NTT DATA Develops "Green DC energy management™" System for Real-Time Visualization of Server Room Environments

Implementation at NTT DATA's carbon neutral data center has reduced cooling energy consumption by approximately 35%

TOKYO – July 29, 2022 – NTT DATA, a global digital business and IT services leader, today announces the development of the "Green DC energy management™" system, which provides visualization in real time of the operating environment inside server rooms. NTT DATA began using this system at its carbon neutral data center, which uses 100% renewable energy, on July 1, 2022. The system monitors temperature and humidity inside the server room, while sensors mounted on the servers allow for integrated management in real time of charge air temperature and current value, electricity consumption, CPU availability, cooling energy, and the amount of renewable energy introduced.

Ordinarily, server rooms are cooled based on temperature and humidity conditions set on a per-room basis. In many cases, however, the environmental capability of IT devices is not fully realized[1], and energy is wasted due to overcooling. This system in NTT DATA's server room uses data received from temperature sensors inside the server room, combined with AI-controlled air conditioning that automatically regulates the AC units using machine learning, in order to determine the high-temperature areas in the room on a per-server basis, allowing for more concentrated cooling. This works to prevent excessive cooling, succeeding in reducing cooling energy consumption by approximately 35%.

Going forward, NTT DATA plans to install this system at all of its data centers, including the Mitaka Data Center EAST 2 Tower[2] currently under construction, in order to reduce energy usage.

Background

NTT DATA has set targets of a 60% reduction in Scope 1 and 2 emissions (compared to fiscal 2016 levels) by 2030, carbon neutrality for Scope 1 and 2 emissions by 2040, and net zero for Scope 1, 2, and 3 emissions by 2050. Since April 2022, energy used at the Toyosu Center Building and Toyosu Center Building Annex where NTT DATA's headquarters is located, and total energy consumed for operation of principal services (the settlement/finance related ANSER®, CAFIS®, and the digital transformation foundation OpenCanvas®), has been 100% renewable energy[3,4]. Further, in December this year, NTT DATA expects to reach carbon neutrality at Okinawa IT Shinryo Park for the electricity used at No. 2 Tower and No. 7 Tower which provides the NTT DATA Group's BPO business.

In addition, NTT DATA is implementing measures to improve operations in its server rooms with the aim of reducing energy consumption at data centers, which account for approximately 80% of the company's electricity use. One such measure is the building of the "Green DC energy management" system to monitor server rooms, and provide visualization of energy use at data centers, which account for Scope 2 emissions.
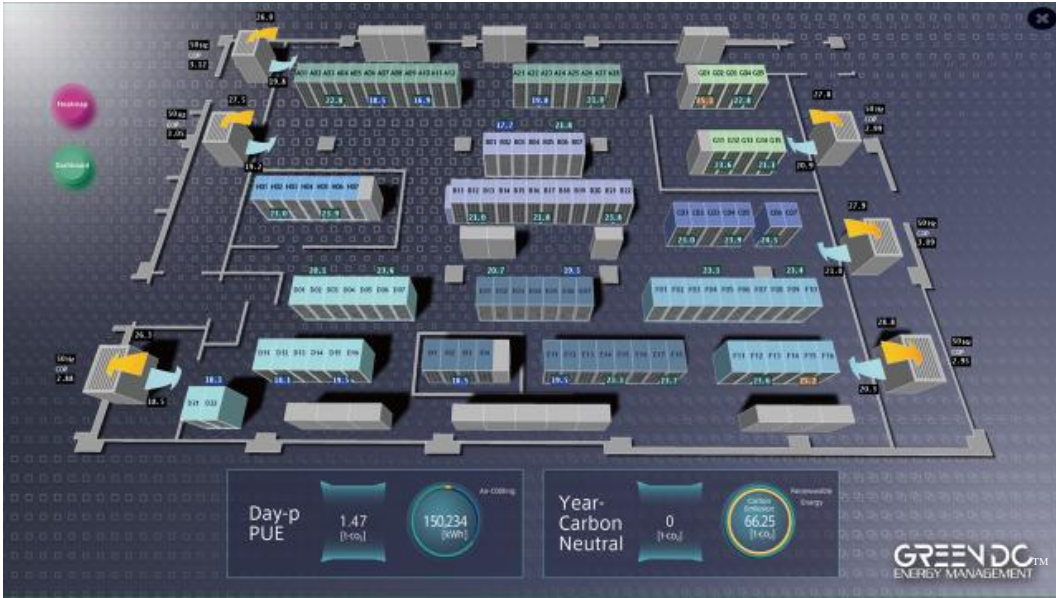
Fig. 1: Green DC energy management™ screen image

