to make sure that they could use feedback from all of the VAV controllers to use in static pressure and discharge air temperature reset schedules to reduce energy consumption with the air handling units.

Solution

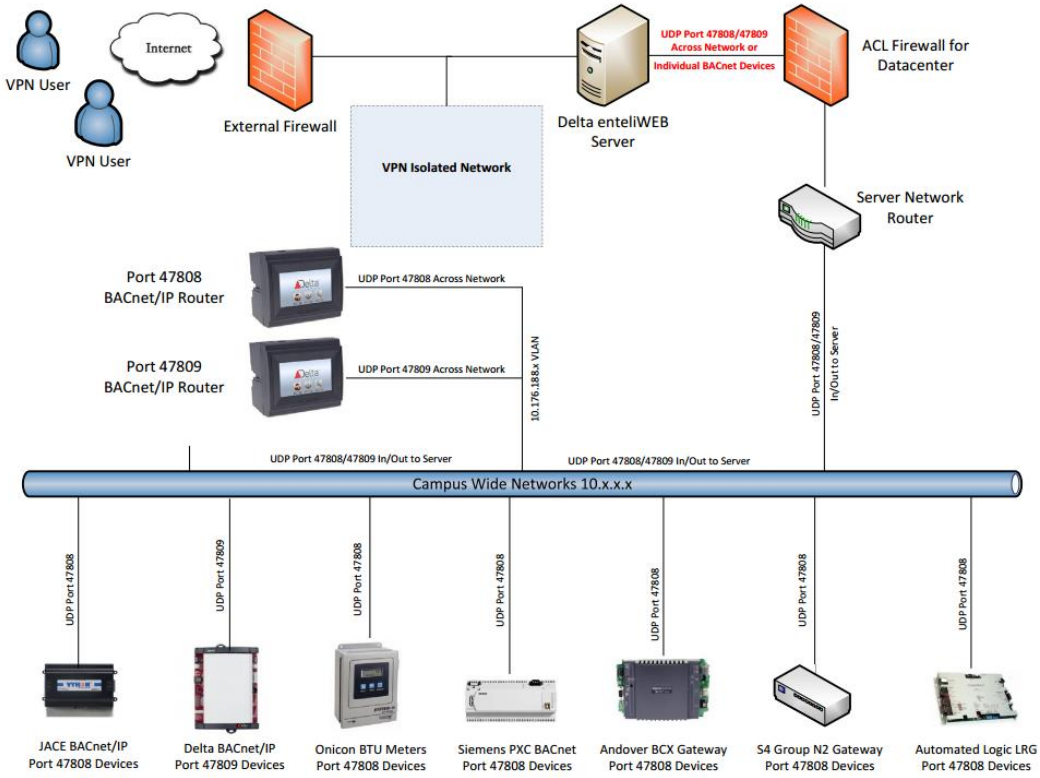
Several technical approaches were considered for these three buildings: replacing the NCMs with an NAE, using the 3rd party N2 driver for the JACE, using a FieldServer device. None of these technologies met all the requirements of the university. The selected solution was to replace the existing Johnson Controls NCM350 controllers with Vykon JACEs for the user interface and global control functions. This required rebuilding the GPL logic, scheduling, global variables, etc. inside the Vykon JACE to provide global/supervisory control functions. All control logic was removed from the NCM supervisory controllers.

A Vykon JACE was installed in each building to assist in building the Niagara network. Once integrated, the system would be monitored and controlled from a single seat interface. After hours service could identify the issues as they arise and notify proper facilities personnel. There are several options for achieving this; however, only one product could do this and meet the expectations of all those involved.

An S4 Open: BACnet-N2 Router was paired with each legacy Metasys® supervisory controller. *The N2 Router provided the integration services between the legacy Metasys® N2 technology and the Vykon JACE via BACnet/IP. Each legacy N2 device is emulated as a virtual BACnet device under a virtual BACnet network.* As such, the Niagara network to implement the single seat and energy improvement applications. In addition, the N2 Router Upstream N2 Interface option enabled the co-existence of the legacy supervisory controllers and Metasys® operator workstation with the Vykon JACEs thereby keeping the critical HVAC pro passthrough support operational for *programming, troubleshooting, and commissioning the existing Johnson Controls N2 field devices*.

The overall campus design required that every controller going forward communicate BACnet to the rest of the network. There were many legacy products that required a JACE for the BACnet translation and to store 3rd party trends and alarms from a single managing contractor.

The following diagram demonstrates the Ohio University campus-wide solution.



This project was handled by two integration companies. Limbach provided the site preparation work and the purchase and installation of the S4 Open: BACnet-N2 Routers. As part of the integration process, they developed custom device templates for the BACnet-N2 Router from Metasys® HVAC PRO configuration files, and then they used the configuration wizard in the S4 Open Management Console to finalize integration into the legacy Metasys® systems. Next they performed *the discovery of the virtualized N2 devices as BACnet devices in the Vykon JACE* and migrated GPL processes from NCM into the JACE. *The final step was confirmation of end-to-end data integrity.*

After the groundwork was laid by Limbach, Building Controls Integrators (BCI) was responsible for point alarms Annunciation and graphics for the enterprise system.

Bryan Upperman of Building Control Integrators stated, **"**The interface seems very easy to work with and I really like how the S4 Open Product creates virtual BACnet devices for every N2 device. BCI has

leveraged the knowledge gained on this project and is now using the S4 Open: BACnet-N2 Router on additional projects."

Outcomes

The customer was very impressed with the minimal downtimes experienced during the project and the goals will be measured over the next several years.

The project was completed with minimal impact on normal facility operations. The installation of the N2 Routers and execution of its Configure Wizard was accomplished in a few hours; at that point the N2 Router was completely transparent to the legacy Metasys head end and it was operations as normal for the building operators and occupants while the rest of the integration process continued.

Full N2 read, write, override, and release capability was delivered for all points on all N2 devices supporting these capabilities.

All sequence of operations goals for the project were met.

Full N2 device configuration, programming, and commissioning functions were retained using the legacy Metasys® head end system and its Passthrough capability. The Upstream N2 interface of the N2 Router facilitated keeping this functionality in place by co-existing with the new Vykon head end.

About Limbach

Across the US, Limbach provides comprehensive facility services consisting of mechanical construction, full HVAC service and maintenance, energy audits and retrofits, engineering and design build services, constructability evaluation, equipment and materials selection, offsite/prefab construction, and the complete range of sustainable building solutions and practices. Limbach's projects are characterized by a true team effort between the customer, GC, architect, and other subcontractors, to reach cost effective and value driven success.

For more information about Limbach, visit their web site at www.limbachinc.com or contact **Randy Rausch,** Senior Controls Account Manager Ph. 614-607-8067 or randy.rausch@limbachinc.com

About BCI

In many ways this project started the beginning of our relationship at Ohio University. BCI has grown the relationship as a result of this project.

BCI is the authorized Delta Controls partner for Ohio and Michigan. Their experience in mechanical systems allows them to determine the proper application for each control's package. BCI's commitment to excellence is proven as they continue to offer customers 'peace of mind'.

Our mission is to make people first by cultivating relationships that transcend business norms. Our greatest assets, employees and customers, deserve nothing less. For further information about BCI please contact Bryan Upperman, Software/Network Engineer 614-334-3300 or bupperman@bcicontrols.com

About The S4 Group, Inc.

The S4 Group, Inc. is an innovator in software and network appliance development. Products include the S4 Open family of network appliances that unlock legacy BAS to open protocols such as BACnet and OPC.

For additional information, please visit our website at www.thes4group.com or contact Steve Jones, steve@thes4group.com.