

CASE STUDY

Cloud Data Center
Chinese Logistics Giant



Capacity Planning and Improving Server Health

Intel® Data Center Manager lowers data center temperature, while improving provisioning efficiency and energy usage to deliver significant annual savings

Business:

One of China's leading providers of comprehensive logistics solutions



Challenges

- Real-time cross-platform thermal and power monitoring and temperature control
- Insight into energy consumption
- Automated discovery and optimization for underutilized servers
- Server-level centralized remote access capability
- Server and environmental health analysis
- Capacity planning

Solution

- Intel® Data Center Manager

Executive Summary

A leading provider of comprehensive logistics solutions headquartered in China installed Intel® Data Center Manager (Intel® DCM) in its Guangdong data center. The company initially deployed the solution across 600 devices to garner enhanced energy, thermal and health monitoring of its data center environment. Leveraging Intel® DCM, the company wanted to better manage server health, load balance more efficiently, analyze and remedy data center cooling issues, and gauge the Power Usage Effectiveness (PUE) of multiple server models. The company currently operates over 10,000 servers across its data center network.

The company deployed the Intel® DCM energy, thermal and health monitoring feature across a broad spectrum of Original Equipment Manufacturer (OEM) servers and safely raised room temperature in the data center by 5°C. The initial test deployment of 600 servers indicated that if Intel® DCM were deployed across all of the company's 10,000 servers, the annual cooling costs of the data center would be reduced by \$228,000 USD.

Intel® DCM's ability to deliver device-level power and thermal data also eliminated the need for intelligent Power Distribution Units (PDUs). Based on the customer's current data center environment of 1,000 racks, the projected savings from this elimination would be \$200,000 USD.

Additionally, through Intel® DCM's health monitoring and utilization capabilities, IT staff optimized server workloads and increased rack density by 30% during the test deployment, while postponing the need for new rack purchases. The added visibility and operational efficiency yielded for a 10,000 server operation would realize a potential annual savings of \$700,000 USD. The overall estimated savings that the company would realize in deploying Intel® DCM would be \$1,128,000 USD.

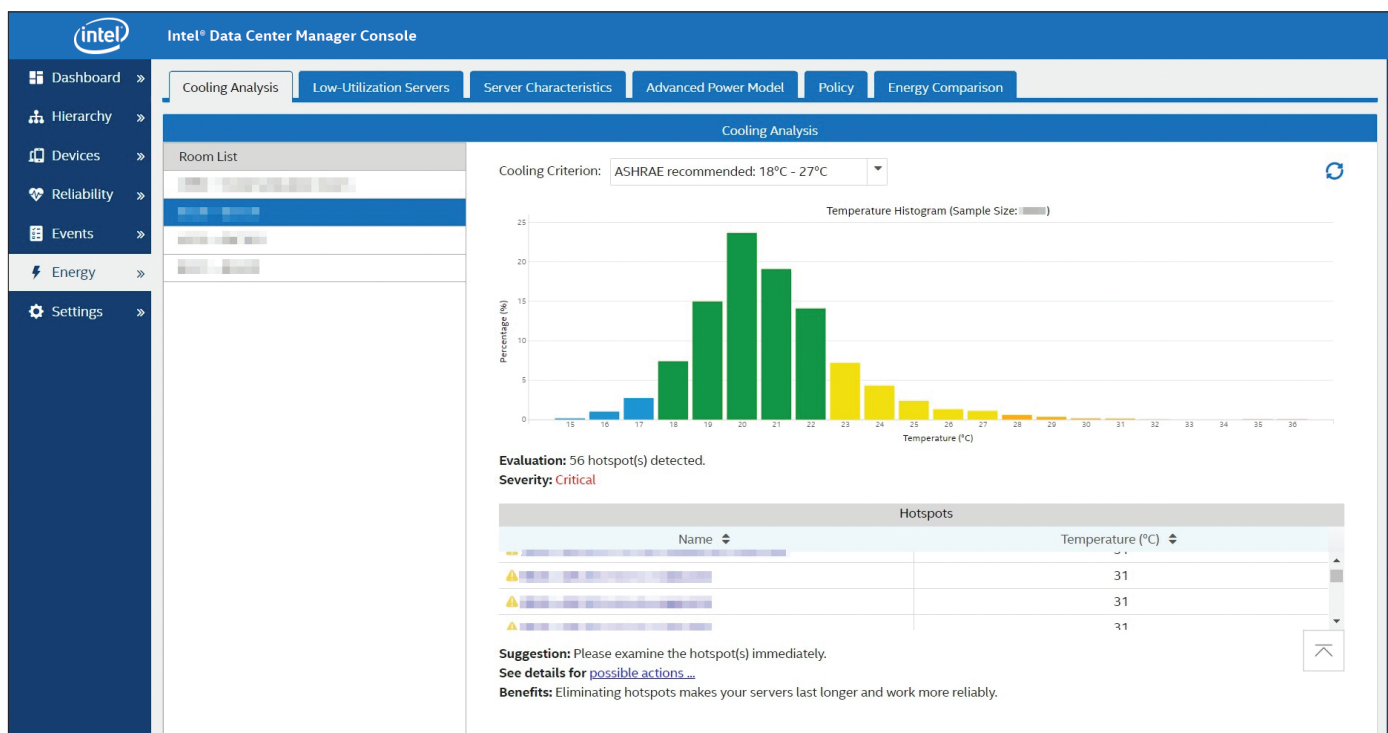


Figure 1. Intel® Data Center Manager Console

Background

One of China's leading providers of comprehensive logistics solutions sought to increase efficiency, extend server life and save energy within their data center operation. Efficiently and effectively tracking shipments for their customer base necessitated the optimization and enhanced distribution of workloads as well as improved server mapping and the identification of problematic hot spots, while safely raising room temperature in the data center.

