

# CASE STUDY

Cloud Data Center  
Sohu Internet Company



# Automating Server Efficiency for High-Capacity Data Center

Intel® Data Center Manager delivers significant annual savings by reducing man hours, and improving server utilization and rack density



## Business:

Sohu Internet Company and its subsidiaries based in Beijing offering advertising, search, online multiplayer gaming, and other services



Figure 1. Sohu.com Internet Plaza (Image: Wikipedia)

## Challenges

- Real-time cross-platform server power and thermal data collection
- Server utilization
- Automated discovery for underutilized servers
- Server-level centralized remote access capability
- Cooling analysis and data center environmental health analysis
- Remote access control and IT device power tracking

## Solution

- Intel® Data Center Manager

## Executive Summary

Sohu Internet Company installed Intel® Data Center Manager (Intel® DCM) at its Beijing, China data center. The solution was deployed across 40 devices to gain greater insight into the facility's resource deployment, energy consumption, cooling efficiency, and capacity planning. Through the use of DCM features such as remote access control, automated server discovery, real-time thermal and health monitoring, and cooling analysis, the company sought to improve the overall efficiency of its data center.

The IT administrators for Sohu installed Intel® DCM and immediately began to analyze the thermal health of their servers and to access the power and thermal consumption data in real time. The ability to remotely access servers cross-platform from the convenience of the DCM console dashboard eliminated the need for manual processes and significantly reduced the stress on their operation team. The resulting reduction in man hours, if deployed across the full operation of 3,000 servers, would yield every year savings of \$150,000 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 333 racks, the projected savings would be \$53,280 USD.

Intel® DCM's real-time power monitoring capability provided the team with a list of servers that were idle or underutilized. This awareness and the remote management capability allowed the team to power off unneeded devices during off-peak times from the convenience of their computer screens. This reduction in energy consumption over one year would yield an additional savings of \$94,608 USD.



Figure 2. Intel® Data Center Manager Console

Finally, Intel® DCM's cooling analysis enabled data center staff to safely increase rack density and monitor server health and air temperatures, while simultaneously eliminating the risk of downtime or performance complications. The ability to continuously monitor devices and correct issues in real time yielded a reduction in cooling costs and improved Power Usage Effectiveness (PUE). The resulting energy efficiency and smaller operational footprint would lower monthly space rent and, if deployed over a year period, would save Sohu an additional \$528,000 USD.

## Background

Sohu installed Intel® Data Center Manager (Intel® DCM) at its Beijing, China data center. By deploying DCM across 40 devices, it sought to gain greater insight into the facility's resource management efficiency, energy consumption, cooling efficiency, and capacity planning. There are 3,000 servers that will be managed by Intel® DCM after complete 1<sup>st</sup> deployment in Sohu.

After the IT staff installed the Intel® DCM console, they immediately began to compile and aggregate data from the servers. Through its ease of use and cross-platform support, Intel® DCM enabled Sohu's IT staff to visualize trend data with features like a 2D front-of-rack visibility and overhead mapping.

Intel® DCM is a middleware, web-service API that integrates easily into existing management systems to monitor, manage, and optimize the energy consumption and thermal health of data center servers.

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. The Intel® DCM power, thermal, and health monitoring capabilities also aggregated to the precise server rack, row, and room

to allow efficient management and quick response times. For servers with Baseboard Management Controller (BMC) properties like the company's Dell servers, Intel® DCM also displays server asset tag and serial number.

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

Using manual processes, on-site data center operators need to check server LEDs one-by-one, which requires additional man hours and increases 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 offers precise real-time insight that allows remote operators to access and monitor server power and thermal readings across platforms from the data-rich DCM dashboard.

Intel® DCM found hardware errors in some servers such as storage drive failures, and quickly diagnosed the root cause, which allowed operators insight to implement the recommended fix and reduce downtime. The solution also allowed the Sohu IT administrators visibility into individual servers with subcomponent granularity, and its remote management feature allowed them to manage from the convenience of their computer monitors. By eliminating the need for manual oversight, Intel® DCM allowed operators the ability to better monitor servers from a centralized location — a critical capability in a high-capacity operation like this with devices numbering 3,000 servers.

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

Product confusion over specific Original Equipment Manufacturer (OEM) device requirements can burden IT operators as to the overall component health within their server rooms. Intel® DCM unifies management and supports

multiple, concurrent power policy types, simplifying the optimization of all devices cross-platform.

IT administrators from Sohu saw immediate benefits with the solution's intuitive console. With Intel® DCM, complex, device-specific configurations, and customized setups are not needed.

Additionally, Intel® DCM power consumption monitoring delivered device-level power and thermal data, eliminating the need to purchase hardware PDUs. DCM receives alerts based on custom power and thermal events predetermined by the user.

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 OEMs.

**Intel® DCM Provides Real-Time Cooling Analysis to Strategically Power 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 the Internet Company's ability to strategically lower power usage while maintaining workload scalability. Intel® DCM allows the IT team to identify underutilized devices and schedule the best times to power off servers, significantly reducing operating costs.