Overview

The Green DC energy management system provides visibility by gathering temperature and humidity data from air conditioning units, room temperature sensors, and servers, as well as data from individual servers, including current value, supply and exhaust temperature, electric power consumption, and CPU availability. The visibility system was jointly developed by NTT DATA and Sumitomo Densetsu Co., Ltd. Data collection from the servers is made using the Intel® Data Center Manager software solution from Intel Corporation. The air conditioning AI control uses the Smart DASH® system from NTT FACILITIES, Inc.

Visualization of the server room environment and operating status of servers allows problems with the present state of operations to be more easily identified, and facilitates measures for ongoing operational improvements.
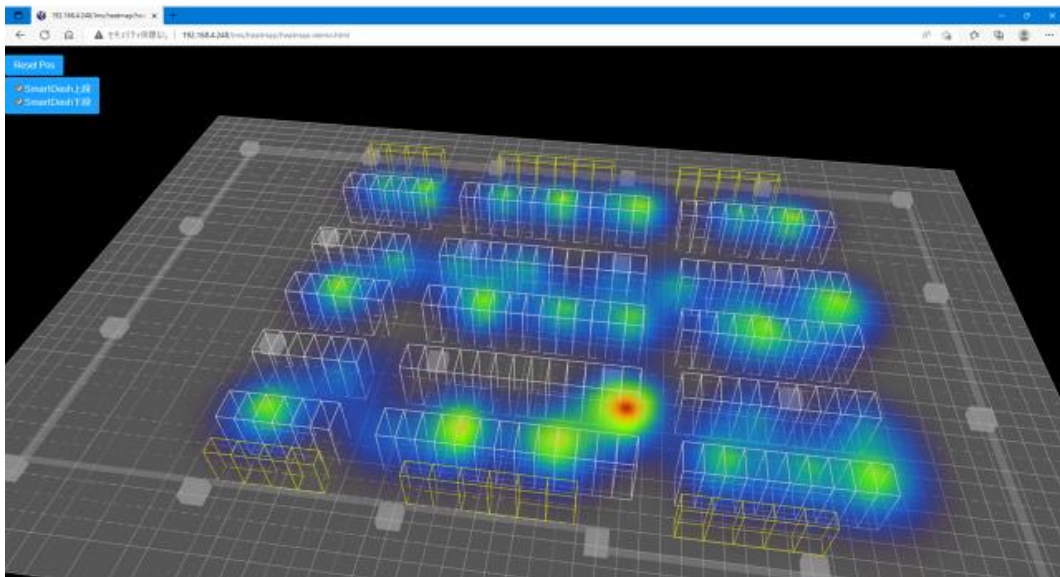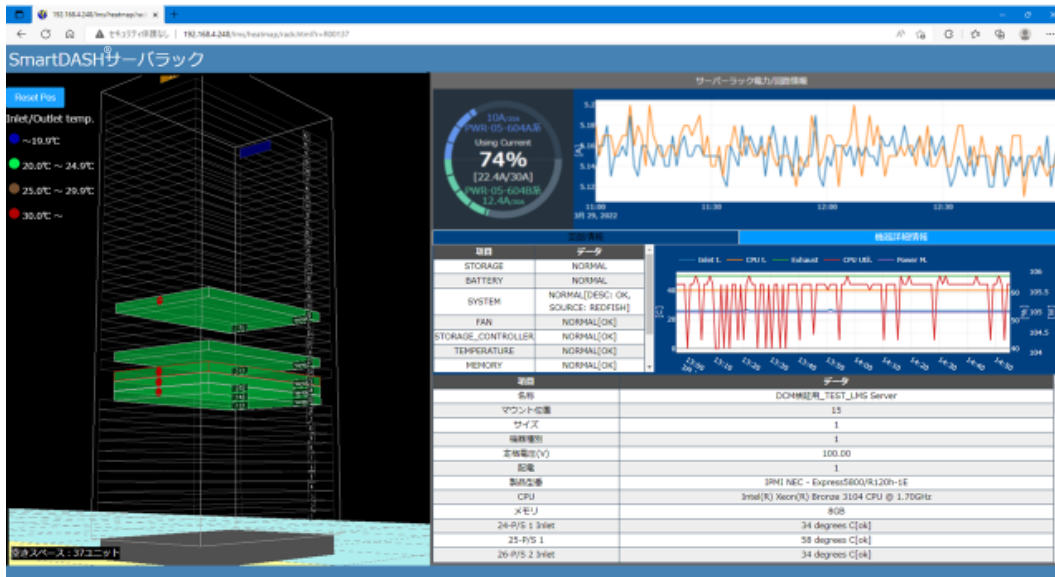
Anticipated Utilization

