case study

70's-Era Big-City Plaza Transforms from Inside Out With N4 Upgrade

Owners and operators of large metropolitan buildings have many reasons to keep their building automation and controls infrastructure up to date. When you are managing a portfolio with assets that are typically 50 to 100 years old, deploying the latest tech is one thing you can do to modernize. Buildings in the Midwest USA, for example, are estimated to be responsible for nearly two-thirds of a city's greenhouse gas emissions, and building owners there have been aggressive in their use of technology to cut carbon use, ease demands on the local power grid and save money. Now, in the 2020s, Big-metro property owners are pioneering solutions to additional challenges like:

- Encouraging occupants to return to the city and to offices after the Covid-19 pandemic.
- 'Electrifying' buildings — getting them zero-carbon and electric-car ready by incorporating more battery storage and renewable energy infrastructure.

Building controls and data strategy are core to the success of all this, which has led to strong, trust-based relationships between large building owners and those MEP (Mechanical/Electrical/Plumbing) contractors that have risen to the call to expand their practices into OT networking, open protocol building automation and digitalization. Conti Corporation is one such multi-trade firm who is working to deliver on on-going contracts for IT/OT services to large-building owners in the Midwest.

CHALLENGE

Mitchell Reed, a Division Manager with Conti, had this to say about a retrofit project involving a skyscraper property and adjoining buildings in a downtown plaza: "The customer asked us to standardize their Building Management System (BMS) deployment across their campus portfolio, allowing the operators to have a single pane of consistent glass to operate the facilities. The overarching challenge for this project was the sheer size of the integration. We needed to accommodate data from all the equipment and devices serving more than 50 floors of diverse space utilization — including open office space, restaurants, and plant & operations."

This Conti project involved integration to Siemens, Honeywell, Distech, Trane, Circon and Johnson Controls brands, along with a migration from legacy Niagara AX to N4 JACE controllers. Conti also replaced out-of-date proprietary-protocol controllers with open-protocol JACE. In addition to all this integration work, the Conti team needed to develop a graphical user interface to serve as central console into the network.

Conti

"50+ floors, 60,000+ points, 6 different protocols, and a multitude of control lines. We need to put this jigsaw together in a way that is unified and useful to building operators. Harnessing the Niagara Framework® has allowed us to simplify the complexities of building automation."

Mitchell Reed
Division Manager
Conti Corporation

FAST FACTS

Project Type: Controls Retrofit of Class-A Office Complex

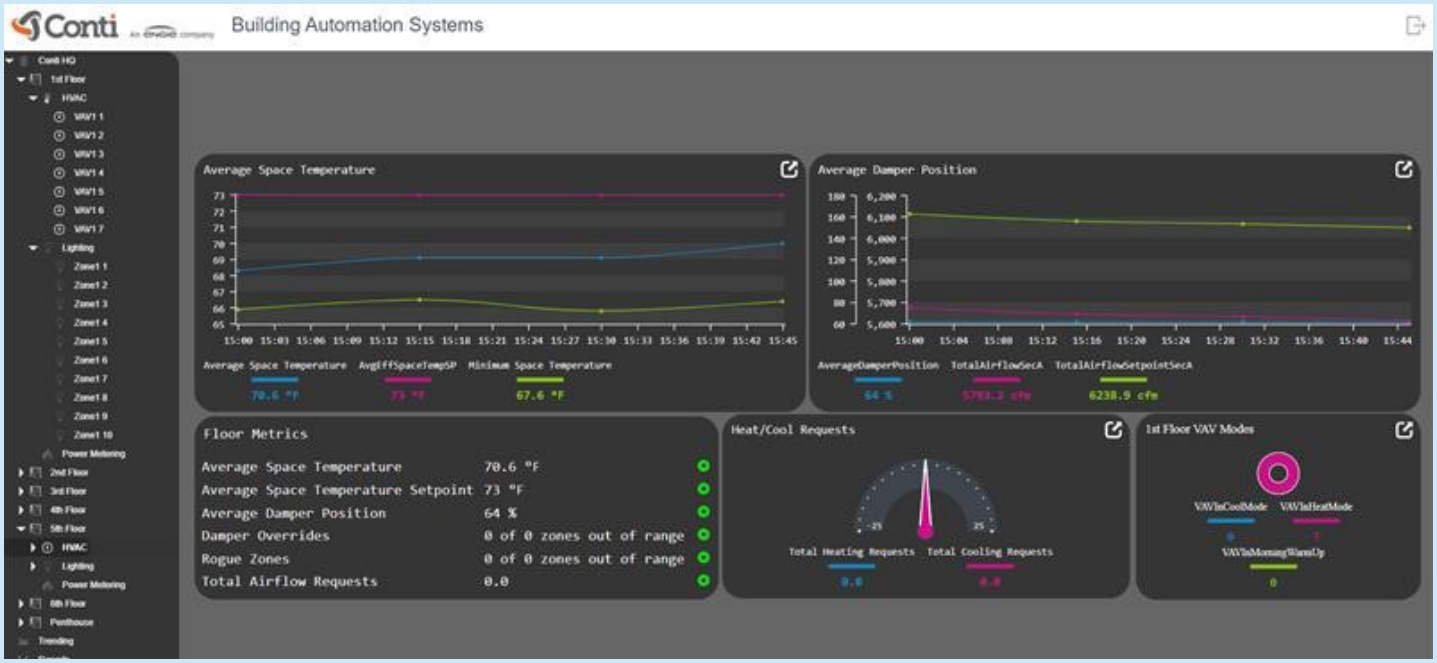
Property: Three buildings in a city plaza, the tallest having 25 floors and total structural height of 114.0 m (374 ft).

