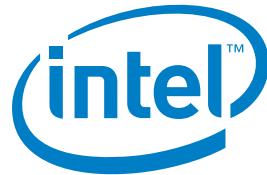


CASE STUDY

Intel® Xeon® Processor E5 Family

Enterprise Server

High Performance, Reliability, Intelligent Virtual Network



Facing Network and Data Demands with Customized Intelligent Cloud

ChinaCache has built a content-aware, one-stop cloud service powered by the Intel® Xeon® processor E5 family to help it address today's growing network and data challenges



"ChinaCache's content-aware cloud-stop service is the new-generation CDN service prepared to face the challenges of the cloud era. Through the Intel® Xeon® processor E5 family's excellent processing performance, powerful I/O and network performance, and high reliability, ChinaCache's content-aware cloud-stop service has gained high recognition from our end-users."

Founded in Beijing in 1998, ChinaCache International Holdings Ltd. (ChinaCache) is China's leading professional content distribution network (CDN) service provider, committed to providing a full range of network content quick distribution solutions. As 2000's first CDN service provider approved by the Ministry of Information Industry, ChinaCache currently operates service nodes in a number of cities across the country and covers major Chinese operators like China Telecom, China Unicom, China Mobile, and China Education and Research Network, providing its customers high-quality CDN services. In 2007, ChinaCache set up a subsidiary in North America, extending its network to customers in the regions of North America and Europe.

CHALLENGES

- **Improve CDN network.** Evolve from traditional into a new-generation CDN network to meet the challenges of new network application models.
- **Increase network performance.** Handle mass network data through high-performance processing to give users a faster surfing experience.
- **Improve power consumption and I/O transmission.** Allow I/O traffic to transmit efficiently to reduce power consumption and eliminate I/O delay.

SOLUTIONS

- **Launch new-generation, content-aware, one-stop cloud service.** Build a more intelligent virtual network that will provide a more dynamic, efficient and reliable Internet experience for end users.
- **Deploy network servers with Intel Xeon processor E5 family.** Achieve superior processing performance and increased network bandwidth of the new CDN network to bring faster surfing experience for end-users.
- **Intel® Data Direct I/O Technology (Intel® DDIO).** Directly transmit the I/O traffic to the processor cache to reduce transmission process to the system memory while decreasing the system's power consumption and I/O delay.

IMPACT

- **Enhanced and more intelligent CDN services.** Intel Xeon processor E5 family-powered CDN network effectively responds to exponentially growing, massive network data and provides data for data-hungry applications.
- **Increased data center bandwidth.** Faster and highly reliable CDN network enhances end-user experience.

Introduction

As China's leading CDN service provider, ChinaCache has always committed itself to providing its users with first-class Internet experiences through its CDN services. CDN is a service network that supports users in surfing the Internet faster and more smoothly. Through the servers in the nodes of the Internet, CDN constructs an intelligent virtual network on the Internet, gathering real-time information such as network traffic, node connections, load conditions, as well as distances of the individual end-users and the response time. With this capability, CDN can direct the end-user's request to the nearest service node to help him obtain the network content in this node. Through CDN, the congestion that can build on the Internet can be resolved, helping improve user access speed for a better and faster surfing experience.

With the launch and development of a variety of new technologies, however, the Internet is facing great changes that a CDN network should keep up with. The Internet terminal is no longer confined to

Yuanhao

Senior Director of Cloud Product BC
ChinaCache International Holdings Ltd.



With help from Intel, ChinaCache has successfully introduced the secure, reliable, and high-performance Intel® Xeon® processor E5 family into its new generation of content-aware, one-stop cloud services, providing its end-users more intelligent and dynamic services

a single PC, but has diversified to include other access ports such as smartphones and tablet PCs. Also, Internet carriers have been evolving from the traditional fixed-line-only model.

To keep pace with these developments, ChinaCache has set its sights on enhancing the performance of its CDN services. Its aim is to build a new-generation, content-aware, one-stop cloud service that will encourage more dynamic and intelligent end-user behavior and to provide an efficient and reliable Internet experience.

Facing the challenges of the new Internet era

ChinaCache's existing CDN network is built primarily for traditional Internet applications, but with ever-changing network forms and terminals, ChinaCache looks at improving its CDN network to suit the changes.

