

Success Brief

Intel® Xeon® Processor

High Performance Computing Platform

Crystal CG Ltd.

Accelerate Animation Rendering

Intel® Xeon® Processor Helps Crystal CG Build a First-Class Animation Rendering Platform



"After using Intel® Xeon® processor-based large-scale cluster rendering system provided by Dawning, we can carry out one month of previous rendering workload in one week now."

Fang Fan
Technical Director
Crystal CG Ltd.

Challenges:

As the world's leading digital visualization technology and service provider, Beijing Crystal CG Ltd. ("Crystal CG") assumed the key responsibility to provide digital imaging contents for more than 10 events throughout the 60-minute opening ceremony of the Beijing 2008 Olympic Games, including providing all digital imaging contents for the 145.5m floor screens and 492m bowl edge screens on the top of the Bird's Nest as well as providing a portion of digital imaging contents for onsite relay screens during the opening ceremony. As required, Crystal CG should display the Chinese traditional cultures and elements ingeniously and creatively within a limited time, and present to the world an opening ceremony of the Beijing 2008 Olympic Games with colorful images, unique designs and high technological contents on August 8. Crystal CG urgently needed to find a higher performance rendering platform, and use it to carry out the digital imaging content rendering task for the opening ceremony of the 2008 Olympic Games.

Solution:

Crystal CG partnered with Beijing Dawning Tianyan Information Technology Company Limited ("Beijing Dawning") to build a cluster rendering platform of 260 Dawning TC2600 blade servers with built-in Intel® Xeon® processors, and break down digital imaging rendering work into small units, and carry out rendering at each rendering node. By using the Intel Xeon processor-based Dawning TC2600 high performance blade servers, Crystal CG increased rendering speed by 4-fold, and successfully carried out the task of rendering digital imaging contents for the opening ceremony of the 2008 Olympic Games.

Challenges Faced by Crystal CG

Crystal CG, established in 1995, is one of the largest digital visualization technology and service providers in Asia. Crystal CG officially became the "Imaging Design Service Provider of the Beijing 2008 Olympic Games" in 2006 and the general contractor of the imaging and operating project for the opening (closing) ceremony of the Beijing 2008 Olympic Games in 2008. As a result, it assumed the key responsibility to provide digital imaging contents for more than 10 events throughout the 60-minute opening ceremony of the Beijing 2008 Olympic Games, including providing all digital imaging contents for the 145.5m floor screens and 492m bowl edge screens on the top of the Bird's Nest as well as providing a portion of digital imaging contents for onsite relay screens during the opening ceremony.

To present the various Chinese traditional cultures and elements ingeniously and creatively to the world, Crystal CG faced unprecedented pressure to carry out such a large-scale digital imaging task within a short time for the first time ever at home or abroad. Well experienced in digital imaging, Crystal CG first thought of the most-timing rendering difficulty of how to conduct coloration and color conversion via the animation model built in computer to reflect the visual effects of color, texture and lighting changes, and display more vivid animation images. In the face of digital imaging rendering of such high quality, large size and long duration, there is an unimaginably large volume of data that needs to be computed, and there is no way to meet such demand using the traditional rendering method.

Crystal CG was then in urgent need of building an efficient, fast and top quality rendering platform to ensure the grand success of the opening ceremony of the Olympic Games.

Solution

As China's high performance computing leader, Beijing Dawning immediately contacted Crystal CG after becoming aware of such needs, and proposed the "cluster" solution within the shortest time possible. As a result of technological discussion and justification, both parties eventually built the Dawning "cluster rendering" system composed of 260 Dawning TC2600 blade servers with built-in Intel® Xeon® processors.

Each node system of Dawning "cluster rendering" system is connected via Gigabit Ethernet; all computing nodes of 10GB backbone network are regulated by management and distribution servers in a unified way; file servers are responsible for managing storage and establishing data sharing between computing nodes. The front end 2D and 3D design group can submit rendering tasks by establishing connection via gigabit network to the distribution and management server; the rendering tasks are then distributed and managed by the rendering distribution and management software installed on the rendering cluster. All rendering results are stored in the file server's disk array. The front end design and production team can directly access data in the file server through Gigabit Ethernet, and thus increase the rendering rate to a level more than four times higher than the traditional rendering mode.

The entire rendering platform is based on Dawning's TC2600 blade servers, which support Intel Xeon 5000 processor series, and deliver superior computing performance and reliable stability. TC2600 blade servers have boosted rendering platform flexibility. Such servers can meet the performance requirement for high density computing to process massive data. In addition, the extensive product line of Intel Xeon 5000 processor series can satisfy the changing business demands of Crystal CG.

"Digital imaging rendering is heavily dependent on the processor's computing capability. With excellent performance, stable operation and superior computing capability, Intel® Xeon® processors are particularly suitable for high density computing application in the digital imaging rendering process."

*Shao Zongyou,
General Manager, Technical Support Center
Dawning Information Industry (Beijing) Co., Ltd.*

Intel Xeon processor plays a vital role in Dawning's "cluster rendering" system:

- **Reliable operation:** Intel Xeon processor based servers have the industry-leading reliability, and can ensure uninterrupted system operation 7x24 around the clock.
- **Excellent performance:** Intel Xeon processors not only have powerful floating point computing capability, but also possess enormous performance expansion space and unmatched multi-task processing capability. Such processors are particularly suitable for carrying out the high density computing task of digital imaging rendering.
- **Easy to expansion:** Under the higher performance and density computing environment, the extensive product line of Intel Xeon processor family can easily meet any demand for performance expansion.

Benefits and Business Values

The Intel Xeon processor-based Dawning "cluster rendering" system offers tremendous benefits for Beijing Dawning and Crystal CG in the following ways:

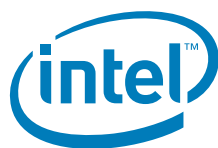
- **Stable and reliable rendering platform operation** avoids rendering platform productivity decline due to system failure.
- **Four-fold rendering rate increase** over the original rendering mode ensures Crystal CG to carry out the digital imaging task for the

opening ceremony of the Olympic Games on time as per high quality standards and boosts the core competence of Crystal CG.

- **Reducing the total ownership costs of Crystal CG.** The Intel® architecture based cluster rendering platform can realize simple, centralized and effective management, and make dynamic adjustments based on customer demand for performance. In addition, the total ownership costs can be reduced as a result of automatic power supply and cooling policy optimization, space savings and deployment efficiency increase.
- **The cluster rendering platform's success** not only demonstrates the innovation capability of Beijing Dawning with proprietary intellectual property rights for blade servers, but also further strengthens the international influence of Beijing Dawning.

As an emerging industry, digital animation is heavily dependent on high performance computer, and in boundless demand of computing capability. Computer technology progresses can enhance the development and maturity of the animation industry. As a platform to realize creative ideas, the large-scale, high-reliable and high performance server cluster can help users more efficiently carry out imaging rendering work. Crystal CG and Beijing Dawning will work together to further optimize the structure and performance of Intel® architecture based cluster rendering platform, and boost digital imaging rendering efficiency on a continuous basis.

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