CASE STUDY

Cloud Data Center
System Integration Company

Saving on Cooling Costs without Hardware Purchases

Intel® Data Center Manager delivers significant savings by reducing cooling costs and achieving better server visibility, while eliminating the need for sensors

NTT DATA

Business:

NTT DATA is a leading IT services provider and global innovation partner headquartered in Tokyo, with business operations in over 50 countries.

Challenges

- Real-time server power and thermal data collection
- Pain point identification
- Real-time health monitoring for Lenovo, HP and Dell servers
- Cooling Analysis
- Cross-platform support
- Historical trend analysis
- Alerting and aggregated control to gain impact visibility into Computer Room Air Conditioning (CRAC) hotspots

Solutions

- Detailed discovery analysis
- Intel® Data Center Manager

Executive Summary

NTT Data, a global leader in system integration installed Intel® Data Center Manager (Intel® DCM) at its Tokyo, Japan data center. The solution was deployed across 50 devices to gain greater insight into the facility's energy consumption and cooling efficiency through the use of DCM features such as real-time power and thermal data collection, server health monitoring, cooling analysis, and alerting and control. The company currently operates several data centers including NTT Internal Cloud at its Tokyo data center.

Intel conducted a detailed discovery session of the system integrator's server environment and to identify the specific pain points that its DCM solution would address. Upon installation, Intel® DCM was able to further analyze the devices, and control power and thermal consumption in real-time through data aggregation as well as optimizing server temperature levels across multiple platforms. Intel® DCM's cooling analysis also enabled data center staff to raise air temperatures in the data center, while simultaneously eliminating risk of downtime or performance complications, as well as continuously monitoring devices to correct issues in real-time. The rise in air temperatures yielded a reduction in cooling costs and improved Power Usage Effectiveness (PUE), resulting in increased energy efficiency.

Intel® DCM was initially deployed across 50 servers within the data center. The results of this test deployment indicated that if the solution was deployed to 3,000 servers, (Note that: we will use the number of 3,000 instead of 50 to calculate all

