

# CASE STUDY

Cloud Data Center  
China Meteorological Association



# Optimizing the Power and Thermals of Servers

**Intel Data Center Manager provides significant annual savings through real-time monitoring of server health and utilization**



## Business:

China Meteorological Administration is a public service agency headquartered in Beijing and is responsible for organizational and operational management of the national meteorological services there as a whole.



## Challenges

- Server power and thermal health monitoring
- Cooling analysis and data center environmental health analysis
- Automated discovery for underutilized servers
- Centralized server-level remote access
- Remote access control and IT device power tracking

## Solution

- Intel® Data Center Manager

## Executive Summary

China Meteorological Administration (CMA), a state-owned public service agency, installed Intel® Data Center Manager (Intel® DCM) in its three data center operations. The solution was deployed across 829 servers to provide greater insight into its server utilization, energy consumption, and server health while eliminating the need for manual intervention.

The IT operations team fully deployed Intel® DCM cross-platform to control and monitor the thermal health of individual servers and components. This increased granularity led to a reduction of additional IT staff and man-hours associated with manual monitoring. With Intel® DCM, the CMA could reduce labor by 500 man-hours per year, yielding a savings of \$207,250 USD over the next five years.

Additionally, Intel® DCM's ability to deliver device-level power and thermal data would eliminate the need for intelligent Power Distribution Units (PDU), another significant source of cost savings. This 103-rack cost reduction across the company's data center network indicated a savings of \$206,000 USD.

The Intel® DCM with real-time power monitoring capability provided the team with a list of idle or underutilized servers. Its remote management capability then allowed the team to power off underutilized servers from the convenience of their computer screens. This reduction in energy consumption over five years would yield an additional savings of \$130,716.72 USD.

Finally, Intel® DCM's cooling analysis enabled data center staff to safely raise temperatures in server rooms and monitor server health and air temperatures. Clear visibility into each device eliminated the risk of downtime and allowed the team to correct issues in real time. This led to an overall reduction in cooling costs and improved Power Usage Effectiveness (PUE) and, if deployed over a five-year period, would save the CMA an additional \$85,828 USD.

