K-12 School District Demands Open Playing Field for Energy Control Vendors

The sub-tropical climate of the Gulf Coast is challenging for any facility manager working toward daytime indoor comfort for teachers, students and administrators. The Niagara Framework® provides critical data and alarming to help the schools in Collier County, Florida, manage energy usage, optimize efficiency and reduce costs.

Collier County Government has 805 buildings, and a large percentage of these are on its 58 school properties. For cooling and dehumidification, the school district relies on DX systems (direct expansion using refrigerant) as well as chilled water systems and ice farms. All this cooling costs in energy, so school districts like Colliers are frequently clients of energy services companies (ESCOs). ESCOs tend to come in and add air-flow and water-flow networks, sub-metering, sensors and control layers in the interest of energy conservation and measuring energy savings. To oversee all this equipment and networking, the facilities team utilizes a mix of building management systems (BMS) and field control devices from a range of manufacturers.

THE CHALLENGE

A government portfolio of building assets like this comes with a legacy of proprietary protocols. To be specific, one chiller serving one individual school campus may have a BACnet IP connection which communicates key data like energy usage with the school district's central Wide-Area Network. But, this doesn't mean that this energy usage and performance data can be easily merged and analyzed in context with the other systems serving that one school or in context with all the other schools in the district. This is because the control systems that get data from the chiller and the native controller inside the chiller are most likely proprietary to their manufacturer.

Collier County and its Master Systems Integrator, Electronic Systems Services, Inc. (ESSI), assessed the situation and recognized that there was need to breakdown the data silos and provide an 'open avenue' wherein Collier County's many vendors could compete on a level playing field technologically and when it comes to giving the county the best value. They asked "How do we seamlessly connect to these systems, create a common graphical user interface, train our team on how to manage these systems and get control over Collier County Schools' energy usage.

THE SOLUTION

In 2015, ESSI deployed Tridium's Niagara Framework on JACE 8000 hardware across Collier County schools, relying on a mix of BACnet IP and MSTP connectivity options. In that first phase of the Niagara 4 deployment, ESSI's network design called for a total of six JACE controllers

> *"When you are working with public schools, budget is always a driving factor. With Niagara-based controls, the cost efficiencies can be counted in many ways — one of them is the productivity of busy facilities staffs and buildings engineers. Now we have a single-tool interface for all the controls points across 58 schools and the customer saves on training too."*
>
> John Potpolak
> Application Engineer

FAST FACTS

Building Type: K-12 School District

MSI: Electronic Systems Services, Inc.

Client: Collier County Government

Project Type: Centralized energy management

Project Scope: 58 school buildings, +63,000 control points under Niagara management serving HVAC, lighting, and other control applications

Key Technologies:

Niagara Framework for data integration, custom UI development, tagging and analytics support; JACE 8000 Controllers under brands including VYKON, Alerton, Honeywell, Lynxspring and others; Niagara Edge 10 Controllers, Lynxspring JENEsys Edge Controllers
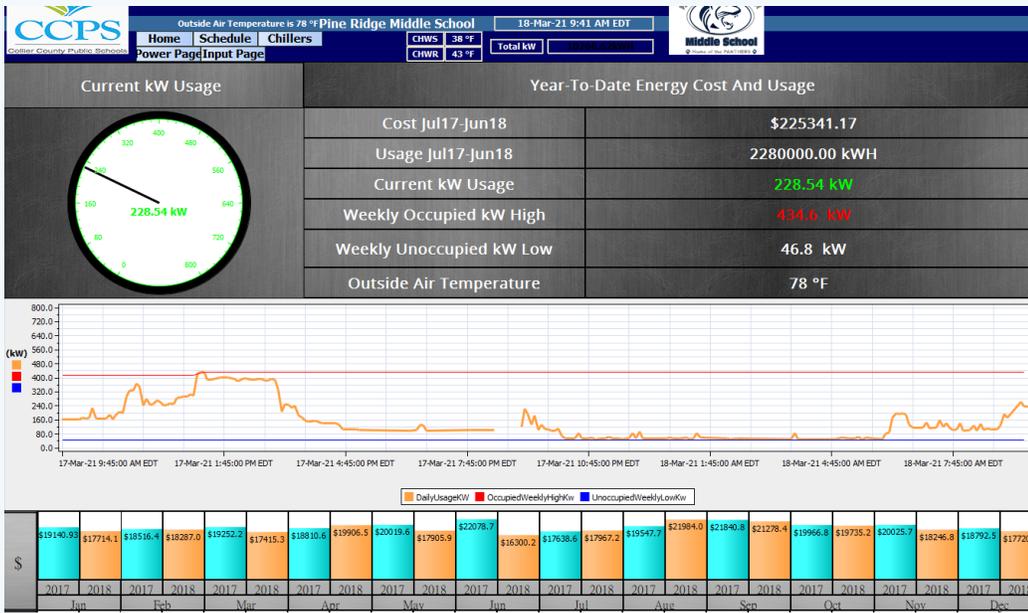
Collier staff uses sub-meter data and a numeric history analysis to track weekly kW usage. The weekly-low data point can reveal equipment running over night, and the weekly-high data reveals the time of day Collier uses the most energy. Each of these values on the dashboard also has a pop up trend showing past history for each value. The graph also shows the trends. The Collier County energy dashboard also provides a window into Collier's monthly utility bill.

connecting over 63,000 points. The Jace 8000s are used as controllers for mechanical systems, air-handling units, lighting, and other building services. The Niagara/JACE software/hardware combination is sold and supported by many manufacturers in a healthy, competitive ecosystem.

Not every elementary and middle school has a BMS. Rather, small school buildings are served by small chiller plants with multi-zone air handling units. In 2018, the need for controls upgrades at some such Colliers campuses coincided with the introduction of the Niagara Edge® 10. ESSI recognized that edge controllers were a good fit in terms of the points of control needed and those available. A classroom could be controlled with 5 inputs/5 outputs, and with the Edge 10 expansion module, the Niagara network design could go bigger should the need arise. Using this edge control strategy kept first-costs lower for the school district. ESSI's drive to get the best price/performance possible for the school district, per I/O point and application, didn't stop at the Niagara Edge10. When Tridium manufacturing partner Lynxspring ported the Niagara operating system to a small VAV controller, these programmable devices were deployed as well. This approach is proving useful in myriad control applications, and the school district's facilities team is benefitting from a single-tool interface , which makes managing the whole network easier and saves on training too.

THE RESULTS

By deploying Niagara Framework as the standard operating system for controls across school campuses, Collier County Government has achieved fast, reliable performance of building equipment; advanced capacity to deploy analytics; easy intuitive user experience via standard HTML5 interfaces; up-to-date cyber defense; and a competitive bid process.

ABOUT TRIDIUM

For over 20 years, Tridium has led the world in open-protocol application frameworks for operational data. Our products allow diverse monitoring, control and automation systems to communicate and collaborate in buildings, data centers, manufacturing systems, smart cities and more. We create smarter, safer and more efficient enterprises and communities — bringing intelligence and connectivity to the network edge and back.

ABOUT ESSI

Since 1986 Electronic System Services, Inc. has been providing the South West Florida commercial building market with Building Automation and Controls, Energy Services, CCTV Security Systems and Lighting Control Solutions. ESSI solutions and services help building owners and managers improve efficiency and reduce operational costs while improving comfort.

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