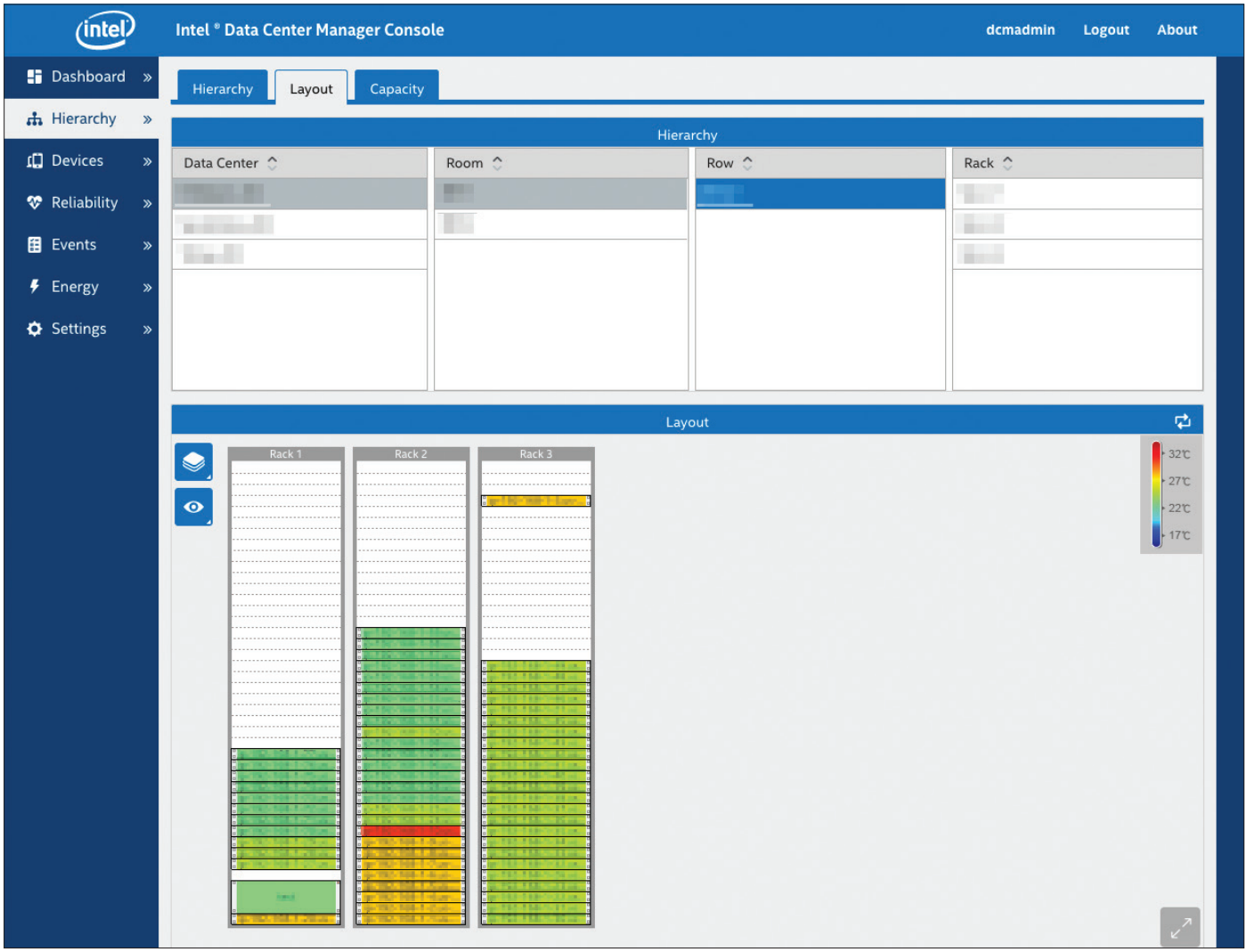

Figure 1. NTT Data's testing environment is small with just around 50 devices.

the savings.) the annual cooling costs of the data center would be reduced by $68,850 USD.

Intel® DCM's ability to deliver device-level power and thermal data also eliminated the need to purchase intelligent Power Distribution Units (PDUs). Based on the customer's current data center environment of 300 racks, the projected savings for this PDU reduction would be $60,000 USD.

Background

Intel® DCM is a middleware, web-service API that integrates easily into existing management systems to monitor, manage and optimize the energy consumption and temperature of data center servers. The global system integration company sought to optimize cooling efficiencies throughout its Tokyo data center environment. IT staff installed the Intel® DCM Console and began to compile and aggregate data from the servers. Through its ease of use and cross-platform support, Intel® DCM enables the company's IT staff to visualize trend data with features like 2D front of rack visibility and overhead mapping.

Once the server data was collected, the IT administrators used the data to establish cooling levels in the server rooms, while maintaining peak health for hardware in real-time. Intel® DCM power, thermal and health monitoring features also aggregated to the precise server rack, row, and room to allow efficient management and quick response times. For HP, IBM and Dell servers, Intel® DCM also displays server asset tag and serial number.

In order to reduce and optimize the overall energy consumption of servers during operations, while effectively decreasing the performance risks of critical company information systems, the IT staff deployed Intel® DCM Cooling Analysis. Intel® DCM is a software and technology product that receives alerts based on custom power and thermal events predetermined by the user. After deployment, IT administrators confirmed the success of the process transition in the data center to assess its value in a broader deployment.

Additionally, Intel® DCM power consumption monitoring delivered device-level power and thermal data, eliminating the need for hardware PDUs. The system integration company was able to safely raise server room temperatures and reduce energy costs while maintaining well-informed control over the thermal environment of their servers.

Intel® DCM Provides Real-Time Power and Thermal Data Collection

Data center thermal design and energy policy execution may cause temperatures to reach upper limits, maxing-out power consumption and leading to hot spots and inefficient use of energy. Moreover, a lack of visibility into actual power consumption leads to energy usage well beyond the levels needed to maintain reserve margins.

Using Intel® DCM real-time power and thermal data, the Tokyo-based company was able to perform an initial power and thermal data analysis and define a starting point to begin identifying energy consumption overages. Data collection required no additional O/S rights or privileges, simplifying the hardware tracking process across multiple platforms.

Intel® DCM Provides Real-Time Health Monitoring, Allowing Granular Visibility

IT administrators at the global system integration company installed Intel® DCM and saw immediate benefits with the solution's intuitive console. With Intel® DCM, complex, device-specific configurations and customized setups are not needed.

As the temperature adjustment process of the server room air conditioning began, the IT staff utilized Intel® DCM health monitoring to obtain granular sub-component power usage data, and analyze it for each of their three server models. Intel® DCM provides power and thermal control and management for servers, racks and groups of servers. IT administrators were not only able to aggregate real-time accurate power and thermal consumption data for their servers, but also manage data center power consumption. This approach enables uniform and sufficiently granular temperature distribution between hot and cold aisles.

In addition, Intel® DCM offers a single solution for power management across all devices in the data center, supporting the multiple proprietary power measurement and control protocols required by different Original Equipment Manufacturers (OEMs).

Power and thermal data are compiled and aggregated to allow IT administrators the ability to identify trends and respond quickly to potential hotspots. Intel® DCM's health monitoring also reduces the demands on data center cooling infrastructure, while ensuring the thermal environment protects IT equipment, especially the servers.

Figure 2. Intel® Data Center Manager Console

Intel® DCM Provides Cooling Analysis

Using the Intel® DCM cooling analysis feature, IT staff were able to raise room temperature in the data center, while continually monitoring devices to anticipate and correct issues as they happened. Their efforts reduced cooling costs and improved PUE, thus increasing energy efficiency.