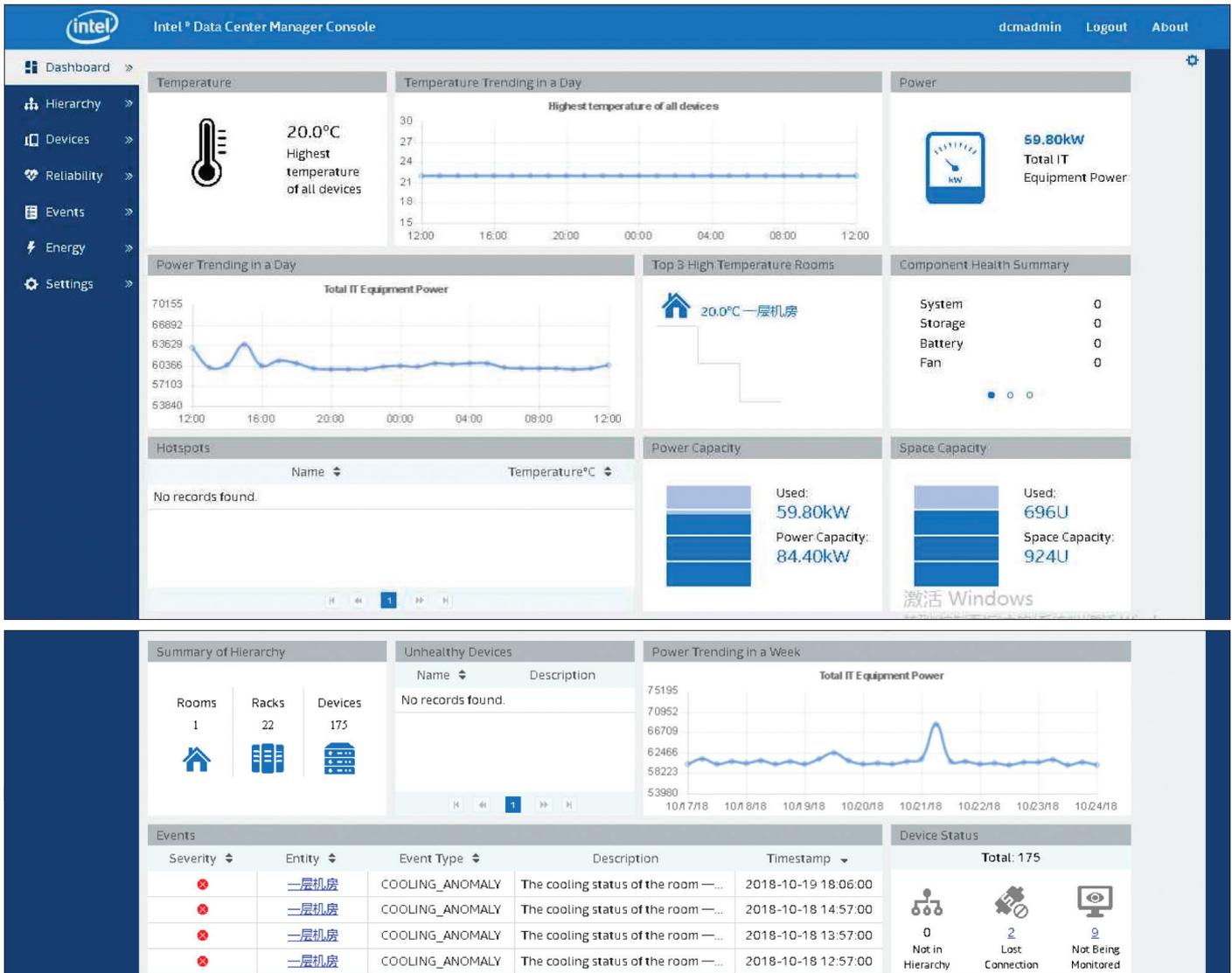


Figure 1. Intel® Data Center Manager Console

## Background

The China Meteorological Administration installed Intel® Data Center Manager (Intel® DCM) in its three data center operations. The solution was deployed across 829 servers to gain greater insight into server utilization, energy consumption, and server health.

Intel® DCM can automatically monitor, manage and optimize the energy consumption and temperature of data center servers. CMA sought to achieve greater access, while remotely monitoring server nodes in its three data center operations. IT staff installed Intel® DCM and began to compile and aggregate data from the servers right away. Through its ease of use and cross-platform support, Intel® DCM enabled the company’s IT staff to visualize trend data with features like its 2D front-of-rack visibility and overhead mapping.

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

Using Intel® DCM with its cross-platform support and easy access limits the amount of staff required to achieve greater

accuracy and control at the device level. The Intel® DCM dashboard allows remote operators to access and monitor server component health, such as power and thermal readings across a network from the convenience of their computer screen.

Intel® DCM allowed CMA IT administrators a view of individual servers and components at subcomponent granularity, which led to a reduction in labor. This capability helped CMA data center staff identify hardware errors. It also took advantage of the Baseboard Management Controller (BMC) capabilities found in some of their servers.

By eliminating the need for manual oversight, Intel® DCM allowed operators to achieve better consistency in the health of their servers, monitoring cross-platform from their offices. Not having to drive to multiple locations while expanding the scope of their work saved both time and money. This capability eliminated the need for additional labor with a significant reduction in the required number of trips to manage on-site operations.

### Intel® DCM Provides Thermal Monitoring & Cooling Analysis

The thermal design of older data centers can cause temperatures to reach upper limits, and lead to hot spots. The lack of visibility into actual power consumption leads to over-provisioning and pushes energy usage well beyond the levels needed to maintain cooling margins. This makes energy policy execution inefficient.

Intel® DCM uses existing servers as wireless sensors, harnessing that ability to deliver device-level power and thermal data in real time, and eliminating the need for intelligent PDUs, another significant source of cost savings. CMA had over-cooled one of its server rooms by seventeen degrees. The team responded and quickly raised the temperatures. Intel® DCM sent the alert with the data that both reported actual power usage and venting temperatures and also diagnosed the required fix.