Using the Intel® DCM single-screen Console, the company's IT administrators quickly gained visibility into the 600-server test deployment and began aggregating and comparing data in real-time as well as assessing workloads to determine the cause of inefficiencies across their environment. The thermal and power data collected clearly identified areas for improvement and simplified the diagnostic process for the company's IT department.

Intel® DCM Thermal Health Monitoring Provides Precise Insight For Better Server Management

Older data centers rely on broad and outdated practices such as maxing-out power consumption to compensate for poor thermal design and energy policy execution. Without actual server data to support decisions, data center policy measures have limited success. Moreover, a lack of visibility into actual power consumption leads to significant overprovisioning to maintain reserve margins.

Leveraging Intel® DCM, the logistics solutions provider was able to aggregate real-time data center health data to understand server energy consumption across a wide range

of equipment to better manage efficiency. The company's IT staff was also able to analyze cooling conditions in the data center, enabling them to raise the temperatures by 5°C, while continually monitoring devices to correct issues in real time. Their efforts reduced cooling costs and improved Power Usage Effectiveness (PUE), thus increasing energy efficiency.

Intel® DCM Automated Server Discovery Presents Targeted Data For Thermal Strategies

Large operations are bound to have unhealthy and underutilized devices. Current designs are not efficient at low-loading levels: an idling server doing zero work still consumes 50 percent of peak power. Intel® DCM pinpoints server energy consumption and temperature fluctuations in real time. With Intel® DCM, the logistics solutions provider was able to identify problematic devices, leading to a restructuring of server loads and better rack utilization.

The logistics solutions provider's data center houses 1,000 racks, requiring two intelligent PDUs per rack. Intel® DCM made additional hardware devices unnecessary, while still receiving alerts from specific servers and racks as required. The solution allows users the ability to evenly implement the same power strategies regardless of the server model. That feature was especially helpful for the logistics solutions provider's data center operation, where the team was managing multiple server models from different OEMs.

With Intel® DCM, servers become wireless sensors, alerting staff when temperature and power extremes occur. Intel® DCM provides device-level power and thermal data, eliminating the need for hardware sensors altogether.

Intel® DCM Remote Server Visibility and Control From Anywhere

A recent study sponsored by Intel® revealed that 43 percent of data centers rely on manual research. Incomplete data sets offer limited visibility at best. Furthermore, without the control and insight provided by Intel® DCM technology, it is difficult to gain an integrated view of a server pool. Intel® DCM analysis allowed the logistics solutions provider to identify and re-deploy long-term, low utilization servers.

The Intel® DCM Management Console with remote server visibility identifies cooling efficiencies, detects underutilized systems, visualizes power consumption in maps and graphs, and models power consumption changes and their impact to infrastructure.

An operation of this size requires clear insight over a broad area. Because Intel® DCM provides power and thermal monitoring and management for servers, racks and server clusters, IT administrators were able to track and manage servers efficiently, while restructuring data center racks.

Intel® DCM Hardware Capacity Planning and Optimization

Monitoring and adjusting power consumption during peak times and lower usage windows enabled minimum power efficiency, better aligning with the company's business priorities. Based on the information and data obtained from

the deployment of Intel® DCM, the logistics solutions provider reduced energy consumption and efficiently optimized its data center operation from multiple perspectives.

Intel® DCM's health monitoring reduces the demand on data center cooling infrastructure. Remote console displays ensure the thermal environment protects servers by monitoring the uniformity of temperature distribution and recirculation between hot and cold aisles.

Intel® DCM provides an intuitive IT asset management interface to display essential Key Performance Indicator (KPI) information for the data center. The interface enables integrated viewing of server asset information as a basis for optimization.

Additionally, Intel® DCM's functionality in a heterogeneous server environment allows servers to be discovered and managed efficiently. Because locating servers becomes easy, IT staff can track asset information, including real-time temperature, real-time power consumption, server name, model number, serial number, and management address — among other data.

TEST DEPLOYMENT DEVICES



600

Total servers across data centers: 10,000

HIGHER TEMP IN DATA CENTER

Reduce cooling costs

\$228K

INTEL® DATA CENTER MANAGER SAVINGS

Projected annual savings

>\$1.12M

CAPACITY PLANNING SAVINGS

When deployed across all

\$700K

AVOIDING INTELLIGENT PDUS

Projected savings

\$200K

INCREASED RACK DENSITY

Potential annual savings

↑ 30%

Figure 2. Key Benefits of Intel® DCM

Intel® Data Center Manager Deployment Results

Using Intel® DCM, the logistics solutions provider implemented power policies and captured a significant reduction in power spend across all seven of its OEM server models. Intel® DCM simplified the process of identifying server health, allowing IT administrators to raise temperatures throughout critical areas of the data center operation.

- Intel® DCM wireless sensor capability made the purchase of additional intelligent PDU hardware unnecessary, while still achieving granular, cross-platform transparency at a savings of \$200,000 USD.
- Intel® DCM could apply a power-capping strategy to save server power, while having no impact on the regular company workload. The power saved for 600 servers indicated that when deployed across the company's 10,000 servers, savings would amount to \$228,000 USD.
- Finally, Intel® DCM provided necessary insight into the better balance of workloads and rack loading for the 600 servers. The organization was able to increase rack density by 30 percent in this test case and an overall anticipated 10 percent for its 10,000-server operation. These efforts indicated additional server and rack purchases could be delayed significantly and a savings of \$700,000 USD would be realized when deployed across 10,000 servers.

Based on Intel® DCM deployment results, the anticipated annual savings of deploying the Intel® DCM solution across the company's 10,000 servers is \$1,128,100 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:

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

