



case study

Mini-Map Makes Big Statement about Niagara for Data Centers

Growth in the cloud-computing infrastructure business is massive, but competition is also fierce. Anything that makes it possible for data center engineers and maintenance technicians to get the job done faster, with less specialized training, and with less chance of error — that's a competitive advantage! The goal is to operate the most energy-efficient, thermally optimized and automated facilities possible. Live data integrated by Niagara Framework® and streamed into a floorplan navigation system can help operators get there. Such an immersive digital-twin experience requires seamlessly integrating edge computing, building management systems (BMS), and cloud-hosted storage and application resources. When a worldwide leader in cloud services sought to unify its operations across multiple data centers in India with such technology, it engaged Niagara partner KED Technology for an advanced integration project.

CHALLENGE

The floor plan of a data center is the operators' window into not only where all the physical assets are placed, but also how server configurations are currently balancing density and capacity. The denser the server system, the more power and cooling required. It's typical for a room to have both high and low-density rack layouts—and these are always changing as new servers with more advanced chip technology are introduced. Renderings of the HVAC systems that control temperature, humidity, air movement and air purity should be revealed on the live floorplan to aid in decision-making as racks are reconfigured. The need for visibility extends to wires and piping for specialized cooling systems that might be installed underfloor or overhead. Electrical and power infrastructure including submeters, generators, UPS batteries and backups are additional data sources. Maintenance technicians that can also see access control assets from their floorplan interface— from digital locks to door alarms and cameras — are further empowered to be more agile and flexible in their decision-making.

The scope of this KED project included normalizing the various protocols used by the array of global field-level controllers for these subsystems to a common standard for data exchange. Subsystems for server-room cooling, high-efficiency lighting, power, access control, fire safety, etc. did not talk to each other. As part of the phased integration, the KED team needed to network together systems and equipment that the customer wanted to orchestrate into a convergence layer and to develop the logical sequences for the head-end, or supervisor, to execute. Then it needed to develop a user interface (UI) that fit within the cognitively programmed (AI-assisted) consoles used for navigating other automation control systems in this cloud provider's data centers.

“Seamless integration of third-party hardware was achieved through Tridium Vykon JACE powered by Niagara 4. Data and UI standardization will enhance operations and reduce engineering efforts going forward.”

Roopesh Kotecha
Founder CEO
KED Technology

FAST FACTS

Authorized Niagara Reseller Partner:



Customer: Major Global Cloud Provider

Project Type: Advanced systems integration and UI development for data center infrastructure management (DCIM)

Project Scope: HVAC including specialized CRAC units; Power including generators and UPS; Access Control; Fire Safety

Key Technologies:

- Niagara Framework for data integration and normalization.
- JACE controller for edge control
- Niagara's [Tag-based Px Graphics](#) for responsive-design UI
- Secure transport of reports, charts and alarms from Niagara station via email



Real-time data served in context of an interactive floorplan user interface can help data center operators make better, faster decisions and be more productive. The Niagara-powered mini-map UI developed by KED Technology fits into the customer's larger "cognitive programming" strategy. Cognitive computing is focused on training machine algorithms to simulate the human thought process, enabling people and machines to work together integratively. Like other branches of AI, cognitive programming requires that compute models ingest vast amounts of structured data. Some of the parameters an operator would want to see at a glance through such an interface are energy usage, temperatures, air flow, humidity, air quality and power levels — the type of building operational data typically aggregated, normalized and contextualized in Niagara Framework.

Setting a clear and ambitious goal for first phase of the integration project, KED wanted the near real-time operational data served by Niagara Framework to successfully populate a mini-map in the customized user interface. A term borrowed from video games, a mini-map displays a top, bird's-eye view of a whole environment in a separate, smaller pane of the UI. A minimap of the whole floorplan viewed concurrently with a close-up view of some server rack or piece of infrastructure equipment can ease navigation and help the operator understand context when doing a repair or replace operation. Generally, the UI design team wanted a mini-map feature that would deliver uniformity in visualizations and would provide a significant operational enhancement for this customer, setting it up for the next, upcoming AI-enhanced phases of data center automation.

SOLUTION

Initially, KED Technology verified data interoperability details with the manufacturers of the various global controllers already installed at this customer's India-based data centers. It thoroughly examined the best way possible to integrate multiple systems from the southbound control layer to the northbound head-end

software. It found no installed global controller capable of normalizing data and delivering it to the local head-end software and to the customer's cloud-based central monitoring system. Tridium Vykon JACE powered by Niagara Framework® was the one solution that would enable all the data to be monitored and controlled at the same level. With its vast features and compatibility, Niagara was the most suitable solution to normalize data and to easily integrate different protocols.

As part of the deployment, the integrated data was normalized, validated, and tagged per the client's standard ontology and labeling scheme. Beyond the essential tags for control point ID, equipment type, and site name, the project team added meta data labels for font size, color, and graphics to enable the mini-map. Cognitive programming on the graphics is configured at each JACE controller for floor-plan navigation. Alarm and history data is maintained onboard the JACE, which ensures that it is not lost in the event of an outage at the supervisor level. As a part of the requirement, KED engineers also configured the LDAP features to meet cyber-security requirements, and they configured e-mail delivery of reports and alarms.

RESULTS

The Mini-Map serving Niagara data is a major feature developed to help this data center's operators navigate its constantly changing floor plans with greater ease. The groundwork has been laid for more AI-assistance in the future through cognitive programming. Niagara Framework responsive, mobile-friendly Px graphics enable the UI to fit within various screen sizes. The JACE platform running Niagara has the capacity to support graphics creation and visualization at the edge level, which improves response time and cuts down on traffic to the cloud. Important alerts and alarms delivered via secure, authenticated e-mail methods has helped to ensure they don't go unnoticed by the operators.

At end of the project, the customer decided to standardize on the Niagara-based control network and min-map UI by Including this work into the controls retrofit section of its specification. The cloud hosting multinational did this to encourage faster deployment at the rest of its data centers in the South Asia region. The data center renovation and automation team recognized the Tridium-Niagara open-protocol approach to data management as an effective way to maintain ownership and ease-of-business-use over its operational data.

ABOUT KED TECHNOLOGY

KED Technology is an end-to-end solution provider for IoT and digital transformation initiatives within the operational technology domain.. It provides a full array of basic and detailed design, engineering and controls implementation solutions within diverse industry domains. It has offices in the Middle East/North Africa regions, as well as throughout the Asia Pacific region. Learn more at www.ked-technology.com.

ABOUT TRIDIUM

For over 25 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