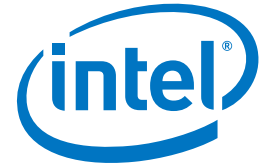


## CASE STUDY

### Intel® Xeon® processor 5600 series

Intel® Data Center Manager

Cloud Computing



# Enhancing Business Advantage

## China Telecom uses Intel® Xeon® processor and Intel® Data Center Manager to implement cloud computing research



“Built on the Intel® Xeon® processor and Intel® Data Center Manager, China Telecom’s cloud computing prototype experimental platform utilized the improved computing and energy-efficient features of the Intel Xeon processor 5600 series and provided reliable testing data for the scaled deployment of China Telecom’s cloud computing framework.”

Ding Shengyong  
Project Manager  
China Telecom

### Introduction

China Telecom is one of the most important telecom service providers in the country. It provides integrated, information-based services for hundreds of millions of users in China, relying on a large number of network bandwidth resources and IDC computer rooms distributed all over the country. With the growing business demands brought by increasing numbers of users and the rapid development of information technology, China Telecom urgently needed to implement cloud computing research and optimize its data center. At same time, it needed to reduce operating costs and energy consumption while further enhancing its business advantage.

### CHALLENGES

- **Optimize data center and increase computing density.** Reduce China Telecom’s cost of operations.
- **Improve the utilization of data center.** Enhance flexibility in managing its business and reduce the cost of introducing new business.
- **Reduce energy consumption of data center.** Enable additional cost savings by reducing power consumption and equipment cooling costs.

### SOLUTIONS

- **Platform deployment.** Intel® Xeon® processor 5600 series and Intel® Data Center Manager.

### IMPACT

- **Enhanced computing capability.** The superior performance of the Intel Xeon processor 5600 series helped to improve the computing efficiency of the data center while allowing more data-intensive computing, enhancing business flexibility and reducing operating costs significantly.
- **Intelligent power management:** Intel® Data Center Manager can monitor and control the data center’s power consumption to help optimize rack density.
- **Accelerate the development of cloud computing:** The experimental platform provides reliable reference data for China Telecom’s cloud computing framework, promoting the further development of cloud computing in this industry.

### Business needs prompt China Telecom to implement cloud computing

China Telecom’s IT infrastructure was slowly becoming a constraining factor in improving business efficiency and expanding the business. “In order to meet ever increasing business needs—whether brought on by the increasing numbers of customers or new business—the only solution has always been to add new servers and build more data centers,” said Ding Shengyong, a project manager at China Telecom. “This model easily results in increasing operational cost, however, due to the limited and cooling capacity and floor space. All of our customers, both enterprise customers and individual customers, hope to meet their information application needs at the lowest possible cost.

“We face big challenges in trying to increase computing density, optimize the data center, and meet our customers’ computing needs while reducing energy. With recent, innovative developments in IT and the emergence of cloud computing, we saw the opportunities for cloud computing research to help us reduce operational costs and energy consumption to provide better services to our customers at lower prices.”



## Incorporating Intel® Data Center Manager into its cloud computing experimental platform, which was based on the Intel Xeon processor 5600 series, laid a solid foundation on which China Telecom could further develop its cloud computing platform.

### Intel helps China Telecom build an open cloud computing platform

Intel worked with the Guangzhou Research Institute of China Telecom to establish an experimental cloud platform to meet China Telecom's operational requirements, based on the Intel Xeon processor 5600 series. Using Intel® Server System SR1690WB with Intel Xeon processor E5540 and x5650 as the core testing platform, China Telecom performed comparison tests against a blade server with Intel Xeon processor L5420. The test made use of massive network traffic data and showed how it could be used to apply cloud computing technology to operational management systems.

### Optimize the data center

China Telecom used a traffic analysis program to analyze and process various amounts of traffic data. The indicator for efficiency was the time required to analyze the data. A shorter time to analyze the data would indicate that the corresponding platform's computing performance was better and the computing efficiency was higher. The test showed that the time needed for processing the same 20 GB test data with the Intel Xeon processor x5650 was 50 to 60 percent of the time needed by the blade server with Intel Xeon processor L5420. "The computing performance of Intel Xeon x5650 processor is very impressive. This means that we are able to complete more computing tasks with

fewer servers. Meanwhile, we can consolidate and take advantage of computing resources using Intel® Virtualization Technology, achieving a significant reduction in operating costs," said Ding Shengyong.

### Controllable data center power consumption

Intel® Data Center Manager is the software technology used for monitoring and managing the power and heating consumption of racks and server groups in the data center. China Telecom performed power consumption tests on the cloud computing platform using Intel® Data Center Manager combined with Intel® Intelligent Power Node Manager. The tests consisted of applying different power loads on the servers to determine the threshold at which the efficiency of server computing performance would not be affected.

"Intel engineers delivered a series of training and guidance on our Intel Intelligent Power Node Manager usage and test methods to help us complete this test. The results showed that we could reduce server power consumption by 8 to 10 percent without affecting computing performance, by controlling the amount of power to the server nodes using Intel Intelligent Power Node Manager," said Ding Shengyong. "Additionally, if the power limit is set too low, Intel Intelligent Power Node Manager will give priority to computing efficiency to meet the application's computing needs. Finally, we have found

### Spotlight: China Telecom

- China Telecom is a very large state-owned telecommunication enterprise. Its main business includes landline phone, mobile communications, satellite communications, Internet access and applications and other integrated information services.
- As of 2009, China Telecom has 194 million landline phone users, 62.36 million mobile phone users and 61.74 million broadband users.
- China Telecom owns not only the largest landline telecommunications network, but also the largest CDMA network in the world.

an accurate method to control the server's power consumption. This provided us sound and precise way on how to reasonably utilize rack space and optimize rack utilization."

### Accelerate the development of cloud computing

The tests enabled China Telecom to achieve its objectives and obtain ample and valuable data and results. As a result, China Telecom gained familiarity with testing methodologies as well as the testing tools and platform. These provided a solid foundation for future test research work. China Telecom also accumulated a lot of performance and power data for future reference. This information will provide China Telecom with technology and solution support for future scaling and deployment of its cloud computing platform or to transform its existing platform and advance the development of cloud computing.

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