



ABOUT THE COMPANY

QTS Realty Trust, Inc. is a leading national provider of core data center products called the 3Cs—custom data center (C1), colocation (C2), and cloud and managed services (C3) supported by best-in-class technology, infrastructure and equipment. The 3C platform allows QTS customers to take advantage of blended and hybrid offerings that give them the flexibility to adjust services to meet current demands.

QTS' robust and redundant fiber-rich facilities are strategically located in or near critical data center markets in the United States.

Headquartered in Overland Park, Kansas, the company has more than 500 employees.

"QTS is committed to continued investment in our facilities in order to provide industry-leading infrastructure as exemplified by our recent cooling system upgrade. It ultimately enhances our ability to provide the efficiency, reliability, and flexibility that our customers have come to expect."

Ken Elkington, Western Region Vice President

Background

QTS has experienced significant growth over the past 10 years, going from a single data center in 2005 to a coast-to-coast portfolio of 12 data centers encompassing more than 4.7 million square feet. To ensure continued provision of leading-edge services and optimal performance from its newly acquired facility, QTS required improved cooling system efficiency and greater visibility into system performance. An upgrade of fans and controls, utilizing the latest in cooling technology, was warranted to maintain cooling stability, improve efficiency, and reduce costs.

Case Summary

Location: Sacramento, California

Services: The team from Vertiv™ Services installed electrically commutated (EC) fans and Liebert® iCOM™ control systems into 64 cooling units, and provided and installed wireless sensors for monitoring of cooling improvements.

Critical Need: QTS sought to achieve energy efficiency goals that would deliver enough cost savings to yield a full return on investment (ROI) in 2.5 years. The company also desired advanced monitoring capabilities for continued best-practice data center management.

Results:

- Earned a \$150,000 rebate by partnering with Sacramento Municipal Utility District
- Initially saved \$12,000 per month in energy costs and expect additional savings with continued system optimization
- Reduced carbon footprint with more than 75 percent immediate reduction in the energy consumption of Liebert thermal management units
- Improved Power Usage Effectiveness (PUE) by 0.16
- Provided better intelligence to building management system (BMS) for improved system visibility
- Improved uniformity of under floor static pressure enabling adjustment of air flow to match equipment loads by changing floor tiles
- Eliminated air leakage through thermal units that were previously off or in standby via the Liebert iCOM control's proprietary virtual damper
- Exceeded minimum ROI estimates by 40 percent and achieved targeted savings sooner than budgeted
- Maximized free cooling through improved unit airflow and cooling control

"The Vertiv™ Services team was very impressive. They completed the entire upgrade of an operating data center on time without any negative impact to QTS, or more importantly, our customers. They also provided updated electrical schematics on the modified thermal units that looked like the originals from the factory."

– **KEN ELKINGTON, WESTERN REGION VICE PRESIDENT**

Solutions

The need for improved system visibility that would allow QTS to provide its customers with more uniform cooling coupled with the desire for cost savings generated from improved energy efficiency led QTS to upgrade one of its facilities with the latest EC fan technology.

QTS was experiencing a very common energy efficiency challenge in its data center. The legacy thermal management systems were providing more airflow than was required in one area, while another had a deficit. Adding EC plug fans would enable QTS to adjust cooling based on load requirements.

QTS sought to partner with a company that could complete the turnkey project within a fixed five-week timeline with limited use of QTS resources and manpower. Another key challenge was that only a certain number of units could be off at any one time to maintain the level of redundancy required. This stipulation called for careful planning and coordination to ensure the project could be completed within the parameters specified.

QTS chose to partner with Vertiv Services to fully implement the cooling solution, stating that working with the original equipment manufacturer (OEM) would ensure high-quality parts and professional installation from factory-trained customer engineers that have proven experience working with the latest technology and configuring it properly for QTS' unique space.

Originally electing to only install EC plug fans, QTS realized it could better achieve its stability and visibility goals through the addition of Liebert® iCOM™ control systems, which enabled

under floor pressure control through BMS integration. This also gave QTS added flexibility through multiple configurations inherent to the controls that balance loading in the space. These configurations include control by wireless and remote temperature sensors; advanced supervisory control; or BMS control. QTS now has the option to coordinate fans, perform auto-tuning, and customize staging or sequencing whenever it is needed to further improve energy efficiency, availability and flexibility.

As installation began, Vertiv Services' project managers and customer engineers discovered the first obstacle. The team informed QTS that the location of some old chilled water piping beneath the floor would interfere with the planned fan installation. As the issue was being resolved, Vertiv Services continued installing equipment that was unaffected in order to meet the deadline. Additionally, the team was able to fix an existing problem from a previous EC fan retrofit and provided documentation that was needed by QTS personnel to perform future adjustments, modifications or repairs.

According to Western Region Vice President Ken Elkington, there is a tremendous advantage to having the OEM perform the work, and the flexibility of Vertiv Services far exceeded expectations.

Due to Vertiv Services' high-quality installation, implementation, and troubleshooting, QTS can now use state-of-the-art technology to provide its customers with a more stable and controlled cooling environment—one with improved energy efficiency that generates significant cost savings for the business.

"We took amp draw measurements on the existing fans. As soon as we placed the first new EC plug fan into a unit, even at 100% speed, the power consumption dropped 30%," Elkington said. "We were very excited to see that result, but then it got even better. By varying the fan speed to match the load in the zone, the power consumption dropped another 33%, and we are now experiencing higher than expected energy savings!"