

CASE STUDY

Intel® Xeon® processor 5600 series

Cloud Computing

Performance: Data-intensive computing



Using Leading Technology to Ensure Quality Service

Intel® Xeon® processor 5600 series helps 21ViaNet's cloud computing platform maximize its virtualization technology advantages



"The significant advantage and superior performance provided by Intel® Virtualization Technology and the computing performance of the Intel® Xeon® processor 5620 meet our needs to upgrade our cloud computing platform servers and enable us to deliver an Internet infrastructure service to our customers with a cloud computing mode while reducing costs and improving services at the same time."

Jjiang Jianping
CTO

CloudEx Technology Co., Ltd.

Introduction

As a company focusing on R&D and business applications for cloud computing services, 21ViaNet launched the first business computing service platform in China, CloudEx Elastic Computing Platform*, in January 2009. It provides Internet infrastructure services to customers with a cloud computing mode using Intel® Virtualization Technology. With the growing recognition of cloud computing services in China, 21ViaNet faces new challenges caused by the growing number of customers and their fast-changing business needs.

CHALLENGES

- **Meet growing customer needs:** 21ViaNet wants to further adjust and optimize its CloudEx Elastic Computing Platform using new technology to meet the increasing needs of its customers.
- **Improve the reliability of virtual machines:** To 21ViaNet, more stable virtual machines with lower failure rates mean better service quality.
- **Enhance server's supportability for virtual machines:** Improving the supportability of a single server can reduce the operating costs of 21ViaNet.

SOLUTIONS

- **Upgrade to Intel® Xeon® processor 5620:** Intel® Xeon® processor 5600 series meets the upgrade demands of 21ViaNet's CloudEx Elastic Computing Platform with its advanced virtualization features, which provide double the computing performance of older-generation processors.

IMPACT

- **Improve service quality:** Virtual machines are more reliable and customers get better user experience by using Internet infrastructure. With the same investment, 21ViaNet can provide better service to its customers.
- **Reduce operating costs:** More virtual machines can be deployed without adding physical servers and space for racks, resulting in lower business operating costs.

The number of customers is growing

21ViaNet has more than 1,000 servers. Its CloudEx Elastic Computing Platform has successfully delivered reliable cloud computing infrastructure services to more than 2,000 customers for their Internet applications using Intel® Xeon® processor 5100 or 5400 series and installing more than 8,000 virtual machines. These customers are from different fields such as online games, application development, logistics platform applications, and website applications. More and more customers began to choose infrastructure services based on cloud computing. 21ViaNet needed to upgrade its CloudEx Elastic Computing Platform to meet increasing customer demands.

Improve the reliability of virtual machines

"There are two aspects involved in the reliability of virtual machines," explained Jjiang Jianping, CTO of CloudEx Technology Co., Ltd.

"First, virtual machines should be able to run stably on physical servers. More importantly, when customers make new demands for computing power and virtual machine storage capacity, the



Intel® Xeon® processor 5600 series provides an ideal operating environment for 21 ViaNet's CloudEx Elastic Computing Platform and also meets future demands with its advanced Intel Virtualization Technology advantage and more powerful computing performance.

virtual machines can obtain the resources stably from their current servers or migrate to other physical servers with more powerful computing performance and larger storage capacity to provide constant, elastic computing service. Today, customers need greater flexibility from an Internet infrastructure service. Therefore, we need to use more advanced technology to guarantee the reliability of virtual machines."

Enhance server's supportability of virtual machines

With limitations on processor computing performance, 21 ViaNet deployed about 10 virtual machines to each physical server. With a growing number of customers and physical space limitations, 21 ViaNet found that deploying a processor with better computing performance enabled a single server to support more virtual machines.

21 ViaNet deployed Intel Xeon processor 5620 on 300 servers after a detailed validation and comparison test. Jiang Jianping, from CloudEx Technology said, "Virtualization is the core and base of 21 ViaNet's CloudEx Elastic Computing Platform. Supporting the next generation of Intel Virtualization Technology is our most important reason for choosing the Intel Xeon processor 5600 series."

Enhance reliability of virtual machines

Intel Xeon processor 5620 supports the new generation of Intel Virtualization Technology,

optimizing resource management at the hardware level of the translation look-aside buffer (TLB). By adding one virtual processor ID (VPID) to each TLB item, 21 ViaNet can identify the address space of different virtual processors, reducing delays in address transformation for virtual machines and improving their performance further. Moreover, the hardware-aided Extended Page Tables management function transforms the virtual machine's memory address to a physical address through hardware assistance. This can save the overhead caused by traditional software processing methods and also reduce the number of virtual machine address transformations. Both the stability of virtual machines and the reliability of migration are further improved.

Jiang Jianping, from CloudEx Technology said, "Starting with the Intel Xeon processor 5500 series, we tested and validated EPT and VPID technology. By adjusting the virtualization software, the virtualization hardware technology can help us efficiently accelerate the deployment of virtual machines, improve their stability, and enhance their performance. For example, EPT and VPID reduced startup time by 30 percent."

Superior computing performance

"Intel® Xeon® processor 5620 can provide double the computing performance of the 5400 series, so we can deploy more virtual machines to a single server with the same rack space," said Jiaping "This

Spotlight: 21 ViaNet Group

- 21 ViaNet Group is the largest telecom-neutral integrated data center industry group and the leader in cloud computing and new-generation, energy-smart data center innovation technology in China.
- In January 2009, 21 ViaNet launched the first business cloud computing service platform in China, CloudEx Elastic Computing Platform.
- 21 ViaNet Group owns a telecom-level data center with over 10,000 m² in Beijing, and also owns several large telecom-level data centers with over 50,000 m² in southern and eastern China and other areas.

enables us to provide more diversified and flexible Internet infrastructure service to more customers and reduce overall business operating costs further. As a firm advocate and practitioner of cloud computing in China, we will continue to cooperate with Intel to explore Intel's innovative technology to further the development of cloud computing in China."

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Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, 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>

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