

CASE STUDY

Cloud Data Center
Fast-Growing Securities Company



Automating Server Energy Efficiency and Health Monitoring

Intel® Data Center Manager lowers data center energy consumption, significantly improves provisioning efficiency, and avoids the purchase of costly hardware

Business:

One of China's fastest-growing securities companies



Challenges

- Real-time cross-platform thermal and power monitoring
- Component health
- Automated discovery for underutilized servers
- Server-level centralized remote access capability
- Cooling analysis and data center environmental health analyses
- Remote access control and IT device power tracking (PDU, KVM)

Solution

- Intel® Data Center Manager

Executive Summary

One of the fastest-growing securities companies in China, headquartered in Shanghai, installed Intel® Data Center Manager (Intel® DCM) in its data center. The company initially deployed the solution across 100 devices to reduce energy consumption and monitor thermal health efficiency within its data center environment. Intel conducted a detailed discovery session of the company server environment to identify the specific pain points that its DCM solution would address.

The securities company wanted to better manage server health and inconsistencies, identify hot spots, analyze and remedy data center cooling issues, and gauge the Power Usage Effectiveness (PUE) of multiple server models. The company currently operates over 1,000 servers across its data center network.

The company deployed the Intel® DCM energy, thermal and health monitoring feature across its three types of Original Equipment Manufacturer (OEM) servers and safely raised room temperature in the data center by 10°C. The initial test deployment of 100 servers indicated that if deployed across the company's 1,000 servers, the annual cooling costs would be reduced by \$45,600 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 \$20,000 USD.

Lastly, the securities company determined that Intel® DCM software management capability would eliminate the need for the Kernel-based Virtual Machine (KVM) hardware solution that it previously required for virtualization of its infrastructure. DCM would save the company an additional \$62,500 USD over five years.



Figure 1. Intel® Data Center Manager Console

Based on the savings realized in the test deployment for Intel® DCM, the solution would yield a savings of \$128,100 USD if deployed across the entire network.

Background

One of China's Shanghai-based securities companies sought to increase efficiency, extend server life and save energy within its data center operation. The company initially deployed the solution across 100 devices to determine the energy efficiency and thermal health of its data center environment. Leveraging Intel® DCM, the company wanted to better manage server health, balance loads more efficiently, and analyze and remedy data center cooling issues to improve the Power Usage Effectiveness (PUE) of multiple server models. The company currently operates over 1,000 servers across its data center network.

The securities company IT administrators installed Intel® DCM and immediately found its wide range of measurement capabilities and intuitive design easy to use. They quickly began to analyze the thermal health data of their servers.

Intel® DCM is a middleware web-service API that integrates easily into existing management systems and will monitor, manage, and optimize the energy consumption and temperature of data center servers. The solution enables data center operators' remote access to power servers off and on as needed, eliminating the need for manual processes. Intel® DCM aggregates data and optimizes server temperature levels cross-platform.

Using the Intel® DCM single-screen Console, the company's IT administrators quickly gained visibility into the 100-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 to Optimize Data Center Environment

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. Additionally, manual processes, including a lack of visibility into actual power consumption, lead operators to overprovision cooling to maintain reserve margins.

IT staff installed Intel® DCM and began to compile and aggregate data from the servers. 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.

Leveraging Intel® DCM, the securities company was able to aggregate real-time data center health data to understand server energy consumption across a broad 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 a stunning 10°C, while continually monitoring devices to correct issues in real time. Their efforts dramatically reduced annual cooling costs and improved PUE, thus increasing energy efficiency.

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

Manual processes can mask unhealthy and underutilized devices that 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 securities company was able to identify problematic devices, leading to a restructuring of server loads and better rack utilization.

The securities company data center operation houses 1,000 racks, requiring two intelligent PDUs per rack. With Intel® DCM, the additional purchase of these hardware devices was unnecessary, yet the company was still able to receive 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 securities company's data center operation, where the team was managing multiple server models from three different OEMs.

Intel® DCM also detected servers of the same model with different firmware. This awareness enabled staff the ability to quickly correct the issue for optimal network performance. 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 securities company 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 on infrastructure.

Intel® DCM remote server visibility saved the securities company from having to purchase a KVM virtualization hardware system. Because the solution 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.

Strategically Powering Servers On-Off To Save Power

Manual processes require additional man-hours and driving operations costs higher while not achieving full efficiency. Automated scheduling of time to power off servers can significantly reduce operating costs. Intel® DCM's real-time energy consumption data improves the operator's ability to strategically lower power usage while maintaining workload scalability.