"Take the network terminal as an example. The traditional Internet terminals are basically PC-based. But in today's Internet terminals, smartphones and tablet PCs account for an extremely large proportion. This means our CDN network must deal with many more network application models involving more complications," explains Yuanhao.

To respond to these changes, ChinaCache has thought of improving its traditional CDN service by creating a new-generation, content-aware, one-stop cloud service that will be able to provide its end-users a network information service that is smarter and more dynamic.

Building the next-generation CDN network

The processing capabilities of the CDN network to deal with all the data generated from the virtual network will have a direct impact on the quality of the CDN service.

Therefore, choosing a powerful processor has always been ChinaCache's key concern.

In the process of building its CDN network, ChinaCache sought the help of Intel. Intel has gained high recognition from ChinaCache since it has been providing high-performance server processors for a long time. There was no doubt in ChinaCache's mind that working with Intel would ensure that significant improvements would be made in the existing CDN network framework.

To help ChinaCache make more achievements in the new generation of content-aware, one-stop cloud services, Intel introduced the Intel Xeon processor E5 family in the design for the CDN network. With its powerful processing performance, the Intel Xeon processor E5 family provided stronger virtual network data processing capabilities, integrating up to eight cores and supporting 768GB of system memory. Compared with the previous-generation Intel Xeon processor 5600 series, the Intel Xeon processor E5 family has improved the performance of the CDN network by 80 percent¹.

Intel Xeon processor E5 family can also support Intel® Advanced Vector Extensions (Intel® AVE) instruction set, and improves compute-intensive application performance by two times, such as the commonly used data analysis and high-performance computing performance in the CDN services. Furthermore, the introduction of a range of unique built-in technologies, including the Intel Xeon processor E5 family's Intel® Turbo Boost Technology², Intel® Hyper-Threading Technology³ (Intel® HT Technology) and Intel® Virtualization Technology⁴, has helped ChinaCache flexibly and dynamically improve the performance of the content-aware, one-stop cloud service infrastructure.

Enhancing surfing experience with powerful I/O and network capacity

As a CDN service provider, ChinaCache aims to provide its end-users better Internet experiences. When using ChinaCache's services, users should be able to enjoy smooth network access. In this process, it is important for the CDN network server processors to have powerful I/O and network performance.

Through the Intel Xeon processor E5 family, which uses Intel® Integrated I/O Technology (Intel® IIO) and Intel® Data Direct I/O Technology (Intel® DDIO), ChinaCache's new content-aware, one-stop cloud service effectively responds to the exponentially growing massive network data, and at the same time provides data for data-hungry applications while increasing the data center's bandwidth. The introduction of Intel DIDO technology has helped ChinaCache's content-aware, one-stop cloud service to directly transmit the I/O traffic to the processor cache, thereby reducing the process of transmitting to the system memory and eventually decreasing the system's power consumption and I/O delay.

In addition to these, the Intel Xeon processor E5 family integrates an I/O controller that can support the PCI Express® 3.0 standard. Compared with the previous generation of products, this function reduces the I/O delay by 30 percent⁵. What's more, when combined with PCI Express 3.0, it can increase the throughput by more than three times.

By building a high-performance, content-aware, one-stop cloud service, ChinaCache has redefined CDN service, giving its users better and enhanced Internet service.

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).

¹ Compared with the previous generation of Intel processor. It is the internal estimated results from Intel. To learn more legal information about the performance estimates, please visit: <http://www.intel.com/performance>

² Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your PC manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit <http://www.intel.com/go/turbo>

³ 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>.

⁴ Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, and virtual machine monitor (VMM). Functionality, performance or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit <http://www.intel.com/go/virtualization>

⁵ Intel measurement data, the average time required to read data from the local system memory when the I/O device is in the idle state. It refers to the performance improvement of Intel Xeon processor E5-2600 family compared with Xeon processor 5600 family.

This document and the information given are for the convenience of Intel's customer base and are provided "AS IS" WITH NO WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NONINFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. Receipt or possession of this document does not grant any license to any of the intellectual property described, displayed, or contained herein. Intel® products are not intended for use in medical, lifesaving, life-sustaining, critical control, or safety systems, or in nuclear facility applications.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

©2012, Intel Corporation. All rights reserved. Intel, the Intel logo, and Intel Xeon inside are trademarks of Intel Corporation in the U.S. and other countries.

*Other names and brands may be claimed as the property of others.

0912/JUX/PMG/XX/PDF

328032-001US