Case Study: Qualcomm Data Center

Qualcomm is a worldwide provider of 3G wireless technology and services, with operations and customers around the globe. Fourteen divisions within the company address everything about mobile technology from engineering and deployment to funding venture startups.

Qualcomm's data center is located in a corporate park in North Carolina's Triangle, the metropolitan area anchored by Raleigh, Durham and Chapel Hill. Once the company took ownership of the five-story building it formerly leased, it wanted to take its building systems off the corporate park's master network and onto its own network. It chose Automated Facility Solutions, Trend's North Carolina technology center, to install a Trend IQ system that incorporated all the building systems into a single building management system (BMS) that monitored everything.

The biggest challenge facing Automated Facility Solutions was to integrate all the data center systems and equipment into a single, cohesive control and monitoring system. Qualcomm's fire protection system, chiller plant, power distribution, and in-rack cooling system would all be incorporated into the heating, ventilating and air-conditioning (HVAC) system and centrally controlled. Any mission-critical input monitored by the company's emergency monitoring system in the server room, telephone closets and two laboratories would also be tied into the Trend BMS.

One of the status uninterruptible power supply (UPS) units; Trend's 963 Supervisor front end centralizes control of all the different building systems and devices.

The Qualcomm data center in Raleigh houses a new Trend building management system that integrated multiple systems and now monitors more than a thousand control points.

"We were renting space and now we own this building," said Vern Rodenberg, Qualcomm's facilities engineer. "We were interested in achieving a much higher level of integration for this data center."

There is a great deal of redundancy built into the Qualcomm data center to ensure continuous operation in case the facility loses power. With the generator, multiple uninterruptible power supply (UPS) units, and power distribution and management modules—in addition to the HVAC, chiller plant and fire suppression systems—there would be more than 1,000 control points to monitor.

Every data center is a mission critical facility, so Qualcomm could not accept a single moment of downtime. The transition from the corporate park's network to its own, therefore, would have to be fast and seamless.

Automated Facility Solutions installed a Trend HVAC system that not only migrated easily from the previous network to Qualcomm's own network, but also integrated several other building systems and thousands of control points. The system includes IQ3xcite, XNC and IQL-VAV controllers, air handling units (AHUs), fan-coil units (FCUs), expansion modules and variable frequency drives (VFDs). The data center also houses a 300-ton Airstack chiller, 26 Active Power in-rack coolers, seven Liebert air conditioning units, four American Power Corp. (APC)

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A graphic of the Airstack chiller gives Qualcomm technicians comprehensive at-a-glance information about both the equipment and the environment .

management and distribution modules, a MGE static UPS, a Caterpillar rotary UPS, a 1.5 MW Caterpillar generator, a Halon system, and a fire protection system that includes sprinklers, a pump house and a diesel-driven booster pump. Trend's 963 Supervisor software monitors and controls every integrated system and device.

Automated Facility Solutions disconnected Qualcomm's system from the campus network and reconnected it into the company's own network. An additional server computer makes the single system an entirely standalone operation. Eight IQ3xcite XNC controllers integrate the data center's numerous existing building systems—fire protection system, chiller plant, power distribution, and in-rack cooling system—into the HVAC system. The XNC facilitates communications between the multiple communication protocols used by the different systems, including Lon, IP and Modbus, making operation seamless.

With the myriad systems inside the data center integrated for central control, the facility's staff can easily monitor, control and alarm the thousands of critical points. Once complete, Automated Facility Solutions provided Qualcomm with graphics of the data center that offered at-a-glance views of the entire integrated system.

The Trend system interfaces with a notification and event analysis software package from American Power Corp (APC) called InfraStruXure® Manager. Data points report to the software, which triggers alarms monitored by the Trend system. For redundancy, both Trend 963 and InfraStruXure Manager send simultaneous alarms to the Automated Facility Solutions team and Qualcomm's mission critical team members, who could be anywhere on earth at any given time.

Qualcomm now enjoys centralized control of the multiple building systems and device inside its mission-critical data center. Most importantly, the Trend system effectively monitors all the different systems that generate redundancy, which is the most important contributor to keeping a data center up and running 24/7.

> *Just being able to achieve all this integration and take in the broad range of manufacturers has been a real highlight of this project. I can sit at a dedicated display and take it all in.*
>
> *Vern Rodenberg, Facilities Engineer Qualcomm*

The Trend BMS was able to integrate several systems and devices from a wide range of manufacturers and enabled communication between them all by facilitating the different communication protocols of each. The unified system also generates, sends out and monitors alarms from any one of those systems or devices for fast resolution.

"That's been a highlight for me, the comfort of knowing my experts are at hand," Rodenberg said. "When you've got that much support—that much muscle brought in—we're solving any problems right when they happen."

Project Scope

- 1 963/SNMP Server software workstation
- 2 IQ3xcite controllers for central plant
- 8 IQ3xcite-XNC controllers for data center integration
- 5 IQ3xact controllers for air handling units
- 155 IQL-VAV controllers
- 11 IQL16 unitary controllers for fan-coil units
- 8 IQ212 unitary controllers for fan-coil units
- 4 expansion modules
- 15 variable frequency drives

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