

Intel® Xeon® Processor Reduces Grand Cloud's Total Ownership Cost by 40%

Grand Cloud improves its computing density and optimizes its energy utilization with Intel Xeon processor, and establishes SNDA ECU to offer measurable computing resources to its customers



"With assistance from Intel, Grand Cloud has not only defined its SNDA elastic calculation unit (ECU), but also reduced its TCO by 40% from the Intel technology. Consequently, Grand Cloud has gained a significant competitive edge in the cloud computing market segment. Compared with our previous products, our customers can now obtain more objective and measurable cloud computing resources as well as the same operational capability at lower prices."

Du Hai
Chairman, Technical Committee
Grand Cloud

Affiliated with Shanda (SNDA), one of the pioneers of China's gaming and Internet industries, Grand Cloud began offering cloud computing services such as cloud hosting, cloud distribution, and cloud storage in July 2011. Relying on the strong server capabilities of its Wuxi and Beijing Data Centers, Grand Cloud has offered excellent services to over 10,000 customers. The rapid development and expansion of cloud computing platforms has doubled business volumes every quarter. Grand Cloud must step up its operations to meet new opportunities and challenges brought about by unprecedented growth.

CHALLENGE

- **Quantify computing resources.** Grand Cloud needs to provide measurable and guaranteed computing resources for its customers.
- **Reduce TCO.** Grand Cloud needs to reduce the cloud computing platform's total cost of ownership (TCO) to stay viable in a fiercely competitive cloud computing market segment.
- **Optimize power management.** A server's cost of power is almost the same as that of its cost during its useful life. Grand Cloud needs a vehicle to manage and optimize each server's energy use.

SOLUTION

- **Define the Grand Cloud Elastic Calculation Unit (ECU).** With newly defined ECU as resource allocation units, Grand Cloud customers can obtain more predictable cloud computing capabilities.
- **Deploy Intel® Xeon® processor E5 series.** Grand Cloud selected cost-effective servers based on the Intel Xeon processor E5 series with Intel® Intelligent Power Node Manager to lower.

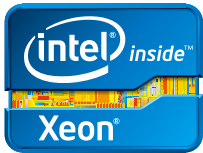
IMPACT

- **Improved computing density.** Grand Cloud's tests have demonstrated that the Intel Xeon processor E5 series has strengthened operational performance by 40% comparing to previous generations, and Intel® Hyper-Threading Technology (Intel® HT Technology) further improved performance by 20 to 25%.
- **Efficient energy utilization.** Powered by the Intel Xeon processor E5 series with built-in Intel Intelligent Power Node Manager, Grand Cloud is able to optimized energy use and improve cabinet utilization by an additional 20 to 30%.
- **Reducing TCO.** Grand Cloud reduces the Total Cost of Ownership (TCO) of their cloud computing platform by 40%.

Lack of standards to quantify computing capability

In the public cloud computing industry, one common service is infrastructure as a service (IaaS) for customers to build a computing pool with servers. Cloud computing services are provided in the form of virtual machines. The processor's cores always determine the number of these virtual machines, and the processor's clock frequency and the cores engaged define the virtual machine's operational performance and price. Grand Cloud is no exception. However, with the rapid development of the cloud computing market segment posed operational challenges.

Du Hai, chairman of Grand Cloud's Technical Committee, said, "We are unable to provide a clear operational performance standard for our customers. Since current servers have different loads, competition for the computing core's resources would lead to varying operational performance. What may take an hour in a certain application may take two hours or half an hour in another, at a different time. The erratic performance has puzzled our users."



Powered by the Intel® Xeon® processor E5 series, Grand Cloud has improved its cloud computing platform's computing density and has optimized server power management, reducing TCO by 40%

A redefined operational resource measurement

Intel assisted Grand Cloud in developing the SNDA ECU measurement system, which provides a more accurate measurement of virtual machine compute capacity. Four SNDA ECUs are roughly equivalent to the performance of a single core 2.0GHz Intel Xeon processor.