Intel® DCM provides automated data collection, management and analysis of power and temperature readings at the individual device level. Leveraging this granular information, the securities company's IT operations team improved server utilization by identifying and decommissioning energy-wasting assets, and strategizing new equipment outlays using predictions based on actual energy usage. After deployment, IT administrators confirmed the success of the process transition in the data center.

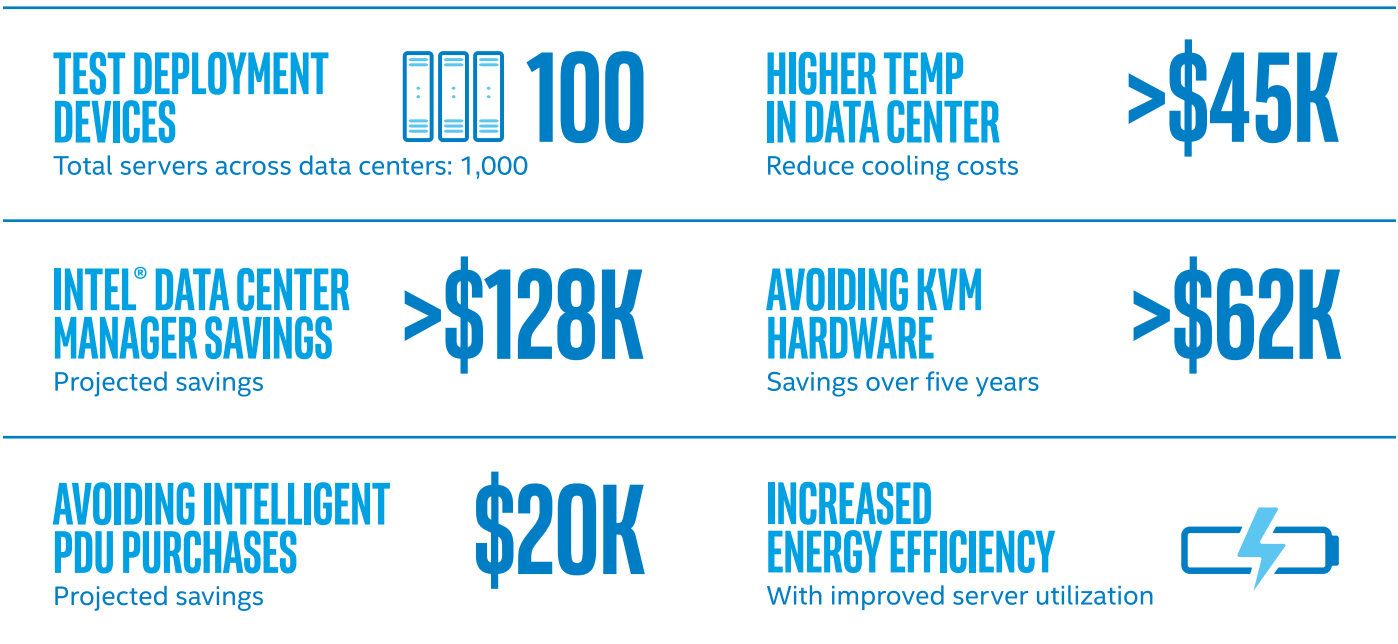


Figure 2. Key Benefits of Intel® DCM

Intel® Data Center Manager Deployment Results

Intel® DCM simplified the thermal management functionality within a heterogeneous server environment, which unified the thermal management and energy efficiency. The implementation of Intel® DCM in the 100-server test deployment helped the IT team achieve remote, cross-platform transparency and precise control of their servers. The ability to power off servers during off-peak times lowered operations costs.

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

- The solution also allowed them to safely raise server room temperatures by 10°C, significantly reducing energy consumption. Intel® DCM would return an annual savings of \$45,600 USD.
- Intel® DCM enabled a monitoring strategy without the need to purchase additional hardware infrastructure, including 200 intelligent PDU sensors to monitor the three types of OEM servers housed in the data center server room. This resulted in an annual cost reduction to the data center of \$20,000 USD.
- Intel® DCM remote management capability enabled IT staff to identify underutilized servers and power them off during off-peak times, lowering operations costs. It also eliminated the need to purchase KVM hardware, which resulted in a five-year savings of \$62,500 USD.

Based on Intel® DCM deployment results, the anticipated annual savings of deploying the Intel® DCM solution across the full 1,000 servers is \$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:

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



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