Using the Intel® DCM cooling analysis, IT staff reduced cooling cost and improved Power Usage Effectiveness (PUE) and energy efficiency. The solution allowed them to safely raise the temperature of the server room and monitor servers for temperature issues in real time.

### Strategically Powering Servers On-Off To Save Power

Energy is fast becoming one of the highest operating costs in a data center. Scheduling time to power off underutilized servers can significantly increase energy efficiency. Intel® DCM's real-time energy consumption data improves the operator's ability to strategically lower power usage while maintaining workload scalability.

Intel® DCM automates the collection and management of current and historical data, improving power and thermal health analysis at the individual device level. Leveraging the granular information cross-platform, CMA's IT operations team identified 132 devices that were being underutilized.

Using this data, operators powered off these devices remotely through the convenience of the DCM console.

The IT staff deployed Intel® DCM cooling analysis to reduce and optimize the overall energy consumption of servers during operations, while effectively decreasing the performance risks of critical company information systems. Intel® DCM allows users to set alert parameters based on predetermined power and thermal event thresholds.

### Improve Capacity Planning and Increase Rack Density

A recent study sponsored by Intel® found 43 percent of data centers use manual methods to plan and forecast. The automated capabilities of Intel® DCM allow IT managers a simple, automated way to collect, manage, and analyze power and temperature readings at the individual device level. With this level of granularity, data center managers can consistently improve capacity planning, identify and decommission energy-wasting assets, and strategize new equipment outlays using predictions based on actual energy usage.

Once CMA collected server data, the team used the data to establish cooling levels in the server rooms, while maintaining peak health for hardware in real time. This practice led to the discovery of servers that were underutilized as well as the diagnosis of servers with hardware errors. This new awareness allowed the team to optimize servers cross-platform and implement a policy-based management approach.

Intel® DCM stores server-related measurement data such as current power consumption, and its historical trending feature maintains this data for a year. Using this data-driven high-precision capacity analysis, data centers can enjoy reliable capacity planning and accurate threshold monitoring.

**DEPLOYMENT  
DEVICES**

 **829**

Servers in three data center operations

**REDUCTION IN DATA  
CENTER LABOR COSTS**

**>\$207K**

Savings over five years

**INTEL® DATA CENTER  
MANAGER SAVINGS**

**>\$629K**

Projected for the five-year cycle

**BETTER SERVER  
UTILIZATION**

**>\$130K**

Savings over five years

**AVOIDING INTELLIGENT  
PDU PURCHASES**

**\$206K**

Savings over five years

**HIGHER TEMPERATURES  
IN DATA CENTER**

**>\$85K**

Savings over five years

Figure 2. Key Benefits of Intel® DCM

## Intel® Data Center Manager Deployment Results

Intel® DCM provided CMA with remote access capability, control, and real-time power and thermal monitoring, thus reducing annual labor costs by 30 percent over five years. The implementation of Intel® DCM helped the IT team achieve remote, cross-platform transparency and precise control of their 829 servers.

Intel® DCM enabled a monitoring strategy without the purchase of additional hardware infrastructure, including 206 intelligent PDU sensors to monitor the five OEM server models housed in the data center server room.

Intel® DCM simplified the thermal management across a heterogeneous server model environment, unifying thermal management and energy efficiency efforts.

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

- Based on this enhanced visibility into the health of their servers, Intel® DCM would allow IT staff to reduce on-site visits to their three data center operations, improving management of their servers. This resulting five-year reduction in labor costs would save \$207,250 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 \$206,000 USD.
- Intel® DCM on-off switching capability would allow operators to save power by shutting down idle servers when not needed. This power conservation would result in a five-year savings of \$130,716.72 USD.
- Intel® DCM allowed IT staff to raise server room temperatures safely by 2° C, yielding a five-year savings on air conditioning amounting to \$68,850 USD.

Based on Intel® DCM deployment results, the anticipated annual savings of deploying the Intel® DCM solution across the company's 829 servers is \$629,794.72 USD.

## Where to Get More Information

For more information on Intel® Data Center Manager, visit [intel.com/dcm](http://intel.com/dcm) or contact [dcmsales@intel.com](mailto: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:

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