The SNDA ECU is now a business advantage to Grand Cloud. Du Hai said, "First, our customers can now clearly understand the operational performance of the cloud hosts they purchase. Operational performance is objective, guaranteed and unaffected by the heavy load of other cloud hosts. Second, we can now consistently provide standard operational performance data for our users, whatever the processor is."

High TCO

Grand Cloud's TCO is relatively high under current operating conditions. Grand Cloud considered cost as one of the most important criteria when it purchased new servers. Grand Cloud has realized that, in this old assessment framework, price took precedence over other important considerations, such as computing capability, cabinet space, and energy consumption. "For example, every server would take a certain amount of space in the Internet Data Center (IDC) cabinet. If one cabinet can accommodate 10 servers, then each server, during its service life, would consume CNY20,000 in terms of cabinet cost. Thus, if the server's computing capability per unit space is doubled, CNY20,000 can be saved for such a server. Moreover, if all factors are carefully considered, including computing capabilities, cabinet cost, network and management fees, a processor with higher operational performance would contribute to a lower TCO," said Du Hai. "To stay competitive, Grand Cloud needs to redefine its cost calculation to reduce its TCO."

Improved computing density, lower TCO

Next, Intel offered Grand Cloud Intel Xeon processor E5 series-based servers for testing. "Grand Cloud gained unexpectedly excellent test results. According to the SNDA ECU measurement, the Intel Xeon processor E5 series has improved its operational performance by 40%, compared to previous generations of Intel processors and other systems we tested. With Intel HT Technology, performance can even be improved by an additional 20 to 25%."

Du Hai continues, "Based on these test results, if we replace all the current racks with Intel Xeon processor E5 series, we can provide services to more customers, significantly reducing our TCO. In the next larger-scale procurement plan, we will be prioritizing Intel Xeon processor E5 series-based servers for our Grand Cloud computing platform."

Optimized energy utilization and management

Thanks Intelligent Power Node Manager built into the Intel Xeon processor E5 series, Grand Cloud's IT administrators can read and analyze server parameters such as current energy consumption and utilization, and use these data to achieve precise power management. Du Hai said, "For example, we can now assume a server's rated power to be 500 watts, and the administrator can evaluate previous server performance. If the server's energy consumption has never exceeded a certain amount, like 200 watts for instance, he can then make adjustments to the server's energy consumption to a maximum of 300 watts. He does not need to worry about any negative impact. We can save 200 watts of energy consumption and deploy more servers on the rack. Furthermore, we can reorganize and adjust server racks based on actual energy consumption data. A preliminary estimate concludes with a 20 to 30% increase in rack utilization. This can help us lower our TCO further."

LESSONS LEARNED

- In the public cloud computing industry, the powerful Intel Xeon processor E5 series is used to improve computing density, thereby significantly reducing TCO.
- The Intel Intelligent Power Node Manager helps obtain parameters such as the equipment's energy consumption and utilization rate, making precise energy management possible.
- Compared with traditional measurement methods, which are based on the processor core's cost/performance, the ECU-based measurement is a more scientific and objective basis for server purchase. Computing resource utilization can be enhanced as well.

Reducing TCO will help Grand Cloud to gain a significant cost advantage in the cloud computing market segment. The customers of Grand Cloud can thus have the same computing capabilities at lower prices, or have more computing capabilities with the same investment. More importantly, although this computing capability exists in the form of virtual machines deployed in the physical servers, performance will be consistent, even with several virtual machines competing for computing resources. "This is very important for our customers," explained Du Hai. "We would not offer different computing periods in different times for the same applications anymore. In other words, our clients are now enjoying 'exclusive' computing performance as if they bought physical servers for themselves."

Grand Cloud will continue to collaborate with Intel, adding Intel® Solid-State Drives and Intel® Ethernet Converged Network Adapters to help maintain its leadership in the public cloud computing field.

Find a solution that's right for your organization. Contact your Intel representative, visit Intel's Business Success Stories for IT Managers (www.intel.com/itcasestudies) or explore the Intel.com IT Center (www.intel.com/itcenter).

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(HT Technology) is available on select Intel® Core™ processors. Requires an Intel® HT Technology-enabled system. Consult your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information including details on which processors support HT Technology, visit <http://www.intel.com/info/hyperthreading>.

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