Case Study
Intel® Xeon® Processor 5600 Series
Intel® Solid-State Drives
Enterprise Server

Fewer Servers and Faster Image Loading

Intel® Xeon® processor 5600 series and Intel® Solid State Drives help to improve the efficiency of CNTV's image servers

CNTV 中国网络电视台

"With outstanding data accessibility, Intel® SSDs can satisfy CNTV's stringent requirements for image servers. Today, not only can each image server accommodate three to four times the original user loads, but data access is also faster."

Bai Jian
Executive Director of
Operations system Department
CNTV

Introduction

CNTV is a national TV broadcast organization and a global, multilingual, and multi-terminal public network video service platform. It focuses on interactive A/V content and combines both the Internet and the TV network. Today, CNTV stores 30 million images on its website across 500 image servers globally. It also provides browsing services to users. With the growing credibility and authority of CNTV, the increasing number of its users, and the growing number of visits to its website, CNTV is facing new business challenges.

CHALLENGES

- **Increase image loading speed.** CNTV needs to decrease the average loading speed of images from 70 milliseconds to 50 milliseconds to optimize user experience and improve service quality.
- **Optimize server utilization ratio.** More images require more servers and additional floor space. To accommodate its future needs, CNTV needs to increase the performance efficiency of its image servers while reducing space requirements.

SOLUTIONS

- **Deploy Intel® Solid State Drives (Intel® SSDs) for image servers.** One original SAS* hard disk of the servers is kept for installation of the operating system and two 160G Intel® High Performance Solid State Drives are adopted for image storage.

Impact

- **Improve service quality.** Intel SSDs enable CNTV's image servers to double access performance while reducing delays and providing improved customer service.
- **Enhance user experience.** Intel SSDs reduce the average image load time from 70ms to 50ms, which enhances the customer experience.
- **Number of servers reduced by about 50 percent.** By incorporating Intel SSDs, each image server can accommodate three to four times the original user loads, allowing CNTV to expand by approximately 50 percent without incurring additional equipment costs.

Increase image loading speed

Since its launch in December 2009, CNTV has rapidly won the recognition and support of cybercitizens by relying on the natural advantages of a traditional TV platform and its innovative product design concept of a "participatory TV experience." With the continuous and rapid growth in the number of users, its website visits have grown by leaps and bounds. "Over the span of six months last year, we received numerous complaints from our users concerning the low display speed when using our website, especially when the tasks involved images. They even had to manually refresh their computers to display images. That has severely affected our user experience," Bai Jian of CNTV says. "We needed to find a solution to the delays in image loading to reduce the time for image loading."

CNTV uses Intel® Xeon® processor 5600 series and Intel® SSDs to double access to the image servers' data and enable each server to accommodate three to four times the original user load.

Optimize server utilization ratio

Images consume the majority of Internet server resources. CNTV has deployed 500 image servers based on the Intel® Xeon® processor 5500 series and furnished with six SAS hard drives each. SAS hard drives are used as RAID 5 arrays to increase data security and accessibility. "However, such an optimization does not work effectively to improve the performances of image servers due to restrictions on the designs of traditional mechanical hard drives," explained Bai Jian. "Tests show that the hard drives can hardly accommodate the massive demands for data reading, although its arithmetic capability and the memory can still accommodate more users. It is highly urgent to break the bottleneck of data accessibility and further optimize the utilization ratio of image servers. Otherwise, we will have to purchase more image servers to accommodate the continuously increasing number of images and users. This solution is not only restricted by our machine room capacity, but also predicted to drive the costs of our server administration and maintenance."

Considering CNTV's requirements for image server loads and performance, and through prototype tests, Intel has managed to win CNTV recognition with the excellent performances of Intel SSDs. As a result, CNTV has deployed an image server solution based on the Intel Xeon processor 5600 series and Intel SSDs for CNTV's 500 image servers.

Faster image loading speed

With the solution, one original SAS hard disk is kept for installing the operating system and two 160G Intel High Performance Solid State Drives are adopted to replace the remaining five SAS hard drives. Different from traditional mechanical hard disk drives, Intel SSDs have no moving parts. Not only can they be directly installed on the SATA interface of the original server, but they also support as many as 32 synchronous operations with their native command queues (NCQs). This leads to a higher input/output speed per second. They have much higher data throughput than traditional hard disk drives. As Bai Jian said, "Tests show that Intel SSDs can satisfy our requirements for image server performance including less writing but massive reading operations, small and numerous files, and high random data accessibility. Our statistics show that we have managed to double the original data accessibility with this solution and reduced the average image loading time from 70ms to 50ms. Our users experience virtually no delay in their visits to the CNTV website and our user experience is excellent."

Full utilization of image servers

The Intel Xeon processor 5600 series, with its high computing ability, and Intel SSDs, with their excellent data accessibility, are both ideal for this solution. Each CNTV image server can accommodate three to four times the original user load now. "This is very important to us because we can fully use the computing and storage capacity of each server. In other words, our image servers can serve more users and satisfy our operating needs while our machine room space remains the same," says Bai Jian.

Spotlight on CNTV

- CNTV was formally launched on December 28, 2009, and is now the national network TV broadcast organization in China.
- CNTV has a rich reserve of 450,000 hours of excellent historic image data and also 1,000-plus hours of video programs, which run on a daily basis on all television stations across China.
- So far, CNTV has launched 10 products including homepage, client end, News Channel, Sports Channel, Entertainment Channel, Xiyou Channel, Bugu Channel, Film Channel, TV Series Channel, Economy Channel, Discovery Channel, and Documentary Channel, as well as the User Center and the Customer Service Center.

Extra gains

In the absence of mechanical parts, Intel SSDs have lower energy consumption and produce less heat. Meanwhile, Intel Xeon processor 5600 series produces intelligent energy savings and can automatically and intelligently adjust power consumption and server capacity according to workload demands. Bai Jian says, "We are very satisfied with the working effects of Intel SSDs because they are more environmentally friendly and energy efficient and have a lower fault rate than the annual mean fault rate of about three percent with mechanical hard drives. No Intel SSDs have failed in the last year since adopting the new solution. CNTV will continue to cooperate with Intel in 10,000M network cards and new-generation SSDs".

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