The system provides a visual representation of the temperature and humidity environment in the server room, allowing problems related to heat buildup from additional servers or other changes to be quickly identified. In addition, the ability to confirm the current value of servers in real time allows engineers to understand the usage conditions for each data line in terms of allowable current value.

Further, combining these features with the air conditioning AI control provided by NTT FACILITIES helps to optimize the air conditioning environment. Verification tests conducted in April and May 2022 confirmed a reduction in cooling energy of approximately 35%.

Future Plans

NTT DATA plans to deploy this system for all its data centers, including the Mitaka Data Center EAST 2 Tower center currently under construction. Further, NTT DATA plans to build an integrated management system with additional capabilities, such as visualization of power usage for the entire building rather than just the server room, management of power usage by tenant or server rack, or control of the environmental load for the entire building.

NTT Green Innovation toward 2040

NTT Group announced its environmental vision "NTT Green Innovation toward 2040" on September 28, 2021, setting goals for FY2030 of an 80% reduction in greenhouse gas emissions (compared to FY2013), with carbon neutrality in the mobile and data centers businesses, and achieving full carbon neutrality by FY2040. NTT Group is expanding its initiatives for carbon neutrality to society at large, supporting the Japanese government's target of a 46% reduction in greenhouse gas emissions (compared to FY2013 levels) by FY2030, and carbon neutrality by 2050.

Notes
1. The temperature and humidity operating ranges for servers and other IT devices is broad, and taking advantage of this environmental capability is important for reducing energy consumption at data centers.
2. Mitaka Data Center EAST 2 Tower is scheduled to commence operations from June 2023.
3. https://www.nttdata.com/jp/ja/news/release/2022/031600/ (Japanese)
4. https://www.nttdata.com/jp/ja/news/release/2022/031601/ (Japanese)
5. https://www.nttdata.com/jp/ja/news/release/2022/042700/ (Japanese)

* "Green DC energy management" is a trademark of NTT DATA Corporation in Japan.
* "ANSER" "CAFIS" and "OpenCanvas" are registered trademarks of NTT DATA Corporation in Japan.
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About NTT DATA

NTT DATA – a part of NTT Group – is a trusted global innovator of IT and business services headquartered in Tokyo. We help clients transform through consulting, industry solutions, business process services, IT modernization and managed services. NTT DATA enables clients, as well as society, to move confidently into the digital future. We are committed to our clients' long-term success and combine global reach with local client attention to serve them in over 50 countries. Visit us at nttdata.com.

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