



FACILITY PRODUCT DEPLOYMENT
FACILITY INFRASTRUCTURE PRODUCTS THAT
SIGNIFICANTLY IMPROVE DATA CENTER ENERGY AND/
OR RESOURCE EFFICIENCY IN AN END-USER FACILITY

COOLING VIRTUALIZATION DELIVERS IMPROVED UPTIME AND DRAMATIC ENERGY SAVINGS

NTT COMMUNICATIONS AND VIGILENT

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NTT Communications, the data infrastructure and networking arm of Japanese telecommunications giant NTT Group, reduced the energy costs of its two largest North American colocation facilities through the use of cooling management technology from Vigilent. NTT saw significant energy and cost savings from the project.

PROJECT OVERVIEW

NTT Communications, the data infrastructure and networking arm of Japanese telecommunications giant NTT Group, recently embarked on a project to reduce the energy costs at its two largest North American data centers. The NTT data centers are multi-tenant colocation and managed web-hosting facilities and serve colocation clients with deployments ranging from a single rack up to 300 racks per customer. Therefore, completing the project without affecting uptime or service-level agreements was of paramount importance.

NTT opted to use cooling management technology from California-based Vigilent at both facilities. Vigilent, formerly Federspiel Controls, was founded in 2004 by Cliff Federspiel, a researcher at the University of California, Berkeley, and a former Johnson Controls engineer. Vigilent's technology uses small wireless temperature and power sensors coupled with an intelligent management system to process data. In 2011, Federspiel Controls, with revenue in the single-digit millions, refocused on the analytical side of its wares and renamed itself Vigilent.

NTT had four main criteria for choosing Vigilent. First, deploying the Vigilent technology did not require any downtime for live customer IT applications. Second, the technology allowed NTT to capture carbon and power savings (both real time and before/after savings) via power consumption meters included in the controllers at each Computer Room Air Conditioner (CRAC) and chilled-water Computer Room Air Handler (CRAH) unit. Third, Vigilent promised a satisfactory return on investment. Finally, a pilot project (in one colocation room at one data center) demonstrated the energy-saving benefits of deploying the technology.

Vigilent compares its technology to server virtualization. Rather than monitoring and managing virtual machines to improve server performance, Vigilent's cooling technology moves cooling operations from inefficiently or lightly provisioned equipment to more heavily provisioned cooling equipment (the company dubs this approach "cooling virtualization").

The cooling systems in the two NTT facilities are a mix of Direct Exchange (DX), CRACs and CRAHs. Each facility has a Vigilent energy management system that identifies under-utilized CRAC and CRAH units based on temperature and power-consumption data from more than 2,700 (total) wireless sensors deployed in the data centers.



Vigilent®

PROJECT AT-A-GLANCE

- NTT Communications set out to improve the overall energy efficiency of its two largest US data centers
- Technology from Vigilent was used to manage cooling systems more efficiently
- NTT managed to eliminate or power down nearly half of its existing cooling units
- Savings included an overall 20% reduction in cooling energy used across the two sites
- Other results included PUE improvements and a reduction in carbon emissions

PROJECT ACHIEVEMENTS

20% reduction in energy used for cooling overall

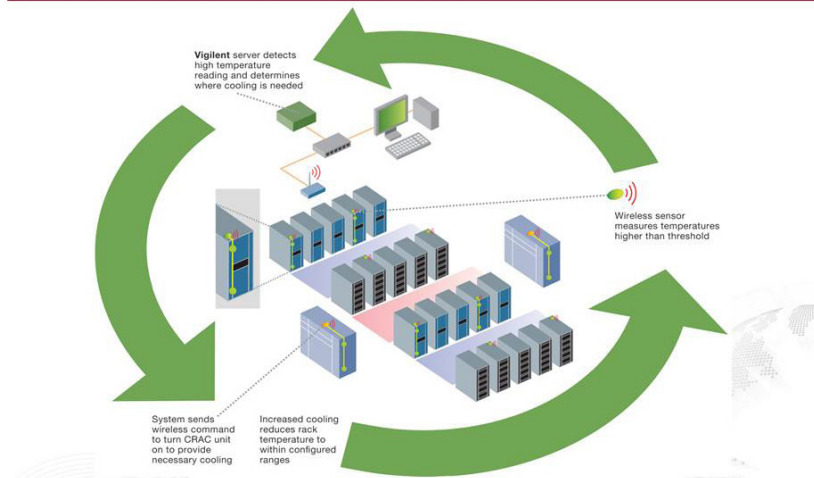
73 of 178 cooling units powered down

5-10% reduction in PUE at facilities in which technology was deployed

Combined annual CO₂ emissions reduced by 8.8 million pounds

NTT COMMUNICATIONS AND VIGILENT: COOLING VIRTUALIZATION DELIVERS IMPROVED UPTIME AND DRAMATIC ENERGY SAVINGS

Dynamic Control System Architecture



ABOUT NTT COMMUNICATIONS

NTT Communications provides consultancy, architecture, security and cloud services to optimize the information and communications technology (ICT) environments of enterprises. These offerings are backed by the company's worldwide infrastructure, including IPv4/IPv6 Global Tier-1 IP Network, Arcstar Universal One™ VPN network reaching more than 150 countries, and more than 120 data centers.

ABOUT VIGILENT

Vigilent is an intelligent energy management systems leader. Vigilent delivers significant, immediate reductions in cooling energy costs through 24/7 monitoring and dynamic management of critical facilities with ongoing operational insights that support risk mitigation and change management.

RESULTS

The Vigilent management system has allowed NTT to either turn off or put into standby mode 73 of 178 cooling units on the data center floors. The result of the project included a 20% reduction in cooling energy use for the two facilities within days of deployment. Power Usage Effectiveness (PUE) ratings at the facilities fell by 5-10%, and combined annual CO₂ emissions were reduced by 8.8 million pounds.

Indirect benefits include reduced maintenance costs through reduced on/off cycling of the CRACs and CRAHs. NTT expects capital cost benefits as well, because the more efficient use of existing equipment should enable the company to defer the purchase of new CRACs and CRAHs.

According to NTT, the key lesson from the project is the realization that many of its previous data center cooling techniques (all CRAH/CRAC units on, all the time) were an unnecessary waste of resources. By dynamically managing its cooling systems, the company was able to cut energy consumption, carbon emissions, machinery wear and tear, and maintenance costs.

Acknowledgements: The information in this case brief was taken from the Green Enterprise IT Award-winning case study "Cooling Virtualization Delivers Improved Uptime and Dramatic Energy Savings," presented by Tarif Abboushi of NTT America and Cliff Federspiel, PhD, of Vigilent at Uptime Institute Symposium 2012 (May 14-16, 2012, Santa Clara, California). The company descriptions are from each company's website.



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