Intel® DCM automates device-level collection, management, and analysis of power and temperature readings. 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 Reduces Operational Costs by Increasing Rack Density**

IT operators that use manual processes typically spend 40 percent of their time in capacity planning because current data center designs are not efficient at low loading levels. Further, the inability to access aggregated thermal health data makes repositioning servers difficult.

Using Intel® DCM automated server discovery, IT staff were able to continually monitor devices to aggregate actual power and venting temperature data aggregated to servers, racks, and groups of servers, as well as specific server component health. Leveraging this granular real-time and historical data, the company's IT operations team improved capacity planning by identifying and decommissioning energy-wasting assets, and strategizing new equipment outlays using predictions based on actual energy usage.

Once server data was compiled, the team used it to establish cooling levels in the server rooms. This data provided the foundation for high-precision capacity analysis, reliable capacity planning, and accurate threshold monitoring. Intel® DCM facilitated server redeployment, which also led to a reduction in the required data center space and lowered space rent costs.

After this test deployment, IT administrators confirmed the success of the process transition in the data center and anticipated its value in a broader deployment.

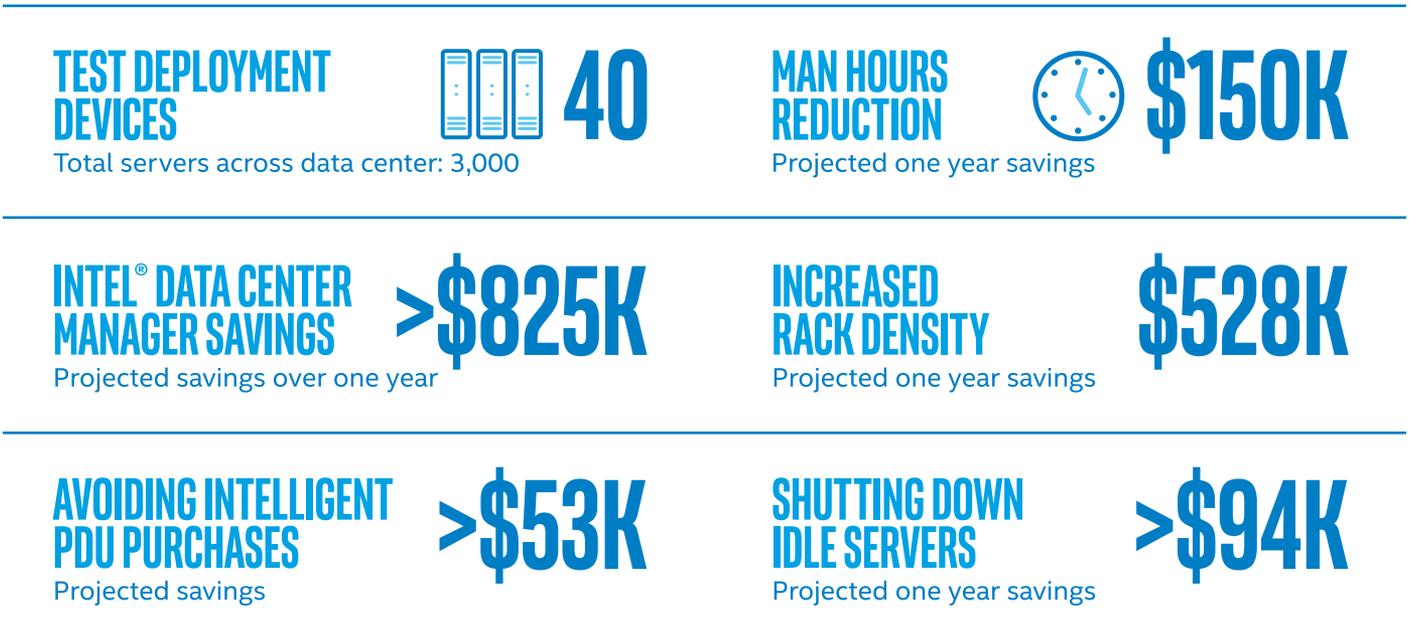


Figure 3. Key Benefits of Intel® DCM

## Intel® Data Center Manager Deployment Results

Sohu established a power monitoring strategy without the purchase of additional hardware infrastructure, including 666 intelligent PDU sensors to monitor its 333 rack and a broad spectrum of OEM server types housed in the data center server room.

Intel® DCM simplified the thermal management functionality within this heterogeneous server environment, which significantly cut man hours, and unified the thermal management and energy efficiency. Using Intel® DCM, IT administrators captured a significant reduction in power spending.

- Intel® DCM implementation helped the IT team achieve cross-platform remote access and visibility transparency, and precise control of the test deployment of 40 data center servers. The reduction in man hours over one year period would significantly lower labor costs by \$150,000 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 \$53,280 USD.
- Based on Intel® DCM enhanced granular visibility into the utilization of their servers, IT staff would be able to turn off idle servers with one year energy savings of \$94,608 USD.
- Intel® DCM would allow the IT team to increase rack density for their 3,000 servers by 10 percent, providing an overall reduction in both cooling costs and space rental, amounting to \$528,000 USD.

Based on Intel® DCM deployment results, the anticipated one year savings of deploying the Intel® DCM solution across Sohu's 3,000 servers is \$825,888 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:

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



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