

CASE STUDY

Cloud Data Center
Chinese Broadcasting Services Company



Optimizing Remote Server Cooling And Management

Intel® DCM delivers significant annual savings by reducing on-site visits, lowering cooling costs and gaining better visibility into server capacity



Business:

China Cable Television Network Co., LTD, is a subsidiary of China Central Television.



Challenges

- Remote access and cross-platform support
- Aggregated control
- Real-time server health monitoring
- Power and thermal data collection
- IT device power (PDU, UPS, Network, Storage)
- Cooling Analysis
- Alerting and aggregated control to gain impact visibility into Computer Room Air Conditioning (CRAC) hotspots

Solution

- Intel® Data Center Manager

Executive Summary

China Cable installed Intel® Data Center Manager (Intel® DCM) at its new WuQing District data center facility, located in Tianjin, China. The solution was deployed across 1,300 devices to gain greater insight into the facility's server utilization and cooling efficiency. The company's IT operations team is based in Beijing, approximately 50 miles away.

The China Cable company installed Intel® DCM in its newly built data center to gain thermal and power visibility into its 300-rack operation. These servers have Original Equipment Manufacturer (OEM) Baseboard Management Controller (BMC) capability.

Intel® DCM provided the China Cable IT operations team a cross-platform view of their servers. The ability to remotely monitor the thermal health of individual servers and subcomponents led to a reduction of additional IT staff and man-hours associated with manual monitoring. With Intel® DCM, the company could reduce labor by 500 man-hours per year, yielding a savings of \$325,000 USD over the next five years.

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 over five years would be \$600,000 USD.

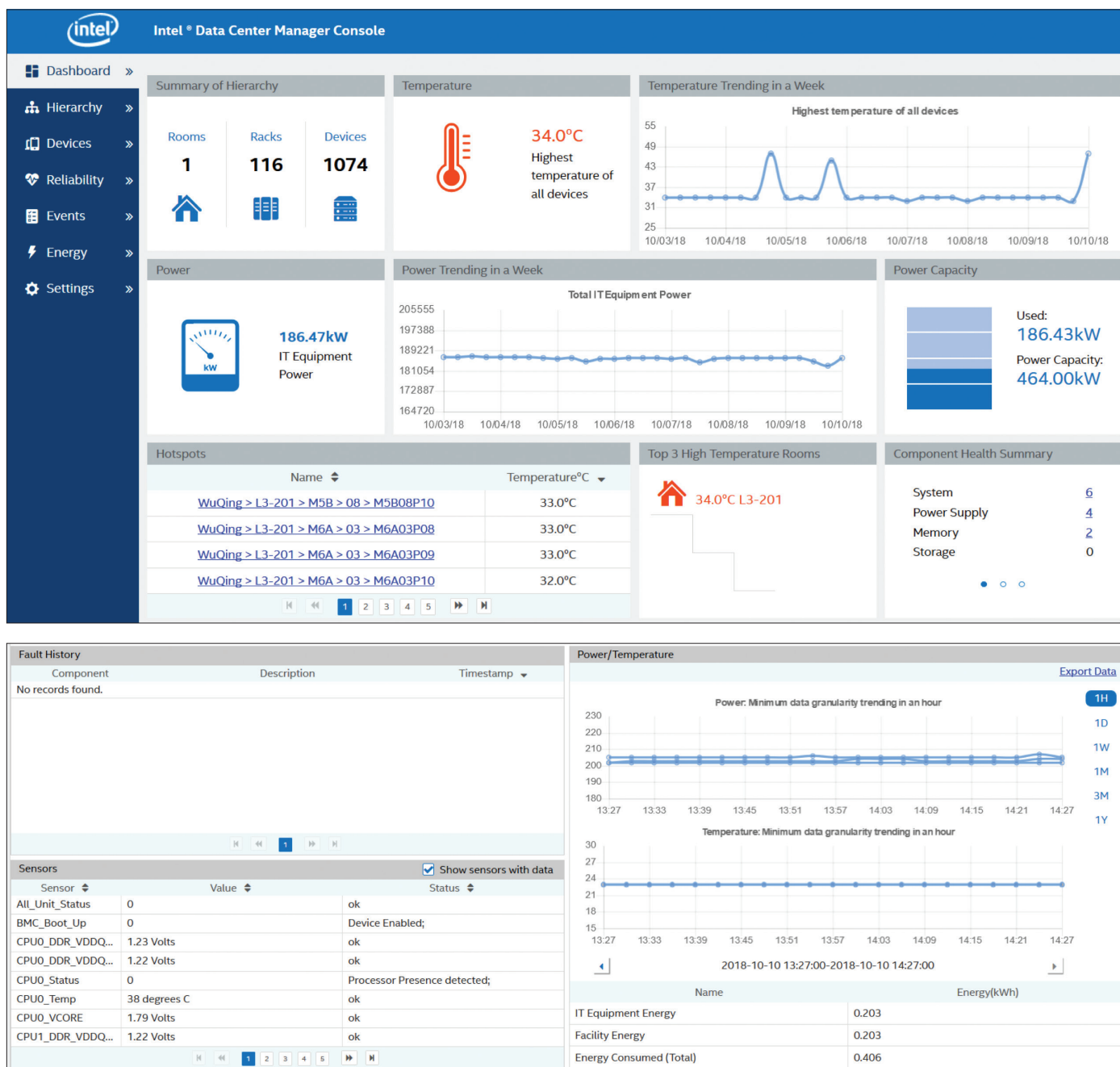


Figure 1. Intel® Data Center Manager Console

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 by 2°C. The rise in air temperatures yielded a reduction in cooling costs and improved Power Usage Effectiveness (PUE), resulting in increased energy efficiency would result in a five-year savings of \$204,982 USD.

