Vigilent®
Optimizing Mission Critical Cooling®

CASE STUDY

DYNAMIC COOLING MANAGEMENT

vXchnge is a leading provider of carrier-neutral colocation services, dedicated to improving the business performance of its customers. As the first 100% ISO 27001 edge provider, vXchnge offers datacenter-as-a-service and has a proven track record of operational resiliency and redundancy. vXchnge favors innovative technology and adoption of engineering best practices to achieve efficient and sustainable operations. The company was recently named to the EPA's Green Power Partnership Top 30 Tech & Telecom Companies, which represent some of the largest green power users in the Green Power Partnership.

vXchnge chose to pilot a project to assess how state-of-the-art technology from Vigilent could improve cooling management in their NY02-Westchester datacenter. Vigilent's ability to automatically optimize thermal environments and enable real-time visibility for facility management were key reasons for vXchnge to initiate the project. The NY02-Westchester project was extremely successful at achieving thermal optimization and efficiency goals, which led to the decision to implement Vigilent in vXchnge's OR01-Portland datacenter as well. Results for the NY02-Westchester project are as follows:

Vigilent automatically reduced cooling energy consumption by 44%, from a baseline of 199kW to 112kW. In addition, the Vigilent system automatically delivered a CRAH △T increase of 4˚F, expanding cooling capacity in the room. Finally, the more stable environment enabled vXchnge to safely increase rack inlet temperature.

PROJECT DELIVERED MORE CONSISTENT ENVIRONMENT AND SIGNIFICANT ENERGY SAVINGS

Following the success of the Westchester pilot project, the Vigilent Dynamic Cooling Management system was deployed in vXchnge's 41,000 sq. foot Portland, Oregon datacenter. The facility was targeted as a prime candidate for the Vigilent system because it had multiple Computer Room Air Conditioner (CRACs) that did not have a cooling control and optimization system in place. The Vigilent system was installed in ten days, and within 24 hours of going live reduced cooling energy 23% from a baseline of 245 kW to 188 kW.

After installation of the system, composed of a wireless mesh network of sensors and controllers, Vigilent's machine learning software automatically created a real-time model of the facility's thermal environment by mapping airflow and determining the precise cooling influence of every unit, both individually and collectively, at every spot across the datacenter. The Vigilent system then took dynamic control of the cooling units – turning them on and off, and ramping fan speeds up and down – to meet pre-specified temperature SLAs in the most efficient manner possible, automatically delivering significant reductions in energy use and PUE.

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"Vigilent's dynamic cooling control and thermal optimization system accomplishes our thermal management goals and reduces the amount of time our operators spend on managing our environment, allowing them to focus more time and attention on the needs of our customers."
Ryan Hunter, Director of Facilities Support

Because Vigilent tracks baseline and post-installation energy use, it was easy for vXchnge to report the resulting energy reductions to the local utility and receive a sizable rebate for their optimization upgrades.

"The Vigilent retrofit successfully added intelligence along with dynamic control to the cooling infrastructure in our datacenter," said Ryan Hunter, Director of Facilities Support at vXchnge, who led the assessment and subsequent deployments. "Vigilent enabled cooling units to work together as a cohesive system, eliminating the inefficiencies that previously existed due to CRAC units operating independently as opposed to working as a team. Through the use of Vigilent technology, vXchnge has increased our ability to deliver on our guaranteed 100% uptime SLA for temperature control."

"The system also provides important information to the facility management team. We now have significant visibility into our thermal environment," Hunter added. "Vigilent's unique influence maps precisely identify where each cooling unit delivers cooling across the entire white floor, showing us where new IT capacity can be deployed, and advising where additional cooling is needed to provide sufficient capacity and redundancy."

Hunter called out the Coefficient of Performance (COP) data as being particularly useful for revealing cooling units that are under-performing. "We are able to easily determine when unit set-points are not optimized or in sync with one another. With Vigilent analytics, we can see when one unit is drawing more kW than similar units that are operating at the same cooling stage. That's our clue that we may need to adapt and adjust set-points across the site," said Hunter. "We can also spot thermal issues and their likely cause based on the differential temperature between top and bottom rack sensors, and the difference between sensors located in the same cold aisle containment environment. Vigilent helps identify those issues as they occur, which enables us to work together with our customers and correct any rack level installation deficiencies that have the potential to negatively impact their hardware and overall operation," he added.

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With a more stable and constantly monitored cooling environment, increased return air temperatures bring cooling unit capacity to design levels, enabling vXchnge customers to rapidly scale their high-density deployments without the need for time-consuming cooling system upgrades.

Lastly, Hunter explained that Vigilent's efficiency advantages extend beyond just energy savings. Operations staff no longer need to make manual adjustments to cooling in dynamic datacenter environments when new customers are deployed and existing customers start to ramp up their production and heat loads. "We've essentially eliminated the need for our operations staff to manually manage the thermal environment, freeing them up to focus on customer service. This allows our Facilities Engineering Staff to focus on customers, reliability, preventive maintenance, and capital projects as opposed to daily tuning and oversight of the thermal environment. Their specialized expertise is better utilized portfolio-wide since they can now rely on Vigilent to automatically maintain thermal reliability and highlight what may need further attention at an individual site. Do I sleep better knowing Vigilent is in control and handling the thermal environment? Absolutely," he said.

PORTFOLIO ROLLOUT

Based on the success of the NY02-Westchester and OR01-Portland projects, vXchnge recently completed a third Vigilent deployment in its TX01-Austin datacenter, which reduced cooling energy by 25% from 802 kW to 605 kW, and increased CRAH △T by 11°F – providing more cooling capacity. Additional deployments are planned in other regions.

"Vigilent achieved the goals our executive management was looking for," said Hunter. "Our energy goals for the two sites were exceeded which enabled the launch of the TX01-Austin Project. Vigilent helps us operate as sustainably and efficiently as we can while ensuring a 100% adherence to our Thermal SLA. Increased thermal stability, efficiency and sustainability are great benefits for our customers and for vXchnge as well."

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"Do I sleep better at night knowing Vigilent is in control and handling the thermal environment? Absolutely." Ryan Hunter

WESTCHESTER PROJECT RESULTS

	BASELINE	VIGILENT	IMPROVEMENT
CRAH Power	199 kW	112 kW	87 kW (44%)
Est. Annual Energy	1,743,240 kWh	978,880 kWh	765,360 kWh (44%)
CRAC △T Increase	9.4°F	13.3°F	3.9°F (41%)

KEY BENEFITS:

- Engineers now have more time to focus on customers
- Exceeded energy savings projections, achieving 23%, 44% and 25% reductions in three deployed facilities – savings that have persisted over time even as the environments have changed
- Achieved savings within hours of Vigilent deployment
- Added intelligent control to datacenters with cooling equipment of mixed brands and ages
- Enabled staff and expertise to be better leveraged across sites, providing competitive advantage by simultaneously reducing cost and increasing reliability

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