Project Area: 3,000,000+ square feet

Project Scope: Services under Niagara management include HVAC, Energy Metering, Steam Monitoring, Gas Detection and Envelope Pressurization.

Key Technologies: Niagara Framework for data integration and normalization across 6 protocols, 28 JACE 8000 controllers

Number of Control Points: 60,000



Floor-level metrics allow a secondary evaluation of floor-level conditions, easily identifying any deficiencies in floor-level units or the upstream units serving the floor. From one graphical page, the end user can determine mode, operation and operator overrides that could negatively influence the space.

"Integrating so much existing equipment inevitably leads to the discovery of mechanical issues present in such a large system," Reed continues, "Half the battle of improving existing systems is in finding and replacing the equipment that has likely not worked properly for a long time. We assist our customers in addressing these issues and we get their buildings back to a stable state. Doing this work requires the continuous building of relationships with customer stakeholders, other contractors and equipment vendors—all while helping our customers reach their goals from an operational perspective."

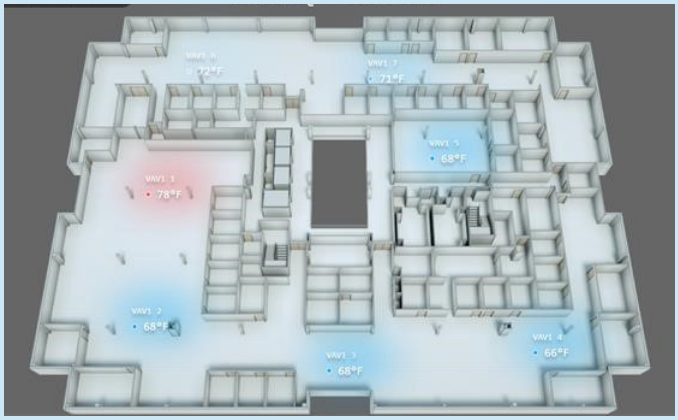
SOLUTION

Both the Conti team and the customer recognized that one of the first issues that needed addressing was moving to a supported N4 version of Niagara Framework® software and off of legacy hardware. Reed challenged his Lead Programmer, Jonathan Bowes, to find a way to complete an AX-to-N4 JACE 8000 migration in under one hour. Bowes not only met that challenge but exceeded it, bringing the time needed to replace a legacy JACE down to less than 20 minutes. Conti has successfully migrated 28 JACEs in seven buildings for this customer. From the owner's perspective, the value of this innovation can be measured both in the energy costs saved by completing the retrofit sooner and less downtime and potential for occupant inconvenience.

RESULTS

Completion of this controls retrofit and upgrade to N4 across the portfolio sets this customer up for a regular cadence of software updating going forward, so that these properties always have the advantage of Niagara's newest features and cyber-defenses. Another outcome of the project is that databases originating from more than eight different temperature controls contractors have been standardized—meaning common naming conventions and metadata tagging.

Conti set forth a standardized system that all contractors adhere to. Mitchell Reed explains it this way: "We wanted to support a data presentation layer that flows like other modern-day applications, providing data with understandable names and not acronyms. When an operator navigates the buildings through our GUI, we aim to provide a simple top-down approach, where campus buildings and equipment are rendered consistently.



The GUI offers easily interpretable information starting at the 3000-foot view. For example, from this heat-map view, the end user is able to quickly determine any problem units via a visual temperature indication.

Example of a Conti-developed home screen for a large building. The graphical user interface (GUI) needs to provide for easy navigation from the portfolio-level, to floor-level, down to pieces of equipment and even VAVs. Visualizations are designed for easy, unambiguous interpretation to facilitate quick reaction and resolution of alarms.

Whether the downstream device is a Siemens, Honeywell, Distech, Trane, Circon or Johnson Controls brand, the look, feel and operation of the Building Management System is unified and consistent."

Conti could count on standardized data interoperability because all these brands support Niagara. And it had great flexibility to customize the user interface down to equipment-level details. Conti needed both to deliver on this particular customer's project goals. One additional bankable advantage to Conti's open-protocol and standardized data management approach: for future maintenance work, this customer will be well positioned to have jobs competitively bid by multiple temperature controls contractors. The pool of Niagara-certified technicians is so much bigger than that of any individual brand. It has been simply good business all around for anyone that wants to thrive in this era of IT/OT convergence to add Niagara to their skillset.

ABOUT CONTI CORPORATION

Conti is a nationally respected multi-trade contractor with an impressive history of quality and service. Since 1969, Conti has led the industry in the development of design and construction solutions that address job requirements while surpassing performance expectations. Today, Conti performs the complete lifecycle of construction services from design/build to field installation, training and maintenance for an array of services. To learn more, visit: www.conticorporation.com.

ABOUT TRIDIUM

For over 20 years, Tridium has led the world in business application frameworks — advancing truly open environments that harness the power of the Internet of Things. 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. Additional information about Tridium is available at www.tridium.com

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