This management capability included real-time monitoring of actual power and venting temperature data aggregated to servers, racks and groups of servers, as well as specific server health component monitoring.

Using the Intel® DCM cooling analysis, IT staff reduced cooling cost and improved PUE as well as energy efficiency by safely raising the temperature of the server room while continuously monitoring data center devices for temperature issues.

OVERVIEW OF NTT DATA PROCESS

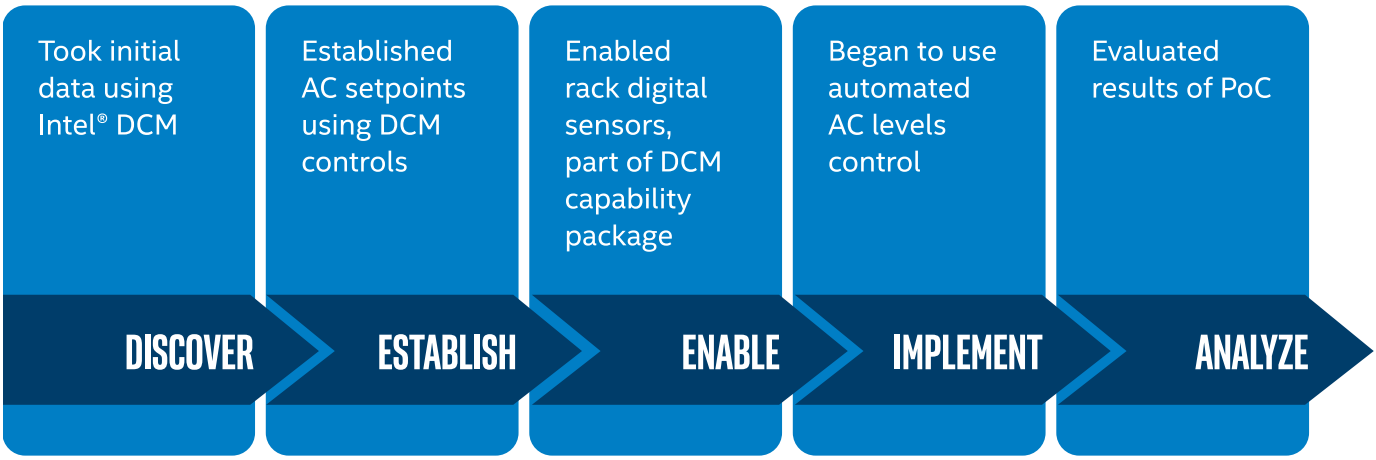

Figure 3. Overview of NTT Data Process Using Intel® Data Center Manager

TEST DEPLOYMENT DEVICES 50
Total servers across data center*: 3,000

HIGHER TEMP IN DATA CENTER >$68K
Reduce cooling costs

INTEL® DATA CENTER MANAGER SAVINGS >$128K
Projected annual savings

AVOIDING INTELLIGENT PDUS $60K
Projected savings

* 3,000 is assumed number of servers for ROI calculation

Figure 4. Key Benefits of Intel® DCM

Intel® Data Center Manager Deployment Results

The global systems integration company established a power monitoring strategy without the purchase of additional hardware infrastructure, including 600 intelligent PDU sensors to monitor the three types of servers housed in the data center server room.

Intel® DCM simplified the thermal management functionality within a heterogeneous server environment, which unified the thermal management and energy efficiency.

Using Intel® DCM, IT administrators captured a significant reduction in power spending.

- Based on this enhanced visibility into the health of their servers, IT staff was able to raise room temperatures in their server rooms by 5°C (the industry standard savings per degree of temperature in a power bill is 3%). Intel® DCM outperforms the standard, making possible a 25% overall savings for the year on air conditioning, amounting to $68,850 USD.
- Intel® DCM wireless sensor capabilities made the purchase of additional PDU hardware unnecessary, while still achieving granular transparency cross-platform at a savings of $60,000 USD.

Based on Intel® DCM deployment results, the anticipated annual savings of deploying the Intel® DCM solution across the company's 3,000 servers* is $128,850 USD.

Where to Get More Information

For more information on Intel® Data Center Manager, visit **intel.com/dcm** or contact **dcmsales@intel.com**

About Intel® Data Center Manager

Intel® Data Center Manager (Intel® DCM) provides accurate, real-time power, thermal and health monitoring and management for individual servers, group of servers, racks and IT equipment in the data center. It's a capability that is useful for both IT and facility administrators, which allows them to work jointly to increase data center efficiency and uptime.

PUE is an indicator defined by Green Grid, a global consortium working to improve power efficiency in the data center system. PUE is a metric for the efficiency of electricity use, defined as:

$$\text{PUE} = \frac{\text{Total power dissipation in a target facility}}{\text{Total power consumption for the IT equipment}}$$