The Intel® DCM deployment results indicated a reduction in the annual cooling costs of the data center by \$23,609 USD annually, with a cumulative savings of \$118,944 USD over five years.

Background

The Beijing-based IT operation team for China Cable selected Intel® DCM and immediately installed the solution to remotely access and assess the energy consumption and temperatures of their 1,300 servers in the newly built WuQing data center operation.

Intel® DCM Console offers ease of use, aggregated control and granular health monitoring. It is a software product to monitor, manage and optimize the energy consumption and temperature of data center servers. China Cable accessed server nodes using DCM and began to compile and aggregate data from the servers.

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

Traditionally, on-site data center operators need to check server LEDs one-by-one, requiring additional man-hours and increasing labor costs. Intel® DCM, with its cross-platform support and easy access, limits the amount of staff required to identify and diagnose issues at the device level. It allows remote operators the capability to access and monitor server power and thermal readings across platforms from the data-rich DCM dashboard.

Intel® DCM allows IT administrators a view of individual servers and components with subcomponent granularity, which led to a reduction in labor. By eliminating the need for manual oversight, Intel® DCM remote capability allowed operators the ability to better monitor servers, while working from their Beijing offices. This also led to a 30 percent reduction in the manual labor required to manage on-site operations.

Intel® DCM Provides Thermal Monitoring & Cooling Analysis

The lack of visibility into actual power consumption leads to energy usage well beyond the levels needed to maintain reserve margins, making 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. This sensor capability saved China Cable from having to purchase additional hardware. The server data reported the actual power and venting temperatures 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 costs and improved Power Usage Effectiveness (PUE), as well as energy efficiency by safely raising the temperature of the server room by 2°C, while continuously monitoring data center devices for temperature issues.

Improve Capacity Planning and Increase Rack Density

Monitoring server health levels, while eliminating the risk of downtime and performance complications, had been difficult for China Cable due to lack of visibility. Intel® DCM automates the collection, management and analysis of power and temperature readings at the individual device level. Leveraging this granularity, data center managers can improve capacity planning, identify and decommission energy-wasting assets, and strategize new equipment outlays using predictions based on actual energy usage.

Once China Cable collected server data, the team used it to establish cooling levels in the server rooms. DCM remote capabilities allowed them to maintain peak health for their servers in real time. This practice further led to the discovery of servers that were underutilized as well as the diagnosis of servers with hardware errors.

Intel® DCM stores server-related measurement data such as current power consumption, and its historical trending feature maintains this data for a year. This data provides the foundation for high-precision capacity analysis, reliable capacity planning and accurate threshold monitoring.

Strategically Powering Servers On/Off To Save Power

The over-provisioning of power to offset thermal issues and maintain even temperatures throughout a data center environment results in higher operating expenses. Intel® DCM's real-time energy consumption data improved China Cable's ability to strategically lower power usage, while maintaining workload scalability. Intel® DCM allows the IT team to identify and schedule the best times to power off servers, significantly reducing operating costs.

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**DEPLOYMENT
DEVICES**



1,300

Data center: 300-rack operation

**HIGHER TEMP
IN DATA CENTER**

>\$118K

Projected five-year savings

**INTEL® DATA CENTER
MANAGER SAVINGS**

>\$1.2M

Projected five-year savings

**IMPROVED CAPACITY
EFFICIENCY**

>\$204K

Projected five-year savings

**AVOIDING
INTELLIGENT PDUS**

Projected five-year savings

\$600K

**REMOTE ACCESS
STRATEGY**

Projected five-year savings

\$325K

Figure 2. Key Benefits of Intel® DCM

strategizing new equipment outlays using predictions based on actual energy usage.

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® Data Center Manager Deployment Results

China Cable deployed Intel® DCM to optimize its new Tianjin data center operation.

- They established a remote management process leveraging Intel® DCM's hardware diagnosis and correction capabilities. This monitoring strategy led to a reduction in the need for on-site visits, while increasing asset visibility and control. By reducing the needs for manual labor and operator travel is predicted to save \$325,000 USD over the next five years.
- Intel® DCM's wireless sensor capability eliminated the need to purchase additional hardware infrastructure, including 600 intelligent PDU sensors to monitor the servers housed in the data center server room, leading to a savings of \$600,000 USD.
- Using Intel® DCM, IT administrators identified underutilized servers and consolidated racks, and captured a significant reduction in power spending. Intel® DCM's on/off switching capability allows operators to save power by shutting down idle servers when not needed. This power conservation will result in a savings of \$204,982 USD over five years.
- Based on this enhanced visibility into the health of their servers, IT staff were able to raise room temperatures in their server rooms by 2°C (the industry standard savings per degree of temperature in a power bill is 3 percent). Intel® DCM outperforms the standard, making it possible for China Cable to achieve an overall savings of \$23,608.80 US per year on air conditioning, or \$118,044 USD over five years.

Based on Intel® DCM deployment results, the anticipated annual savings of deploying Intel® DCM across the company's 1,300 servers over five years would be \$1,248,026 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:

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

